Striving for innovation – A Triple Helix exploration of how one Irish college is pursuing this goal

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Abstract

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Universities are central in the creation and diffusion of the knowledge required to advance the notion of the Knowledge Economy. This economic conceptualisation of the university has resulted in the traditional teaching and research oriented university becoming “entrepreneurial”, resulting in the university’s so called third mission to innovate. Many higher education institutions, in particular the organisation under investigation, a former vocational education body, now recognised college, are only engaged in the teaching and learning function. This research explores how such institutions strive to innovate through interaction with university, industry and government actors.

A case study methodology, utilising the Triple Helix Model as a conceptual theoretical lens to investigate innovation was employed. The Triple Helix Model emphasises the role of networks in the description and prescription of approaches to innovation. Eleven semi-structured interviews with participants from Industry and University were conducted. To account for the government perspective, Critical Discourse Analysis on Ireland’s seminal innovation policy text was conducted.

The data generated from the interviews and analysis of the policy text highlights that people have different conceptualisations of what innovation is. Most examples cited were in fact process improvements and did not conform to a triple helix conceptualisation of innovation.

I contend the model does not adequately account for higher education institutions only engaged in teaching and learning. The Triple Helix Model’s skewed view, favours certain disciplines over others, e.g. science, engineering, more product focused disciplines that lead to the commercialisation of its research more readily. For institutions like the Institute, innovation occurs when graduates return and apply the learning in their workplace. Most of the time it may be process improvements that result but some may produce big “I” innovations.

The model can still be used as a tool to understand the importance of networks and the power imbalance between actors. All actors are assumed equal yet what emerges in this research is the dependence of institutions such as the Institute, a college with a narrow discipline, no research remit, only engaged in human capital development on government and industry engagement. The view from Industry, Government and internally is the Institute exists to serve their needs. This resonates with the analysis of the policy text promulgating a hegemonic government position, placing higher education secondary to economic aims.

The implication of this study for the Institute is recognition on their part of the need to lessen their dependency on any one relationship and become more of an active participant in networks of multiple actors.

Dedication

This dissertation is dedicated to my beautiful family, Tess, Grace and Daniel .Eventually, whatever the outcome, I am back with you.

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This research would not have been possible without the respondents who gave so selflessly of their valuable time to be interviewed. I thank them for their insights and honesty. My colleagues always encouraged me and assisted me whenever they could. I work with the best and brightest. They know who they are. The financial support provided by my employer is gratefully acknowledged.

My thanks go to my fellow EdD students. I think you have become my academic family of sorts as your support and insights assisted me greatly in navigating this path.

To friends and family, thank you for all your kind wishes and support over this journey. I am looking forward to spending time with you all again. Special thanks must go to my Mam and my sister, Mary and Margaret Murphy. From an early age they had their work cut out with me. Their unfaltering belief in me has, I hope, now been justified.

To my father, John B. Murphy (RIP), thank you dad for instilling in me a curiosity that needed to be addressed and for my genuine love of learning.

Professor Brian O'Kelly, you've taught me, you've mentored me and cajoled me when required to get the EdD over the line. Your friendship and advice have always been treasured.

Mr Clive Kelly & Dr Margaret Cullen, you don't know how helpful you were in listening to me over the last few years. You calmed me down on many an occasion. I am in your debt and your friendship is appreciated.

Dr Gerry Grenham, your encouragement and understanding deserve notable mention and a 'free' lunch.

Both Grace and Daniel were born during my studies. I'd like to think they will be normal, well-adjusted kids despite my absence in their early years. They inspired me to persevere in times when it looked too tough. I can use this experience to become a better parent. The lessons I learned and which I intend to impart to them are to embrace education, be curious, seek out answers, challenge convention, not be scared of hard work, engage positively with people and be pragmatic.

Finally, I want to thank my beautiful wife Tess. Her belief in me when times were tough enabled me to realise my academic ambitions while she shouldered the burden of acting as a single parent family on many an occasion. Your friendship, love and insights anchor me. Only Tess will understand this but, 'I'm mad about ya'.

Declaration

I hereby certify that the submitted work is my own work, was completed while registered as a candidate for the degree of Doctor of Education and I have not obtained a degree elsewhere on the basis of the research presented in this submitted work

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Timothy Finbarr Murphy

Table of Contents

List of Figures 9

List of Tables 10

Chapter 1: Research Proposition 11

1.1 Introduction 11
1.2 Research Aims and Objectives 11
1.3 Research Question 11
1.4 Research Strategy 11
1.5 The Researcher 12
1.6 Motivation for studying innovation in higher education 12
1.7 Contribution to Knowledge 13
1.8 Thesis Overview 14

Chapter 2: Description of the Case Institution – The Institute of Banking in Ireland 16

2.1 Introduction 16
2.2 Governance, funding and members 16
2.3 Evolution of banking, economic landscape and the Institute (1898–2013) 19
2.4 Triple Helix categorisation of relationships 24
2.5 Education portfolio – engagement with industry and university 28
2.6 Higher Education characteristics 29
2.6.1 Characteristics of Professional/Vocational Higher Education 30
2.6.2 Characteristics of academic institutions 32
2.6.3 Rival versions of competence view of the university 34
2.7 Academic–vocational drift 35
2.8 From drift to full integration 36
2.9 Evolution of relationship with UCD – The Institute's university partner 37
2.10 Conclusion 39

Chapter 3: Innovation, Higher Education and the Triple Helix Model 41

3.1 Introduction 41
3.2 The components of the research question 41
3.3 Dis-spelling common misconceptions and making clearer distinctions about innovation 42
3.4 A comprehensive multidisciplinary definition of innovation 44
3.5 Role of education and its economisation 46
3.6 Critiques on the economisation of education 48

3.7 The Triple Helix Model 50
3.8 How it works 51
3.9 Criticisms of and challenges to the Triple Helix Model 52
3.10 Triple Helix Spheres – research and how they interact 53
3.10.1 The University Sphere 53
3.10.1.1 Entrepreneurial University 53
3.10.2 University interaction with the other institutional actors 57
3.10.2.1 University – Industry 57
3.10.2.2 University – Government 62
3.11 Conclusion 63

Chapter 4: Research Methodology 65
4.1 Introduction 65
4.1.1 Justifying the use of a single policy text 66
4.2 Research Design 67
4.2.1 Research Philosophy 67
4.2.2 Research Approach 68
4.2.3 Research Strategy – Case Study 68
4.2.4 Research quality 73
4.3 Research Process 74
4.3.1 Interviews 74
4.3.2 Ethical Considerations 76
4.3.3 Research Planning 78
4.4 Data Analysis 79
4.4.1 Content Analysis 80
4.4.2 Critical Discourse Analysis (CDA) 81
4.5 Conclusion 85

Chapter 5: Findings 87
5.1 Introduction 87
5.2 Initial observations on research conducted 88
5.3 What ‘to innovate’ means and how it coalesces with education 88
5.4 Analysis of the education functions 91
5.4.1 Teaching and learning 91
5.4.2 Course delivery 94
5.4.3 Curriculum Development 95
5.4.4 Accreditation 96
5.4.5 Assessment 96

5.5 Analysis of components of the innovation system – Triple Helix actors 97
5.6 Analysis of relationships between Triple Helix actors 97
5.6.1 Nature of the relationships and which is the most important 98
5.6.2 Types of relationships and perceptions between spheres 101
5.7 Differentiating between a knowledge and smart economy 110
5.8 Analysis of the policy text 111
5.8.1 Where are networks present in the text? 112
5.8.2 Where is education situated within the text? 113
5.9 Higher education policy developments 114
5.10 Evaluating the quality of findings 116
5.11 Conclusion 118

Chapter 6: Concluding Reflections 121
6.1 Introduction 121
6.2 Main insights and implications for the Institute 123
6.3 Limitations of this research 125
6.4 Future research 127
6.5 Final Conclusion 128

References 131

Appendices 152
Appendix One: Respondent Pack 153
Appendix Two: Other policy texts considered to represent the government voice 163
Appendix Three: Interview Guide 167
Appendix Four: Colour coded responses to T1Q1 172
Appendix Five: David Hyatt's (2005) Critical Literacy Frame 176
Appendix Six: Respondent and interviewer profiles 177
Appendix Seven: Characteristics of the pilot and ten other interviews 180
Appendix Eight: Summary of the key attributes of innovation by word frequency 180
Appendix Nine: Ranking of knowledge typologies 181
Appendix Ten: Ranking of importance in relationships – past, present and future 181
Appendix Eleven: Significant actors by Triple Helix category 182

List of Figures

Figure 1: The Institute Governance Structure 1898–2013 ..... 16~~17~~

Figure 2: The Institute's core values, vision and mission ..... 18~~19~~

Figure 3: The Institute Stakeholder Map by Triple Helix Category..... 27~~28~~

Figure 4: Diagrammatic definition of innovation..... 46~~45~~

Figure 5: Flow chart for the research methodology process..... 66~~65~~

List of Tables

Table 1: Membership of the Institute 1923

Table 2: Difference in selected skills in order of importance to employers and education providers 6062

Chapter 1: Research Proposition

1.1 Introduction

This chapter sets out the rationale for conducting this research and presents an overview of how it was conducted. A description of the researcher's ontological and epistemological stance follows. Propositions of how this research will contribute to knowledge are made and the chapter concludes with an overview of the structure of the thesis.

1.2 Research Aims and Objectives

The aim of this thesis is to make a contribution to the theoretical discourse concerning the generation, adoption and diffusion of innovation through the case study of a professional organisation in higher education. From a practitioner perspective, the aim is to raise awareness of the expectations of actors from the three institutional spheres of the Triple Helix Model (Leydesdorff and Etzkowitz, 1998a, 1998b), namely government–industry–university, and ways of meeting these expectations as a result of reflection by these actors. Depending on the context the terms `sphere', `actor' and `component' are used to describe the elements of the Triple Helix. This thesis focuses on assessing and exploring the dynamics and application of government–industry–university interaction as key factors in determining innovation. The Triple Helix Model is the conceptual framework used to explore and assess these relationships between the Institute of Banking in Ireland and the three components that constitute this model, namely government–industry–university.

This was investigated using a case study methodology.

The specific objectives of this research are to:

1. Provide theoretical and empirical perspectives on how innovation and education interact, based on an exploration of interaction as the Triple Helix postulates.
2. Generate findings and make recommendations that can be utilised by management within the Institute and inform and/or assist practitioners from the three institutional spheres: government–industry–university.

1.3 Research Question

In what ways does interaction with university, industry and government actors contribute to the pursuit of innovation within the Institute of Banking in Ireland?

1.4 Research Strategy

This research is a case study based inquiry utilising the Triple Helix Model as its conceptual lens. The data for this research was collected from September 2012 to December 2012. Ten semi-structured recorded interviews were conducted, yielding 183 pages of transcribed data (over 67,378 words). Prior to conducting the interviews, a pilot interview was conducted to assist in the refinement of questions, the sequence in which they were asked and the manner in which they were posed.

Participation was voluntary and all respondents received an Information Sheet (see Appendix 1) to read in relation to the purpose of the study. They also signed Consent Forms. All participants were

assured that all information and participation would be treated confidentially and their anonymity protected. Institutional anonymity was not offered or could not be assumed. This was stated in the Combined Information Sheet and Consent Form (See Appendix 1).

The Irish government's seminal innovation policy text, Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal, was analysed by employing Hyatt's (2005) Critical Literacy Frame (see Appendix 4). The frame is grounded in a social constructionist orientation to language, and is underpinned by insights from Critical Discourse Analysis and Critical Literacy. The rationale for choosing only one policy text is discussed in Chapter 4.

Institutional documents on the Institute and its partners, such as annual reports, documents from websites and other internal documents, which were not confidential, were used to gather information about the Institute, its partners and how they interacted and created networks leading to innovative outcomes.

1.5 The Researcher

From a paradigmatic perspective, this thesis will not fit with a positivist paradigm, as I, the researcher, cannot remain objective and value-free. I worked in the organisation under investigation and know many of the participants well. As a researcher, I would consider myself a 'passionate participant' (Guba and Lincoln, 1994, p.112), favouring a constructivist-interpretive paradigm.

All paradigms have truth assertions and, as Foucault (1988) writes, 'I believe too much in truth not to suppose that there are different truths and different ways of speaking the truth' (p.51). Therefore, no research paradigm has a monopoly on quality. Methodologically, a case study approach was adopted, as the Institute has undergone significant change from a professional vocational body to becoming a recognised higher education college. I consider this quite novel as many other higher education organisations are also evolving as a result of policies supporting mergers and institutional collaboration.

The next section discusses why I chose to study the dynamics of the co-dependent fields of innovation and higher education.

1.6 Motivation for studying innovation in higher education

I have worked in higher education for ten years. Prior to that, I worked for nine years in the financial services industry and for two years as a secondary school teacher. In all of these different fields, I noticed the inappropriate use of the term innovation and its various derivations. I always thought people used the terms creativity and innovation interchangeably.

Education is a unique process and service. When participants engage with it successfully, it can generate economic wealth, a sense of well-being and at the same time create value and benefit to society at large. Innovation as a process strives to achieve these aims too.

As a practitioner in the higher education field, I am fascinated by the economisation and commoditisation of the education field. Many have written about the blurring of the lines and converging of the two fields of education and economics (e.g. Slaughter and Rhoades, 2004; Slaughter and Leslie, 1997). It is my view that market forces are a primary driver of change rather than inherent educational processes dictating a need for change. I accept the primacy of the economic conceptualisation of education, but believe the idea of education as a public good and its emancipatory ability do not have to be foregone. Rather, education can be infused within such an economic conceptualisation.

As countries and regions strive to be knowledge based, the role of the university is changing. As the majority of universities are publicly funded and resources are scarce, funding is becoming contingent on universities making a direct contribution to the economy. Under the Triple Helix Model, interaction between universities and industry is encouraged and incentivised by government in order to produce innovative outcomes, with the ultimate aim of universities being commercially sustainable. Therefore, as education now must contribute to an economy's well-being, how can governments interact with universities? Marginson (1999) considers the strategies governments employ towards universities. The first strategy 'involves a reaffirmation of the state functions of education as a "public good", while the second strategy subjects education to the disciplines of the market and the methods and values of business and redefines it as a competitive private good' (Marginson, 1999, p.122). He contends that these strategies promote differentiation in higher education between world-class research-intensive universities and universities that specialise in cost-effective mass credentialisation and opportunities for life-long learning at a more local or regional level. As stated earlier, it is my view that the second strategy is the most prevalent strategy currently employed.

In the context of the case under investigation there was an institutional interest too in innovation, as it is one of the Institute's core values, discussed in more detail in Chapter 2. This was important as the Institute became an externally recognised college of UCD.

There were a number of strategic changes happening in the Institute, a new institutional arrangement from assuming college status, a new CEO with banking industry experience and the aftermath of an economic crisis affecting not just the banking industry but governments and universities alike. To understand the shifts happening between the Institute and different organisational bodies and actors from these fields, I used the Triple Helix Model to problematise and capture the different dynamics at play.

As innovation is now at the forefront of government, organisation and individual agendas, I needed to immerse myself in the field and try to inculcate an innovative mindset within my own professional practice. If I could elucidate this issue for others, all the better.

1.7 Contribution to Knowledge

The aim of this research is to:

- Contribute to the current paucity of research conducted in the area of innovation in the

professional education sector.

- Provide accounts, experiences and opinions from senior higher education actors. It is these individuals who inculcate higher education policy in their professional practices, which ultimately affects the experiences of participants in the higher education field.
- Provide insights into the social/cultural/political as well as the power/knowledge contexts under which innovation and education policies emerge.
- Provide an added understanding of the interdependence of innovation and education. Critical reflection on the interviews conducted may effect a change in my world view. As the research progresses, so too will my competence as a practitioner-led researcher.
- Make the study accessible to different audiences too. This could be as a result of the style of writing or because the reader has an interest. By using a case study I also hope to facilitate a greater understanding of the phenomenon, as Stake (1995) believes that data generated by case studies can often resonate experientially with a cross section of readers, thereby facilitating a greater understanding of the phenomenon.

1.8 Thesis Overview

The thesis is organised as follows:

Chapter 2 describes the case organisation – the Institute of Banking in Ireland. It outlines how it has evolved since its inception in 1898, documenting its past and current involvement with its partner university, government and industry. The nature and variety of such relationships are considered in the wider context of developments in the Irish economy, banking sector and higher education system. Characteristics and differences between universities and vocational education institutions are discussed to highlight the hybrid nature of the Institute.

Chapter 3 deals with the three constructs of the thesis: innovation, education and the Triple Helix Model. It presents a multidisciplinary definition of innovation for use throughout the study along with the Institute's articulation of innovation. The subsequent sections relate to higher education, its aims, its economisation and critiques of such a conceptualisation. This is followed by a description of the conceptual lens in the study – the Triple Helix Model – its assumptions, how it works, critiques of the model and a review of some empirical research conducted in or between institutional actors on the Triple Helix Model. Emphasis is mainly on the university component as this is the domain of the Institute.

Chapter 4 sets out the research methodology in three stages, which is iterative in nature. The stages are research design, research process and how the data was analysed. A case study research strategy was employed. Data was collected by conducting ten transcribed semi-structured interviews and one pilot interview. The majority of respondents were from the university sector. Critical Discourse Analysis and Content Analysis were the methods of analysis chosen to systematically analyse the data generated and to provide resultant recommendations from the findings. Chapter 4 also describes any issues that arose and how ethical considerations were addressed.

Chapters 5 presents the insights obtained from the interviews and critical discourse analysis of the policy text. These try to explain, clarify, interpret and expand on issues that have been identified as significant in the study in order to answer the research question posed.

Chapter 6 discusses concluding reflections on the research conducted, ascertaining whether the research question was addressed, knowledge gained, limitations of the research acknowledged and suggestions for further research considered.

Chapter 2: Description of the Case Institution – The Institute of Banking in Ireland

2.1 Introduction

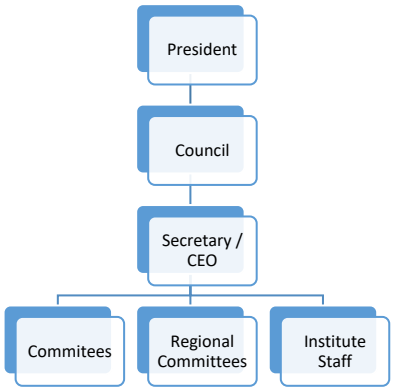
This chapter provides a description of the case organisation: the Institute of Banking in Ireland (the Institute), formerly the Institute of Bankers in Ireland. It aims to present how the Institute evolved from a purely professional member-based organisation to assuming an academic role by acquiring college status whilst also retaining some professional related functions. Examples of how the Institute interacts and engages in networks with government, industry and university actors are presented.

The Institute was established in 1898 with a goal that remains today, to raise standards and have greater professionalism in the banking sector, achieved primarily through education. The primary sources for this chapter were information from the Institute website, documents such as annual reports and documents from the university with which the Institute is a partner. Characteristics of academic and vocational education are discussed in brief, along with an alternative view, Barnett's (1994) Rival versions of competence view of higher education, in order to explain and enhance the reader's understanding of the approach the Institute took with its partner university. This is best considered as academic and vocational drift leading to full integration of the Institute into the university. Extracts from a book commissioned for the Institute's centennial celebrations in 1998, *A Century in Banking: The life and times of the Institute of Bankers in Ireland 1898 to 1998*, by Dan White, also helped to build a picture of the Institute. The inclusion of an economic commentary provides a context for how and why developments by the Institute occurred.

2.2 Governance, funding and members

Figure 1 depicts the governance structure of the Institute, which to this date still remains, albeit with a reduced number on Council. The text following this figure outlines the various elements of that structure.

Figure 1: The Institute Governance Structure 1898–2013



President: For the first 40 years of the Institute's existence, the President was always the Governor of the Bank of Ireland. In 1938 the Council decided to rotate the presidency between the banks going forward.

Council: This originally consisted of representatives from all nine banks and two merchant banks, the founding members. There could be up to 60 representatives. Their role was to formulate strategy. It would not be until 1953 that an ordinary bank staff member was admitted to Council.

Secretary/CEO: This was a voluntary role until it became a full-time paid position in 1964. In 1983 the title Secretary was replaced by the title CEO. The CEO title was an attempt to professionalise the operations of the Institute and the term was considered more readily identifiable with its members. The Secretary/CEO was responsible for operations and for achieving the strategic goals as directed by Council. Council used to meet 11 times a year. By the end of the 1980s, they met four times a year.

A new CEO was appointed in 2000 – an Accountant and former Professor in Accounting and Dean of a Business School from one of Ireland's leading universities. This appointment was significant, as the new CEO developed the Institute in an academic direction, doubled its membership and steered it through the financial crisis.

In 2012 there was a change of senior management in the Institute. Both the Chief Executive Officer (CEO) and Deputy Chief Executive Officer retired. A new CEO and senior management team took up office. The new CEO and management team previously worked in senior positions in banking. This signalled a change in orientation from the previous administration, which possessed academic backgrounds.

Institute Staff: Initially the Institute was staffed by volunteers. As the Institute grew, full-time paid employees were recruited. Now there are over 60 members of staff working in a wide range of roles, including management, academic, customer service, instructional and multi-media design, and information technology. An associate lecturer model (industry practitioners and academics) is adopted in the delivery of its suite of educational programme offerings. There are over 200 such positions, with part-time academic subject matter experts, lecturers and examiners.

Committees/Regional Committees: The Committee structure evolved as the operations of the Institute evolved. The Council works through six committees (Executive Committee, Appointments Committee, Education Committee, Finance Committee, Audit Committee, Membership Services Committee) and three regional committees. The three regional committees are Belfast Region, East Region and South Region. Their objective is to coordinate activities in their regions for members, communicate to Council the needs of members and assist Council in achieving its objectives.

Figure 2 reproduces from the Institute's website what the Institute's core values, vision and mission are. Innovation and academic excellence are two of its six core values. The two central constructs of this thesis are innovation and education. The figure below makes explicit the view the Institute holds about them.

Figure 2: The Institute's core values, vision and mission

Mission: As a recognised college of UCD and the leading professional education body for banking and financial services, with an ethos of life-long learning, the Institute of Banking will make a defining contribution to the renewal of the professional standards and standing of Irish banking and financial services to the ultimate benefit of customers and society.

Vision: To be renowned as the leading educational institution that equips financial services professionals for a changing world.

The Institute is funded by annual subscriptions from members (719 in 1898, (White, 1998) to 34,381 in 2014 (Institute of Banking Annual Report 2014)) and corporate member subscriptions from banks and merchant banks. Corporate membership had long been restricted to banks. In 1991 Building Societies were admitted, which now meant the Institute represented the wider financial services community.

Table 1 provides an outline of the level of membership in the Institute.

Table 1: Membership of the Institute

1898	1909–1913	1924	1930s	1948	1950s	1998
719	Stagnant at 900	1,483	Circa 3,300	3,401	Circa 3,300–3,400	15,000

(White, 1998)

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
20,802	20,665	21,777	29,086	32,815	35,538	34,578	33,047	33,815	32,890

(Institute of Banking in Ireland Annual Report, 2014)

In addition to offering education programmes, the Institute is involved in continuing professional development of its members. Over 22,000 members annually engage in the Continuing Professional Development (CPD) regimes offered by the Institute. Certain qualifications have a corresponding designation attached. Members are invited to apply for these designations after their educational qualification has been ratified and awarded by an exam board. Designations can be revoked if a person contravenes the rules governing a CPD regime. However, when one attains an academic qualification, this can never be rescinded.

The above levels of membership are best understood within the context of the prevailing banking and wider economic landscape of the period. The next section describes this in a chronological manner.

2.3 Evolution of banking, economic landscape and the Institute (1898–2013)

The Early Days and turn of the century (1898–1920)

White's (1998) commissioned study about the Institute revealed that in 1898 Ireland had a large developed banking system with nine banks and a large network of branches (660) (p.9), with 2,506 employees by 1901 (ibid., p.13). Until 1921 Ireland was part of the United Kingdom. The issue of Irish home rule led to a failed rebellion in Easter 1916. Partition occurred after the signing of the Anglo-Irish Treaty in December 1921. Six of the 32 counties in Ireland became Northern Ireland and remained within the United Kingdom. The other 26 became the Irish Free State, now the Republic of Ireland. A bitter civil war ensued between 1921 and 1922. Whilst trying to maintain a detached political stance, the Institute was affected by such events as it was an all-Ireland organisation (p.20). In 1921 it

abandoned a lot of the social activities it offered to concentrate solely on education and to counter accusations that it was elitist in nature (p.22). In the 1901 Census, there were 2,927 people who stated they were bankers. The majority of bankers were classified as Protestant and held the most senior positions in banks. Females only entered banking in numbers from the onset of World War One, as many bankers enlisted. World War One resulted in a slight dip in member numbers due to bankers enlisting in the British army (p.22).

A new republic, economic stagnation, resilient banking sector (1920s–1950s)

As the Irish Free State was in its infancy and in the midst of a civil war, it required money. In order to get these badly needed funds, the government coerced the banks into providing loans at preferential rates. If bankers resisted, they were threatened with withdrawal of military protection for banks, compensation payments would cease for property damaged as a result of the civil war and, if necessary, emergency legislation would be enacted compelling them to do provide such loans (p.54). This exemplifies the power governments can wield over the market, compelling industry to comply with their needs and demands. In the early days of the Irish Free State government also utilised members from the university in an advisory capacity. Professor Timothy Smiddy of University College Cork (UCC) advised the government on monetary matters and the establishment of a Central Bank (p.73).

There was a change of government in 1932 and an economic nationalism policy prevailed. After achieving independence, Ireland sought to be economically self-sufficient. It relied on agriculture, exporting of primary produce to the UK market and manufacturing for the local population of 3 million people. This new government had been opposed to the signing of the Anglo-Irish Treaty, so a policy of economic nationalism was pursued. This resulted in a trade war with the UK. The Institute expressed unease with such an economic stance, but avoided any overt political intervention. Banks survived such a government position because they were massively under lent and costs were controlled, as the 1930s marked a period of limited recruitment (pp.55–57). World War Two led to a period of high inflation which doubled prices (p.57).

The 1950s was a period of economic stagnation; unemployment was high, as was emigration. It was becoming clear that the policy of economic nationalism was not sustainable. Policy change was proposed in 1958 when the then Secretary of the Department of Finance, T.K. Whitaker, called for a cessation of the economic nationalism policy. He authored a report, Economic Development, which advocated free trade, foreign investment, and increased expenditure, especially in the area of education. The Government decided to abandon its protectionist stance and adopt the approach espoused in Economic Development. This would herald a new era of prosperity for Ireland.

Boom to Recession – Part 1 (1960s–1980s) – Much change for the Institute

The opening of markets led to a boom period in the 1960s. Prior to 1960, higher education was not on the political agenda. It was only in 1960 that the Irish Government decided that higher education could play an important role in the socio-economic development of the state and that there was a need to

examine the whole question of third-level education. A Commission on Higher Education was established to 'inquire into and make recommendations in relation to university, professional, technological and higher education generally' (Commission on Higher Education, 1967, p.1). The situation faced by this Commission was summed up in its report as follows:

> *The existing system of higher education was developed piecemeal; it is not a unified system but a complex set of separate units, involving some unnecessary duplication and leaving areas of higher education un-provided for…. There is as a rule, no planning machinery for the system and too little planning on the part of its component institutions. (Commission on Higher Education, 1967, p.22)*

This prompted the government to develop a binary system and set up 'a host of new institutions amenable to its concerns for technological, scientific and applied education' (Coolahan, 1990, p.11). Governments adopted the binary system to be seen as 'a more modern and economically relevant public sector alternative to the universities and, in particular, one able to appeal to social groups that had little tradition of accessing higher education' (King, 2004, p.126).

An influential report by the Department of Education in response to OECD observations on education in Ireland, Investment in Education, emphasised the importance of education in the future of Ireland's economy and society (Department of Education, 1965). In 1967, shortly after this report was published, the government offered free secondary education, which resulted in a rapid rise in educational attainment. The banking landscape was to change irrevocably in this decade too. Ireland for the first time attracted foreign banks. Citicorp, now Citi, set up in 1965, followed by Bank of Nova Scotia in 1966. The effects of such global competition led to a period of mergers and takeovers (p.59). In 1958 there were still nine banks in Ireland. Eight years later there were primarily two banking giants left in the Republic (p.60).

This period was difficult for the Institute, as such merger and acquisition activity in the sector affected membership. Bank strikes were common in the period too. The 1966 bank strike lasted three months in the Republic and six weeks in Northern Ireland. Many members in this period let their membership lapse. In the new globalised competitive marketplace banks became a lot more commercially focused. The banks which previously recruited staff from secondary school were now recruiting university graduates. Banks also started to allocate resources and funds to their own Training and Development departments. This reduced their dependency on the Institute. The Institute needed to change, and to improve their standards and the relevance of qualifications. In the 1970s the Institute reviewed its education portfolio, discussed later in this chapter.

Dargan (2006) charts Ireland's progress from its joining of the European Economic Community (EEC), now the European Union (EU), in 1973 to its becoming known as the Celtic Tiger. Membership of the EU opened markets even further. Multinationals established operations in Ireland to use the country as an export base for Europe. There was a rapid expansion in public expenditure in the 1970s, coupled with reductions in tax. Inflation was extremely high, driven partly by international factors such

as the oil crisis and partly by a sharp increase in domestic demand as the population increased for the first time in three decades. Unemployment started to rise in the latter half of the decade. Budget deficits and high public borrowing were features of the latter half of this decade. Despite this economic upheaval, banks remained profitable. The domestic banks had diversified their product and service offerings, expanded outside of the domestic market and started to engage in merger and acquisition activity in the UK and US. This presented more opportunities and challenges for the Institute. The opportunities included potential new qualifications as a result of the new products and services offered and new potential markets.

Economically, the 1980s marked a reversion to the dark days of the 1950s – high unemployment, emigration and worsening public finances. Public expenditure had grown so much that much of government tax revenues were only servicing the spiralling national debt. Inflation was high as a consequence of the oil crises of the 1970s, and a baby boom in the 1960s, with a resultant growing workforce population, increased demand. Despite this bleak outlook, the government was still able to attract direct foreign investment and many multinationals were established, for example IBM, Microsoft, Bausch and Lomb, and Lotus. There were some high profile failures too, raising questions about the strategy. The main argument was that the domestic economy was weak as excessive attention was given to overseas companies rather than to indigenous businesses.

Booms to Bust – Part 2 (1990s–2013)

In the early 1990s a new government was elected, ironically the same government that in the 1970s engaged in a large spending spree. This time they proposed a number of measures: abolition of government agencies, modest wage increases to negate inflation, promoting competition, reduced spending but promotion of business investment. An example of such investment is the development of the International Financial Services Centre (IFSC) in Dublin. This was a success and impacted positively on Institute membership numbers with the introduction of new banks on the island. Government constantly stressed the importance of education and technical skills, and it had retained a central position in government development policies since the 1960s. A period of prosperity ensued from the mid-1990s, with Ireland being referred to as the Celtic Tiger, a metaphor to describe its economic take-off similar to that of the Asian tiger economies in the 1980s.

Aldrick (2010), in an article for the Telegraph newspaper entitled, ‘How Ireland’s boom became bust’, described how Ireland fell from being a Celtic Tiger to an ailing Eurozone nation in need of a European Union (EU)/International Monetary Fund (IMF) bailout. Ireland slipped into recession in 2008, its first since 1983, after a property bubble burst and a global meltdown in the world economy. The reasons are varied, but relate to improper and risky behaviours by various stakeholders, primarily financial institutions and sometimes their regulators. The Irish government unveiled a €440 billion bank deposit guarantee to avoid a run on banks. The annual budget that ordinarily takes place in December was also brought forward to October to decrease spending and increase revenue. In 2008 the state took control over one bank, Anglo Irish Bank, and recapitalised others. A supplementary

budget in April 2009 raised further revenues and cut spending. A further €4 billion in cuts was announced in the December budget in 2009. Ireland's credit rating was reduced by all rating agencies, which affected the government's ability to seek credit and attract investment. In September 2010 Professor Honohan, Governor of the Central Bank in Ireland, suggested that an expected further €3 billion in cuts was required. In November it was announced that in the budget in December a €6 billion cost-cutting programme would be imposed. By the end of the month, the IMF and EU would need to bail out the government and avert a run on the banks in Ireland. Other EU nations would require similar assistance, including Portugal, Spain and Greece. The EU/IMF bailout changed the dynamic of how government and the banks would interact going forward.

Impact to and response from Institute to economic crisis

Despite this the Institute made an operating surplus in the financial years 2008/09 and 2009/10. As per the 2010 Annual Report, '[t]his was achieved, in spite of a modest decline in revenues, by undertaking a programme of efficiency and cost reduction across all divisions of the organisation' (p.3).

For example, no recruitment or replacement of staff and no pay rises or bonuses occurred. Figures from the Institute's Annual Reports of 2009, 2010 and 2011 in the Financial Report section show the average number of employees steadily declining over the period: 2008 – 54, 2009 – 53, 2010 – 50 and 2011 – 48. Correspondently, salaries also declined from €3,287,129 (2008) to €3,030,437 (2011).

As the full extent of the financial crisis took hold, 'challenging trading conditions caused a significant decline in income from that achieved in the previous year and despite stringent cost management, the income decline and non-recurring costs gave rise to an operating deficit' (Annual Report 2011, p.3).

Prudent management whilst maintaining close links with industry and its university partner enabled the Institute to maintain its membership (see Table 1 above).

To bolster consumer confidence and address shortcomings identified as a consequence of the financial crisis, the Central Bank of Ireland introduced a regime in 2011 referred to as the Minimum Competency Code. Anyone advising or selling retail financial products needed to complete an educational programme in specific areas in order to ensure they met the minimum requirements to engage in such activities. This resulted in an influx of new members for the Institute, as many of the programmes it offered were approved by the Central Bank as meeting the criteria required to advise and sell such products and services. Professional qualifications and continuing professional development are now vital for everyone working in a bank, as confirmation of their competency and capability. The Central Bank's Fitness and Probity regime announced in December 2011 and in place since December 2012 introduced a regulatory requirement on those working in banking to provide evidence of standards of proficiency. The above highlights the power government can wield over industry and its participants by imposing rules that affect their ability to operate. The above examples positively impacted the Institute, resulting in many more students taking their programmes.

In 2013 the Institute completed a corporate rebranding and replaced the Coat of Arms it had commissioned back in 1956 with a logo. The organisation name changed from The Institute of Bankers in Ireland to the Institute of Banking in Ireland. The function as opposed to the person was now in the title of the Institute.

2.4 Triple Helix categorisation of relationships

A stakeholder map was compiled for senior management in 2013 in order to assist the Chief Executive and Deputy Chief Executive Officer devise a five year strategic plan for the Institute. Figure 3: The Institute Stakeholder Map by Triple Helix Category, is a modified version of this map, with each entry now being affixed by either a U – University, I – Industry or G – Government to denote the Triple Helix components that best describe the nature of the stakeholder relationship with the Institute.

From a representative perspective, the majority of stakeholders are industry actors. The university sphere then has the next largest number of stakeholders, while the least number of stakeholders belongs to government. Obviously this only gives a snapshot, and no inference on the importance ascribed to any one stakeholder from this map can be made. Nonetheless, it is quite revealing as to where attention is paid. In all three categories the effects of globalisation are evident. Many banks have international operations. University partners are UK (CISI), Canada (CISI Canada), FPS Board (Global) and even governments as they assist banks in other jurisdictions. This will affect the dynamic of how the Institute engages with such entities in Ireland, for example DepFa were recapitalised by the German Government.

Industry

The first category is that of individual members. This category relates to how individuals engage with the Institute. These individuals are from banking and the wider financial services environment. Interaction between the individual and the Institute has many forms and is not conducted discretely, as the individual can simultaneously be a student on one programme and be attending events for continuing professional education purposes at the same time. Becoming a member is the first step. Being an individual member entitles the person to utilise Institute services, attend events and register to any of the programmes, subject to meeting the admission requirements.

Another form of membership is the Committee structure of the Institute, which forms a largely unchanged governance structure since its inception back in 1898. Corporate Members is a category that has experienced significant change. As a consequence of the financial crisis and consolidation in the industry in the period following the crisis from 2008 to 2013, the number of corporate members reduced. The contacts in corporates has also changed as people have retired, left the industry or moved companies. Of the five corporates in the pipeline category, three relate to government: An Post, Central Bank and DepFa. Increased attention to government actors could be a result of government assuming a more active role in both the banking and education sector going forward.

Key Suppliers enable the Institute to deliver their programmes and administer exams. Others assist the Institute in operating. For example, Version One is responsible for maintaining the IT infrastructure and Deloitte is the Institute's accountant and provides consulting services.

Industry – University

Employees have a mix of industry and university backgrounds. An associate lecturer model is employed and many of the different roles in the process are conducted by people who are not full-time Institute staff. Van-Hoek et al. (2011) considered the role of guest lecturers in embedding insights from industry, a practice relied heavily upon in the Institute. Many programmes and modules are jointly offered by an academic and practitioner. Both are assigned parity of esteem and engage in the planning and delivery of content. Van-Hoek et al. (2011) espouse an approach whereby guest lecturers should augment and not be a substitute for the academic. The guest lecturer's role is to provide context, an application of the theoretical aspects as imparted by the academic.

As expected, the primary university relationship is with UCD. Although assigned as university for Triple Helix purposes, the majority of the others in this category are similar type organisations to that of the Institute, for example the Irish Taxation Institute, Insurance Institute of Ireland, Life Insurance Association, and the Chartered Institute of Bankers in Scotland.

Industry – Government

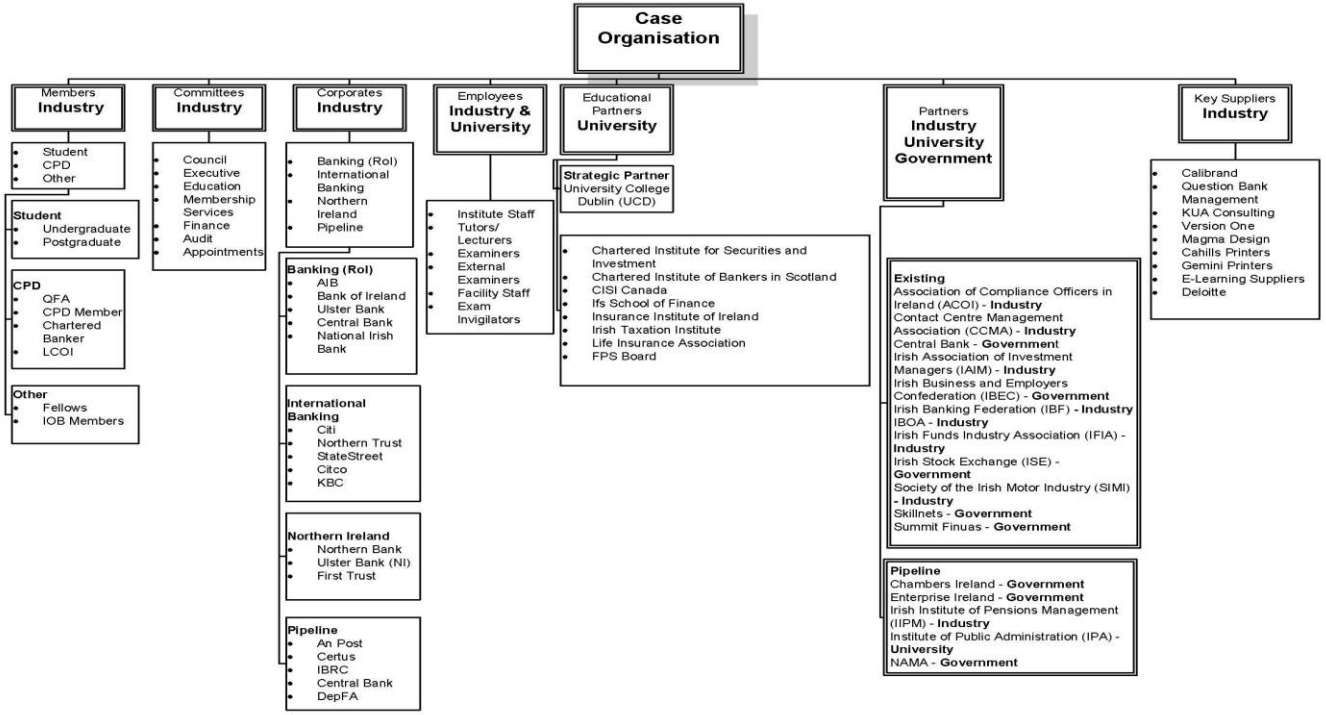
Existing partners are predominantly industry actors with the introduction of new government actors after the financial crisis, such as Skillsnet and Summit Finuas Network. These organisations were established as a consequence of targeted government initiatives to reach out to specific groups or to better manage a specific policy issue. Such remedial policy actions were necessary to raise financial awareness and education. An explanation of the Summit Finuas Network illustrates this. The Network is under the auspices of IBEC, the Irish Business and Employers' Confederation, and is a state-funded programme for developing enterprise-led learning networks within the international financial services sector. The aim is to support the sector by investing in and further developing the specialist skills and expertise of its workforce. This is achieved by developing and delivering educational programmes and training in the areas of banking and capital markets, investment management, insurance and specialist professional services to the sector. A number of places on some programmes run by Finuas Networks are also available to job-seekers. The network is managed by Skillsnet Ltd on behalf of the Department of Education and Skills.

The creation of this network between all Triple Helix actors has also resulted in change for all parties, as the initiative provides a forum for companies to work with providers to develop industry-relevant education and training programmes. It also acts as a platform for industry leaders and education providers to create new solutions to skills required in the market. As the output is new it can be defined as innovative instead of being an improvement. From a government perspective, it fulfils its intermediary role of facilitating interaction between industry and university, whilst at the same time

tackling the issue of unemployment. The Institute has numerous programmes that receive network funding. It is an Approved Training Provider and provides the majority of accredited technical programmes offered in the disciplines of banking and compliance. It also offers programmes for the funds sector. This is evident on the course listing from the Summit Finuas Network website, http://www.summitfinuasnetwork.com/coursecategories. Any programme prefixed with Professional Certificate or Professional Diploma is an Institute programme.

Three of the five organisations in the pipeline category are government entities. What could be inferred from this is that a focus on initiating and cultivating government interaction is at the forefront of the minds of Institute management.

Figure 3: The Institute Stakeholder Map by Triple Helix Category



2.5 Education portfolio – engagement with industry and university

White (1998) explains that in 1898 the Institute offered one education programme, a Certificate in Banking, which the Institute awarded. The Certificate was of an applied nature and assisted bankers in expediting their duties. Students sat papers in Arithmetic and Algebra, Bookkeeping, Commercial Law, Political Economy and Practical Banking (p.6). The syllabus was developed jointly between the Institute and the banks. Sixteen people were awarded the Certificate in 1899. This rose to 189 by 1903. Staff in six of the nine banks were being offered monetary awards to take the Institute exams by 1901 (p.17).

Each Irish bank issued its own bank notes. Sterling was still widely used. In 1922 the Institute added to their education portfolio by offering a Diploma in Foreign Exchange (p.47). The education portfolio was extended in 1944 to include a Diploma in Executor and Trustee Work (p.47). By 1948 there were 1,509 holders of the Certificate in Banking, 294 awarded the Diploma in Foreign Exchange and 125 the Diploma in Executor and Trustee Work. The Certificate in Banking exams were taken by 312 in 1948, but little had changed from 1908 in terms of the success of students. Seventy-eight of the 312 did not sit the exam. Only 16% of those who sat passed the preliminary exam and 32% the final exam. Examiner reports from 1948 echo what was said in 1908, that students were poorly prepared and demonstrated a lack of understanding and judgement (p.48). The Institute needed to address this shortcoming or its relevance would be questioned.

In 1971 a report submitted to Council proposed a programme with a block of full-time teaching with students nominated by their banks (p.101). Representatives on Council from the Irish Bank Official Organisation (IBOA) representing clerical and mid-level bankers wholly opposed this idea of the banks nominating staff. The Institute engaged with the banks to develop an Advanced Diploma and review the existing Bank Diplomas. In 1973 the existing Diploma in Banking was made more accessible to all bankers as the Institute allowed the then Regional Technical Colleges, now Institutes of Technology, to offer part of the Diploma. After a period of extensive negotiations with the banks, the Institute restructured all of its qualifications in 1975. They proposed replacing the existing Diploma with a two year Certificate, followed by a two year Diploma which would include the existing Diploma in Foreign Exchange. Most banks were in favour of this except one of the larger banks, Allied Irish Bank (AIB). They expressed reservation that this duplicated the work of their Training and Development department and that any subsequent development needed to concentrate on professional subjects. They also wanted the Institute to establish a degree level programme (p.102). This exemplifies the power of the industry and the Institute's responsiveness to their demands. In 1976 this new Diploma was offered in NIHE Limerick, now University of Limerick, and in Northern Ireland from January 1977 at the University of Ulster campus in Coleraine. Initially numbers were low (p.103).

After conducting a series of strategic reviews in the period to ensure the Institute remained relevant to the industry, the Institute concluded that it needed to narrow the gap still existing between the

programmes it offered and the services that the banks' own training departments offered. Friction had been present between the Institute and bank training departments since the 1970s, as both competed against each other. The Institute researched the market place in this period before it created a suite of new mini certificates that it could offer at a fraction of the cost it would cost banks. Investment in technology in the development and delivery of these mini certificates allowed cost savings. Banks had also been impacted by the widespread use of technology. This replaced many expensive labour intensive operations and this, coupled with the introduction of lower entry grade staff, led to the Institute concentrating on certificate level rather than degree level programmes for new entrants, re-entrants and those re-skilling.

Numbers were small on the Diploma and the majority of members were still only completing the Certificate. In 1987 a Diploma in Financial Services was unveiled. It was considered by all as pioneering in the field as all course materials were contained on CDs (p.131). The flexibility it afforded Institute members did not go unnoticed as demand was buoyant for this new qualification. This signalled the Institute's positive disposition to consider technology as a facilitator in the teaching and learning delivery of its programmes.

In 2013 the Institute launched the Professional Education Framework for the banking sector. This was an attempt by the Institute to contribute to rebuilding customers' confidence in Irish banking and to restoring the self-esteem and purpose of banking professionals after the financial crisis. The framework is designed to meet the needs of the learner, whatever the person's age, career stage, qualifications, experience or ambition. It focuses on developing the knowledge, competencies and skills necessary and expected at different career stages. Whilst the framework itself is not particularly innovative or novel, it is the product of a process that could be considered innovative. The framework was developed in consultation with the banking sector and underpinned academically by its university partner. The cooperation and collaboration between the Institute, industry and university is reflective of behaviours espoused between actors under the Triple Helix Model of innovation, the conceptual lens of this research. It also highlights the fact that people wanted to learn and become financially aware and that financial institutions had to become more accountable. Targeted initiatives such as the Professional Education Framework were required to remediate the adverse experience of the financial crisis. It resulted in the creation of new programmes, new modules and new ways to improve the learner experience, innovation occurred through collaboration.

2.6 Higher Education characteristics

The Institute of Banking is primarily a professional/vocational higher education organisation but is also a recognised college of an academic institution. An understanding of the different characteristics of both forms of education and an alternative conceptualisation of the university as proposed by Ronald Barnett, who describes the university as a site of rival versions of competence, are discussed in this section. The intention is to highlight where there are commonalities and differences in the different

forms, leading to an explanation of the evolution of the relationship between the Institute and its university partner, UCD.

2.6.1 Characteristics of Professional/Vocational Higher Education

Professional higher education is a distinct form of higher education. The integration of the workplace in all aspects of teaching, learning, research and governance focuses on application of learning to enhance employability. Practical skills and theoretical expertise are pronounced under such a system. This is contrasted with the concentration of universities on theory and abstract conceptual knowledge. Moodie (2002) suggested that there were four unique characteristics that identify vocational education and training. They are epistemological, teleological, hierarchical and pragmatic in nature.

Epistemological characteristics are the development of a distinctive way of knowing – a distinctive way of learning – and could even be considered as a distinct field of knowledge.

Teleological characteristics refer to purpose. Moodie states that vocational education and training is for an extrinsic purpose compared with cultivation for intrinsic worth in general higher education.

Commonly held distinctions between the different forms of higher education are being challenged, such as the idea that vocational education is for work directed by others, while education is for self-directed work, and vocational education is for paid employment, while higher education is for the professions, where professionals receive fees or rates. Yet this no longer applies, as many professions such as lawyers, engineers and doctors are now employees in large organisations.

Moodie (2002) further proposed three types of hierarchical classification of vocational education and training. These were at an occupational level, an educational level and a cognitive level.

Occupational level

Decomposing an occupational sector into occupational roles and functions can elucidate its underlying purpose. This practice governs the design of Institute programmes, as they are a representative body for a particular industry. Throughout the interviews, respondents referred to the requirement to be responsive to industry needs.

Concentration by vocational education providers on direct workplace relevance to a particular occupational role highlights their responsiveness to employer needs and wants, a criticism often levied against its university peers. A commonly held criticism refers to the emphasis in universities on too much ‘abstract’ theory, academic self-interest and indulgence in what will be taught, with not enough attention to workplace competence, Robertson (1995) asserted that:

> The curriculum in higher education has conventionally been inward-facing and self-defining. It has ... reflected the aspirations and values of the scholarly community, largely predisposed

> towards research, the reproduction of the next generation of academics, and occasionally nodding in the direction of kindred professions. Students entering universities have generally been expected to suspend most questions concerning the appropriateness of their learning programmes for future labour market aspirations, deferring to the view that the experience of higher education was an end in itself (p.291).

Wellington (1993) argues that vocational education is technocratic, specific, practical and managerial, while general education is democratic, egalitarian, critical and collaborative.

Educational level

Vocational education is considered to be neither at secondary level nor higher education level (Stevenson, 1998). Another ongoing question to consider is whether vocational education should be defined by students' achievement upon their exit, or rather on their entry to the sector (Williams, 1965).

Cognitive level

Cognitive and educational levels are closely linked. Stevenson (1998) refers to Engestrom's (1994) hierarchy of learning:

• First order learning (conditioning, imitation and rote learning).

• Second order learning (trial and error or learning by doing and problem solving, or investigative learning).

• Third order learning (questioning and transforming the context or community of practice).

He contends that vocational education involves first and second order learning and that higher education involves second and third order learning.

White's (2001) study made observations on the characteristics of technical colleges and identified that they provide programmes of shorter duration than universities within a narrow range of subjects, mostly engineering and business. The curriculum is more practically oriented; hence they are more responsive to industry and business. Research is not conducted, or if it is, it is applied in nature. Teaching and learning are the main function of the institution. All Institute programmes are banking related. They do not engage in research. This form of higher education more closely approximates how the Institute operates.

The development of the Professional Education Framework by the Institute is a practical manifestation of all three hierarchical classifications in vocational education as proposed by Moodie (2002). The framework explicitly suggests a particular education programme depending on a person's occupational role, previous educational attainment and knowledge acquired whilst working.

2.6.2 Characteristics of academic institutions

The Institute is now a recognised college of a university. Therefore it should adopt many of its practices, characteristics and processes. This section presents these characteristics in order to consider which ones are held in common between the Institute and its university partner, and which ones are distinctive.

Overall System

Terms such as 'organised anarchies' (Cohen and March, 1974) or 'loosely coupled systems' (Weick, 1976) have been used to characterise academic institutions.

Cohen and March (1974) consider universities as sites where goals are ambivalent and where a multiplicity of objectives exists so that it is difficult to achieve consensus and resolve issues. Second, their processes are ambiguous.

Third, there is fluid participation. The degree of participation (time and effort) by members of such organisations is determined by the particular issue, the choices required, timing and temperament. Sometimes a person will focus solely on their own work, leaving organisational decision making to others; at other times, they may be exceedingly concerned with organisational matters, hence the importance of professional autonomy in such higher education institutions. This notion is being challenged, however, with the rise of 'new managerialism' (Deem, 1998) and new public money approaches to funding the sector.

Four, the status quo can be maintained as issues tend to be considered insignificant most of time. Five, there is a weak information base. Ambiguous processes and fluidity of participation create a situation whereby data necessary for informed decision making is not commonly collected.

This extreme diffusion of decision-making power was considered by Weick (1976) and Cohen and March (1974). All these authors agree, however, that universities are complex organisations with a unique set of features.

Knowledge is the Focus of Attention

This characteristic is the one I consider most common to the Institute and academic institutions, the only difference being the concentration of knowledge in the Institute on one particular discipline. Knowledge areas shape the structure of such institutions. Fragmentation is abundant. Groups are formed by specialists in specific knowledge fields to teach and undertake research. They are insulated to a large extent from the rest of the organisation, using their autonomy and expertise to perform the basic activities of the higher education institution. According to Burton Clark (1983), this organisational

fragmentation explains the adaptivity of higher education institutions. Adaptivity is 'the capacity to add and subtract fields of knowledge and related units without disturbing all the others' (p.186). This is an exemplar of what Weick (1976) referred to as a loosely coupled system. He intended to 'convey the image that coupled events are responsive, but that each event also preserves its own identity and some evidence of its physical or logical separateness' (p.3). He further asserted that '[l]oose coupling also carries connotation of impermanence, dissolvability and tacitness all of which are potentially crucial properties of the "glue" that holds organisations together' (p.3).

Belief System

Organisations dominated by professionals such as universities can be viewed as value-rational organisations. This is the view held by Satow (1975). Dill (1982) says that in such organisations '[m]embers have absolute belief in the values of the organisation for their own sake, independent of the values' prospects for success' (p.308). Satow further suggests that value-rational organisations are not only identified by their ideologies, but bound together by them.

Burton Clark believes that the culture of an academic organisation is more complex than that of other organisations, and that ideologies or systems of belief permeate academic institutions at three levels: the culture of the enterprise, the culture of the academic profession at large, and the culture of academic discipline. In his seminal text, The Higher Education System (1983), he refers to a triangle of coordination, where every higher education system can be located conceptually somewhere in the triangle. Each corner denotes a sphere, state-authority, market or academic oligarchy. Competing pressures emerge from within and Clark contends that integration occurs when the university resolves these forces. He also states that change is far more frequent and deep in higher education institutions than conventional wisdom suggests:

> Despite the belief that academic systems change significantly only when pressured by external forces, such systems increasingly exhibit innovation and adaptation among their bottom lines. Invention and diffusion are institutionalised in the work of the departments and counterpart units that embody the disciplines and professions ... Such change is widely overlooked ... It occurs in segments of the operating level ... In a bottom-heavy knowledge institution, grassroots innovation is a crucial form of change (pp.234–235).

If you accept this view, therefore, innovation occurs in semi-autonomous units in the organisation through professional activities. Effectively it occurs at the level of subject specialism. Kerr (1982) agrees with this point of view. Clark also contends that innovations in higher education are mainly incremental in nature, that radical change is rare, and that because of the fragmentation of tasks and the diffusion of power, such changes are extremely difficult to effect.

Becher and Kogan (1980) argue that because of the fundamental characteristics of higher education systems, innovation processes are localised and specific:

> We are not dealing with a hierarchical system, where change can be decreed from above, but rather with a negotiative one, in which individuals, basic units and institutions each regard themselves as having the right to decide what is best for them. It follows that any innovative proposal has to be finally sanctioned by those who are in a position to put it into effect (p. 121).

They propose the presence of four levels in these systems: the system as a whole, the institution, the basic unit (within the institution) and the individual. Innovative attempts often fail, they argue, because they are unable to accommodate to existing structural constraints.

Higher education systems and institutions are extremely complex, fragmented and diffuse, and undertake a wide variety of tasks and activities. Clark (1983) argues that in these complex systems various forms of system integration can be distinguished, each with its own ways of promoting and limiting innovation. The forms are bureaucratic, oligarchic, political and market integration. Clark assumes that market integration normally has the strongest adaptive capacity. It stimulates higher education institutions to be responsive and creative and therefore incorporates an influential incentive to innovate. This form of integration complements what the Triple Helix Model proposes.

2.6.3 Rival versions of competence view of the university

Tension exists between what the state wants and what the university wants. A binary system is one mechanism to alleviate such tension. Instead of just viewing education as either being vocational or academic in nature, Ronald Barnett (1994) describes the university as a site of rival versions of what it is to know the world. He makes the distinction on the basis of academic and operational competences. Academic competences are within the academy and operational competences are set within the world of work. There in increasing pressure in the direction of achieving operational competence which he suggests is changing our epistemological existence. In his 1994 book, *The Limits of Competence*, Barnett argues that competence is an entirely acceptable aim of education but it is essential that the nature and context are well articulated so that those who have to demonstrate competence are clear about its aim. He contends that it only becomes problematic when it becomes the dominant aim, lessening the claim of other aims of education. Tensions also arise if competence is constructed in an over-narrowly manner. Barnett considers the higher education market as unique and unusual, as the consumer is both a producer as well as being a product.

Barnett's rival versions of competence argument and his proposed third scenario, life-world becoming, centre on the idea that the world is unknowable. Language and discourse are central to the scenario. Barnett identifies the common ambitions of both definitions of competence and contends that the life-becoming world scenario transcends both as it provides a liberating yet disciplined curriculum:

> Disciplines, objective knowledge, occupational standards, skills and the whole ragbag have to be seen for what they are: ideologies exerting power and constraint, requiring a certain form of human development. In this sense, both the academic and operationalists are in league in framing the conception of ideal human beings and in requiring the student to conform to it. If we

> see higher education as a form of becoming in which students become themselves, an altogether different notion of becoming is required (1994, p.191).

Tensions can surface if you take an operational view, solely looking for practical outcomes based on reflection by an individual doing what works and ignoring many of the values and principles of academics.

Transcendence would require an awareness of the need to change identity to achieve this third form. By his own admission, Barnett said it is 'unlikely to find many takers' (p.192). His world as unknowable thesis could be viewed as the ultimate rejection of science. Symes and McIntyre (2000) contend that the world is unknowable claim is too strong an assertion, leading to claims of fallibilism, for example, that no knowledge is immune from revision, and knowledge claims that were once true can subsequently be found to be false. They also highlighted the weak basis of the thesis. Irrespective of whether or not knowledge is fixed or the extent of social reflexivity, human understanding seldom demolishes or presents new structures by starting again from the beginning.

Despite this, using Barnett's interpretation of operational and academic competence can highlight where confusion and tensions may arise. In the context of bankers, it is expected that they are ethical and technically proficient. The Institute of Banking identified the need in the period after the financial crisis to provide a clear and well-constructed framework where bankers could demonstrate competence in an appropriate way. In 2013 the Institute launched the Professional Education Framework. It was developed in consultation with the banking sector and underpinned academically by its university partner. It is an attempt by the Institute to contribute to rebuilding customers' confidence in Irish banking and to restoring the self-esteem and purpose of banking professionals. .

2.7 Academic–vocational drift

This section describes what is meant by the term 'academic–vocational drift'. The academic drift describes the influence of the attractiveness of achieving parity of esteem and status for non-university institutions with their university peers (Neave, 1996; Grubb et al., 1991; Pratt and Burgess, 1974). It also describes a tendency to make vocational education more academic (Neave, 1996). Pratt and Burgess (1974) first coined the phrase academic drift to describe the situation occurring in polytechnics in the UK. Polytechnics had been set up to widen access, expand a cheaper form of higher education and meet the demand for more programmes of a vocational and professional nature. Also at this time, international competitiveness demanded that the non-university sector needed to increase its effectiveness. Whilst maintaining their original brief, polytechnics also started to emulate the university model by offering degree and postgraduate programmes of longer duration, increasing their student intake in more applied technical subjects. Polytechnics rapidly expanded as the UK moved towards an Americanised version of mass education. This ultimately led to the demise of the binary divide in the UK higher education system and the granting of university status to polytechnics in 1992. In his book, *The*

Polytechnic Experiment 1965–1992 (1997), John Pratt alluded to two predominant opinions as to whether polytechnics were successful or failed. Firstly, they provided a new selection mechanism in the higher education system which led to increased numbers progressing from second level education. This in turn alleviated pressure from the university sector. The second opinion to consider in determining the success or failure of polytechnics is that they represented a liberal vocationalism, assisting local people in gaining employment.

Many non-university institutions now offer short term tertiary cycles or are co-operating with universities, thus entering into the academic field. Arguably, this could be understood or conceptualised as academic drift. However, at the same time the emphasis on employability, practice orientation and professional relevance generates what is known as vocational drift (Neave, 1996), manifested by academic programmes being redesigned to meet work place demands, industry participation in lecturing, etc. This was echoed by the European Universities Association (EUA, 2003), which reported that 91% of the Heads of European higher education institutions regard the employability of their graduates to be an important – or even a very important – concern when designing or restructuring their curricula. Employability, degree structures and institutional diversity are therefore all closely linked.

According to Berryman et al. (1992), the integration of academic and vocational education is an educational strategy that addresses curricular and instructional matters in an attempt to make learning more available and meaningful to students. Students achieve vocational competencies whilst also learning abstract and theoretical concepts in an applied manner. Therefore, such integration emphasises the contextualisation of knowledge to enhance students' problem solving and employability skills.

Vocational education has been criticised on two fronts: for providing overly specific training and for encouraging a dual structure that segregates vocational and academic education. Academic education is levied with the criticism that its curriculum lacks participatory forms of learning and opportunities for students to connect learning to 'real world' events (Grubb et al., 1991). Both vocational and academic sectors are increasingly under pressure to enhance the employability of their graduates. Whilst this current fascination about employability is valid, it must also recognise that occupational skills depend on and do not exist apart from, their academic foundations.

2.8 From drift to full integration

The Institute as a professional vocational organisation adopted more academic practices and eventually assumed a full academic identity as the first externally recognised college of UCD. The 'Academy model' as proposed by Grubb et al. (1991), who identified eight integration models, best classifies how the Institute became integrated with its partner university. An academy model is organised around a major industry or career area. Institutions that adopt this model offer a focused, in-depth curriculum

lasting several years, and are most effective for students who have an interest in a particular industry or career that is the focus of the academy, banking and its related jobs in respect of the Institute.

According to Bailey (1997), despite some degree of success on curriculum integration, academic and industry skills standards are developed in isolation, with one seldom considering the other. He acknowledges the attention given by vocational education institutions to generic skills in preparing their students for the workplace, but suggests that:

> Ultimately generic standards will be meaningful only to the extent that they can be assessed so both academic and industry groups have a large stake in the success of those efforts. Academic skills must reflect not only a person's ability to know, but his/her ability to relate learning to work applications (p.v).

Overlap and permeability are two central concepts of integration. Permeability relates to the ability of students and lecturers to move between the two systems. This leads to the introduction of the labour market as a strong contextual aspect of the interaction between the university and non-university sector. Employability as referred to above has redefined the missions of both sectors.

Government policies that can support and enhance permeability include smoothing access between sectors, building bridges between the sectors, defining an overarching qualifications framework (which is in place as outlined above) as well as fostering networking and competitive diversity within and between sectors. Such policies of interaction support the pertinence of choosing the Triple Helix Model as a conceptual lens in this thesis.

As students become more aware of the demands of the job market, they may assume more responsibility for their learning so it can aid motivation. It is not always the student that benefits from workplace links; industry also benefits by having more technically proficient workers. A balanced curriculum between academic and vocational content maximises both areas of learning.

2.9 Evolution of relationship with UCD – The Institute's university partner

In 1979 the Institute and representatives from various banks initiated talks with University College Dublin to establish a degree in banking and finance. The first students were enrolled in 1982. Part of the degree design was that exemptions were offered to holders of Institute qualifications and access was open to all. The development and addition of a degree in the Institute's education portfolio was driven primarily by industry rather than by the Institute's own initiative. These roles would reverse in the future, with the Institute pre-empting requirements from industry. There was a will from Institute management to ensure relevance to the sector in order to survive.

The Institute still felt that it had no degree of its own, despite the joint degree in Banking and Finance with UCD. Throughout the latter half of the 1980s, the Institute had worked closely with the banks and UCD to address this. All this work would come to fruition with the unveiling of the Bachelor in Financial Services in 1990 (White, p.132).

At last the Institute had a degree that it could call its own. The Bachelor in Financial Services was offered on a distance learning basis. The structure was as follows: the Banking Certificate equated to Level 1 (Year 1), the Diploma was Level 2 (Year 2) and the Degree was Year 3, devised jointly by the Institute and UCD. The first students commenced their studies in Queen's University, Belfast, in 1991. Demand for places was high from bank staff who had entered banking when secondary education was the entry level requirement. The Institute knew, however, that this market would be a finite one.

In order to differentiate the Institute from other member-based professional organisations, the need to leverage the unique relationship the Institute had with UCD was identified early on. The Institute only had links with the university on the jointly offered Bachelor in Financial Services. Prolonged negotiations between the Institute and UCD culminated in the announcement on 11th May 2006 of a long-term strategic alliance between the Institute and UCD. From the news release on the UCD website, the brief was to enhance and develop education in research in banking and financial services. The research brief never materialised. As part of the alliance, the Institute became the first recognised external school of UCD, affiliated to its Business and Law School. The new school was named the School of Professional Finance. What this meant was that all existing Institute qualifications were now being accredited and awarded by UCD. They were fully integrated into the university and mapped directly onto the Framework of Qualifications of the Irish National Qualifications Authority in Ireland (now Quality and Qualifications Ireland (QQI)). The Institute had achieved its goal of differentiation relative to other similar organisations. The Institutional transformation of the Institute and the creation of the School was gradual and created a new entity, hence innovation occurred as a result of collaboration between UCD and the Institute.

In April 2011 the Institute requested that UCD conduct a Periodic Quality Review of the School of Professional Finance. The request was made in order to ensure that the Institute was compliant with all UCD practices and operating to the standards of internal schools. The report indicates the view that its university partner has of the Institute and why such a partnership exists:

> The School's programmes, designed for their members' combination of work and study, are all part-time, post experience offerings. Professional certificates and professional diplomas serve as both stand-alone qualifications and as qualifiers for those seeking progression routes to degree and postgraduate qualifications…. The school's activity is also aligned with key aspects of UCD's mission in respect of contribution to the social, cultural and economic life of Ireland. It also supports UCD's strategic plans, which include an increase in the percentage intake to the student body from non-traditional backgrounds (Richardson et al. p. 4).

The Institute was commended on the time spent and effort made in re-structuring to mirror the standards and operational model required by UCD. It even referred to certain practices as being better then what is required, for example marketing and promotion materials were considered to be

'exceptional'. In its conclusions, the Review Group acknowledged the management and governance of the School as being well structured and very effective in collaboration with industry participants and academic and administrative staff. Now the Institute could create and modify accredited programmes subject to UCD Academic Council approval.

2.10 Conclusion

This chapter described how the Institute evolved from a purely member-based professional organisation to becoming a recognised college of a university and discussed the Institute's core values. Figure 2 highlighted what the Institute considers to be important. Innovation and Academic Excellence are two of the Institute's six values. Throughout the chapter, examples were provided of how the Institute engaged with industry, government and university actors. For example, there was engagement with industry to develop content on programmes, with its university partner to accredit these programmes and with government in meeting identified needs, such as those from Summit Finuas Network for international financial services. What emerges is an organisation that operates simultaneously as an externally recognised college of a university and a member-based professional organisation. Instead of competing with the academic, the Institute has successfully complemented its original vocational function by assuming an academic function.

Not all of its 34,000 members will ever study with the Institute. Many joined to be members of a community and to use the Institute as a platform to network with their peers. The Institute retains individuals through Continuing Professional Development. A total of 22,000 of the 34,000 members are maintaining designations through the completion of CPD courses after graduating from accredited programmes.

Throughout its existence, the Institute has interacted with the university to differentiate itself from its competitors and to provide its members with accredited professional programmes. Various interview respondents referred to this, especially respondents three, four and seven. Interaction with UCD ensures the academic rigour of its programmes through adherence to UCD Quality Assurance processes. At the same time, there is on-going interaction with industry to provide it with students, inform it on content required and provide people to lecture and give context. As stated above, the Institute as a member-based professional body must ensure that it is relevant to the industry it represents. Government interaction was minimal until the financial crisis of 2008. The Institute now recognises the importance of engaging with government actors as evidenced in the Stakeholder analysis it conducted in 2013. Government now assumes the contradictory dual role of regulator of the sector and a major shareholder in banks. There is a willingness on the Institute's part to be a member in bi-lateral and tri-lateral arrangements with university–industry–government actors. How it networks in practice is becoming more sophisticated as it positions itself with the various actors by orchestrating arrangements whereby interaction advances its objectives. An example of this is the planning involved

in its engagement with UCD. Initially it was to develop the relationship, and then to achieve school and ultimately college status.

In addition to the description of the Institute in Chapter Two, the characteristics of both vocational and academic education along with an alternative conceptualisation of higher education were discussed to assist readers form a view of the hybrid nature of the form of the Institute. It is evident that characteristics from both systems form the institutional architecture of the Institute, notwithstanding the prevalence of the vocational orientation. Discussing these characteristics also informs the reader of similar and juxtaposed aspects of these different forms of higher education. Knowledge is the focus of attention under both, but distinctions are made on the nature (epistemological), purpose (teleological) and hierarchical aspects of the knowledge in professional/vocational education. Having a culture that embraces change assists organisations in their pursuit of innovation. The belief systems under both forms of higher education are complex. The three levels, as espoused by Clark (1983), of how ideologies and belief systems permeate academic institutions, highlight the complexity of academic institutions.

The next chapter proposes the use of a multi-disciplinary definition of innovation, followed by a discussion on the processes of innovation and education. A review of the conceptual lens in this research follows, describing the Triple Helix Model and how it works. The model is critiqued and examples of empirical studies are provided to illustrate the application of the model in the interactions between university–industry–government actors.

Chapter 3: Innovation, Higher Education and the Triple Helix Model

3.1 Introduction

The central construct of this thesis is innovation. Because of its normative nature, there is a need to contextualise innovation, as it cannot be understood as a pure notion. A multidisciplinary definition of innovation as offered by Bareghah et al. (2009) is proposed for the analysis of responses from participants. Subsequent sections relate to the aims and role of higher education, discussing competing views on the public good role of higher education and the economisation of the system as a whole.

The Triple Helix Model is used to determine how interaction between the main innovation agents (university–industry–government) occurs in the context of the environment within which the Institute operates. Commentary on its underlying assumptions, how it works, critiques of the model, and finally how it has been applied are presented. Innovation and change can occur from an intra-helical (within one sector, just university) and inter-helical (between sectors) perspective. The model's historical and evolutionary approach to analysis addresses all three temporal spaces: past, present and future. Analysing the institutional dynamics and the social functions between the three institutional actors, university–industry–government, was, I consider, conceptually unambiguous.

3.2 The components of the research question

The research question under investigation is:

In what ways does interaction with university, industry and government actors contribute to the pursuit of innovation within the Institute of Banking in Ireland?

The three components of the research question are innovation, education (the Institute) and the Triple Helix Model of innovation. As stated above, how the Institute pursues innovation is explored using the Triple Helix Model of innovation. A brief discussion of each component of the research question follows.

The Institute – Education Component

The higher education environment in which the Institute operates was discussed in Chapter 2. Chapter 3 discusses the aims and role of higher education, competing views on the public good role of higher education, the economisation of the system and how it manifests in the entrepreneurial university view. The description of an entrepreneurial university highlights how different the Institute is to the institutions described in this view. I contend, however, that the Institute can still contribute to the innovation agenda.

Application of Triple Helix Model – Means to achieve innovation, the desired goal

Innovation – the Goal

Innovation systems can be portrayed as consisting of two parts: components and relationships. The components correspond to the different organisations and institutions of the actors involved in the system. The boundaries between components can be easily identified when defined in spatially bounded terms, such as by administrative units or geography. It is more difficult when systems are spatially open, such as is the case with sectors. The relationships acknowledge how these components interact with each other. They compete, exchange goods and services and share knowledge within their policy network (Edquist, 2005).

By incorporating the functions of higher education into an innovation system such as teaching and learning, research and the third mission – innovation – a higher education innovation analytical framework can be envisaged. As the Institute only engages in teaching and learning activities, the emphasis going forward will be on this domain. Despite that, I consider that innovation within one function can impact positively on the other functions.

Analysis of components, relationships and the teaching and learning function of the Institute are discussed in Chapter 5.

3.3 Dis-spelling common misconceptions and making clearer distinctions about innovation

The findings from a three year empirical study, known as the Minnesota Innovation Research Program (Van der Ven, 1986) conducted on innovation processes refute many previous held ideas and mainstream thinking about innovation. For example, innovation is a linear process, its characterised by pure randomness and chance or stages in the process occur in a predictable manner. Stakeholders assumed numerous roles, engaged at different levels throughout and opinions converged and were divergent over time. This reference to stakeholders, their role and opinions complements the use of the Triple Helix Concept. The study found that ideas and inventions tended to expand rather than remain focused. Not all ideas resulted in an innovation as some ideas were terminated abruptly.

A common misconception to dispel is that the term creativity and innovation are interchangeable. These terms are favoured differently in different fields, for example in business the word innovation is often mis-used even when it refers to the creative process and work (Sternberg and Lubart, 1999). Craft (2005) sees creativity as the ability to see possibilities that others haven't noticed, therefore creativity and innovation are obviously inter-related. Creativity is seen as the "infinite source of innovation" (EC, 2008), in turn innovation can then be perceived as the application and implementation of creativity (Craft, 2005).

Another misconception is that an invention is an innovation. For an invention to become an innovation there are two conditions required: a need must be present and the invention must improve lives in some way. The process is such that an idea must be developed in order for an invention to be developed

which leads to an innovation. Becker and Whisler (1967) differentiated these two distinct concepts when they said, “invention is the creative act, while innovation is the first or early employment of an idea by one organisation or a set of organisations with similar goals” (p. 463).

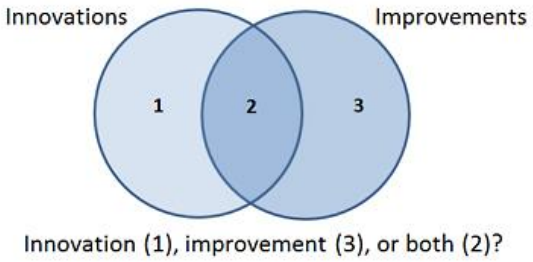
Furthermore, Esquivel (1995) sees creativity as the critical process involved in the generation of new ideas. Unless implementation occurs, an idea can-not progress to an invention and an invention into an innovation. Under this conceptualisation an innovation’s impact determines its qualification, which has a greater affinity with the world of economics and business. In an educational context I favour the impact as that espoused by Ferrari, et al. (2009) when they endorsed an inclusive and democratic perspective of creativity in education utilising Craft et al.’s (2001) LCC concept. Craft developed the “big C” and “little c”. The first (big C creativity or BCC) refers to the creativity of the genius i.e. Einstein. A genius’s achievements are novel, excellent, socially recognised and valued. It is not very common. Little c creativity (LCC), doesn’t relate to the gifted, talented or to creative and innovative events that impacts society at large. LCC refers to behaviour and mental attitude, or as the ability to find new and effective solutions to everyday problems. Higher education is there for both “big C” and “little c” participants. The objective is for every student to realise their full potential.

A distinction between innovation and improvement is also required. As stated an innovation creates something new. An improvement enhances something, making it faster, better, cheaper etc. Improvements can assist people making smarter decisions. The iPhone by many is considered as innovative. I would contend that each edition is a process improvement on the last. Even the original phone was based on a widely available phone platform. Within process improvement a further distinction is required. The terms effective and efficient are often used interchangeably. Being effective means doing something to a high standard. Being efficient means doing something in a way that best utilises your resources.

Commented [Vp1]: Not sure this contributes much to the discussion. Keep your focus.

An innovation transforms an invention or improvement into something that has a new impact on an organisation or market. Therefore innovation is revolutionary and improvement is evolutionary.

Keathley et al. (2013, p.3) illustrated the relationship between innovation and improvement as follows;



Not all improvements are innovations, yet most innovations are improvements, with some innovations not leading to improvements. An example from the banking world f an innovation and improvement is the process of `tap and pay'. This has changed the way people pay for goods and services. it is quicker and cheaper than the cost of an ATM withdrawal. In Ireland Allied Irish Bank was the first to adopt this technology and this is the innovation. Their competitors, other banks now offer this service too. This is improvement and not innovation on the part of the other banks.

It is easy to confuse the two terms improvement and innovation. The research and development costs, time and resources required to innovate can deter firms and result in conscious decisions to concentrate on improvements.

The next section presents a comprehensive definition of what innovation is. Responses from respondents will be considered in the context of the proposed definitions and the prevailing mis-conceptions that many people hold.

3.4 A comprehensive multidisciplinary definition of innovation

Joseph Schumpeter (1950, 1934), an Austrian economist, is considered by many as a pioneer in the field (Lundvall, 2007, 1998; Etzkowitz and Leydesdorff, 2000, 1998, 1996). In the 1930s Schumpeter studied how the capitalist system led to market innovations. He described a process which he called ‘creative destruction’, whereby new markets opened and the organisation developed. He likened the organisation’s development to a process of industrial mutation that revolutionised its economic structure from within, destroying the old one. He first suggested that the source for most innovations came from small entrepreneurs, and that large firms with some degree of monopoly power are most likely to innovate later. The weakness in Schumpeter’s claim was a lack of empirical evidence. His contribution is that innovation can be viewed in terms of ‘creative destruction’ waves. In turn, the market is restructured and those who grasp the discontinuities are favoured over those who do not. His argument is that organisations should innovate in order to prosper. The Triple Helix Model encompasses his vision, but also considers innovation dynamics arising within each of the three institutional spheres of university, industry and government as well as their interactions.

Bareghah et al. (2009) claim that ‘[i]nnovation has many definitions that align with the dominant paradigm’ (p.1323) of different disciplines. They agree with the view of McAdam et al. (2004) that because of the number and diversity of definitions, ambiguity and confusion ensue. This is problematic, because there is no agreed definition of innovation. Despite this, there are certain common views, most notably that innovation is a process. Thereafter, the language differs. Craft (2005) considers innovation as value generating, whereas Drucker (1993a) considers it as wealth creating. Lundvall (1998) refers to innovation having risks as uncertainty prevails and states that ‘being innovative differentiates and enables an organisation to grow and sustain operations’ (p.407). Dosi (1990) refers to innovation as being ‘inherently linked to learning as one needs to discover ways, processes to create changes to

occur' (p.299). The above conceptualisations highlight differences and emphasise aspects of the innovation process as purely economic in nature or pertaining to an organisation or individual.

In an attempt to address this problem of conceptual ambiguity, Bareghah et al. (2009) conducted content analysis on extant definitions of innovation – sixty in total – to produce an integrative, cross-disciplinary definition of innovation.

They achieved this by reviewing literature from economics, engineering, technology, business and management, science, innovation and entrepreneurship. They identified six recurring attributes of innovation included in the diverse definitions. The attributes are:

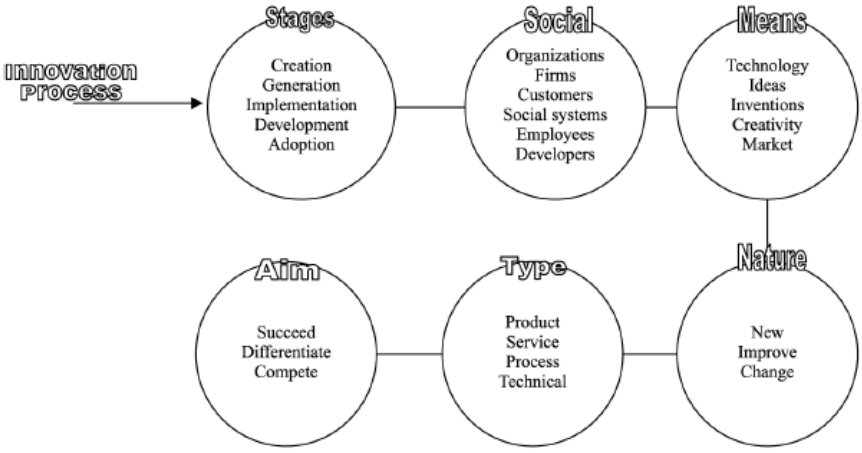
1. Aim of innovation – the result being sought through innovation.
2. The nature of innovation – the form the innovation takes, new or improved (change).
3. Type of innovation – the type of output, for example product, process or service.
4. Social context – any social entity, system or group of people involved in the innovation process or environmental factors affecting it.
5. Means of innovation – resources (financial, technical and creative) that need to be in place for innovation to occur.
6. Stages of innovation – steps during the process, typically idea generation through to commercialisation.

The study highlighted the tendency of many to concentrate on the types and nature of an innovation, followed by the means and social context (the networking perspective). The stages and then the previously absent reference to the aim of innovation were the least considered attributes.

The temporal dimension of innovation was an attribute not considered, as it was absent from many of the definitions. By their own admission, adopting a temporal perspective would feature in future research, as they stated that evidence shows that the nature and focus of innovation has changed over time.

A diagrammatic model supplemented the textual definition. The aim of the diagrammatic definition was to present the essence of innovation, regardless of the organisational or disciplinary context. Figure 4 incorporates the six attributes and their corresponding descriptors to present a possible flow of the innovation process with multiple starting points, heavily influenced by a person's disciplinary background. For example, an engineer might focus on the technical possibilities of a new product whilst a marketer is more concerned with identifying new markets. These corresponding descriptors were used in the analysis of responses from respondents on what they thought to innovate meant. This is discussed in Chapter 5.

Figure 4: Diagrammatic definition of innovation



Bareghah et al. (2009, p.1333)

Bareghah et al. (2009) articulate the diagrammatic definition as innovation being a 'multi-stage process whereby organisations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace' (p. 1334).

I consider Bareghah et al.'s definition to be comprehensive because it has been derived from seminal thinkers in various fields. In Figure 2 (Chapter 2), the Institute's Core Values are presented, and innovation is explicitly stated as the following: 'We constantly strive to introduce new ideas, new education programmes and services and to make things better for our members.'

The Institute definition considers the temporal perspective as it refers to the intention to 'constantly strive'. It makes no reference to new processes. I would consider that 'to make things better for our members' closely approximates the same outcome as that espoused under Bareghah et al.'s definition 'to advance, compete and differentiate themselves successfully in their marketplace'.

The next section provides a brief overview of how the aims of education have assumed an economic orientation and how some are critical of such an orientation. Because of the commercial orientation of the Institute, as its funding and responsiveness to the market require it to be, I consider it difficult to ignore the pervasiveness of the economic conceptualisation of higher education.

3.5 Role of education and its economisation

There is little doubt that although policymakers refer to the importance of the wider aims of education, they consider the economic role to have assumed primacy. Innovation is perceived to be the major input to long-term economic growth (EC, 2008) and for the market to thrive (Aho, 2006). As education is

largely funded by national governments, the benefits of education are seen to belong not only to the individual but also to their country. The economic gains can be viewed as mutually beneficial. Lauder et al. (2006) explain that the knowledge economy concept contends that 'the state provides opportunity for employment, thus addressing issues of poverty, inequality and unemployment. Therefore it is the responsibility of the individual to be employable (p. 47).

The aims and purposes of education as outlined in The Dearing Report 1997 are comprehensive, yet also highlight other considerations. Whilst the report was commissioned to review the UK higher education system, I consider its findings applicable in an Irish context too.

In Chapter Five, subsection 5.10 of the Report, the following aim of higher education is proposed: 'to enable society to make progress through an understanding of itself and its world.'

The Report states that the four main purposes of higher education (Chapter Five, subsection 5.11) are:

- To inspire and enable individuals to develop their capabilities to the highest potential levels throughout life, so that they grow intellectually, are well-equipped for work, can contribute effectively to society and achieve personal fulfilment.
- To increase knowledge and understanding for their own sake and to foster their application to the benefit of the economy and society.
- To serve the needs of an adaptable, sustainable, knowledge-based economy at local, regional and national levels.
- To play a major role in shaping a democratic, civilised, inclusive society.

Only the first purpose relates to the individual; the remaining three relate to society. I would contend that the first three purposes have an economic dimension, as the first purpose refers to being 'well-equipped for work', the second refers to 'application to the benefit of the economy' and the third refers to serving 'the needs of an adaptable, sustainable, knowledge-based economy'.

The role of higher education in serving the public good is at the centre of many debates on university governance, resource allocation, access and autonomy. A cost benefit approach to production in higher education is an economic framing of the debate on how the costs could be shared between taxpayers and direct beneficiaries (Marginson, 2007, 2004; Tierney, 2006; Pusser, 2002). Higher education provides both public and private benefits. Any research conducted can provide both public and private goods. The state has a role to produce public goods. Applying an economic view, public goods are not scarce, they are non-rival (my consumption will not affect your consumption) and non-excludable, that is, they are available to all whether paid for or not. Allocation is not based on preference. By contrast, private goods provided through the market are rival, excludable and the laws of demand and supply

reveal preferences and determine the amount produced. Marginson (2007, 2004) considers this distinction to be an oversimplification, based on distinctions such as state/non-state ownership, state/market and market activity and non-market activity. Marginson (2007) contends that these economic and statist notions treat public and private goods as mutually exclusive, when history shows that activities such as education are often shifted between private and public, and vice versa (2007, p.310). The main private goods produced in higher education are individualised status benefits, or positional goods (Marginson, 2004, 1997) that are obtained by students. Stiglitz (1999, p.308) notes that knowledge is almost as close as we can get to a natural public good. Marginson (2007) acknowledges the usefulness of the economic terms of excludability, rivalry, externalities and under production of public goods, but considers them 'poorly equipped to analyse and place a value on collective goods; that is, those benefits of higher education with no individualistic component at all, such as the codification of knowledge or language' (p.312). Stiglitz (2000) classifies education as a publicly provided private good because of the large marginal cost associated with educating each additional child, which makes education rivalrous. It is excludable too, as evidenced by the existence of private universities and fee paying institutions. Therefore education does not fit with an economic definition of a public good, as it is freely bought and sold in a market. Pusser (2002) states that the basis for public provision of education is to ensure provision if the market fails to produce an optimal level of education outputs or an equitable distribution of education opportunities and outcomes. In order to account for the variable character of higher education whereby some aspects are recognised as being more excludable, rivalrous and production can be configured in public and private ways, Marginson (2007) redefined public goods as 'goods that (1) have a significant element of non-rivalry and/or non-excludability, and (2) goods that are made broadly available across populations. Good without attributes (1) or (2) are private goods'.

3.6 Critiques on the economisation of education

There are many critics of this conceptualisation of education. Olsen (2004) argues that schools/universities are important as democratic organisations, through the particular way that they are connected to communities and through their ability to empower and involve minority groups in participatory projects. They assist in developing civic virtue, resulting in patterns and habits of good citizenship. This is what he signals as the real importance of the 'knowledge economy' and now, by extension, the 'smart economy'.

Ireland, like most other western economies, has increasingly become a pluralist society with many different cultures. Therefore there are competing value systems. Higher Education institutions can imbue ethical behaviour through their value systems. Both the Irish Government's policy document, *Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal*, and the Hunt Report 2011 espouse a view that not just scientists and engineers should make a contribution. Artists, expert practitioners in the humanities and social scientists must also contribute. They could nurture in

students the creativity, enthusiasm and skills required for continual engagement with learning: 'While most discussion of research focuses on the hard sciences, it is the arts, humanities and social sciences that have consistently attracted the largest numbers of students, and these are the domains in which Ireland has made a real global impact' (Hunt Report, 2011, p.38).

Education is necessary to construct the network of norms that permit both the market and democracy to function. Governments worldwide are promoting reforms in their education systems to match global economic and technological advances with the aim of producing citizens who can become productive members in this new society (Calderhead, 2001; Apple, 2000). Likewise Wolf (2004) argues that the pervasive policy consensus that education is a mechanism for increasing economic growth rests on assumptions and interpretations of data that are highly questionable. For example, the widely cited metric of the number of years in formal education completed is too simple a measure of education's contribution to economic performance and growth. She also contends that the level of spending is by no means an indicator of the quality of educational output. Education does have a contribution to make but is not all about economic performance.

Furthermore, Lynch (2006) has raised concerns about the ways in which the social role of higher education is secondary to the economic. She argues:

> Throughout the [OECD] report on Irish HE this focus is on developing a skilled workforce for the economy. There is no reference in the body of the report to the role of the universities in developing the civil, political, social or cultural institutions of society, either locally or globally (p.305).

Questions are being raised about the dual role that Irish higher education might play; for some, the aim of economic advancement is not necessarily commensurate with the aim to develop social well-being (Fisher, 2006).

Whilst both sides have valid arguments, I find it difficult to ignore the pervasiveness of the economic argument, as the Institute's funding and responsiveness to the market require it to be even more cognisant of the changes occurring in its environment.

Having considered two of the three components in the research question, namely education and innovation, being the Institute and the environment it operates in along with the ultimate goal of achieving innovative outcomes, the next section will address how, in the context of this thesis, innovation can be achieved. This requires a description of the Triple Helix Model and how it works, and critiques its assertions. This is followed by a review of the literature on how the university component interacts both internally and with the other two institutional spheres: industry and government.

3.7 The Triple Helix Model

Leydesdorff and Etzkowitz (1998a and 1998b) proposed the Triple Helix Model to describe the dynamics existing in the institutional arrangements involving universities, industries and governments and the relations between them occurring during the processes of innovation. This spiral model enables the analysis of multiple reciprocal relationships at different stages in the process of generating and utilising knowledge. Knowledge is the essential ingredient in the model.

Triple Helix collaboration generally implies a pattern of social interaction, which is associated with a regular open exchange of knowledge, mutual use of assets and interactive coordination of decisions between the three institutional spheres. Therefore it is a non-hierarchical model of coordination, based on the principle of collaboration in consensus-making. Triple Helix collaboration radically differs from private-public partnerships of the industrial economy. The three actors not only network their communications, but interactively coordinate their decisions and mutually borrow their functions, to become hybrid organisations (Etzkowitz, 2008). Etzkowitz maintains that such functional networking is a key to understanding typical Triple Helix design and its synergy effects.

Innovation takes place in the context of relationships that form a network via the linkages between firms and their human and financial resources (Russell et al., 2011) or, indeed, the institutions where people study. People familiar with the context are motivated to understand their individual role in value co-creation within the larger context and can then communicate their shared vision to get results. The role of innovation networks has been highlighted by many: 'collaboration is premised on information technology that increasingly occurs through a network at various levels, from local to international' (Etzkowitz, 2008, p.22). Any given relationship may change over time (e.g. from weak to strong), and a whole structure of relationships can change too. When changes in relationships and structures occur as a result of a coherent social process, this is termed network evolution.

The Triple Helix Model also sees innovation ecosystems as networks of relationships through which information and talent flow for value co-creation. The character and boundaries of the ecosystem are shaped by three institutional spheres: industry, government and university. Etzkowitz and Viale (2010) consider that the institutional spheres are bounded permeable entities:

> with networks and collaborations giving organisations an outward as well as an inward focus. Networking and taking advantage of complementarities supersedes 'boundary work', or defence of structures, as an organisational priority. These changes are driven by a reciprocal relationship between the emergence of polyvalent knowledge and the differentiation and integration of the Triple Helix (p. 402).

Network analysis is used to visualise these relationships and to network orchestration for their transformation. The capacity of Triple Helix participants depends on their ability to orchestrate networks of relationships in order to co-create value, create and activate technical and managerial talent, and attract and leverage capital (Russell et al., 2011).

3.8 How it works

It is possible to identify the existence of four processes related to the main changes in production, exchange and use of knowledge that emerge from the model leading to innovation. This enables analysis of the presence of Triple Helix effects on the system as a whole or within any of the institutional spheres (Etzkowitz et al., 2000).

The first process relates to the internal transformation in each of the spheres, for example an awareness on the part of each helix actor that they need to adapt to the external environment. This can take the form of strategic alliances between spheres or the assumption of the functions of another sphere – economic development in the case of the university.

The second process refers to the influence of one helix actor upon another. For example, government enacts a law to regulate the market. In addition to legislation, they could reconstruct the market and modify market participant behaviour by creating market incentives. These actions affect the other components: industry and university.

The third process is the creation of new trilateral networks and organisations with the purpose of generating new ideas and innovations. The three selection environments can operate on a dually-layered network; on one level they can constrain each other's behaviour and on another level they can influence and shape each other's expectations. For example, the function of university–industry relations can be performed by different institutional arrangements such as transfer offices or spin-off companies, etc. These three sub-dynamics are dynamic, continually being reconstructed as a result of interacting selectively.

The fourth process relates to the effect repeated inter-institutional networks have on the originating spheres and on society at large. At different times, certain relationships are more important because incentives to change come from different sources and there are multiple selection environments operating concurrently.

The Triple Helix Model of innovation is not stable; the sources of innovation that make up a Triple Helix are not synchronised a priori. This means they are derived by the actors' ability to reason, based on theoretical deduction rather than empirical observation. As the actors interact, reflectivity occurs so that intentions, strategies and projects that can create value happen through the reorganisation and harmonisation of the infrastructure (Etzkowitz and Leydesdorff, 2000). As this process happens continuously, it impels the system to become knowledge-based, as illustrated below.

Fig. 4. The overlay of communications and expectations at the network level guides the reconstruction of institutional arrangements.

Source: Etzkowitz and Leydesdorff, 2000, p.112

All spheres have challenges; for universities it is to successfully incorporate entrepreneurial activities with its traditional activities of teaching and research. Industry needs to consider how it can utilise the resources available from university. Pudkova and Uvarov (2011) highlight that business rarely calls for innovation unless it initiates it. Governments, on a global, transnational, national, regional and local level need to be at the nexus of a networked infrastructure that ensures that productive and sustainable relationships exist between university and industry spheres.

3.9 Criticisms of and challenges to the Triple Helix Model

In this section the limitations of the Triple Helix Model will be discussed, referring to debates about the changes of knowledge production and the various actors which interact in the process of innovation.

The criticisms of Tunnainen (2002), Fuller (1998) and Shinn (1999) all relate to shortcomings in the Triple Helix Model when research is conducted. As the Institute does not conduct research, this alleviates such concerns.

The emergence of Triple Helix Twins (Etzkowitz and Zhou, 2006) and the introduction of a fourth actor – the public sphere – in the Quadruple Helix (Carayannis and Campbell, 2010, 2009), could be seen as an admission that not all actors belong to industry, government or university and yet may nevertheless have an influence on the promotion of innovation. Lindberg (2011, p.1) asserts that 'innovation theories and policies are characterised by a top-down approach in practice, ascribing superiority to certain

actors and areas in advance while marginalising others'. However, there have been no calls to replace the Triple Helix Model as the dominant model in innovation and most developed and developing countries are adopting Triple Helix processes in how they develop their innovation systems. This thesis is an attempt to apply the Triple Helix at a lower level of analysis – the analysis of a single organisation.

The normative and descriptive nature of the Triple Helix Model is acknowledged by Leydesdorff and Meyer (2006), but rather than criticising this, they contend that it should 'enable agents to distinguish integration from differentiation in different dimensions, and thus to contribute reflexively to the construction of competitive advantages in the knowledge-based economy by specifying new functions and institutional needs' (p.1448).

The next section discusses the three different institutional spheres of the Triple Helix Model, reviewing research conducted on how the spheres interact. It also addresses intra-helical relationships.

3.10 Triple Helix Spheres – research and how they interact

3.10.1 The University Sphere

The notion of the entrepreneurial university as suggested in Clark's seminal text, *Creating Entrepreneurial Universities: Organisational Pathways to Transformation* (1998), is discussed. This is interspersed with empirical research on how change, conflict and innovations occur in such organisations. The notion of an entrepreneurial university aligns itself better with the activities of UCD, the university partner of the Institute. The notion of an Entrepreneurial University is a central proposition under the Triple Helix Model of the role the university needs to play. This section finishes with a description of how the Institute can contribute and be innovative despite not engaging in research.

3.10.1.1 Entrepreneurial University

Governments have embraced the principles of the Triple Helix Model of economic development, resulting in increased interaction between industry–university–government. The university has now advanced from just providing an influencing role to making a contribution to the economy; hence the phrase 'the entrepreneurial university', which is discussed in this section.

Etzkowitz and Leydesdorff (1996, p.281) argue that the three components of the Triple Helix are treated as formally equivalent in the model, but that they are substantially very different. In reality, though, as government and industry co-opt universities to engage in their activities more than government and industry adopting university activities, it becomes clear that the university component is institutionally less powerful than them. University provides the other spheres with new discursive knowledge (e.g. papers) and new knowledge carriers (students). From this perspective, the university can be considered as the main carrier of the knowledge-based innovation system (Godin and Gingras, 2000). The Institute

is only engaged in the provision of new knowledge carriers for the industry it represents. It provides know how (skills and capability) and know why (general principles and laws).

Clark characterises the university's relationship with its environment as one of deepening asymmetry between demands from its environment and an institution's capacity to respond. Current demands on universities which challenge their capacity to respond are: more students, more qualifications in a professional career, more expectations from patrons and more knowledge than the system can absorb. This results in a need for an overall capacity to respond flexibly and selectively to change.

University transformation is not accidental or incidental. Clark (1998) identifies five common elements of successful institutional transformation to make them more entrepreneurial. They are:

(i) Strengthened steering core

Clark contends that traditional universities have a weak capacity to steer themselves and as complexity and change accelerate, this weakness in management debilitates them further. Ambitious universities need to be quicker, more flexible and more focused in their reactions to the expanding and changing demands of the environment. The core can have different shapes, but it must operationally reconcile new managerial values with traditional academic values.

(ii) Expanded developmental periphery

Enterprising universities exhibit a growth of units as they link up with external organisations. The forms these units take is spin off companies, knowledge transfer offices and more commonly industry contact. This is an attempt by universities to cope with societal demands.

(iii) Diversified funding base

Widening the funding base is now essential as government support is waning and it comes with a number of conditions. A defining feature of the entrepreneurial university is what Clark called the 'stand-up university', whereby universities have institutional autonomy as they can set their own priorities and do not tamely accept those proposed by the state and reinforced through the state funding mechanism. Discretionary money also enables entrepreneurial universities to learn faster as system wide enactments can be slow. Diversity in funding could be considered as a prerequisite for adaptability.

(iv) Stimulated academic heartland

The heartland is found in the traditional academic departments formed around disciplines. It is at this stage that an innovation or change is most likely to succeed or fail. Clark says that traditional units need to reach outside with new programmes and to develop new relationships and income streams. A modified belief system is required where traditional academic values can be blended with new managerial views. .

Earlier, Kerr (1964) argued that universities need to create a stable, continuous, equitable environment for their members. He contended that innovation was infrequent and that the individual faculty member is torn between 'guild' and 'socialist' views of the university. The guild view is elitist toward the external environment, conservative toward internal change and conformist in relation to the opinion of colleagues. The socialist view is democratic toward society, radical toward change, and non-conformist. He suggested that the irony is that few institutions are as conservative as universities about their own affairs while their members are so liberal about the affairs of others. Becher (1989) stressed that the resistance to new ideas is evidenced by the protracted length of time academic communities take to accept them.

(v) Integrated entrepreneurial culture

Enterprising universities are like high tech industry, developing a culture that embraces change. Strong cultures are rooted in strong practices. As ideas and practices interact, the cultural and symbolic side of the university becomes important in cultivating institutional identity and distinctive reputation. Organisational values cannot be treated independently of the structure and procedures through which they are expressed. An institutional perspective is required. The first four elements are the means by which transforming beliefs are made operative. As the university develops an entrepreneurial response from adopting new practices and beliefs, the long term character of the university will change, with more risk taking and flexibility being exhibited along the way.

Innovation is closely associated with the notion of change, as organisations employ innovation as a tool in order to influence an environment or because of their changing environment, internal and external (Damanpour, 1991).

Levine (1980) developed a theoretical model of how innovations can be managed in organisations. In this model, which stage occurs in the innovative process depends on two variables: compatibility and profitability.

Levine considers compatibility as the extent to which an innovation's values and goals are the same as those of the organisation which has to adopt the innovation. Profitability is subjective, as it considers how satisfied the adopter of an innovation is, whether the innovation meets their needs and whether it is better than existing mechanisms. Levine asserted that both are crucial variables in ascertaining the reason why an innovation succeeded or failed. An innovation fails if the levels of compatibility and profitability of the innovation decline. Profitability affects the adoption of an innovation more, as an innovation can still be accepted, even if its compatibility is low, while an innovation will fail when profitability is low and compatibility high. Becher and Kogan (1980) stress that externally initiated innovations can be successful provided that they are 'acceptable in terms of intellectual substance (compatibility) and that they establish their worth, for instance in terms of student recruitment (profitability)' (p.132).

The concepts of compatibility and profitability have been applied in the research by Becher and Kogan, and Clark. They link these two concepts to their analytical interpretation of the potential success of an innovation. According to Clark (1998), accepting or rejecting an innovation is based on the power amongst groups in the decision-making process. The behaviour of each group and individual involved is guided by self-interest.

These five elements of transformation must interact incrementally over time as an internal culture receptive to change is developed. Collegiality is normally biased towards the status quo, whereas Clark's collective entrepreneurship in his study challenges this view of collegiality and asserts that collegiality should be forward looking and biased in favour of change.

An entrepreneurial university can mean three things:

- The university itself, as an organisation, becomes entrepreneurial.
- The members of the university – faculty, students, and employees – try to become entrepreneurial.
- The interaction of the university with its environment, between university and industry and government, follows entrepreneurial patterns.

1. The university as an organisation

Etzkowitz and Viale (2010) argue that because of the time scale, complexity and multiplicity of expertise required to realise discontinuous innovations, academic institutions by their nature are best placed to cope with these demands. Moreover, they contend that university is the only sphere that will not be trapped by issues of non-translatability and tacit knowledge when science, technology and innovation are interfacing.

2. Members of the university

Two types of scientist have emerged: the traditional scientist operating from a science lab and the applied scientist operating from the corporate lab. Non-translatability of knowledge becomes a problem the more different they are epistemologically, methodologically and in terms of cognitive style. Owen-Smith (2003) found that the more these scientists' aims and styles converge, the more the problem of non-translatability is resolved. As there are three institutional spheres within the Triple Helix, individuals can lead triple lives as they simultaneously or successively interact between the institutional spheres.

3. The interaction of the university with its environment

The notion of the entrepreneurial university has been extended to incorporate a regional development role too; hence the term an engaged university. Engaged universities design programmes, build institutions, and facilitate networks specific to the region they are located in (Gunasekara, 2006; Keane

and Allison, 1999). This regional development remit in engaged universities builds social and civic capital resulting in enhanced local services and leadership in the region (Benneworth and Hospers, 2007; Chatterton and Goddard, 2000).

In addition to knowledge transfer, universities play a key role in human capital development. They produce graduates and develop the workforce, which is a mode of regional/sectoral engagement that promotes economic development. Mueller and Groic (2003) argue that in the longer term it is the development of entrepreneurial attitudes and skills that will significantly change an economy as its entrepreneurs create ventures that act as catalysts for technological and social progress. .

As stated earlier, the Institute's role in its strategic alliance with UCD enables UCD to concentrate on more entrepreneurial activities and meet its intake of students from non-traditional backgrounds. I would contend that despite the Institute not engaging in research, either pure or applied, its role in national innovation is still important. Moodie (2006) argued that vocational education institutions have a mediation role between creators and users of new knowledge. He asserts that in developed countries research is concentrated in a select number of universities but should be incorporated into the productive process to garner more support from government and industry. As Salter and Martin (2001) observe, paraphrasing the OECD, 'knowledge and information abound, it is the capacity to use them in meaningful ways that is in scarce supply' (p.512).

Furthermore, Gibbons (2004) argues that 'much innovation, and hence economic development, is dependent, less on original discoveries, and more on the timely take up, modification, and marketing of knowledge solutions that already exist but need to be adapted to local environments' (p.97). Lundvall and Borrás (1997) observe that; '[i]ncremental technical innovation based on learning, diffusion of technology and organisational change are certainly more important for the performance of any single national or regional economy than major innovations' (p.133). This is supported by Moussouris (1998) who argues 'that there is too much concentration on research breakthroughs and too little attention to the importance of research diffusion in generating economic development' (pp.93–94).

The next section considers how the university interacts with the other institutional actors in the Triple Helix Model.

3.10.2 University interaction with the other institutional actors

3.10.2.1 University – Industry

As stated earlier, the Institute does not engage in research. The Institute interacts with industry for many different reasons, primarily within the confines of the teaching and learning function. They provide human capital for the banking and financial services industry, and industry practitioner–lecturers and guest speakers assist in programme delivery, curriculum design and the production of learning

materials. Increasingly, the Institute acts in an advisory capacity to ensure compliance with regulatory requirements imposed on the industry, for example, Minimum Competency Code.

The following sections are in two parts. The first section discusses research relating to topics such as institutional learning and an institution's willingness and ability to interact with university. It also considers the skills and competencies they expect from students exiting university. The second section considers studies of when university – industry interact in teaching and learning related activities.

What industry expects – how and why they interact with university

An institution's willingness and ability to engage and interact with university is related to their awareness of how they learn, their capacity to learn and experiential learning to date. The nature of learning in organisations is considered by March (1991). He developed a distinction between explorative and exploitative organisational learning. Explorative learning refers to discoveries, new undeveloped ideas, with little emphasis on improving internal competencies, and is principally associated with non-linearity of innovation. Conversely, exploitative learning is focused on improvements in knowledge by means of organic growth, resembling a linear innovation path. The difference between adopting one of two approaches may be resource-based, with a good balance between the two being associated with the highest levels of effectiveness (Gupta et al., 2006; March and Levinthal, 1993; March, 1991). In this respect it is important to consider the relational assets, especially network capital in the form of inter-organisational networks, underpinning the processes through which either form of learning occurs in an externalised environment (Huggins, 2010; Huggins and Johnston, 2010).

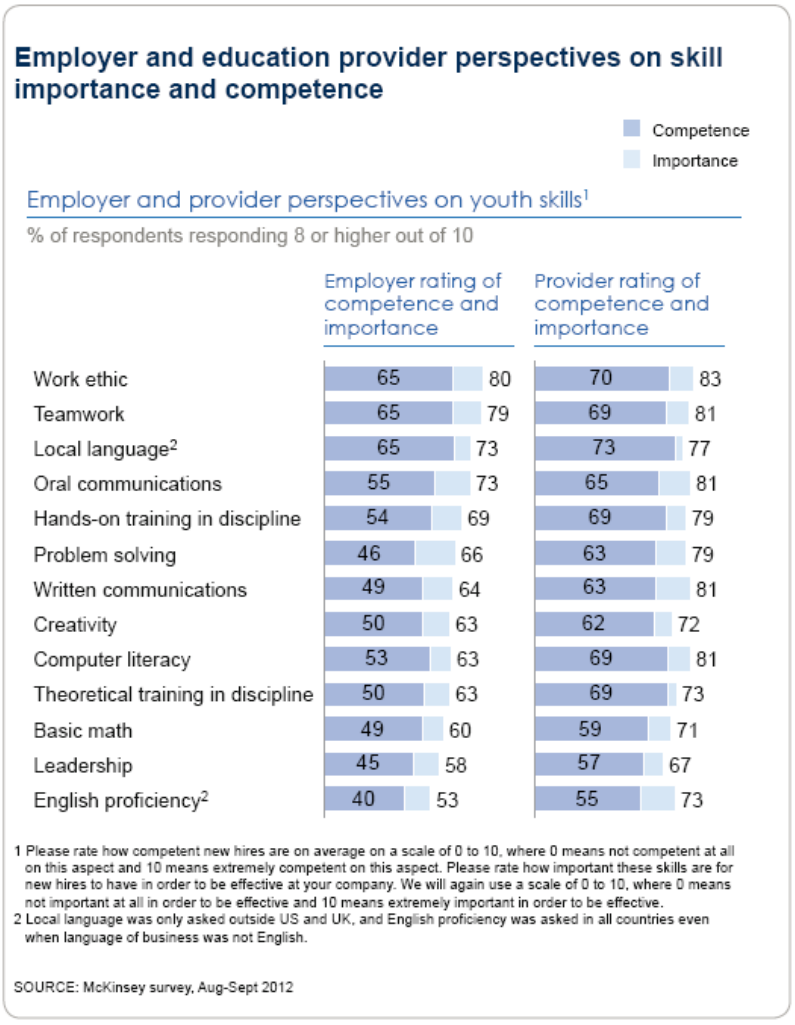
Being better linked and thus participating in denser networks is related to increased performance of firms (Fleming et al., 2007; Hochberg et al., 2007). Firms need to have a capacity not only to access new knowledge but also to exploit it. Knowledge acts as a competitive advantage only when it is embedded in the members, tools, and tasks of an organisation (Argote and McGrath, 1993). The 'absorptive capacity' of firms is the way in which they are able to identify, assimilate and apply external knowledge to commercial ends (March and Levinthal, 1993). The capacity of firms to absorb knowledge is determined in part by their existing knowledge. For Cohen and Levinthal (1990, 1989), it is experiential learning that increases the absorptive capacity of firms. They argue that prior knowledge obtained though previous learning and problem solving experiences is what determines how well firms will assimilate new knowledge. There are, however, limits to experiential learning. March and Levinthal (1993) note that learning myopias make it difficult for firms to continue to absorb knowledge as they gain competencies. These myopias occur when firms overlook distant times (temporal myopia), distant places (the spatial myopia) and the lessons from negative learning (the failure myopia). They argue that

firms must find the appropriate balance between explorative and exploitative learning in order to survive.

Knowledge flow of firms increases with closer proximity to universities (Audretsch, 1998; Adams and Jaffe, 1996). In fact, March and Levinthal (1993) argue that to remain competitive firms need to avoid the spatial myopia. In 2003 the Institute moved premises to locate in the International Financial Services Centre (IFSC). There are more than 35,000 people employed in over 500 IFSC operations. It hosts half of the top 50 international banks and half of the top 20 insurance companies. It was important for the Institute to be close to its member base; hence its relocation to the IFSC.

A discussion of what industry expects graduates from higher education institutions to possess follows. These expectations have implications for higher education institutions on matters such as curriculum development, industry input on delivery of programmes and supplying students to enrol on these programmes. This discussion draws on a survey conducted in 2012 by McKinsey and Company, a global consultancy company, about closing the gap between education and employment. They surveyed 8,000 employers, education providers and young people and examined 100 innovative programmes to develop a global perspective on what characterises a successful skills-training system. Table 2 below illustrates the divergent views held by education providers, employers and students on how adequately prepared students are upon exit to join the workforce. Education providers rated students more adequately prepared (72%) for employment than employers (42%) and the students themselves (45%). For the purposes of analysis, I consider employers as a proxy for industry.

Table 2: Difference in selected skills in order of importance to employers and education providers



(Extract from McKinsey Report, Education to Employment: Designing a system that works, Exhibit 15, p.44)

This sentiment was echoed also in a report entitled Working towards your future: making the most of your time in higher education, jointly produced by the Confederation of British Industry and the National Union of Students (CBI and NUS, 2011). It recommended that universities increase the employability of

their graduates by providing opportunities, both within and outside of the taught curriculum, for their students to develop key employability skills. Based on this report, Lewis (2011) discussed how the faculty of Biosciences at the University of Leeds used ethics themed projects and internships to provide students with an opportunity to develop and provide evidence of these skills. As a consequence of the economic crisis and the erosion of trust of consumers of financial services, the Institute introduced ethics themed modules across a number of its programmes. There are numerous other studies (Dopson and Tas, 2004; Lang et al., 1999; Buttlar and Ruhig, 1989) which investigated industry/practitioner input in curriculum development to counter the gap between what industry actors expect and what university delivers in terms of knowledge, skills and competencies.

Studies on effective industry – university interaction

The term Triple Helix refers to a networked view on how to promote knowledge development and innovation. Therefore, an innovative approach to teaching and learning would be networked learning programmes, for example the LEAD programme at Lancaster University which is a leadership and management programme for SMEs throughout the Northwest of England. Networked learning has two components: it is constructed between members of a peer learning community and it is situated in activity. Therefore, learning arises from participation in a community and being recognised as a member of that community. This is relevant, as the Institute is a representative body for the banking profession. Hodgson (2009) linked situated learning theory and management education, arguing that becoming a member of a community can be interpreted as:

> Learning through participation in the pedagogy and curriculum of a given educational programme. Through this participation students learn how to be a participant or member of a given knowledge community and acquire the language and an identity that is recognised by that community (p.131).

The relationship between teachers and learners is based on collaboration and co-construction of knowledge rather than on that of expert and acolyte (E-Quality Network, 2002). Greener and Perriton (2005) argue that networked learning opens up new avenues in pedagogy, enabling communities of learners to come together. Design for networked learning is becoming increasingly significant for higher education institutions (Fox, 2005). Research in this area and outcomes from programmes delivered in this manner can inform policy in the area of university and business interaction. Since 2012, the Institute has developed two executive education programmes guided by a networked learning pedagogical approach. Participants are directors and non-executive directors in banks and fund management firms.

The above sections considered Triple Helix type research and practices within the teaching and learning function that occur between university and industry. The next section will discuss how the university interacts with government actors.

3.10.2.2 University – Government

Collaborative networks are considered a better mechanism through which companies can absorb knowledge than are market transactions (Maskell and Malmberg, 1999; Arrow, 1971). The need to ensure that knowledge in all its forms – especially tacit and uncodified knowledge – is not lost imposes an obligation on governments to ensure that a functioning knowledge market exists. This is where government can intervene and where most public policy is aimed to stimulate more effective knowledge networks. Increasingly, new modes of interaction are being developed, as evidenced in academics assuming advisory roles in government departments, joint research endeavours and supra-national involvement in bodies such as the OECD.

Within the Triple Helix Model, Government's main role is as an active and multi-faceted intermediary, facilitating knowledge exchange between industry and university. This is achieved by creating bridging ties and interfaces, by diagnosing needs and articulating the demand for certain kinds of innovation, by instituting a dynamic framework for change and by working to achieve the change through financing and other means (Howells, 2006; Bessant and Rush, 1995). Furthermore, with emphasis on the Triple Helix dynamics, Etzkowitz (2008) asserts that 'the role of government in the Triple Helix firm is at an embryonic state and its effectiveness is rather low' (p.53).

Strategies to achieve their objective

How governments reach their objectives varies depending on the resources they use. Hood (1983) identified four categories of instruments they can employ. The first category of instruments has to do with providing information. The second category is 'the power of treasure', the power to sign cheques. The third category is instruments of authority. They are used to command and to forbid, to commend and permit. The aim is to restrict or modify behaviour. It is the public's willingness to accept them that determines its success. Austerity measures are a recent example of the exercise of such instruments. The fourth category is direct action. Government can use its own resources to produce certain outcomes or to perform certain tasks. Government strategy is the use of these instruments to achieve its goals.

van Vught (1989) stated that:

> The fundamental characteristics of higher education institutions, basic academic values and practices related to them show that strongly restrictive instruments are not suited to innovating in higher education. Government strategy may be more effective when grounded on instruments influencing the way professionals perceive the relative attractiveness of the various alternatives for action, rather than on directives, rules and instructions (p 268).

As Clark has put it; '[t]hose at the top have to "carry the field" rather than command it' (Clark, 1983, p.236). The instruments of treasure and authority may be more effective than the restraining instruments of authority and instruments of action.

Hayashi (2003) purports that it is best to employ diverse programmes of finance and promotion to ensure industry – university collaboration. An example of international collaboration between two universities (MIT and Cambridge) supported by the UK government is the creation of the knowledge integration community known as the Cambridge–MIT Institute (CMI).

Neave (1986) identified two broad strategies European governments have adopted since the 1970s in their pursuit of creativity and excellence in higher education. The first strategy related to the approach adopted in the 1970s of more governmental planning and control. Higher education was governed by strict regulations. Government put a number of control mechanisms in place in order to meet its own objectives. One could argue that there was a reversion to this approach after the financial crisis as budgetary cuts and resource reallocations took hold in many European countries. The second strategy is a departure from this approach, whereby the state de-regulates its control of higher education. Under such a system, there would be a shift in power as higher education assumed more autonomy. This new strategy has been called the strategy of self-regulation (van Vught, 1988). Neave contends that both strategies are effective, as innovation is the end goal for both. van Vught (1989) stated that:

> The strategy of self-regulation seems to offer the best perspective and appears better suited to the higher education context. It takes account of the fundamental characteristics of higher education institutions. It stimulates them to define their own missions and to develop the courses and curricula which fit these missions (p.269).

Self-regulation affords higher education institutions an enhanced capacity to innovate as greater autonomy enables them to adjust, anticipate and initiate innovations; government merely facilitates these innovations. Autonomy is a defining feature of the entrepreneurial university.

3.11 Conclusion

Innovation can be viewed as a product or as a process. If viewed as a product within an education context, the focus is on a specific object (a programme, a course, etc.), which may or may not be adopted by end users, for example individuals or organisations. The product is a result of a process of creation or to solve a problem. When innovation is conceptualised as a process, what is analysed is the process itself, and the decisions and interactions of various actors identified in the process who are developing a new idea or approach. The focus of this thesis is on innovation, a core value of the Institute, the case under investigation. The Triple Helix Model therefore becomes the means, a heuristic on how to examine and conceptualise process change in the Institute, particularly in regard to its identity change from assuming college status as a result of interaction with its university partner, UCD. Bareghah et al.'s (2009) multidisciplinary definition of innovation used in this research considers innovation as a multi-stage process with six attributes that have multiple starting points.

Despite the economisation of education, there are other aims from a higher education system. The role of education's public good and private benefits was discussed.

A description of the Triple Helix Model, how it works, its limitations and how it has been applied were presented, as this model is the analytical framework employed in this research to analyse the network of relationships the Institute engages in between the different components of the Model.

The emergence of the Entrepreneurial University and its impact on how higher education systems operate were discussed, highlighting the fact that innovation is not just restricted to the output of research intensive universities. Vocational education has a role to play in the diffusion and use of new knowledge created.

A discussion of what industry expects and how it interacts with the university highlights a disparity in views of how effective higher education is. Also, interaction can be difficult as both parties have different expectations, for example time to conduct research, ownership of intellectual property thereafter, etc. Governments provide a knowledge market by incentivising or compelling parties to interact, for example universities have to generate an alternative funding stream; hence engagement with industry. Examples of empirical research on university engagement with both industry and government were reviewed to elaborate on these issues and to highlight some successful outcomes from interaction.

From inception, industry assumed primacy over all other spheres, but the dynamics of this relationship and the relationship between the Institute and the other two spheres have evolved significantly. Chapter 5 presents the findings of the research, the nature, form, frequency and other aspects of interaction between the Institute and Triple Helix actors.

The next chapter outlines the research methodology employed to investigate the research question of this study.

Chapter 4: Research Methodology

4.1 Introduction

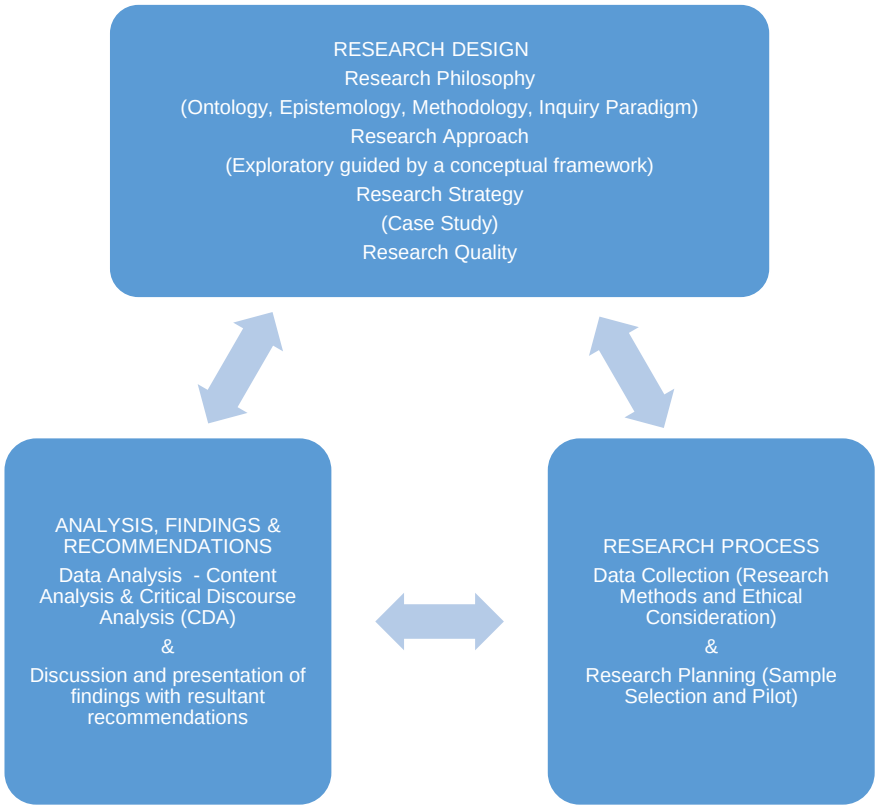
There are three phases in the research methodology process: research design, research process and data analysis. These are not discrete and are iterative in nature. This chapter describes each of these stages in the journey. After reviewing the literature on all these areas, an interpretive philosophy guided by a conceptual framework – the Triple Helix Model, with the focus on a single institution – was adopted. This chapter starts by discussing the researcher's perspective on the nature of reality (ontology), what constitutes knowledge, the theory of knowledge (epistemology) and how knowledge can be investigated (methodologies) in order to achieve the research aims. Within a constructivist-interpretive paradigm, individuals seek understanding of the world in which they live and work. A case study approach was considered the most appropriate research strategy with which to investigate the research question. I acknowledge that there is a lack of well-developed methods and techniques for the analysis of case study data and propose ways to strengthen the applicability, fit, contextualisation, depth, logic and creativity of the findings from this research. Having been an employee of the Institute, I am in the position as an insider, inside the case, which complements an interpretive philosophy.

The data for this research was generated between September 2012 and December 2012. Ten semi-structured interviews were conducted with participants from two of the three components of the Triple Helix model, namely Industry and University respondents. The term University is ascribed to the Institute and its university partner. I was unsuccessful in securing an interview with a person from the government sphere. In an attempt to include the government perspective and the policy component of the Triple Helix Model, Critical Discourse Analysis (CDA) was conducted on Ireland's seminal innovation policy text, Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal.

The interviews yielded over 183 pages of transcribed data (67,378 words). The Institute was categorised as being within the university sphere, so it was more important to concentrate within this domain; hence the disproportionate number of respondents from this sphere. Another consideration was ease of access to such respondents.

The other data collection method was the use of secondary documentary data. Hitchcock and Hughes (1995) suggest using triangulation and re-interviewing in the validation process. Wolcott (1988) suggests that triangulated techniques are helpful 'for cross checking, or ferreting out varying perspectives on complex issues and events' (p.180). Only one interview per respondent was conducted, but through the use of different research methods an attempt to ensure a degree of triangulation occurred. Figure 5 is a flowchart of the research methodology process.

Figure 5: Flow chart for the research methodology process



The next section attempts to justify the analysis of a single policy text to stand proxy for government actions.

4.1.1 Justifying the use of a single policy text

Leung (1985, p.64) considers that 'a policy is a concrete expression of values, which involves the distribution of resources and power'. Whilst the policy text analysed, Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal, is not stand alone and was meant to complement other texts, it is a close approximation of the government view on innovation and how education fits within its view of achieving an innovative, smart economy. I chose to analyse this single policy text in a detailed and systematic manner, having read many policies published by the OECD, the EU, and Irish Government. (See Appendix Two for other policy documents considered.) There were seven other policy texts considered. When I was happy that there was commonality in content across these key

themes, innovation and education, I could justify the in-depth analysis of one single policy text which included both innovation and education content in the text. I took this view having considered the balance between the timely and cost effective analysis of one policy text relative to the marginal increase in quality having reviewed a larger sample. Effectively, I did not want to fall prey to paralysis of analysis, as the government voice is not the main focus of this research.

Higher education policy developments were discussed earlier in Chapter 2 and will also appear in Chapter 5 following the analysis of the policy text chosen.

The next section outlines the research design adopted to conduct this research. Areas such as my ontological, epistemological and methodological stance are discussed. Research approach and research strategy are the other aspects of research design elucidated in this section.

4.2 Research Design

4.2.1 Research Philosophy

According to Hussey and Hussey (1997), the research design phase is the overall approach to the research process. This relates to the theoretical assumptions being made, and how data will be collected and analysed. Therefore research design is affected by the particular inquiry paradigm chosen.

Inquiry paradigms

Inquiry paradigms are the 'cluster of beliefs and dictates' (Armitage, 2007, p.2) based on ontological, epistemological and methodological assumptions which result in a specific view of the nature of produced knowledge (Guba et al., 1998). In essence, the inquiry paradigm influences what is to be researched, what research methodology is to be used, and how the research results will be interpreted. The concepts of ontology, epistemology and methodology will now be discussed.

Ontology

Ontology refers to 'the nature of existence in terms of whether the realities of the social world are perceived from an objective or subjective nature' (Burrell and Morgan, 1979, p.1). Quite simply, there are three ontological stances. Empiricists take the view that the world can be observed and research confirms or denies the existence of something. Relativists hold the world view that reality is socially constructed by different groups and cultures, and Realists adopt the viewpoint that a person's experiences constitute reality. I favour the relativist stance, which complements an interpretive perspective.

Epistemology

Whereas ontologies consider how researchers view reality, epistemologies deal with the nature of knowledge, its construction and its various sources (Mars, 1995) and provide 'a set of criteria for evaluating knowledge claims and establishing whether such claims are warranted' (Khazanchi and Munkvold, 2003, p.2). Epistemologies provide a view on the relationship between the researcher and the subject of the research. For example, an objectivist/dualist epistemology takes the stance that the researcher and subject of research are independent entities, whereas a transactional/subjectivist epistemology accepts that the personal values of the researcher will influence the inquiry being undertaken (Guba et al.,1998). As a former employee of the Institute, I cannot separate myself from the research as I am part of it, it affects me and I acknowledge a transactional/subjectivist epistemological stance. This again is consistent with the adoption of an interpretive perspective.

Methodology

Methodology, as defined by Jayaratna (1997, p.37) is:

> An explicit way of structuring one's thinking and actions. Methodologies contain model(s) and reflect particular perspectives of reality based on a set of philosophical paradigms. A methodology should tell you what steps to take and how to perform those steps but most importantly the reasons why those steps should be taken, in that particular order.

There are broadly three categories: qualitative, quantitative and mixed methods. This research is adopting a qualitative methodology, employing a case study approach. It is exploratory in nature, utilising qualitative methods such as interview data and documentary data. The case study methodology is discussed in greater detail later in this chapter.

4.2.2 Research Approach

Research approach is the way knowledge has been acquired. It describes how the researcher undertook the task of producing reliable and valid knowledge.

This research is an exploratory study investigating innovation in a higher education institution. It is guided through its use of a conceptual lens, as postulated from the Triple Helix Model. As stated in Chapter 3, the Triple Helix Model is descriptive and normative in nature. Therefore this research is working from the general to the specific, that is, using the theory from the Triple Helix Model (the general) to explore and attempt to explain the innovativeness of one college, the Institute (the specific).

4.2.3 Research Strategy – Case Study

Different research strategies require different designs for collecting and analysing the empirical evidence, and so the choice of research design is important (Creswell, 2003; Yin, 1984). A case study strategy was chosen because it allowed for an exploratory in-depth study of various issues relating to

innovation attitudes, practices, processes and activities within the Institute. Yin (1984, p.23) described the case study research method 'as an empirical inquiry investigating a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used'. Numerous authors (Yin, 2003, 1994, 1993, 1984; Stake, 1995; Hamel et al., 1993; Eisenhardt, 1989) have provided detailed descriptions of the process of case study research, and the process of developing the case study itself.

There are different opinions about the classification of case study research, as some texts refer to it as a methodology and others as a methodological approach. Stake (1995, p.134) writes that 'case study is not a methodological choice but a choice of what is to be studied. By whatever methods, we choose to study the case'. Berg (2004, p.251) further asserted that 'case study is not actually a data-gathering technique but a methodological approach that incorporates a number of data-gathering techniques'. Yin (2003), however, argues that design, data collection and data analysis are all encompassed within the case study method, stating that '[i]n this sense, the case study is not either a data collection tactic or merely a design feature alone but a comprehensive research strategy' (p.14).

Stake (1995) distinguishes between instrumental and intrinsic case studies. In the former, the case is of secondary interest, studied in depth in order to facilitate our understanding of something else. In contrast, the intrinsic case study is researched for its own sake. As Stake states, '[i]t is not undertaken primarily because the case represents other cases or because it illustrates a particular trait or problem, but because, in all its particularity and ordinariness, this case itself is of interest' (ibid., p.136). The Institute is of intrinsic interest, as I worked there and there is a paucity of research on professional member-based organisations. Elements of the instrumental case study where 'a particular case is examined mainly to provide insight into an issue' (p.137) also exist, as financial services and in particular banking are in a state of turmoil. Contraction and rationalisation are commonplace, and public finances are scarce, putting further pressures on higher education institutions to become more entrepreneurial. On balance, though, I consider this research to be more instrumental in nature, as the Institute consciously engages in a networked manner with universities, industry and government. Becoming a recognised college of its university partner enabled the Institute to accredit its programmes. Closely liaising with industry and government ensured relevant content coverage on programmes and student enrolment. From a Triple Helix perspective, the Institute attempted to assume the role of the other actors in order to understand their needs and then address them. By concentrating on teaching and learning, they enable their university partner to concentrate on research and innovation. Interaction with industry benefits both the individual and their employer, whilst also assisting government's intermediary responsibilities and employment mandate. As discussed in Chapter 2, the university partner was motivated to engage with the Institute to meet its aim of widening participation of non-traditional students and accessing particular markets. This phenomenon is now commonplace in higher

education. In respect of the Institute's university partner, UCD has recognised further colleges since the Institute assumed college status, e.g. the Institute of Public Administration.

Yin (1994) considers that there are at least four applications for a case study model:

1. Explain complex causal links in real-life events.
2. Describe the real-life context in which the event has occurred.
3. Describe the event itself.
4. Explore those situations in which the event being evaluated has no clear set of outcomes.

An event implies a change in contexts and participants. This research focuses on assessing and exploring the dynamics and application of government–industry–university as key actors in determining innovation within the Institute. As stated in Chapter 3, the Triple Helix Model has two levels of analysis: historical (descriptive like points 2 and 3 above) and evolutionary (points 1 and 4 above). Using the lens of the Triple Helix Model with a case study methodology enables the description, exploration and explanation of interaction between the Institute and other organisations in order to provide an assessment of where real world organisations fit in the Triple Helix Model of innovation. Some examples of research using a case study methodology and the Triple Helix Model were discussed in Chapter 3.

Criticisms and remedial action of case study research

Researcher Subjectivity

Case study research by nature is not value free and there is an element of bias that needs to be addressed and managed (Miles and Huberman, 1994). Having a close association or exposure to the study of the case can compromise the researcher and bias the findings. I worked in the Institute and with this brings a solid understanding of the institution and its culture but, at the same time, I could be seen as an influencing agent. However, I am aware of this matter, and by clearly adhering to the research methodology process, stating my position up front and constantly being reflective, I have tried to negate this criticism. Instead of it being a limitation, having been from the same culture as that under scrutiny has helped me to understand clearly the complexity of the situation under investigation and to explore the factors in more detail.

Another criticism is that case study research has purely qualitative data instruments that cannot be easily detached from their objects of study. Miles and Huberman (1994) refer to how informants are members of a particular culture at a specific historical moment and subconsciously, by what they hear or observe, are affected. Researcher subjectivity can be particularly problematic in case study research. Yin (1994) proposed three remedies to counteract this:

(1) Use of multiple sources of evidence

To enhance the dependability of a study, it is important to have multiple sources of data (Stake, 1995; Yin, 1994). The six sources identified by Yin (1994) are:

- Documentation
- Archival records
- Interviews
- Direct observation
- Participant observation
- Physical artefacts

The last three did not form part of this study. I consider interviews as the most important source of information, as respondents provided insights and proposed solutions/alternative courses of action.

(2) Establishing a chain of evidence

The Thesis Supervisor acted as an external observer who followed the derivation of evidence from initial research question to ultimate case study conclusions. In addition, this research was reviewed by colleagues who possess doctorates.

(3) Key informants review a draft case study report

Respondents were probed and clarification sought before the writing up commenced. A transcription of the interview was not offered to respondents to verify. The rationale was that they might in hindsight wish to amend what came naturally in the first instance.

Subjective Inferences

The case study approach provides an in-depth look into phenomena that might be missed when using a quantitative strategy, for example questionnaires that cover a large number of universities but disregard the particular context in which they operate. Adopting a case study strategy enables the researcher to become immersed in the research process. In other words, the researcher has become part of this project; therefore, it is more likely for the researcher to interpret different internal subjective views within the context of the case study rather than focusing on the surface circumstance with many case studies involved. Problems can arise when researchers make subjective inferences. Colour coding and thematic analysis is an attempt to negate this problem.

Colour coding techniques were employed in this study. All field questions are themed, but any emergent themes were acknowledged and assessed for relevance. If relevant, they were included in the research.

Concentration on a single case

Dependence on a single case makes conclusions lack application. This is a frequent criticism of the case study methodology. A single case study such as in this research could warrant such criticism. Yet Yin (2003, p.40) asserted that 'a single case study can represent a significant contribution to knowledge and theory building and can help to refocus further investigation'. Yin always argued that the relative size of the sample used does not favour a multiple case approach. The aim of the study establishes the parameters of the research. Therefore, a single case is acceptable so long as it meets the goal of the research. Yin (1994) further asserted that generality of results is made to theory and not to populations, allowing for single or multiple case designs.

Unscientific/lacking ability to replicate

Yin (2003) concedes that the strategies and techniques for analysing case study data are not well defined. This is, he asserts, 'one of the least developed and most difficult aspects of doing case studies' (p.109). In 1994 he suggested four principles that require attention in order to negate this criticism and produce analysis of a high quality. They were:

- Show that the analysis relied on all the relevant evidence.
- Include all major rival interpretations in the analysis.
- Address the most significant aspect of the case study.
- Use the researcher's prior expert knowledge to further the analysis.

To enhance the quality of the research, both Yin (1994) and Stake (1995) espouse the use of case study protocol to address concerns about reliability of the findings. Stake also recommends categorical aggregation as another means for analysis. Stake (1995, p.49) points out that there is 'no particular moment when data gathering begins. It begins before there is the commitment to do the study'. He highlighted also that early impressions formed by the researcher as they become acquainted with the case inform the data generated. He acknowledges, however, that as the research progresses these early impressions will later be refined or replaced.

The case study protocol as suggested by Yin (1994) requires the researcher to document each stage in the process to satisfy the three tenets of the qualitative methodology: describing, understanding, and explaining. A protocol should contain the following sections:

- Overview of the project (project objectives and case study issues).
- Field procedures (credentials and access to sites).
- Questions (specific questions that the investigator must keep in mind during data collection).
- Guide for the report (outline, format for the narrative) (Yin, 1994, p.64).

All of the above are considered in this research.

4.2.4 Research quality

The final stage of the research design process is how the issue of research quality is addressed, devising criteria for evaluating the findings.

Triangulation is typically a strategy for improving the evaluation of findings. Mathison elaborates on this by saying that:

> Triangulation has raised an important methodological issue in naturalistic and qualitative approaches to evaluation (in order to) control bias and establish valid propositions because traditional scientific techniques are incompatible with this alternate epistemology. Through triangulation, the researcher keeps evaluating, refining and modifying the research in terms of themes, interpretation and analysis. It also increases the accuracy of data analysis (1988, p.15).

In this research, data was triangulated from two sources: i) primary data (for example interview audio records and transcripts; field notes on non-verbal behaviours, like body language); and ii) secondary data based on documents (for example policy text; internal documents from the Institute).

Terms such as credibility, applicability, transferability, dependability, and confirmability replaced the usual positivist criteria of internal and external validity, reliability, generalisability and objectivity. I was guided by the frameworks of Grounded Theorists like Corbin and Strauss (2008), Lincoln and Guba (1985) and Glaser and Strauss (1967), who argue that the same set of judgement criteria cannot be applied across qualitative methodologies. To Corbin and Strauss (2008), quality of findings and validity of findings are not synonymous. They write that:

> Credibility indicates that findings are trustworthy and believable in that they reflect participants', researchers', and readers' experiences with a phenomenon but at the same time the explanation is only one of many possible, plausible interpretations possible from the data (p.302).

They further described quality qualitative research as that which:

> Resonates with readers' and participants' life experiences … that blend conceptualisation with sufficient descriptive detail to allow the reader to reach his or her own conclusions about the data and to judge the credibility of the researcher's data and analysis … that stimulates discussion and further research on a topic (p.302).

Corbin and Strauss (2008) presented a list of general criteria that I used to evaluate the quality of findings from this research. These are contained in Chapter 5.

After choosing a research strategy, the next step is organising the research process. This involves the selection of research methods, addressing any ethical considerations, sample selection of respondents and conducting any pilot or pre-tests. The next section addresses all these areas.

4.3 Research Process

The aim of this section is to present an account of how the research was conducted.

Becker and Geer (1957) proclaimed that the 'most complete form of the sociological datum … is the form in which the participant observer gathers it' (p.28). Trow (1957, cited in Bryman 1984, p.76) counter argued that 'the problem under investigation properly dictates the methods of investigation' (p.33). The latter view is very much the one I took. The next section presents the methods I chose to conduct the research. The primary means of data collection was through semi-structured interviews. Documentary analysis complemented the interviews and provided a source for gathering secondary data.

4.3.1 Interviews

The benefits of face-to-face interviews are many, as they allow observations to be made of the surroundings and they also offer in-depth information. A semi-structured interview format was adopted, as I only wanted answers to specific questions which also afforded me 'flexibility' (Denscombe, 2003, p.167) and 'adaptability' (Bryman and Bell, 2003, p.135) for probing if the need arose. I considered a formal structured interview as too 'artificial' (Hammersley, 1992, p.163), as I have a relationship with most of the respondents. Semi-structured interviews also correspond to an interpretive epistemology.

The approach an interviewer adopts depends on what they want to know (Rubin and Rubin, 1995). This process of discovering what a respondent feels and thinks about their world should result in an understanding of the major points of their message and how it compares to one's own situation. Shea (2000) highlights this ethical issue when he writes that:

> Everyone agrees that among the highest duties of academics is to make sure that the human beings they study—fellow citizens they probe, query, prod, and palpate—are treated with dignity and respect (p.28).

This is how all participants were treated in the research.

Establishing rapport and trust early on enables the interviewer to gather information without controlling the flow of information (Schoenberg, 2002), and to record it accurately (May, 1989). Choosing a semi-structured interview format controls the flow to a certain extent, but I believe that the advantages of this method outweigh this disadvantage. I disagree with May's contention of controlling information. I favour the idea of directing the interview to maintain the original purpose being explored. Authenticity, credibility, intuitiveness, receptivity, and reciprocity are considered as other qualities a good interviewer possesses (Rew et al., 1993).

Kvale's (1996) nine different question types informed the design of questions in the construction of the Interview Guide. The questions incorporated different types of topics. For example, certain questions asked for an opinion; others were about feelings, level of knowledge or behaviour, or were sensory in

nature. Appendix 2 shows the interview guide used. The interview questions were separated into three different groups. Informative questions address objective facts and the typical question word is 'what'. Next, analytical questions expect the interviewees to analyse certain phenomena and discuss the associated reasons for certain circumstances or demonstrate a particular process; the typical question words are 'why' and 'how'. Evaluative questions are designed to investigate the respondents' subjective views. Respondents are requested to evaluate or comment on certain circumstances that may or may not correspond to their own points of view. Different questions can present different degrees of difficulty for respondents. Cooper and Branthwaite (1977) suggest that researchers should be aware of this so that they can plan and devise strategies to cope better in an interview setting. The interview questions used in this research were assigned as informative, analytical or evaluative. This inferred an incremental level of cognitive involvement. Respondents would feel evaluative questions are more difficult to answer compared to informative questions.

There were three themes in the questions posed, which were:

- Conceptualisation of innovation and how it coalesces with education.
- Cultural/leadership impact of the innovative ecosystem of the Institute. I consider that an ecosystem infers a continuous dimension. Innovation is living and breathing. It is not a discrete occurrence.
- Network dimensions – exploring Triple Helix dynamics.

As the interviews progressed, it became apparent that these themed questions would enable the answering of the research question. Questions were arranged in accordance with the themes above, as reflected in the interview guide.

A digital voice recorder was used in all interviews and prior approval was sought from participants. The use of the digital voice recorder was for transcription purposes. Audio can be replayed to ensure accurate accounts of the exchange. It also assisted the analysis and reflexive element of the research process. McCracken (1988) states that the use of field notes and the tape recording and transcription of interviews are important safeguards of both reliability and validity. Bassey (1999, p.82) points out that 'the alternative is to paraphrase and make a shortened report of the tape', but with the added caveat that 'some of the nuances of the tape will be lost'.

All interviews except the pilot were recorded and transcribed. As McLellan et al. (2003) state:

> The transcript is a tool that helps the qualitative researcher make sense of and understand interviewees' experiences and perception. However, researchers should always remember that what is transcribed, what is not transcribed and how the transcript is structured very much influences the analysis process (p.74).

Derrida and Caputo (1997) assert that 'every speech act is fundamentally a promise' (p.23). Speech acts can be words and/or silent breaths. Irigaray (1999/2002) believes that to ignore the breaths and the silences is to become dogmatic and lose respect for life. It is a researcher's role to allow these silences to speak. I was cognisant of this in the analysis of the transcribed interviews. All participants are quite well versed in the art of the interview and I would infer silence as the participant being in a contemplative state or an unwillingness to answer the question rather than not having a voice or being unable to articulate a response. Quotes used in the analysis were rechecked for accuracy using the original recording.

In addition to conducting interviews, documentary analysis techniques were adopted to ensure triangulation occurred. This in turn enhanced the credibility of the findings, discussed in Chapter 5.

4.3.2 Ethical Considerations

Confidentiality and anonymity

Confidentiality and anonymity are related but are distinct concepts. van den Hoonard (2002) said that 'promises of confidentiality are easier to make than to keep' (p.8). In respect of this study, confidentiality of responses could be assured as transcripts were identified by respondent number only, and recordings were password protected on a PC to which only the researcher had access. Anonymity was much harder to ensure, as people cross referencing respondent profiles and the description of the Institute could potentially reveal the identity of respondents. I offered both confidentiality and anonymity to respondents, but all expressed that this was not a pressing concern for them. Institutional anonymity was not promised and was contained in the pack each respondent received prior to being interviewed. Appendix 1 shows approval from the Institute CEO to be named in the thesis. This was a recommendation of the Examiners upon initial submission of this thesis.

All participants engaged on a voluntary basis and were notified that they could at any time withdraw from the study. All participants were adults, aged over 18 and void of any mental illness or incapacity. Anonymity was offered and informed consent obtained from all participants. (See Appendix 1 for copies of the combined Information and Consent Form and the Confidentiality and Anonymity Information Sheet.)

The higher education institution in which I was employed .was the site of the study, with many of the participants senior to me. Therefore, I had a multiplicity of roles: researcher, colleague, employee and employer in the case of some industry practitioners. Confidentiality and anonymity could have been contentious, but were not. I was more conscious of my position in relation to the participants.

In an attempt to address these potential tensions, each participant received a copy of the University of Sheffield Ethics Approval to conduct this research, combined Information and Informed Consent Form and a Confidentiality and Anonymity Information Sheet (see Appendix 1) prior to any interviews being

conducted. All respondents were anonymous, with clarification given on how this was dealt with. Once that had been successfully completed, each respondent received a Consent Form, addressing the items on the Example Participant Consent Form provided by the University of Sheffield. This Informed Consent Form confirmed that the participants were willing to be interviewed and to have that interview taped – the reasons for taping the conversations were explained. In addition to an Information Sheet and signed Informed Consent Form, the purpose of the interview was reiterated and explained before each interview. All data was stored on a secure server, to which only I had access. I agreed with respondents that I would destroy all recordings upon completion of this study. There were no identifying details included on the transcripts, as they were categorised numerically. All respondents were very willing and there were no issues of access.

Power dynamics

The issue and effect of power relations in the interviews affected the style of questioning. All participants are senior to me, so I was uncomfortable adopting a contrarian style of questioning. Because of my insider status, I would consider that the interviews conducted could best be described as cosy and consensual. In an attempt to 'bracket' myself, I reiterated at the start of each interview that this was nothing to do with my role within the Institute. The research was being conducted as part of my doctoral studies.

Most of the respondents are skilled in the art of the interview and many are powerful figures in education or industry. Ball (1994) highlighted that such individuals are cautious about what and how they say things in interviews.

In his book, *Researching the Powerful in Education*, Walford (1994) stresses the importance of thorough preparation before interviews, to 'do your homework', especially when interviewing the powerful who:

> Are prepared to question the interviewer and to demand explanations as to why particular questions are being asked. They assume that the interviewer has already read what is published on the issues and is well aware of the general political and economic background (p.225).

Ball (1994) states that in many of these interviews, the respondent has specific aims for the interview:

> To present themselves in a good light, not to be indiscreet, to convey a particular interpretation of events, to get arguments and points of view across, to deride or displace other interpretations and points of view (pp.97–98)

At all times I was cognisant of what Walford (1994) stressed as the way in which 'the powerful are well able to control the interview process such that certain topics are discussed and others are dismissed' (p.8). Cookson (1994) argues that researchers can be influenced by the discourses of the elite as much as the public at large. In particular, there is often the threat within the 'power discourse that signals to

the listener and observer that, if they do not accept the message of the discourse, it is because they have failed to understand and not because the message is flawed' (p.124). Extensive reading of the seminal and important documents around Irish Innovation and Higher Education policy provided technical competence. Researching and practising the intended research methods assisted in my ability to become a competent practitioner-led researcher.

In respect of the interviewer-interviewee relationship, Glesne and Peshkin (1992) considered whether a non-hierarchical position is possible in the event of an interview, as it is the researcher who constructs the text. The best outcome to be sought is to seek reciprocity. They contend that reciprocity in the knowledge-power game of the interview rarely involves equality. All respondents in this study are senior to the researcher. Verification of respondent transcripts was not offered.

There is also a power relationship between the interviewer and with his or her research community, in this case between the University of Sheffield and me. The intellectual rigour and validity of the interpretations made need to meet the requirements of the university rather than the agreement of the respondents.

Kvale (2006) believes a common misleading practice is referring to an interview as a dialogue. He defines a dialogue as 'a joint endeavour where egalitarian partners, through conversation, search for true understanding and knowledge' (p.483). Kvale contrasts the mutuality and equity in a dialogue to the power dynamics at play in an interview, where one party seeks understanding and the other party serves as a means to meet the interviewer's needs. Later in the same paper, Kvale states that:

> The use of power in interviews to produce knowledge is a valuable and legitimate way of conducting research. With interview knowledge jointly constructed by interviewer and interviewee, overlooking the complex power dynamics of the social construction process may, however, seriously impair the validity of the knowledge constructed (p.485).

Being sponsored by the Institute to conduct research helped me gain access and collect all the data for this study. I was never coerced into producing research that would promulgate the Institute's goals or place them in a favourable light. They did, however, incorporate the completion of the EdD into my formal performance review process on an annual basis. This had a disciplinary effect on me, motivating me to meet any targets set as a part of the review process. I ceased employment with the Institute in 2015, but they kindly still assisted me in the completion of this thesis.

4.3.3 Research Planning

In respect of choosing participants for the study, the logic of Spradley (1979) to choose people who are currently in the situation of being able to afford you the time to interview them but also have a history of the situation was applied. A pilot interview and ten other interviews were conducted. In an attempt to anonymise respondents in the Institute, the respondents were all assigned as senior management.

Some of the senior management within the Institute, though, are more influential than others. Respondent and interviewer profiles are contained in Appendix 5.

Sampson (2004) stresses the importance of conducting a pilot study in any qualitative research. The results of the pilot interview were integrated into the wider research project. The pilot interview was conducted on 10th September 2012 with a senior member of the management team. This proved extremely beneficial in terms of refining the questions, the sequence of questions and how questions were posed.

The final stage, the data analysis on data generated, will be discussed in the next section.

4.4 Data Analysis

Miles and Huberman (1994) suggest that 'qualitative research … requires robust data collection techniques and the documentation of research procedure' (p. 22). Data Analysis consists of three activities conducted simultaneously: data reduction, data display and making conclusions. By their own admission, Miles and Huberman feel that data analysis is middle ground between the positivist and realist camp: positivist because of their concerns about validity and verifiability, and realist because of their belief that full determination and closure can never be achieved.

A data analysis process as proposed by Miles and Huberman (1984) was followed. They contend that the first step in analysing qualitative data is data reduction. The aim of reducing data is to organise it into clear categories or to assign identified patterns. This research produced interview transcripts which total 183 pages, containing 67,378 words from 10 interviews conducted. The pilot interview was not transcribed. The process of selecting and identifying the volume of data into patterns depended largely on the researcher's informed subjective perception of research themes and interview questions. This interpretation determined which data was important and which category it should be assigned to. During data reduction, I was mindful of the study objectives, research philosophy and strategy in order to make a sound selection. The aim of the data reduction process was to highlight the specificities of each component group in the Triple Helix Model. There were really only two groups interviewed: university and industry respondents. In reality, the delineation between the boundaries of the helix elements is much more blurred. This is best exemplified in the case of respondent nine, who is primarily assigned in the industry category, as they work in a bank and only part-time as a lecturer. As most respondents (eight of the 10 transcribed and the pilot respondent) are assigned as university respondents, an important part of the analysis is intra-helical analysis.

The data reduction procedure employed was informed by that used in Jiang and Carpenter's (2013) evaluation of four faculties of a post-1992 university in the United Kingdom. It was as follows:

- Each respondent's answers were aligned with a particular interview question.

- Secondly, key points from each answer were summarised. The keywords presented the respondent's main meaning. The keywords were highlighted in transcripts. For example, colour coding was employed for responses to the question, what you think 'to innovate' means and why is it so important now? (Analysis discussed in Chapter 5; see Appendix 3 for the colour coded responses.)

- Next, each respondent's answer to a particular question was denoted as initially being affirmative or negative. Responses were further categorised as having common points (agreed by all); partially shared points (agreed between two or more respondents or groups, such as University – Industry, Industry – Government, as articulated through government text, and individual/group-specific points (unique to a single individual/group). At this stage, the reduced key points were separated into seven sub-groups: one group of common points, three groups of partially shared points, and three groups of group-specific points. At this stage, the data reduction process was completed. The next step is data analysis.

With an interpretive study, the research findings rely much more on the researcher's own interpretation of the circumstance. Shah and Corley (2006) stated that:

> Interpretive research implicitly assumes that every person conducting a research study will have a unique interpretation of the results; data analysis cannot be judged on whether or not the results are replicable by another researcher. Interpretive data analysis is assessed on its ability to provide reasonable and plausible insight into a phenomenon such that a deeper understanding of the phenomenon can be gained (p. 1823).

Jiang and Carpenter (2013) assert that 'qualitative data analysis requires the data to be presented in ways which enable others to interpret, analyse, evaluate and draw conclusions' (p.247). Two data analysis strategies were adopted: content analysis and critical discourse analysis (CDA). The next section discusses these techniques.

4.4.1 Content Analysis

Based on various researchers' definitions, content analysis can be defined as a systematic, replicable technique for compressing text into content categories based on explicit rules of coding (Stemler, 2001; Weber, 1990; Krippendorff, 1980; and Berelson, 1952). The benefit of using such a technique is that the focus of an individual, group, institution or social attention can be identified (Weber, 1990). Content analysis is one of the most common strategies in qualitative data analysis (Stemler, 2001). It adopts a quantitative method to analyse qualitative data. The analysis process is quite similar to data reduction where the researcher keeps reading content word by word and highlighting (literally with a highlighter) the key points simultaneously. The content (texts/transcripts) is the prerequisite for content analysis because content analysis works on denotation. By combining content analysis with critical discourse

analysis (CDA), the interpretation of the underlying connotation can deliver interpretations and conclusions even when there is no visible denotative meaning. Before I discuss CDA, I want to briefly clarify what is meant by the terms denotation and connotation.

The denotative meaning of a linguistic sign is what the dictionary provides. It is the literal meaning of a sign. Its connotative meaning refers to the social, cultural and 'personal' (ideological and emotional) associations of the sign (Wilden, 1987). These associations are typically related to the researcher's inter-subjective view, such as how the researcher views the circumstance and what position the researcher holds when they view it. The meaning of connotation can be influenced by inter-subjective perception, experience, age, ethnicity and so on. Fiske (1982, p.91) states that 'denotation is what is photographed; connotation is how it is photographed'. Therefore, there is significant difference between denotation and connotation, though they work as two halves of a whole and cannot be separated during data analysis. Voloshinov (1973) insists that this is because no sign is purely denotative or lacking connotation.

According to Barthes (1974), connotation produces the illusion of denotation. In this study, the denotative meaning was reported and interpreted for the connotations associated with it. The interpretation was derived from connotative evidence (sources of the data collection); the interpretation was subjective, but not random, arbitrary or entirely personal either. Stressing the individual subjectivity of connotation highlights that within a culture or certain context, subjective responses are shared to some degree, while denotation always holds a common agreement. For example, there is a clear answer to the question: Does the Institute represent a particular industry? If the Institute were known to you, then this is a sign of denotation, as all respondents would be in full agreement. However, the answers would be quite divergent if I were to ask respondents: why does the Institute concentrate its efforts in this industry? The answers to analytical and evaluative questions show an emerging individual perspective. The implication of these answers made me ask myself the question: Why do the respondents have different views? I acknowledge that all respondents have different experiences, interests and priorities, but the potential answers could be a result of a lack of knowledge or because they know why, but purposely do not want to share this information because of ethical issues. These can be the interpretations of the answer they provided.

Through CDA, this research not only recognises what is shown by denotation, (for example, the written words or texts), but also interprets the underlying connotative meaning. A discussion of the use of Critical Discourse Analysis as a method to investigate the research question now follows.

4.4.2 Critical Discourse Analysis (CDA)

CDA provides a framework to investigate discourse-led social change. Throughout Norman Fairclough's work (2005a, 2005b, 2004a, 2004b, 2003, 2001, 2000, 1992, 1989), he has researched

the effects of social change when social practices and the networking of these social practices change, as articulated in the constitution of social fields, institutions and organisations.

Change also includes changes in the order of discourse and in the relations between orders of discourse. Before social change can occur, changes in orders of discourse must occur. Social practices relate to social structures and social events. They are relatively stable and durable forms of social activity, articulated together to constitute social fields, institutions and organisations. They are networked in a particular way to constitute a social order. I acknowledge that networks in the Triple Helix form are more dynamic than these relatively stable forms (as order and change are interwoven), yet I consider CDA complementary to the Triple Helix as it is an inherent component of both concepts and is network driven.

Discourse includes representations of how things were and are, and imaginaries of the future. New discourse can be enacted but never fully inculcated. For example, managerial discourses have been extensively enacted within universities, yet the degree of how instilled it is in the system is debatable. This is because many if not most academics do not 'own' these management discourses.

Next I will discuss the rationale for my use of CDA to analyse the Irish Government publication, Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal, the seminal policy text on Ireland's innovation strategy.

Why use CDA?

David Hyatt's (2005) Critical Literacy Frame was used to systematically review the Irish government policy text. The frame is grounded in a social constructionist orientation to language, and is underpinned by insights from CDA and Critical Literacy. (See Appendix 4 for a more detailed description.) The results of applying Hyatt's Critical Literacy Frame will be analysed in Chapter 5.

CDA affords the researcher the opportunity to recognise the denotative meaning and to interpret the underlying connotative meaning. According to Fairclough (2005a):

> It allows one to incorporate elements of 'context' into the analysis of texts, to show the relationship between concrete occasional events and more durable social practices, to show innovation and change in texts. And it has a mediating role in allowing one to connect detailed linguistic and semiotic features of texts with processes of social change on a broader scale (p.79).

Fairclough was heavily influenced by and built on Foucault's theory of the power relations between discourse and knowledge.

CDA is a way of thinking about or approaching a problem. It provides an awareness of the hidden motivation of others and oneself by making the researcher ask ontological and epistemological questions. It focuses on the existence and the message in texts within a historical and social context. It

makes no truth assertions nor does it confirm the validity of any research method. Wodak (1989) defines the field as an interdisciplinary approach to language study with a critical point of view. She stresses the importance of diverse theoretical and methodological concepts, which can be used for analysing issues of social relevance and attempting to expose inequality and injustice.

Taylor (2004) argues that in contemporary society CDA's value lies in its ability to document multiple and competing discourses in policy texts, highlighting marginalised and hybrid discourses, and in documenting discursive shifts in policy implementation processes. Jorgensen and Phillips (2002) believe that Fairclough's approach with the CDA movement is the most developed theory and method for research in communication, culture and society.

Critics of CDA

Most critics of CDA have different perspectives, but all are concerned with the same fundamental question: Does CDA produce valid knowledge? Hammersley (1997) directs his criticism of CDA at the most fundamental level, saying that it is unclear of its philosophical foundations, lacks adequately developed sociological theory and is overly ambitious in trying to effect social change. He argues that 'critical' social enquiry cannot be founded on the same basis as the physical sciences. Silverman (2001, p.222) proposes a guide of ten questions to evaluate the validity of the research conducted. This overcomes this criticism to some extent. The orientation questions in Hyatt's (2005) Critical Literacy Frame are also an attempt to counteract this assertion.

Hammersley's second argument refers to how users of CDA validate their approach. Here he refers to Habermas's notion of Decisionism, embedded in much of Fairclough's and Wodak's work. He observes that '[a]ccording to this position, one chooses one's values and this involves a leap of faith or an act of will: it cannot be based on rational deliberation' (p.249). As he also reminds us, the problem with this is that 'leaps of faith can go in any direction' (p.250). If CDA is based on the conviction that emancipatory ends are right, then why is there such widespread manipulative misuse of discourses as evidenced in the fields of politics, media and advertising to name a few? Fairclough acknowledges this shortcoming in his work.

Martin (1992, p.587) expresses concern about the unachieved practical ambitions of 'linguistics which is articulated as a form of social action'. He has called repeatedly for a Positive Discourse Analysis. Examples of his work are his analysis of excerpts from the autobiography of Nelson Mandela and music of U2. He states:

> If discourse analysts are serious about wanting to use their work to enact social change, then they will have to broaden their coverage to include discourse of this kind – discourse that inspires, encourages, heartens; discourse we like, that cheers us along. We need, in other words, more positive discourse analysis (PDA?) alongside our critique; and this means dealing with texts we admire, alongside those we dislike and try to expose (1999 [2002], pp.196–197).

In a series of articles, Widdowson (2001a, 2001b, 2000a, 2000b, 1998, 1997, 1996, 1995a, 1995b) has presented a sustained and forceful argument against critical approaches to discourse.

He asserts that:

1. CDA is not analysis in support of theory but (merely) interpretation in support of belief.

A counter argument to this could be that between the two relevant types of knowledge, linguistic and social theoretical required for CDA, a greater emphasis should be placed on the social theory or a researcher must be mindful of the balance of the two when conducting research.

2. The beliefs of analysts are ideologically biased, leading to analysts reading meaning into, rather than out of, texts.

Everyone has an ideological stance and when a researcher states their stance clearly it allows the reader of the research to know the researcher's position. My position is clearly outlined in the first section of this chapter and in Chapter 1.

3. This bias is further compounded by the fact that the analyst selects only those texts that will confirm his or her beliefs.

I acknowledge that this practice is widespread, and in an attempt to counter this, I chose to transcribe the interviews and, as stated in the introduction of this chapter, different policies were read and considered before the seminal policy text document in the Irish Government's strategy to develop a Smart Economy was chosen.

4. The distinction between the interpretation of the analyst and that of the lay reader is ignored.

Fairclough (1989) attempts to answer this criticism. He refers to a term 'member resources (MR)', which are the resources drawn upon by both participants and analysts:

> The analyst is doing the same as the participant interpreter, but unlike the participant interpreter the analyst is concerned to explicate what she is doing. For the critical analyst, moreover, the aim is to eliminate even that difference: to develop self-consciousness about the rootedness of discourse in common-sense assumptions of MR (p.167).

He defines Member Resources as what 'people have in their heads and draw upon when they produce or interpret texts – including their knowledge of language, representations of the natural and social world they inhabit, values, beliefs, assumptions and so on' (p.24). It is obvious that people will vary greatly in this regard.

This is an argument I am unable to refute, as I agree with it. Nevertheless, certain measures can be taken to minimise this disconnect. Seeking corroboration of your intuition that a difference exists in

interpretation via survey or interview is obviously a more sound and valid means than relying on self-consciousness. Respondents were probed during interviews to offset this.

Pennycook (2001) is ideologically opposed to Widdowson and questions the sociological framework which he says CDA inherits from Marx, which is simple divisions such as oppressed/oppressors and dominated/dominant. Primacy under CDA is given to capitalism as a source of power in society. He offers an alternative in the form of what he calls critical applied linguistics as problematising practice. This was an attempt to establish a new paradigm, a 'postlinguistics' based firmly on a poststructuralist, Foucaultian model of discourse. He states that:

> Critical approaches to text become situated practices … that search for the political/discursive (sub-textual), social/historical (pre-textual), and local/contingent (contextual) ways in which texts and readers produce (inter-textual) meanings in relation across texts (p.112).

Unfortunately, his work lacks specificity on how to get to grips with texts.

Hay (2002) believes that CDA is by definition a descriptive (and not analytical) approach and is incapable of adopting a normative stance to ethical issues in politics. Weiss and Weiss (2003) refute this claim. Even though they acknowledge that it is difficult to provide sufficient defence of Hay's criticism, they point to the methodological development of CDA as being more critical and descriptive and being innovative in its findings.

Therefore, it is apparent that no hard data is generated in CDA. Reliability and validity depend on the force and logic of one's argument. No definite answers are provided; it provides insights and knowledge based on debate and argumentation.

4.5 Conclusion

Chapter 4 presented the research philosophy, strategy and design of the chosen research methods. This research was a single case study design using semi-structured interviews as the primary means to answer the research question and to fulfil the aims and objectives of this research.

The reason why this research adopts a combination of content analysis and discourse analysis is that the primary source of data is the interview transcripts. Content analysis was initially employed on the text for denotative purposes. Interview questions and answers are grouped into three categories: informative (typically requires an objective response), analytical and evaluative (subjective). Discourse analysis is appropriate when analysing the subjective responses which contain the connotative meaning of the respondents' view of reality. As the interviews were recorded, some aspects are not captured by the text. What can be missed is reference to a respondents' vocal tone and volume, body language and facial expressions. These are a part of the context; their absence would result in fewer connotations being derived, but were noted in the course of the interviews.

In addition to the pre-selected themes discussed earlier, issues and themes emerge through identification from the documentary evidence and from the views of those interviewed. A reconciliation of these two sets of evidence, noting where they are compatible and inconsistent, was highlighted.

To conclude, I will use the analogy of taking a trip, with the roadmap devised above (the methodology and methods). I must now embark on the journey (using the research question, field questions and observations), continually reverting back to the original point of the journey (the objectives of the thesis) to arrive at the destination (evaluation, interpretation and review of the evidence). The next chapter presents the findings from this research, and any resultant recommendations are discussed in Chapter 6.

Chapter 5: Findings

5.1 Introduction

To begin, we should reacquaint ourselves with the research question under investigation:
In what ways does interaction with university, industry and government actors contribute to the pursuit of innovation within the institute of Banking in Ireland?

As presented in the earlier methodology chapter, the research question was investigated through in-depth interviews. Data was collected and analysed using a case study methodology framed through a theoretical lens, the Triple Helix Model. In addition, Critical Discourse Analysis was conducted on the Irish Government's seminal policy text, Building Ireland's Smart Economy: A framework for sustainable economic renewal (2008).

This chapter progresses from initial observations on the interviews conducted to a more detailed analysis of the responses given. This is followed by an analysis of the three aspects of a higher education innovation system as espoused by the Triple Helix Model: firstly, analysis of the education function (teaching and learning activities of the Institute); secondly, analysis of the components (Triple Helix actors within each institutional sphere) within the innovation system; and thirdly, analysis of the relationships between the components. This relates to the network dynamics and how the Institute manages change in order for innovation to occur. What emerges are some divergent views between influential members of senior management (R3 and R4), and different perceptions between respondents with long service in the Institute and new entrants to the organisation (R5 and R6). Respondents seven, eight and nine, who are external to the organisation, from the university and industry spheres, tended to provide affirmative responses regarding the innovativeness of the Institute.

The emphasis of this chapter is intra-helical considerations of university respondents and members of senior management of the Institute as a result of relationships the Institute has with other Triple Helix actors – industry and government. I will present findings that highlight the existence of Triple Helix processes at work, but suggest that a deeper, more creative analysis of the Triple Helix Model is required to account for innovation dynamics in organisations such as the Institute that only engage in one of the higher education functions and are more closely aligned to industry then their university peers. Its size, professional and service orientation, and the narrow range of subjects, specialising in one industry, blur component boundaries concerning its identity as a university or industry.

The final section outlines the analysis conducted on the Irish Government's seminal policy text, Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal. As the interview sample did not include direct government representation, this analysis was an attempt to act as a proxy for the

government position on how innovation and education interact. The analysis shows how globalisation discourse is interpreted by the Irish Government, primarily articulated through this policy text. What is also evident from the discourse is the hegemonic position the government assumes, they being the only ones equipped to manage the transition to a smart economy. The text asserts that education's role should primarily be concerned with achieving the desired goal of sustainable growth, secondary to any other educational aims.

5.2 Initial observations on research conducted

Summary details on the interviews conducted are contained in Appendix 6. From these, it emerges that the more senior the respondent (respondents three and four), the shorter the duration of the interview. This was not a consequence of my unwillingness to take up too much of their time. They had both set aside 1.5 hours for the interview. Of note too is respondent four, who is reasonably new to the Institute and who was asked two additional questions in comparison to respondents five and six, and yet whose interview was the second shortest in duration.

Three reasons could explain this variation: clarity of focus, being well versed in interviews, and finally not wanting to provide any sensitive information. Answers were delivered in a decisive manner. The average duration of interviews was 57 minutes 25 seconds. This is somewhat skewed by the duration of the pilot interview and the interviews with respondents five and six. Seven respondent interviews were less than the average, and four were greater than the average interview duration. Respondents two and ten were comparable in duration, but respondent two said more, as evidenced in the word count in their transcribed interviews. Even on a pro-rata basis, R1 said the least. She was the only female respondent, she gave precise answers, and only she and respondents five and six admitted limited knowledge when asked certain questions, for example question 4, section 3, requiring an opinion on how effective the government has been in adopting an intermediary role in facilitating and providing incentives to promote interaction between industry and the university sector.

In all cases except for respondent seven, I chose the location. Because of the seniority of all respondents, there was a need to do a lot of rescheduling of interviews. Only the pilot respondent, R9 and R10 interviews were conducted at the pre-agreed time. This did not impact on the quality of responses or undermine my role in any way. It was mentioned for information purposes and to provide some rationale for the space between interviews and the clustering of interviews in December 2012.

This chapter analyses the responses to the various field questions posed to the respondents. A more detailed interview guide can be found in Appendix 2.

5.3 What 'to innovate' means and how it coalesces with education

The Institute articulated innovation as one of its six values. (See Figure 2, Chapter 2.) To reiterate, the Institute states: 'We constantly strive to introduce new ideas, new education programmes and services and to make things better for our members'. This, along with Bareghah et al.'s (2009) multi-disciplinary

definition of innovation (Chapter 3), provided the basis for analysis of responses given. Initially, responses were colour coded to the six attributes of their definition, namely words associated with the nature of the innovation, type of innovation, aim of innovation, stages of innovation, means of innovation and the social context in which innovation occurs. (See Appendix 3 for the colour coded responses.) A summary of these key attributes and the corresponding word frequency between respondents is contained in Appendix 7, which highlights that respondents concentrated mostly on the nature of the innovation, that is, the form the innovation can take. The significance of this is that respondents are exhibiting a lack of awareness or disregard for the sequence of the attributes. The social context, or people dimension, is constant throughout the innovation process. It is at this level – where the Triple Helix asserts itself through network activity – that innovation occurs. The initial aim of innovation only ranked third. One could argue that this should be the starting point. I was surprised that the notion of value creation was not mentioned more. Only R6 made this connection. Also, only respondents three and four made the connection between innovation and learning. Could that be as a consequence of the phrasing of the question? But after the pilot interview was conducted, the phrasing of this question was refined to avoid such ambiguity. The original question was: Define what you think innovation means? This was rephrased to: Explain what you think 'to innovate' means? I thought that by referring to innovation as a verb with no object after it in the question, respondents would make the connection with it being a process.

R9 contextualised the need for innovation within a financial services perspective by stating, 'I always ask myself, is it serving a real need? Because if it's not then chances are it's not very good.' This has implications in respect of the programmes the Institute offers. Is there still a need for a particular programme? Is there an opportunity to develop a new programme or modify an existing one to meet the real needs of industry?

The type of innovation was spilt mainly between the term product/process. Viewing education as a product complements the economic conceptualisation of education. This view is the prevalent view held by respondents.

Only respondents three, four and eight explicitly referred to the Institute and education. For example, R4 articulated the connection between innovation and education when he asserted:

> I think to innovate is to find new ways to improve learning. Education is all about transferring knowledge. There are lots of barriers getting knowledge into people. Innovation should be all about improving ways of getting people up the curve in their knowledge.

The absence of any reference to technology and creativity as the means of innovation were ranked the lowest, which was surprising to me. Only four respondents made reference to it. R6 was emphatic in dispelling a common misconception that innovation is not invention. For an invention to become an innovation, there are two conditions required: a need must be present and the invention must improve lives in some way. The process is such that an idea must be developed in order for an invention to be

developed which leads to an innovation. Becker and Whisler (1967) differentiate between these two distinct concepts when they say: 'invention is the creative act, while innovation is the first or early employment of an idea by one organisation or a set of organisations with similar goals' (p.463). Furthermore, Esquivel (1995) sees creativity as the critical process involved in the generation of new ideas. Unless implementation occurs, an idea cannot progress to an invention and an invention into an innovation. Under this conceptualisation, an innovation's impact determines its qualification, which has a greater affinity with the world of economics and business. In an educational context, I favour the impact as that espoused by Ferrari et al. (2009) when they endorse an inclusive and democratic perspective of creativity in education utilising Craft et al.'s (2001) LCC concept. Craft developed the 'big C' and 'little c'. The first (big C creativity or BCC) refers to the creativity of the genius, for example Einstein. A genius's achievements are novel, excellent, socially recognised, and valued. They are not very common. Little c creativity (LCC) doesn't relate to the gifted or talented, or to creative and innovative events that impact society at large. LCC refers to behaviour and mental attitude, or to the ability to find new and effective solutions to everyday problems. Higher education is there for both 'big C' and 'little c' participants. The objective is for every student to realise their full potential.

Innovation is typically considered as a positive activity, as wealth and value can be created. Interestingly, R9 contradicted this, as he stated on two occasions that:

> Frankly the innovation that is common is actually of a negative variety, people are taking new risks which they couldn't especially manage so from that point of view I'm always a little bit suspicious about innovation in the Financial Markets.

He further stated: 'There is that concern that generally speaking financial innovation is code for problems frankly.'

Four of the respondents made direct reference to the scale of innovation (respondents one, two, three and nine), with only R1 making a temporal connection in her response, saying: 'To innovate is to constantly change…'. This is the closest reference to the Institute's definition of innovation as articulated through its values. Reference is made to minor change (R1), substantial change (R2), and significant change (R3). R9 referred to revolutionary breakthrough but asserted that:

> I'd almost prefer to see incremental because I don't like in the sense of especially if it's complex end to end process you have to make sure that you understood it fully from the beginning.

Overall what emerged from the responses of both university and industry respondents was a lack of contextualisation between the connection of education and innovation. Also the respondents from the Institute articulated innovation quite differently to the way the Institute articulated it through its value statement, Figure 2, Chapter 2.

5.4 Analysis of the education functions

As stated previously, the Institute only engages in education related activities, one of the three functions of higher education institutions. Research has been consciously not conducted, as R3 stated:

> If I wanted to get into research for example, to me that is at the end of the food chain, after doing all the basics well. You can innovate from a strong base. You can't innovate from a weak base because you've no credibility.

This quote indicates that the traditional mission of education, teaching and learning, is considered as the first and basic function of higher education. In that view, innovation is seen in a linear manner. Innovation through research cannot be considered or conducted until an activity prior to it, teaching and learning, has been performed well. However, institutions can engage in both functions simultaneously, or strategically decide to only engage in one activity; hence the existence of pure research institutes, professional education bodies like the Institute and the existence of entrepreneurial universities engaging in all three activities: teaching, research and innovation.

Analysing the competencies of the different Triple Helix actors in determining innovation enhances the performance of the education function in the Institute.

Government has a limited role in relation to the education activities of the Institute. It assumes a strategic and coordinating role. As stated in Chapter 2, the Central Bank introduced a Minimum Competency Code for the industry to which the Institute provides services. This had implications for programme development, content covered and how programmes were delivered to meet gaps identified.

Using examples provided by respondents concerning education related activities in the Institute, the following sections demonstrate that the Institute innovatively uses technology to assist them in this regard. They also leverage off the competencies of industry and their university partners to provide technical and functional capabilities, which in turn positively impact the performance of the Institute's delivery of its education remit.

5.4.1 Teaching and learning

As stated previously in Chapter 3, knowledge is the focus of attention in universities and in organisations like the Institute. Asking respondents to rank knowledge typologies was an attempt to better understand the style of innovation favoured in the Institute. The knowledge typologies chosen as reference points were informed by the work of Bengt-Ake Lundvall and Björn Johnson (1994), leading proponents of the National Systems of Innovation (NSI) approach. They contend that success emanates from learning and innovation. Their proposition is that knowledge is the most important resource in any economy and that the most important process is learning. Uncertainty in the analysis of the learning and innovation process is central to this approach. They believe that large parts of the

knowledge base are tacit in nature and emerge from basic learning by doing something or using something repeatedly and by interacting with people. In fact, Lundvall and Johnson referred to these as a taxonomy of knowledge. The taxonomy is as follows: know-what, know-how, know-who and know-why.

Know-what refers to knowledge about facts. Know-why refers to knowledge about principles and laws of motion in nature. I chose to substitute this one with know-where. The rationale was to introduce a spatial dimension. Knowledge doesn't necessarily reside within an individual. It can be a geographical location or central repository, for example the web. For me, the use of technology was prevalent in this knowledge typology. Know-how refers to skills, and a tacit dimension is implicit here. It is a capability to do something, or knowing the process to reproduce an outcome or a framework to review things. This infers that it is a type of knowledge developed and kept within the individual or particular entity. Lundvall and Johnson contend that know-who is increasingly important to create networks to share and combine elements of know-how. This is also central to the premise of the Triple Helix Model. During the interviews, each respondent was informed of what the different knowledge typologies meant.

The ranking of these knowledge typologies by respondents (see Appendix 8) clearly shows that know-what is the most important, followed by know-how, know-who and finally know-where. The know-who is not considered as very important by industry respondents, though university respondents differ in opinion. This somewhat contradicts the Triple Helix Model assertion of interaction between spheres. The difference is that the Triple Helix is more at an institutional level, and the respondents answered this at an individual level. R1 from the Institute asserted that the Institute was now less dependent on the 'know-who' factor then it was previously:

> If we look at the personnel change in banks, the people we knew in them 2 years ago are now different. We put a lot of effort into that. If you're doing the right thing the right way, maybe this is naïve, if you know the needs of your customers I think the 'who' will accept that.

R8 from industry contradicts this by stating:

> To get the innovation agenda pushed forward you can have the best product in the world, developed with a view to saying it'll work in a particular sector but if you have not engaged with or put it in front of the right people it can be difficult for it to be a success.

Whilst R5 and R7 agreed with the hierarchy of knowledge typologies, what they said highlighted the difference between how innovation is viewed by a person from a university (R7) and a person from a professional education organisation (R5 from the Institute). R5 views innovation in a linear manner. He articulated this by providing an example of developing a new course, emphasising the masculinity in the process when he said:

> I think we should develop a course, develop a piece if I use that as an example. Know what – that's the content. I think the 'who' comes next because for us to figure out what ***he*** needs to confirm our belief, then we'll have a conversation with ***him***. Once we know the needs then

> we're into the 'how' we're going to do it. Where it's going to happen is probably number four, could be three or four. It does depend on the situation though. That is true.

R7 considered innovation from both a non-linear and linear perspective:

> By knowing who they can come up with an idea of something to do. Things can flow in a non-linear kind of way. It's not a linear pipeline. You could say in that way. You learn by doing. That necessarily might not be necessarily linear. So it may go from a whom to a how to a where, back and forth between those. I think that if you looked at it in a linear way. You may start at to know what to do, then know who would do it. Then they'd tell you how to do it, or assist in how to do it and then where would be fourth.

Despite know-what being respondent six's first choice, because of the changed landscape he stated:

> Know-how for me is the big one because (pause) that's what makes organisations different, what makes universities different, what makes some more successful than others, it's that know-how, which is developed in a way which competitors find very, very difficult to …disaggregate, dissect and replicate. That's what makes organisations successful and really special.

Because of the tacit element implied in the know-how, R10 provided another dimension I had not considered: emotional intelligence. He said:

> There's an emotional intelligence to it, like you know, you just kind of react or not even react but when someone says something to you, you understand it inherently or you misunderstand it inherently. Either you have the understanding or you don't.

I consider innovation as a non-linear process that can be enacted through any of the different knowledge typologies. Like the definition Bareghah et al. (2009) proposed, it is a multi-stage process. The Triple Helix Model is to all intents and purposes a conceptualisation of how knowledge is acquired and disseminated. It emphasises interaction between the different spheres.

For innovation to occur, change has to occur. In order to create change, you need to be aware that change is required, necessary and will happen. The above section considered the relative importance respondents assigned to different knowledge typologies in the pursuit of innovative outcomes from teaching and learning activities.

Innovation is inculcated in the Institute practices through the incorporation of feedback and lessons learned through experiences internally and with external stakeholders. This will ensure an education process of continuous development. Communication emerged as a key theme from all respondents of the Institute as a means of ensuring that innovations are captured and open to all to learn and use. Respondents one and five referred to the structure in the Institute as incorporating a constant feedback loop which informs all activity conducted in the Institute. R5 said:

> We incorporate the feedback loop; nothing is lost or falls through the cracks. I think we're quite good at it from an organisational/structure perspective, incorporating the feedback so it doesn't get lost or reside in just one person.

By stressing the importance of communication, this supports a view held by Boland and Tenkasi (1995) that new complex knowledge and innovation are produced when there is effective communication both within (perspective making) and between (perspective taking) various open system communities. This, I consider, complements the Triple Helix Model, as each institutional sphere, university–industry–government, can be considered as an open system community. I acknowledge that the unit of social organisation is different under both, the network being the unit from a Triple Helix perspective and the community from Boland and Tenkasi's (1995) 'language game model of communications'.

A common problem facing all organisations is the transfer of the huge amount of latent knowledge held individually by its staff. Nonaka (1994) sees the sharing of tacit knowledge as essential for organisational learning and innovation. This process is hindered by the inevitable presence of professional jealousy, egoism and rivalry. Quinn et al. (1996) suggest that professionals have a natural reluctance to share knowledge, as it is their most precious asset. In 2012 a Teaching and Learning Committee was started by the Institute. The Institute liaised with other professional member-based organisations to become involved. Two such organisations are now on the committee. It is an open forum where ideas and practices in common activities and functions are discussed to assist all organisations deliver better programmes and constantly improve the student's experience of studying with each organisation. R1 stated that its aim was to:

> Allow e-learning people, programme managers and people from partner organisations to discuss, not necessarily huge projects but ways in which the various materials, ways we deliver, various aspects of how we interact with students and how these can be improved upon.

This opened up dialogue with partner organisations and the initial remit broadened as a result of early successes.

5.4.2 Course delivery

The majority of the thirty programmes the Institute offers to its members is delivered through e-learning, a webinar based format. On the degree and postgraduate programmes, the lecturer/facilitator face-to-face format is favoured. A blended learning approach was piloted recently on one programme, with very positive results. It is envisaged that blended learning will be the applied pedagogical approach on other programmes going forward. The use of technology to deliver educational offerings and to provide efficiencies in processes was the only reference made by most respondents regarding technology. I expected more references to be made to the role of technology. R10 was the only person who framed many of his responses from a technology perspective.

Technology and innovation are linked. Technology enables innovation. The use of webinars as an alternative to face-to-face lectures was mentioned throughout the interviews by virtually all respondents. Apart from the advantage of being available long after a lecture has been delivered, it has efficiencies from a cost perspective too, as proposed by R3:

> Where originally the objective was to create a better learning experience for students. What we found was that the richness of the information the learning management system gave us about the use by students of the webinar and other on-line learning allowed us to learn much more than we expected about how the students learn, the issues they were finding easy, the issues they were finding hard.

In the past many members of the Institute could not attend lectures, as they worked and resided significant distances from lecture venues. The ability of members to enrol on programmes because of the flexibility of delivery afforded by e-learning enabled the Institute to extend its member base whilst meeting student and employer needs. This is important to industry, as R8 stated: 'You're asking them to take time out and invest time in themselves. You should be thinking of solutions to assist them in this.'

The example cited above conforms to a definition of process improvement rather than innovation, as neither the technology or its use is innovative but it did result in improvements for the Institute and its students.

5.4.3 Curriculum Development

As the Institute concentrates on a particular industry, what this industry expects and needs informs and assists the Institute in curriculum design. The tension that can develop here is the potential of relevance to professional expectations of content to override academic rigor; hence the requirement for robust quality assurance practices. This means that educational institutions need to reflect on their established structures to enable the effective development and delivery of their educational programmes (Rowley, 1995). Employers require validation of the quality of the academic or professional programmes their staff undertake (Peace Linn, 2000). R4 alluded to this when he said:

> Funding is gone so industry is only interested in real value and bench mark quality. If we don't get into that space and innovate and think of things they need before they think of them then we won't succeed.

Customers also seek quality validation, as they need to have confidence that they are dealing with a quality organisation (Blackmore, 2004). This applies especially to customers of the banking industry.

A distinction was made by R7 between the Institute and universities. He was critical of programme design at universities. He contends that:

> Universities probably are not incentivised to do the thinking only in the context of large programmes and certainly they just do them again and again. It's the financials. In the Institute it's to do with relevance.

Throughout, respondents referred to the Institute needing to respond to the needs of the industry. The development of the new Professional Education Framework by the Institute for the banking industry is an example of innovation in curriculum design co-constructed with industry and university partners. Despite this innovative development, only one respondent referred to it. R2 referred to the framework in the context of how the Institute collaborates and cooperates to assist industry in solving problems.

5.4.4 Accreditation

The Institute as a recognised college of its partner university has the ability to create educational qualifications, subject to the university's Academic Council approval. In a highly competitive environment, this ability to accredit programmes is considered by all respondents as a significant differentiator. R5 stated that 'there are a number of new entrants in our market and we have to be seen to add value. With "*our university partner*" we've an accreditation that others can't use.' The pilot respondent agreed, but also highlighted that accreditation can be achieved in a number of ways, and he did not emphasise the importance of the particular relationship with the partner university.

5.4.5 Assessment

Assessment is an integral part of the learning process, as well as a tool to measure understanding and application. As the Institute is a professional education organisation, assessments vary in terms of the balance of assessing knowledge and skills. The practice of an end of term exam is the predominant assessment strategy to gauge the acquisition of learning outcomes. The majority of sub-degree programmes work on a pass/fail regime. They are also predominantly more professionally and skills-oriented. Degree and postgraduate programmes conform more to the university system of a summative end of term exam complemented by coursework throughout the term. Any innovations in the assessment space resulted as a consequence of addressing a problem experienced.

One such problem that persisted for four to five years was the requirement for programmes to run within the times that conformed to the university term time. Financial Services is highly regulated and people working in the field require certification of competency to perform their job; therefore, they required results quickly. If they were unsuccessful, they missed out on the next available exam sitting because the Institute needed to comply with university regulations around lead times required for studying modules. This meant people could lose out six months between when they got results and when they progressed. This was outside the students' control and could impact them significantly. It was also a problem for their employers, as they could not allow the person to work in certain roles. As R4 said:

> So we sat down, how could we address this without compromising our standards, can we change it? We found a solution and improved our efficiency. They saved time and it was important to their employers too. It didn't cost us anything apart from how we processed our exams.

Deconstructing the exam process into its component parts enabled the Institute to improve lead times and create other efficiencies, whilst maintaining study time and quality concerns from the university. This resulted in a solution that pleased 420 students immediately, as they were both available to their employer six months earlier and able to perform the role six months earlier.

Feedback to a student after an assessment is critical for the student's development of learning. It needs to be timely and meaningful. The Pilot respondent referred to a simple yet effective enhancement of providing feedback to students that took multiple choice mock exams. Feedback is electronic and instant. Previously, feedback only highlighted the area in which the student went wrong. This learning tool was enhanced to give the right answer too.

The above analysis of the education function of the Institute highlights the existence of Triple Helix dynamics as industry and government considerations dictate many of the decisions taken by the Institute in the areas of teaching and learning, delivery, curriculum, assessment, and accreditation. Yet as a conceptual lens, it was developed more to investigate the dynamics in the other functions that higher education institutions engage in, namely research and innovation. Examples cited mostly refer to process improvements, e.g. technology improving course delivery and access, refining the assessment process to enable quicker processing of results. Innovation occurs mostly in the Institute's interaction with actors in developing curriculum. The Triple Helix Model has not been applied within a professional education context. Therefore, it is for this reason that I consider that the original and novel contribution to knowledge of this thesis is its use of the Triple Helix to investigate innovation in professional education. The next two sections consider the other two aspects of a higher education innovation framework: components and the relationship between these components.

5.5 Analysis of components of the innovation system – Triple Helix actors

Component analysis is based on who are the actors, institutional and individuals who contribute to generating, diffusing and using innovations. As the Triple Helix Model was the conceptual lens employed in this research, the institutional boundaries were pre-defined, that is, institutions and individuals were assigned to being either university, industry or government. (See Figure 3 in Chapter 2, the Institute Stakeholder Map by Triple Helix Category.) The reality, though, is that boundaries are permeable and blurry. Individuals (respondents four, five and six) and institutions can exhibit traits and practices common to different spheres. This will be discussed further in the next section, the focus of this chapter.

5.6 Analysis of relationships between Triple Helix actors

Analysis of relationships between components (actors) in an innovation system focuses on how the actors interact and perceive each other. The first section will discuss the nature of the relationships between actors. An analysis of the type of relationships follows, with an emphasis on intra-helical analysis of network dynamics within the Institute. The importance of relationships and awareness of network dynamics in the Institute is illustrated in the following quote from R2:

> I think the thing that's really driving what we're doing is what courses have we on offer and that's really driven by our stakeholders and all that kind of stuff, our connections with stakeholders and with the regulator, the banks, what they want, our individual students, what they want so it's that kind of network thing is really the important thing.

5.6.1 Nature of the relationships and which is the most important

Social or technological dimension

Any activity that involves more than one person has a social dimension. Education is considered as a social process (Dewey, 1897). All respondents agreed that innovation is as much a social process as it is a technological one. As stated in Chapter 3, for something to become an innovation a need has to be met. Therefore, unless people use, adopt and understand the innovation, it 'won't ever take off' (R9).

All respondents consider technology as an enabler for innovation to occur in education, primarily for programme delivery purposes in the Institute. R8 referred to this when he said:

> I think how you deliver to students there has been a number of developments. You use them here, webinars and how you use technology. The use of various media to deliver lectures … I think it is not necessarily cutting edge innovation but I think it moves education towards delivering things in a different manner. This is not available in all the education institutions I work in.

The Pilot respondent and R1 referred to this too. The innovativeness arises from how the Institute uses the technology and not by any means from developing the technology in the first instance.

Innovation and education are two distinct processes that have a co-dependency. Why they interact for educational purposes was described by R4: 'Innovation is important in terms of doing something new with the ultimate goal of making it easier for people to learn.' The way students learn, engage with their peers and members of the university, and how programmes are delivered is changing. R1 considers that the social and technological dimensions of learning are inextricably linked and in a fluid state:

> The way students learn constantly changes especially with social technology. The traditional way courses were delivered and how exams are taken is not as applicable because of the way students interact between themselves and the environment around them.

The Institute made significant investment in technology to enable android, iPad and other medium functionality so its programmes and content could become more accessible for its members. Their web site was also changed. Investment in technology, as R6 states, is:

> Part of our new strategy we're making a fairly significant investment in our IT system, to bring us onto the next level and to support our strategic ambitions of the organisation. We're prepared at a time when there's a lot of challenges to invest for the future.

The above section emphasises that the social dimension of the relationship is more important than technology. Technology is an enabler and should serve the needs of the user and not the user serving the needs of technology.

Who is the most important relationship?

As you would expect from a professional member-based organisation, many respondents emphasised that the Institute existed to serve the needs of the industry it represents. Therefore, maintaining, developing and strengthening relations with industry has in the past, present and in the future the most important network of relationships. (See Appendix 9 for detailed analysis by respondents) The Institute has a dual identity, as it is simultaneously a professional member-based organisation and a college. Interaction with other university actors is a distant second place. This dynamic seemed to be more important in the past, as the relationship between the Institute and its university partner evolved. As the university partner – Institute relationship evolved, it exhibited many of the different stages of academic-vocational integration. This was discussed in detail in Chapter 2.

Maintaining, developing and strengthening the relationship with industry is considered the most important. R1 put it succinctly when she said, 'industry calls the shots'. This was evident in the emphasis by many respondents of the Institute as being a professional organisation, there to serve the needs of a particular industry. For example, R2 said:

> If you're not doing what the industry needs and requires as a professional body, we don't really have, (pause), you can have the best strategic partners in the world and consider yourself the best university or academic body but the point is we wouldn't be relevant.

Both university and industry respondents referred to the importance of the Institute being relevant to industry and having innovation endorsed and recognised by them to meet their needs. The Institute needs to become a thought leader to assist industry. I would contend that this consensus in views legitimises the concentration of the Institute on engagement with industry, and also highlights university awareness and acceptance of this.

An interesting distinction was offered by R7, who commented that industry provides the Institute with their revenue base and university provides its accreditation base. The nature of the relationship with the university is one of co-dependency, while with industry and government the Institute is dependent.

According to three respondents, strengthening the alliance between the Institute and its university partner and the move from school to college status was the reason why the university was considered most important in the past. R4 rationalised why university had to outrank industry in the past.

> Basically because our raison d'être is to be a font of all knowledge for a particular industry and if we're going to achieve that then we've to know the industry. On the other hand there are a 1000 other people that know the industry and can do the same thing but us having a relationship with the university gives us the quality and bench marking and standards that industry need to have value. Basically in this organisation in the last 4–5 years we were all about building our **credibility** as a university, which is absolutely crucial (long pause). It was run as an education body with educational expertise and educational frameworks that looked out to industry.

The reference to credibility in the above quote goes beyond accreditation of the Institute programmes. It also includes issues such as reputation, branding, legitimacy and credentials.

Despite the primacy of the industry relationship, the importance of the Institute's relationship with its university partner is emphasised by past and new senior management team (respondents three, four, five and six). Speaking about the future dynamic of the relationship with university, R7 asserted that 'we had bedded down the structures so the relationship with university is more structured and innovation will occur at the industry interaction level.'

The importance of informing and responding to industry and government was raised by many. R8 said:

> I think there's a role in that they are aware of what's happening at government or industry level and then to develop offerings to meet those needs. I also think there's a role for the education institution to be innovative and to a certain extent lead or influence the appropriate bodies and government too you know begin the innovation process.

I would consider that the Institute has taken on the challenge as articulated above by becoming an integral member of schemes such as the Summit Finuas Network, as discussed in Chapter 2.

All respondents, from both university and industry, agree that innovation is central to an organisation's growth strategy. Growth, if it occurs, will be as a result of interaction primarily with industry and then with government. The nature of the university relationship will be more one of maintenance. Interaction with industry and government is different. The Institute responds to their needs.

A review of the responses identified some individual Triple Helix actors which were considered strategically important (see Appendix 10) to the innovation system of the Institute. No individual actor within the industry sphere was mentioned. Bank, insurance and financial services were the collective terms used. This, I consider, is significant, as all actors in the industry sphere must be considered as significant. Industry has multiple roles as clients, drivers, beneficiaries and veto holders of innovation by the Institute. This is exercised by their ability to provide students on programmes.

Underlying quality or purely business?

The nature of any relationship has financial (costs and expected returns) and non-financial aspects (e.g. gaining status or prestige) to it. Opinion differs between university and industry respondents on the importance of these two different aspects. Both industry respondents consider the business side of the relationship as most important. R9 further clarified that initially interaction is based on business dynamics, and that to develop and ultimately sustain a relationship, the underlying quality then becomes more important. Respondents from the Institute differ in opinion; the more senior consider the quality of a relationship as more important. This divergence in opinion between industry and university actors has implications for the way the Institute could interact with the component of the helix it considers as most important. This illustrates both the first and second dimensions of the Triple Helix

Model, namely internal transformation in each of the components and the influence of one component upon another. As industry exerts its influence over the university/Institute, requiring a more business/entrepreneurial mode of interaction, the university/Institute must decide upon and in some cases transform how it engages with industry.

5.6.2 Types of relationships and perceptions between spheres

Broadly speaking, relationships can be considered in three categories: collaboration, substitution and networking. Collaboration is when actors from two or more spheres collaborate either from a top-down or a bottom-up approach. Substitution occurs when one actor assumes the lead on a function traditionally belonging to another actor. Networking is a practice of social organisation and coordination. As relationships are formed and nurtured, social capital is acquired in a network. Kaufmann and Tödtling (2001) believe that networking reflects the growing non-linearity and interactivity of innovation processes, whilst Steinmueller (1994) considers the several benefits networking provides. The Institute needs to improve networking. As R6 says:

> We haven't been great at and is very important in my view is networking. This means you know attending events where our customers are present, more informal events. There's a treasure of information that can be obtained in those settings because people are less formal, people are, I suppose more generous in terms of snippets of real information of what's really happening.

The exchange of information and development potential in relationship building afforded from networking can lead to innovation.

All three types of relationships complement the processes of the Triple Helix Model, and examples of relationships throughout this section will demonstrate this.

Network Dynamics – At an organisational level

Cooperation and collaboration are encouraged and strengthened to create an innovative infrastructure within and outside of the Institute through what R2 refers to as 'the nexus of the network'. He states:

> For us going forward, the networking thing is very important because we are networked if you like with our members, our corporate and individual members. We are also networked with our stakeholders and beginning to get networked with our university partner.

This need to be at the centre of a network of partners is shared by all university respondents. The Institute initiates many innovative processes, such as engaging with their university partner to become a recognised college. The rationale for the Institute adopting a network approach to innovation is described by R3:

> The Institute is what I would call a professional education body. Its primary focus is education, but it's growing out of an old professional body, a professional institute. That leaves us with a very, very wide range of stakeholders to manage, ranging from our students, our staff, the government regulators, other regulators, other professional bodies, the wider public service and

> the general public at large just to mention a few. Now what that means is if you want to successfully innovate, you have to bring a substantial majority of those people with you. So particularly in our situation that social element becomes very, very important.

He further alludes to the need for reorganisation within the University dimension (the first dimension of the Triple Helix Model), saying:

> The educational professional body landscape in financial services was characterised by a large profusion of small and in some cases, not particularly effective, educational bodies. In many cases there was a lot of costly duplication, so what we are trying to do is to generate partnership, create better experiences for students without being predatory. In that last piece it is almost impossible to merge or take over in an educational setting. There are very, very few successful mergers and if you like acquisitions in education. The substitute for that is partnership and co-operation, so you eliminate the duplication, particularly of cost bases. It does take enormous amounts of time.

This diverges from how industry operates, as mergers, acquisitions and consolidation are commonplace corporate activities. Both industry respondents referred to the highly regulated nature of the industry. R8 spoke about being in the top three global insurers and how 'other insurers would look to our organisation for examples of innovation. It's a small point but it's also relevant to your institution'. This quote elucidates the notion of influence as an important determinant in networking.

The ability to influence (second dimension of the Triple Helix Model) and understand the needs of other helix members was articulated by R4:

> From an external perspective it's all about influencing. It's all about understanding what you want out of the network, the relationships, and understanding what they want. You have to find a place where it works for the both of you. Then you have to work damn hard at keeping in touch to make sure there are no communication glitches or misunderstanding. No other organisation is the same as us. Universities have their own culture, we're all different. Like any relationship you have to understand the complexities. There has to be some common ground. Networking is all about keeping in touch and making sure where you're going and tracking this.

Existence of both the third and fourth dimensions of the Triple Helix Model, namely the creation of new trilateral networks and organisations with the purpose of generating new ideas and innovations and the recursive effect of inter-institutional networks both in their originating spheres and society at large respectively, have occurred from interaction with government actors instead of industry. An example of this is the Summit Finuas Network discussed in Chapter 2.

Network Dynamics – At an individual level

The above was an analysis of network considerations at an institutional level. Individuals make up institutions, so issues relating to accountability and ownership arose at the individual level. As R6 said:

> Innovation has to become imbued in to the culture of our organisation and it has to be a mind-set issue for all staff … we're not resting easy. It's our responsibility as a teaching and learning organisation to be a leader in terms of, I suppose I would call, a Thought Leader, looking at the industry that we serve.

R4 was in agreement that innovation is not the preserve of just senior management, the top-down approach. He holds an inclusive and bottom-up view that 'everyone has to own innovation. No one person has the right to it. Some of the best innovations come from junior members of staff and one or two have from here.'

Internal Dynamics of the Institute

New vs old management regime

Internally within the Institute what emerged are some divergent opinions between the new management members and other members of senior management, especially between respondents three and four. For innovation to occur, change must happen. In the context of the Institute, significant change has occurred over a relatively short space of time in its existence. It has been operating since 1898; however, the change experienced between 2008 and 2013 altered its identity, its culture and how it operates. The overriding sentiment was that pragmatism ensued, for example, an attitude of 'shoulders to the wheel' (R7), and 'we prepare very, very, very well and pre-exempt as much as we can' (R1). R5 refers to the transition and its implications for the Institute:

> We're in transition at the moment from a traditional business model that's served us well and we are beginning a new phase. We've a new strategic vision and mission which is requiring innovation from a number of perspectives, 1) we've developed new courses, programmes that didn't exist here before 2) we're amending, changing existing programmes because the needs of the end user, i.e. our customers, who are in this case, the banks, financial institutions and also the Regulator, their needs are constantly evolving. Therefore we have to be innovative.

An interesting observation is the use of the pronoun 'we'. This refers to the new management within the Institute. R5 is asserting a hegemonic position that the new management, through innovation, can meet the needs of its stakeholders, which the previous 'traditional business model' may not have been able to do.

R4 also made this distinction between old and new, with 'we' referring to the new. He said:

> Basically this organisation sometimes if they wanted help for example with SME Credit they knew one person and they'd make it fit. We know thirty, we know who the good ones are, and that's an additional bonus if you want to be the best.

The above contention claims an extended network of contacts with whom new management can liaise in order to produce better outcomes.

R3 felt people were willing to take measured risks. He didn't think 'the place was ever particularly hierarchical'. Respondent four adopted a contrarian stance when he gave his opinion on the significant change experienced by the Institute. He said:

> The one that affected the organisation most in people's heads was the new CEO because they see that every day and it impacts on their day to day lives. The bank crisis, well it was a top-

> down organisation, the bank recession almost happened out there, they were almost immune from it in some way. The college status, well we were a school, moving to college status was important to senior and strategic people but I'd say the general staff couldn't explain in two sentences if it made any damn difference. People are cautious. People always play, 'wait and see'. The second thing they do is see how it affects them. Some come in with 'hand grenades'. I decided not to come in with a 'hand grenade'. That was a conscious decision. It may not be right.

I consider that the above quote illustrates a dismissive and disparaging view of many of the employees of the Institute. The distinction made between the views of senior and strategic people and general staff on acquiring college status is evidence of this.

Previously, the focus in the Institute was concentrated on the university and on obtaining college status. Going forward, serving industry needs is the priority. New members of senior management are all from the industry sphere, they are well placed and more informed than existing senior management, who mainly worked in the university space prior to being employed in the Institute.

Perceptions of how innovative the Institute is

There is divergent opinion, as some consider that the Institute proactively innovates (four respondents), while others feel it replicates innovations (two respondents) and the remaining five respondents consider there to be a mix of both replication and proactivity in innovation.

An interesting observation is that there are divergent responses between respondents with long service within the Institute and those who are new entrants. For example, R1 and R3 were emphatic that they believed the organisation proactively innovates, whilst new entrants, R5 and R6, were more critical, and R4 felt both practices existed. R5 stated:

> Would I say that we'd benchmark ourselves as an innovative organisation? I don't think so. Do we have an aspiration to become a very innovative organisation? I think we do. Our challenge is to deliver people and a culture that fosters this.

The industry respondents, R8 and R9, considered the Institute as innovative, even more than others in the field of higher education. R8 asserted that 'the big thing for me is people talk about innovation, creativity, they talk about passion. You have to devote some time and dedicate resources into it'. This quote directly relates to what was absent from Bareghah et al.'s (2009) definition of innovation, the temporal dimension. R9 stated: 'I would regard it as being very forward thinking, I would say its antennae are up all the time, anticipating opportunities, anticipating market needs, and responding to them.'

The above analysis highlights that the Institute may be more critical of itself than are its external stakeholders.

Prevalence of the economic conceptualisation of education – industry needs before all others

This whole area of realising that the students taking your courses are customers of your organisation needs to be promulgated throughout education institutions. (R8)

Banking and financial services, the industry base for the Institute, is undergoing massive change, rebuilding and restructuring. As a result, their needs will change. Most respondents referred to the importance of listening to and meeting industry needs. R8 continued:

> I think it is also innovative in particular when taking the lead with its interaction with industry, not just its business interaction, but their ability to listen to industry and recognise that there are needs to be met out there that can be positive for both industry and the education institution. It's taking the lead in developing education offerings to meet these needs.

The relationship with industry was ranked as the most important relationship for the Institute. R8 continuously referred to the requirement of university to include industry in assisting with curriculum design and content, lecturing, guest lecturing and other activities to make learning more accessible and meaningful to students. Having industry input creates an environment of application-based learning of abstract or theoretical concepts that enables students to achieve vocational competencies. This emphasises the contextualisation of knowledge to enhance students' problem solving and employability skills. These matters were discussed in Chapters 2 and 3.

R5 highlights that within the institute 'not alone has the relationship changed but the numbers of relationships are less' between the Institute and industry. R9 thinks that interaction between parties of the Triple Helix will decrease going forward because of what happened in the past. This opinion relates more to how industry engaged with other members of industry, but nonetheless all other spheres will be affected because of this. Creativity from an industry perspective has negative connotations, as there is reluctance to be creative. As R9 said: 'They feel they haven't done a very good job and therefore lacking that confidence they're not willing to go off and take chances.'

Within the Institute, all respondents considered understanding the industry needs as critical. R3 alluded to another consideration that may assist industry, that of informing them of developments and not just always responding to their needs. He said:

> I think the piece of us trying to inform them can be sometimes as important as responding to their needs in the case of an educational organisation. I think it's very easy to fall into the trap of responding to their needs. I think part of what we need to do is to understand their needs and to understand the national and international context in which they and we are working. So in some cases we specifically wouldn't respond to their interpretation of their needs. If you like their needs would inform but would not be the 'be all and the end all'.

Framing and providing alternative readings of industry needs increases the complexity of the role of the Institute beyond just the serving of these needs. In order to be considered as a Thought Leader, though, the Institute must assume such a role.

Mismatch in university – industry expectations

Whilst responses from industry respondents were different, both agreed that universities did not provide the skills and knowledge required to meet the demands of the workplace. R8 said:

> I think for leading organisations it's all about providing students with an ability to ask questions, the right questions, to challenge, to think a little bit differently, to understand and learn from other people from different industries and to bring that to their own organisations. I think if you can equip students with that you are meeting the ever increasing demands of the workplace.

Whilst R9 referred to the other aims of education, he accepts the primacy of the economic conceptualisation of education: 'I think ultimately circumstances will dictate, education must come second to the immediate needs of a job.'

The opinions expressed above clearly indicate the importance of industry and the higher education sector working more closely to ensure that students learn the skills they need to succeed in work.

Industry perceptions about the future

Despite the above, both industry respondents are optimistic about the future of the Irish higher education sector, and in particular the market within which the Institute operates. They acknowledge that the market the Institute operates in is extremely fragile and requires the Institute to understand its needs and provide value in everything it does.

The view held by R8 directly relates to one of the six core values the Institute has adopted (see Figure 2 in Chapter 2), putting the member (student) first.

The student is at the centre of everything the Institute does. As stated earlier, the Institute elicits and learns from feedback from its students. R8 acknowledged attempts by the Institute to do this, saying:

> It's a failure on both the education institution and student's part if they come out of courses and it's not met their requirements. I think this institution has been relatively progressive in engaging with practitioners from industry and I think the more you do that the more likely you are able to meet the needs of students, equipping them to meet the needs of their organisations. You must not just be innovative in terms of what you deliver but also in how you deliver it, how you meet your customer needs.

A moral dimension inherent in education to counteract the behaviour of the past is espoused by R9:

> There's huge potential for improvement as the industry the Institute serves was hit hard. I think that my view of innovation certainly is very jaundiced right now. A lot of the activities it has undertaken is socially useless and therefore should be much more about doing simple things and doing them well and the extent that we can actually have individuals who are educated in a moral sense as well as in a purely technical sense and that they will end up hopefully questioning the kind of behaviour which was indeed I was going to say almost encouraged or not accepted during the go-go years. Yes I feel humbled by let's say our poor performance and yet I feel confident that we can actually improve on that and hopefully that will be worth achieving.

These views are encouraging, but reinforce the contention that education is there to serve the needs of industry and cannot be extricated from the notion of employability, and that anything other is, as R9 says, an 'indulgence'. This is evidence of the pervasiveness of the economic conceptualisation of education, especially for organisations like the Institute.

How the university perceives the Institute

There was only one respondent (R7) from the university (UCD).

The Institute is different but that's not a bad thing

R7 formerly worked in a senior managerial capacity in the Institute and returned after a five-year sabbatical to his place in a public funded university. I would consider his views on the Institute as more informed then some of his peers in the partner university, as he has worked in both organisations. He considers that the Institute proactively innovates at the level of curriculum development and course delivery. This is insightful, as it gives the impression that from a public (government) perspective universities are not as innovative or are more reactive. He makes a distinction between the Institute and a university, stating that 'because the nature of the organisation, the nature of the industry it provides a service too, it's not a public sector organisation with the same rigidities that you'd have in here'. He also said:

> Universities can be somewhat ivory towers whereas in relation to commercial organisations, such as the Institute, notwithstanding its educational focus. It is by its definition more responsive than the universities have been to providing relevant industry related qualifications.

It seems that parity of status is still an issue despite an increasing number of individuals from the Institutes having worked in academic capacities before. The uniqueness of the people in the Institute was referred to by R3 when answering a question about enabling people to view problems differently and to seek alternative solutions. He stated:

> I think firstly in an educational organisation where many of the people's background would be in academia that's less of an issue. I think almost by the culture that they've come from and not just the culture that they find here there would be a search for many different approaches … a management team with a very wide experience, I'm sorry with a great deal of experience and a wide range of backgrounds, a wide range I suppose of central backgrounds. So they tended to create different views of the world which tended to create very healthy tension.

This tension was also considered from a conservative – creative perspective by R1 when she stated:

> People were encouraged to discuss projects and then they saw that they were not actioned. So while you might have the responsibility for coming up with innovative ideas you didn't have the authority to action them. In the past that was a problem. There are certainly key individuals who'll just stop projects because they're not comfortable or their conservative nature would stop it.

This observation aligns with the opinion of Kerr (1982) and many others that higher education institutions are by nature conservative and innovations are not likely to occur.

Fostering an environment that enables individuals to be confident to offer ideas and to challenge ideas in a constructive manner is important. As R3 said, 'I think people would know at all levels that if they have ideas they'll be listened to and if their ideas are better than "senior people's" ideas it's the ideas not the people that drives the decisions.'

In this regard, the Institute exhibits similar traits to a university, knowledge being its focus of attention. However, its narrow range of subjects, professional orientation and a staff largely made up of non-academics means that it does not reflect the unique characteristics of a university as discussed in Chapter 2. R7's reference to it being a commercial entity with an educational focus and other respondents referring throughout to the Institute as being a college, school, professional education body, a member-based organisation or a mix of these terms interchangeably has different denotative and connotative meanings. Clarity on its institutional identity is required internally first, and this should then be communicated clearly to avoid any ambiguity externally for industry, government and the university sector.

Perceptions about the Government role

The Critical Discourse Analysis conducted acted as a proxy for the government voice. This was in addition to responses to questions directly about the government component. Responses that contained reference to relations with the government component now follow.

The industry relationship assumes primacy for university respondents in all three temporal dimensions: past, present and in the future. Industry respondents consider the government relationship as the most important relationship to nurture going forward. For both industry and the Institute, the government role has evolved as an important determinant in shaping their innovation agendas. This is primarily as a result of increased regulation of industry and funding incentives in the provision of education to the industry. This has resulted in closer interaction between all actors within the Triple Helix. As R2 put it, 'you know in the end Government set an edict or a certain qualification is required. Then industry must liaise with the university to get qualified'.

Many respondents felt government had no role in innovating but had in creating the right environment. This meant incentivising interaction and favourable taxation treatment. R10 further elaborated by relating the importance of government involvement in job creation, specifically through multinationals like Google and Facebook, which are considered innovative. He refers to the culture of multinationals, largely US companies, as being different, and suggests that having Irish people involved in the innovation process is beneficial, as it 'transfers into our culture and society' because 'it's a very different

mind-set to how they carry on business and to how we carry on business.' This is the view also espoused by government in their policy text, discussed later.

Interaction between the Institute and government was previously confined primarily to interaction with the Regulator/Central Bank of Ireland. The Institute now has different government stakeholders, as illustrated in the Stakeholder Map, Figure 3 in Chapter 2.

In respect of the effectiveness of the government's role as an intermediary facilitating and providing incentives to promote interaction between industry and university sectors, both industry respondents were positive. A novel view was offered by R8 in saying that university and industry should jointly lobby to ensure appropriate incentives, funding and tax to create interaction. As national governments across the globe capitalised banks to counteract economic instability, they created a dual role as a major shareholder/owner in these entities and as Regulator to them. R9 believes the government should be 'like the strict parent, it must be the disciplinarian rather than the relationship builder'.

Opinion was divided among university respondents. Five of the nine were positive, but implied that involvement should be confined to enabling interaction between university and industry. As R3 stated:

> They are effective. But primarily what you're getting at is that primarily underlying that there ... that they have no place in the actual assumption of the role. The innovation is the output from the actual interaction between industry and the university.

Etzkowitz (2008) asserts that 'the role of government in the Triple Helix firm is at an embryonic state and its effectiveness is rather low' (p.53).

Common themes in most responses given were that government is there to fund (power of treasure) and regulate (instrument of authority), but not to engage in educational service provision (direct action). This is evidence of Hood's (1983) instruments at a government's disposal to achieve its objectives. Chapter 3 discussed this in greater detail. A lack of understanding and appreciation from an educational and service perspective were reasons cited by the Pilot respondent and respondents one and two for government being ineffective.

Despite some of the responses above, the Institute's aspiration is to develop the link with government stakeholders further, as evidenced in the pipeline category in the Stakeholder Map, Figure 3 in Chapter 2.

The next section in the analysis of findings is an interpretation of the Irish government innovation policy. Critical Discourse Analysis was applied. Through this, I contend that the Irish government promulgates an assertion I made earlier, that the economic conceptualisation of education is prevalent over the other aims of education. Empirical evidence (Lavoie, 2008) would suggest that harmonising the two distinct yet interrelated policy spaces of education and innovation produces positive outcomes for an economy, which is evident in Lavoie's study of the Canadian education system and economy.

5.7 Differentiating between a knowledge and smart economy

Before the policy text is analysed, it is important to differentiate between the terms a 'knowledge-based economy' and a 'smart economy', and place this in an Irish context.

The view of Powell and Snellman (2004) of a knowledge economy is one that features rapid obsolescence as the pace of technical and scientific advances is predicated by knowledge-intensive activities. Intellectual capital is valued in such a dynamically changing economy as knowledge is constantly created and exploited (Shapiro and Varian, 1999). To succeed, you must be able to innovate and learn continuously (Nonaka and Takeuchi 1995; Drucker, 1993b; Bell, 1973). This is evident in government policies, as they stress upgrading human capital through promoting access to a range of skills, especially the capacity to learn (OECD, 1996).

A central theme throughout Fairclough's research (2005a, 2005b, 2004a, 2004b, 2003, 2001, 2000, 1992) is the linking of the notion of a 'knowledge economy' to a discourse of 'major social change', with this in turn being used as a justification for the restructuring of national systems. Effectively, a knowledge economy can be viewed as a strategy for effecting change, but also a discourse comprising a particular way of representing a system, including some realities while excluding others (Kenway et al., 2006).

Different discourses are textured together to form the Smart Economy strategy. Adie (2008) defines a Smart Economy as a:

> diverse and disparate array of people, ideas, practices and routines as well as agencies, policies, organisations, texts, images, technologies and an inordinate number of inanimate objects. An effective way of exploring the complex array of elements that make up a 'Smart State' is to view each as a discourse or in relationship to the discourse that informs it (p.252).

Adie further asserts that conceptualising the smart economy in such a manner 'allows relationships to be established between language and social practices … discourses, or elements in relation to a discourse, providing a framework to demonstrate the existing network' (p.253).

In the policy text, Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal, the Irish Government states that 'a Smart Economy combines the successful elements of the enterprise economy and the innovation or "ideas" economy while promoting a high-quality environment, improving energy security and promoting social cohesion' (p.32). This infers a degree of selectivity. Ireland intends to concentrate on specific sectors, which are higher up the value chain, thus supporting well paid quality jobs, for example in areas such as Applied Nanotechnology, Advanced Manufacturing Productivity, Energy, Bio Energy, Composites and Advance CMOS Circuits. They also intend to pursue international opportunities in Tourism, Construction, the Maritime Sector, Arbitration and Digital Trade Facilitation. Significant investment is planned for Research and Development (R&D) in these areas and there is to be favourable taxation treatment, especially for multinationals.

5.8 Analysis of the policy text

The policy document, Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal, was launched on Thursday 18th December 2008 at a time when the Irish Government was facing its biggest and toughest economic challenge since the creation of the state. It was directed at all citizens. The foreword stated that '[i]t requires a national effort in particular to meet short-term, but crucial, challenges'. This document was not designed to be a standalone document, but to complement others. Other documents considered were discussed in Chapter 4. Its purpose was not to introduce the notion of a smart economy; it was to promulgate and progress it. It set out actions to reorganise the economy over five years in order to ensure Ireland's return to sustainable growth. A framework was provided to address the economic challenges. In effect, a direction is espoused but it is stressed that the policy text does not seek to outline all the reforms or measures required across the economy. Development of a Smart Economy is the means to ensure the desired goal.

Innovation is a nodal discourse and is apparent in many policy documents and political and business speeches. The nodality of innovation is that it is the point at which different systems, paths and, in the case of the Triple Helix, relationships, meet. Fairclough (2005b) stated that innovation is discussed as one condition the Government must promote. Innovation is a key feature of the Smart Economy approach. What this means to the Irish government is that through effective use of human capital (knowledge, skills and creativity), ideas can be translated into innovative products and services. They consider that by building an 'ideas' economy, a new 'Innovation Ireland' can be created. This will be achieved by incentivising multinationals to engage in higher value activities and technological convergence, favourable taxation treatment, and increased R&D funding in specific areas, primarily in the sciences and ICT. From an education perspective, the Government seeks to position Ireland as a location of choice in the international education market, attract the brightest academics and researchers, restructure higher education institutions, and promote study in the areas of science, engineering, maths and languages. An indication of the global shift in power is evident in the Government's desire to strengthen bilateral education relations between Irish and Chinese authorities at third level, including further development of economic and cultural links and the learning of the Chinese language.

The extracts chosen here from the documents are summative in nature, in order to give the reader a 'flavour' of the document. Discourses on globalisation, innovation, Government legitimisation and social democracy are prevalent in the document. There are instances in which the discourses are textured together to set up particular relations that are a part of the nodal discourse of a knowledge/smart economy. Change and flexibility are themes throughout. The terms are used interchangeably to progress the notion of a Smart Economy and to focus people on change and flexibility. Of note linguistically, the use of the pronoun 'we' shifts from 'we' being all of the people to 'we' being the Government.

The Government positions itself as the expert authority that knows how to address the current economic challenges and restore Ireland to prosperity. The measures in the action plan and the use of 'we will' reasserts this contention. The document progresses from a description of the challenges the economy faces to prescription – the action plan to achieve a Smart Economy. The use of statements as actualities has the aim of hegemonising the Smart Economy strategy. An extract from page 10 confirms this:

> Meeting the challenge of securing the economy in what are among the most difficult global economic circumstances since the foundation of the Irish state is an absolute priority for Government. We are implementing a strategy to manage the current short-term difficulties, maximise the rate of pick–up in economic activity, restore competitiveness, stabilise the banking sector, and assist those who lose their jobs during the downturn, while respecting the unavoidable constraints on policy arising from the fiscal and international environment. This strategy to secure Ireland's Enterprise Economy will provide a strong base from which to pursue the next phase of economic development.

Fairclough (2004b) refers to this as TINA (there is no alternative) strategy, this is the way the world is, so this is what we must do. This is further emphasised by the degree of urgency implied by the Government stating it as their absolute priority. This gets reiterated again in their statement on ensuring implementation of the action plan on page 105: 'the agenda set out here will command first attention by the Government and all Ministers and Departments.'

Social democratic discourse is evident but is marginalised and secondary to the neo-liberal discourses of economic growth and innovation. This is evident in the extract from page 32: 'A sense of community and shared values contributes to the cohesiveness of society and is highly significant in promoting the well-being of the population which, in turn, drives economic and social progress.' Whilst social democratic concerns like a sense of community are espoused, the reference to it driving economic progress seems like the ultimate goal.

5.8.1 Where are networks present in the text?

There are 34 references in the policy to networking. These mainly refer to the use of physical networks such as gas, electricity, transport (motor, air and rail), government networks (diplomatic and government agencies) and communication networks (broadband) as 'key drivers for turning research and innovation into valuable commercialised products and services' (p.61). Broadband is considered as a key enabling infrastructure required to advance the notion of a smart economy. Broadband enables communication to occur between network actors. In addition to networks, capital in its various forms – public, private, venture, human, social and physical – are required to complement the increased significance of networks. The objective of increasing capital and business networks is to assist start-up research intensive enterprises. Multinationals are considered as a key driver of innovation, as they are typically research active and have a track record of being able to commercialise such research. In

addition, '[m]ore than half of Ireland's new entrepreneurs, at some time in their careers, worked for a multinational company' (p.37). There are 27 references to multinationals within the text.

International financial services is one of the sectors considered as being high value and in which Ireland has a high geographical concentration of multinationals. This is the marketplace of the Institute, and as multinationals will be 'incentivised to intensify innovative, high-value activity and technological convergence which will provide quality jobs' (p.13), the sector will require the expertise of the Institute to provide relevant programme offerings and students with the required skills to fill these roles. The text suggests that 'the presence of multinationals and the evidence of technological convergence – the tendency for different technological systems to evolve towards performing similar tasks – creates a demand for innovation and partnering with start-up companies, which gives Ireland a competitive advantage in innovation' (p.37).

The Institute can contribute to innovation as the government acknowledges the need to ensure efficiency and effectiveness in the delivery of public services:

> Consideration must be given to involving the private and not-for-profit sectors in the delivery of certain services where they can deliver cost efficiencies or offer better local networks and public access (p.99).

As stated earlier, the Institute is increasingly offering programmes attracting significant government funding because they meet a different need of government. For example, Summit Finuas Network funded programmes are considered as strategically important in advancing Ireland up the value chain in producing high quality jobs.

5.8.2 Where is education situated within the text?

There are 37 references in the policy to education in all its forms. The discourse of change and flexibility surrounds the text in relation to education – for example, the requirement to restructure higher education institutions, to increase lifelong learning participation, and to up-skill and re-skill individuals. An extract from page 75 considers education as a means to achieve growth and suggests Triple Helix measures such as alliances and new organisational arrangements as means to achieve growth:

> The challenge to the higher education sector itself is to create new possibilities through new alliances and new organisational arrangements that can advance our knowledge capacity and generate opportunity for new levels of efficiency, performance, innovation and growth.

An extract from page 14 states that:

> Higher Education institutions will be supported in pursuing new organisational mergers and alliances that can advance performance through more effective concentration of expertise and investment.

The above extracts are the only two distinct references in the text to Triple Helix dynamics in an educational context. The level and nature of support is not specified elsewhere in the document. Despite that, there are numerous references to government incentivising multinational corporations to engage in research, favourable taxation treatment for start-up companies, intellectual property, and fast tracking visa applications to attract internationally reputable researchers and students. Such incentivisation favours one type of higher education institution – the research intensive university. Higher education institutions such as the Institute forego the possibility of such a revenue stream.

5.9 Higher education policy developments

Debate is required on the future direction of the Irish higher education system. The emphasis on the economic contribution of Irish higher education has prompted some questions about the role of higher education as a public good. (See also Chapter 2 for commentary on critiques of the economic conceptualisation of education.)

Since Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal, there have been two significant reports: the Hunt Report of 2011, and Towards a Future Higher Education Landscape in February 2012. All three policy texts call for increased consolidation within the university sphere.

The Hunt Report was compiled by an expert group with a remit to formulate a national strategy for higher education. The team was chaired by an economist, stockbroker and banker, Dr Colin Hunt.

It proposed 28 recommendations to bring about a wide range of cost saving and consolidation measures in Irish higher education. Examples of some are as follows:

- Performance-related pay for college staff but much greater transparency of their workload.
- Greater managerial discretion with regard to under-performance by staff in higher education institutions.
- No university status for the Waterford and Dublin Institutes of Technology.
- Research and Development to be increased to 3% of national income, requiring a doubling in investment.
- A direct student contribution to third level education costs, based on a combination of upfront fees and an income-contingent loan scheme.
- Grants to be asset tested as well as income tested.
- Lower fees in key subject areas where there are skill shortages.

The group proposed that additional funding of €500m was required each year so that 'change can also be promoted and accelerated by incorporating appropriate incentives into the funding model for the institutions, aimed at eliminating overlap and pooling strength' (p.97).

Regarding consolidation and collaboration within the higher education field, the report stated that the system should be strengthened by the development of regional clusters of collaborating institutions (universities, institutes of technology and other providers) and by institutional consolidation that will result in a smaller number of larger institutions (p.15).

The report was welcomed by the Irish Universities Association (IUA), the body representing the seven universities. The Union of Students in Ireland (USI) also acknowledged that there were many positive recommendations in the report, but spoke out strongly against any proposal for a deferred payment scheme for student contributions, which the union claimed would lead to a further brain drain. Within the Institutes of Technology (IoTs), there was mixed feeling. Structural reform of the Institute of Technology sector is seen as quite challenging and requires a high level of commitment and engagement from the Institutes. Generally, this road map for a future strategy for higher education has been endorsed and is being implemented.

Quite soon after the Hunt Report of 2011, another follow-up report, Towards a Future Higher Landscape, was launched in February 2012. It was to complement the Hunt Report.

Its stated purpose was 'bridging the gap between the necessarily high level strategy and what is needed in terms of the structure, or landscape, of the higher education system to meet the objectives of the strategy and address its recommendations' (p.2).

Extracts from pages 10 and 11 of this report posit that all higher education institutions needed to respond within six months with detailed plans of how they intended to position themselves going forward.

> Each Higher Education Institution is now asked to respond, within a period of six months from the date of issue of this document, regarding where and how it proposes to position itself within the Irish higher education system as outlined in this document (p.11).
>
> … should provide high level strategic plans with regard to mission, institutional alliances and clusters. Strategic plans could result in: + Proposal to merge with another HEI(s) + Proposal to apply for designation as a technological university + Proposal to establish a specialist institution (p.10).

Not many institutions reverted within the proposed six months. Many Institutes of Technology began talks to consider consolidating operations. This is still a work in progress.

Now the research has been completed, it is only prudent to assess and evaluate the quality of the findings from the interviews conducted and analysis of the policy text.

5.10 Evaluating the quality of findings

Corbin and Strauss's (2008, pp.305–307) criteria for evaluating grounded theory was adapted in order to judge the quality of the findings from the above analysis of interviews and policy text. There are ten aspects to consider. I acknowledge that I am self-appraising the research conducted and that this is only a subjective judgement. In an attempt to counter this shortcoming and assuage the subjectivity contention, this work has been peer reviewed.

The first criterion is to ask if the findings resonate/fit with the experience of both the professionals for whom the research was intended and the participants who took part in the study. I acknowledged from the offset that there was no individual representation made from the government component. The findings are constructed from the opinions and experiences of the respondents and CDA conducted on government policy text, as a proxy for government representation. Many persons assigned within a component of the helix straddle more than one institutional sphere, and component blurriness is evident in this research. For example, R4 worked in industry for over thirty years prior to joining senior management in the Institute. Also, by adopting a case study approach, the data generated according to Stake (1995) can often resonate experientially with a wide ranging audience of readers, thereby facilitating a greater understanding of the phenomenon in question.

Next is the applicability of findings, or their usefulness. Do the findings offer new explanations or insights? Can they be used to develop practice and add to the knowledge base of a profession? I contend that the findings have significant implications for the Institute, as responses assist in the clarification, uniformity of purpose and planning of any change management or progression of an idea. The implications from a government perspective relate to structure/agency and how policy is interpreted and enacted in practice. The practical realities of how the Institute operates in practice with industry and government can be viewed relative to other organisations that have engaged in academic vocational integration.

Thirdly, are concepts developed? Do the findings have substance? Are they more than just a mass of un-interpreted data, confusing to the reader? The research contains illustrative examples of coding techniques and the evolution of conceptual categories. The use of tables, figures and appendices to present the data supports the presentation of category construction and development.

Fourth, are concepts contextualised? Findings cannot be devoid of context. Without context, the reader of the research cannot fully appreciate why events occurred, why certain meanings and not others are ascribed from events, or why experiences were one way and not the other. As demonstrated through the Institute description in Chapter 2, how the Institute is depicted in a Triple Helix sense in Chapter 3, and analysis in Chapter 5, context has played a significant part in theorising the role innovation and education play within the Institute. Contextual factors such as innovation, cultural landscape, strategic

considerations and network have been explored. Their importance has been re-enforced through the presentation of the research.

The fifth aspect to consider is, is there a logical flow of ideas? Do the findings make sense or are there gaps or missing links in the logic that leave the reader confused? Are methodological decisions made clear so that the reader can judge their appropriateness for gathering and analysing data and doing analysis? The research methodology chapter (Chapter 4) and related appendices provide a comprehensive description of the researcher's approach to gathering and analysing data, including the selection of research participants.

The sixth consideration is, do the findings have depth of substance? Concepts give structure to the findings, but it is the descriptive detail of the findings that adds richness and variation and lifts the findings beyond the mere ordinary, making a difference to policy and practice. This determinant of quality I consider the hardest to justify or, put differently, to be the weakest link. This is because, whilst I can demonstrate the existence of Triple Helix processes in this research, the full analytical capability and ensuing prescriptions of the Triple Helix were not applicable in this research because of the nature of the Institute. All findings were described in detail and there is a novelty and richness to them, but a more refined telescopic Triple Helix lens may have produced even richer content.

The seventh aspect to consider is variation. Has variation been built into the findings? That is, are there examples of cases that do not fit the pattern or that show differences along certain dimensions or properties? Including variation demonstrates the complexity of human life. Contrarian opinion existed between new members and persons with a longer association with the Institute on many fronts, but predominantly on cultural aspects of innovation and their views of it. New members suggested the Institute was not very innovative and required considerable structural and fundamental change within the Institute. I focused on these variations in the experiences of research participants. Through exploring the variation in these experiences, I sought to identify the conditions that led to this being the case. Interesting variations emerged between respondents three and four, influential members of senior management in the past and present respectively.

Has creativity been employed? Are the findings presented in a creative and innovative manner? Does the research say something new? Are new understandings of a topic brought forth? To do this, procedures must be used consistently, creatively, and flexibly rather than in a dogmatic fashion. By applying an overarching case study methodology complemented by various analytical tools, semi-structured interviews and CDA, I contend that the resultant findings have been constructed and presented in a manner that can be considered relatable to the phenomena under investigation.

Was the issue of sensitivity considered? Did the researcher demonstrate sensitivity to the participants and to the data? Did the analysis drive the research or was the research driven by pre-conceived ideas and assumptions imposed on the data? My professional experience sensitised me to the nuances in the data. I was always aware and stated bias and assumptions in the research. There were no attempts made to force the data. All assumptions are clearly stated in Chapters 1 and 4. As a former employee and a 'passionate participant' (Guba and Lincoln, 1994, p.112) in the Institute, I readily admit to having had pre-conceived notions of how I thought innovation was viewed and how the Institute engaged to achieve it. My view was that it was the preserve of senior management to consider innovation and that the rest of us were to operationalise whatever decision had been made by a few. This was very successful for a long period. There was strong leadership and vision clearly given, but I personally felt many did not freely contribute to innovative endeavours because of a general inability to do so or a belief that it was not their place to do so. Now the landscape externally and internally has changed. Under the new regime managing the Institute, transparency, ownership and accountability are being promoted even further. I would contend, however, that within senior management there are still different conceptualisations of innovation despite a common definition for the Institute. Innovation is one of the Institute's core values as illustrated in Figure 2 in Chapter 2.

Is there evidence of memos? Since a researcher cannot possibly recall all of the insights, questions, and depth of thinking that goes on during the analysis, memos are among the most necessary of all procedures. Memos should grow in depth and degree of abstraction as the research moves along. In addition to the interview transcripts, field notes were used. Notes constructed in the early stages of the fieldwork were invaluable in the final stages. The style changed considerably during the course of data collection and analysis, reflecting the development of numerous concepts into categories of depth and description. This is discussed fully in Chapter 4.

5.11 Conclusion

This chapter outlined the findings from the analysis conducted on the data generated from the 11 in-depth interviews conducted, 10 of which were transcribed, and CDA conducted on Ireland's seminal innovation policy text. What has emerged from the research is that the Institute considers its relationship with industry to be its most important relationship. Yet government is considered by industry as the most important relationship. The rationale for this being the case is the highly regulated nature of the industry, which arose because of its past risky behaviour, which resulted in even more regulation after the recent financial crisis. I contend that whilst maintaining relationships with University (and partner institutes) and Industry, an approach similar to that espoused by respondent three of informing industry as well as meeting their needs will require the Institute to nurture their relationship further with the Central Bank of Ireland. The Central Bank of Ireland is the main actor in the government sphere for both industry and the Institute. By informing industry, the Institute can emerge as a Thought Leader, assisting industry, and thereby further differentiating itself from its competitors and imbuing a

creative culture conducive for innovation to flourish through the introduction of new programmes and new delivery methods, etc. where required.

Whilst there is evidence of Triple Helix processes presented above through teaching and learning related activities, the complexity and richness of the Triple Helix Model was originally intended as an analytical framework for universities that engaged in research and innovation activities, in addition to their traditional teaching and learning function. The second process of the Triple Helix, influence of one sphere over another, is the most readily identifiable process, as the influence of industry is the main focus of the Institute. This has led to an internal transformation in the Institute as they attempt to adopt industry behaviours and practices to inform and meet the needs of industry. This will remain the strategic imperative for the Institute for the foreseeable future.

Clarifying expectations of industry, perceptions of the government role and university perceptions of how innovative the organisation is will further equip the Institute to understand the tasks inherent in their education role and the lengths they need to go to execute these tasks.

Overall, I would consider that the responses provide an awareness of the strategic importance of innovation but that there are quite divergent views on what innovation is, or more importantly on what innovation is to the Institute. Divergent values, beliefs, and attitudes have been expressed, mainly between new and existing members of senior management of the Institute. Despite this, all are focused on the external environment, with the aim being to re-professionalise the banking and financial services industry in Ireland. In the foreseeable future the economic view of education will prevail, especially in the banking and financial services industry. Within this constraint, the new Professional Education Framework developed by the Institute can meet industry needs regarding relevance of qualifications in an academically rigorous manner.

From a Triple Helix perspective, the analysis on policy texts highlights the future trajectory of change in the higher education field, whereby there will be less fragmentation and the issue of scarcity of resources is addressed, with alternative funding mechanisms and more performance and managerial related practices being inculcated within institutions. Cooperation and collaboration between industry and university is encouraged and in some cases incentivised.

The quality of the findings from analysing the semi-structured interviews and analysis of the policy text highlights that all criteria have been considered, but identifies that not all the findings have depth of substance, which would give a detailed understanding of the processes in practice. The Triple Helix Model has rarely been applied in the context of organisations like the Institute. My interpretation of this is that the Triple Helix Model only partially captures reality. Despite this, it can lead to new insights. The model needs to be modified to capture changes in organisations like the Institute – organisations that only engage in teaching and learning activities.

The final chapter in the thesis contains concluding reflections on the research conducted, asking if the research question was answered and if any claims to knowledge gained occurred. Key limitations of the research are considered and avenues for further research are identified.

Chapter 6: Concluding Reflections

6.1 Introduction

This chapter draws the research to a conclusion. It ascertains the contribution of the thesis to knowledge. Main insights of the research are highlighted, stating why and how they are important or novel. The implications and conclusions for the Institute and the wider implications for other actors are considered. Limitations of the research and their implications are presented. Finally, avenues for further research are considered.

Most respondents concentrated on the nature and form that innovation can take. The aim, social context and different stages were referred to less, and the means by which an innovation can occur were considered the least important. This would imply that no strong or confident grounding emerges that networking, as advocated by the Triple Helix Model, is a means to achieving innovation within the Institute. Evidence of the first two processes in the Triple Helix Model, a need to adapt so that internal transformation occurs along with how the Institute is affected by the influence exerted by other Triple Helix actors, was most prevalent. Apart from the creation of the college, Summit Finuas Network initiative and the creation of the Professional Education Framework by the Institute, there is an absence of reference to creation of new trilateral networks or organisations. Respondents evaluated relationships from three temporal perspectives in an attempt to consider the effect of inter-institutional networking on the Institute. It highlighted that most respondents considered industry, unsurprisingly, as the most important component, but some also highlighted that the dynamics in relationships are changing. For example, governments impact industry more now, so they will therefore become more important than relations with university actors in the future. The university was previously more important as the Institute evolved to become a college.

This thesis focused on assessing and exploring the dynamics and application of government–industry–university interaction as key factors in determining innovation. The Triple Helix Model is the conceptual framework used to explore and assess these relationships between the Institute of Banking in Ireland and the three components that constitute this model.

This research was an attempt to contribute to the current paucity of research conducted into the dynamics of how professional member-based higher education institutions engage with their environment while striving for innovation. The aim was to generate findings and make recommendations that can be utilised by management within the Institute and inform and/or assist practitioners from the three institutional spheres of the Triple Helix Model: government–industry–university.

The research question under investigation was:

In what ways does interaction with university, industry and government actors contribute to the pursuit of innovation within the Institute of Banking in Ireland?

I started by describing in Chapter 2 how the case – the Institute – evolved from a purely professional member-based organisation to acquiring college status. It provided context to the reader and a basis for the empirical exploration that followed.

Chapter 3 discussed the three main constructs of the thesis: education, innovation and the Triple Helix Model. As the higher education landscape evolves, there is evidence that many institutions are increasingly entering into strategic arrangements with university partners to differentiate themselves. Therefore, such institutions plan and orchestrate arrangements whereby the process of networking realises this objective. An innovative endeavour by the Institute was to identify early on that through functional networking it could differentiate itself. The evolution of its relationship with UCD follows the principle of collaboration in consensus making as espoused by Ezkowitz (2008), as both UCD and the Institute interactively coordinated decisions and mutually borrowed functions to become a hybrid organisation – the college. Also, in respect of the arrangement between the Institute and its partner, UCD, I contend that the arrangement accounts for the variable character of both higher education institutions whereby the aspects of excludability, rivalry and production can be configured in public and private ways. The view of education as a public or private good was discussed in Chapter 3. Marginson's 2007 definition accounts for both public and private aspects of education as a good.

A description and critique of the Triple Helix Model, the conceptual lens used in this research, followed. It was used to explore the complex dynamics and sub-dynamics of interactions between one college – the Institute – with the other Triple Helix actors: university–industry–government, in order for innovation to occur.

Through an interpretive exploration using semi-structured interviews with members of university and industry and CDA on Ireland's seminal innovation policy text, a proxy for the government voice, the importance of networking and collaboration between institutional spheres became quite apparent.

Critical reflection occurred throughout the research process. Chapter 4 referred to the methodological approach adopted in the investigation of the research question. My ontological and epistemological stance has not been altered. As a former employee of the Institute, I could not separate myself from the research, as I am part of it and it affects me. Therefore, I acknowledge a transactional/subjectivist epistemological stance. This is consistent with the adoption of an interpretive ontological perspective. I suspect that if I were to engage in research outside of this domain this perspective might differ.

Conducting critical discourse analysis on the Irish government's seminal innovation policy text, Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal (Chapter 5), and reviewing research conducted on education and how Triple Helix actors relate (Chapter 3) provided insights into the social/cultural/political as well as the power/knowledge contexts under which innovation and education policies emerge. The data generated from the interviews and CDA also provide further insights. This can be seen in the assertions government make that education must make a contribution to the economy and become more self-sufficient in funding. The economisation of education is articulated in the aims of education as outlined in the Dearing Report 1997, referred to in Chapter 3. Higher education must now contribute to the economy. It is considered a primary driver in producing innovative outcomes. The economisation of education now assumes primacy over its other traditional aims. The implications of such a conceptualisation of higher education are: consolidation in the industry; more strategic alliances; alternative funding mechanisms; concentration of resources in preferred fields, for example, sciences; research with an applied and commercial value; innovative use of technology in the delivery of programmes and operations in such organisations; more engagement between Triple Helix actors; and more accountability across the sector. In Chapter 3, the notion of employability is promulgated, as research highlighted the disparity in skills and competencies that industry and students expected to have upon exit from a university. I would argue that this alone legitimises the Institute's commercial orientation. Throughout the interviews, university and industry respondents referred to the importance of the Institute being relevant to industry and having innovation endorsed and recognised by them to meet their needs. The Institute needs to become a thought leader to assist industry. I would contend that this consensus in views legitimises the Institute's concentration on engagement with industry and also highlights university awareness and acceptance of this.

6.2 Main insights and implications for the Institute

Expectation of thought leadership

Throughout the interviews, many respondents and particularly those from the Institute, acknowledged that the Institute must develop into a thought leader for industry and in certain circumstances for government to assist these two sectors in realising their goals. The needs of industry, understanding industry, and meeting or serving industry are considered the priority from any temporal perspective. In terms of the role of education and the Institute as a means to meet and serve industry needs, the university is secondary to industry. Theoretically speaking, the university is supposed to have been assigned an equal role under the Triple Helix proposition.

In order to achieve college status, the university was important in the past. Going forward, the government actors have been identified as more important than university. Maintenance of relations is the theme between university and the Institute going forward. Developing relationships, which is a more involved process, will typify the dynamic of interaction with industry and government. Respondents from industry consider government to be the most important, which places an obligation on the Institute to

understand the government role and to function better. That way they can assist industry to meet the obligations imposed on them through their interaction with government.

The policy text, a proxy for the government voice, refers to the need to involve private enterprise and to engage in more public-private partnerships. Targeted initiatives like that from Summit Finuas Network as discussed in Chapter 2 highlight this. The Institute is involved in such initiatives.

Institutional blurriness

The Institute is an externally recognised college of a university and simultaneously a commercial entity engaged with industry in the provision of continuing professional development events. Network orchestration between the Institute, its partner university (UCD) and industry provides evidence of vocational-academic drift leading to full academic integration. Despite the Institute's college status, the Institute only exhibits some characteristics of universities as described in Chapter 3. It only conforms to one of the five criteria of Cohen and March's (1974) 'organised anarchy' conceptualisation of the university, that most issues, most of the time, are low in significance for the majority of people. The Institute's goals are not ambivalent, processes are streamlined, participation is not fluid and the information base is not weak. Many respondents referred to a constant feedback loop and the importance of communication.

The Institute's dual function of college and a commercial entity leads to the next finding of competing cultures internally and tensions between the new and longer serving members of senior management.

Tension between new and old management

Baregheh et al.'s (2009) multi-disciplinary definition of innovation highlighted that innovation is a multi-stage process (see Chapter 3 for more details). Responses showed that there was a concentration on the nature and types of innovation. Awareness of the other innovation attributes creates possibilities that could be currently overlooked.

Within the Institute, there seems to be evidence of divergence in opinion between new and longer term senior management perspectives. For example, new management considered the organisation too academic in focus and lacking an awareness of industry needs. Reference was made by respondent four to 'them' knowing more people in industry, which would enable them to ascertain industry needs. Access to more readily available market information is positive for programme development, amendment to existing programme content and delivery, and building relationships based on mutual understanding. New senior management is from industry and the former and some current management from the university field. These affiliations are evident in the strategic directions the Institute took in the past and will take in the future. How university respondents interact with industry actors is completely different from how they interact with government actors and vice versa.

New management have their own ideas, yet can still leverage from previous practices that they considered worked well.

Preconceived notions that did not emerge

Finally, I would like to consider some aspects that were expected but unnoticed in the responses about innovation. Unless the question explicitly referred to technology, there was an absence in many of the responses of the link between technology and innovation. The concept of creativity was not referred to much either. The notion of value creation for both parties through network engagement and arrangements was only referenced by a few respondents. Most, I suspect, tangentially and subconsciously referred to this. Appendices 4 and 8 reinforce these contentions, as you can see from a content analysis perspective the word frequency associated with the use of these words when respondents attempted to define what 'to innovate' meant to them. Respondents concentrated mostly on the nature of the innovation, that is, the form the innovation can take. The significance of this is that respondents are exhibiting a lack of awareness or disregard for the sequence of the attributes. The social context or people dimension is constant throughout the innovation process. It is at this level, where the Triple Helix asserts through network activity, that innovation occurs. This, I contend, shows that Triple Helix thinking is not embedded in the Institute.

Divergent views on innovation

From the responses, I would contend that respondents from the Institute were either unaware or had consciously chosen to adopt a contrary view of innovation to the Institute's conceptualisation of innovation as articulated in its values (see Figure 2, Chapter 2). Values are an indicator of an organisation's culture. If senior management articulate or espouse a particular view on innovation but in reality they speak or practise differently, then this negates the effectiveness of implementing such a value, undermines the efforts to achieve the outcomes and behaviours required to achieve such goals, and signals/miscommunicates the view of innovation to the rest of staff. Values need to be inculcated in the practices of the organisation. Clarity and action are required to avoid these pitfalls.

Most examples cited by respondents are in fact process improvements, whereby incremental improvements occur. The outcome from an innovation is more substantial.

Despite this, overall I consider that the research adhered to robust methodological processes, producing some novel, idiosyncratic and general findings. I would consider, though, that due to the nature of the Institute the full power and depth of the analytical capability of the Triple Helix could not be employed.

6.3 Limitations of this research

I would consider the following as possible limitations to this research.

Paucity of academic literature on Triple Helix application in professional education bodies

The paradox of this research being novel as a paucity of research had been conducted in this space is also a potential limitation, as the absence of research exploring the application of the Triple Helix Model in professional education provided a gap in the academic literature. Because of this absence of prior qualitative or interpretive empirical research, there was a limited empirical frame of reference within which to contextualise this study other than prior research conducted on the entrepreneurial type university and the interaction of this type of university with industry and government. This thesis is an attempt to apply the Triple Helix at a lower level of analysis – the analysis of a single organisation.

I would contend that this study highlights the limitations of the theoretical lens applied. The Triple Helix Model assumes a different role for the university than the role the Institute provides. Under the Triple Helix Model, the notion of the entrepreneurial university is promulgated. The Model has a skewed view, favouring certain academic disciplines over others, e.g. science, engineering, more product focused disciplines that lead to the commercialisation of its research more readily. These disciplines are the primary focus of much of the empirical work conducted using the Triple Helix Model.

As stated in Chapter 3, the entrepreneurial university is based on research and innovation thereafter. The fact that certain actors (Institute/professional education bodies) within the university sphere rarely conduct research, are rarely the focus of research, and are considered as less of a priority implies that conclusions drawn about the character and processes of innovation are incomplete. The Institute and bodies like it can still make a contribution to innovation. Industry respondents and respondent seven from the university considered the Institute as proactive in innovating. Whilst industry respondents were pessimistic about the outlook for them, they were optimistic about the future for the Institute.

has a skewed view, favouring certain disciplines over others, e.g. science, engineering, more product focused disciplines that lead to the commercialisation of its research more readily.

Participant selection – gender concentration and lack of representation

This was something outside of my control. There were four female senior managers in the Institute at the time. Two were on maternity leave during the data collection phase. I felt that choosing one from the remaining two was justified. Not all male senior management were interviewed. The only way to redress the balance would have been to request female respondents from within the industry component. A larger sample size could also have addressed this shortcoming.

This potential limitation also highlights the fact that within the Institute there is an imbalance between genders at a senior management level. A possible future piece of research would be to investigate if this is a system-wide phenomenon in the sector.

Also, whilst the university and industry were represented in the interviews, I was unsuccessful in getting government representation. Representation was sought from various people, but proved unsuccessful; hence the use of critical discourse analysis on the Irish government innovation policy text as a proxy for the government voice.

6.4 Future research

Different perspectives on how innovative the Institute is perceived to be

A possible further study could be completed using the same methodological approach but an alternative data set being explored – middle managers and/or administrative staff of the Institute. Typically, it is these individuals who have to execute on a daily basis the strategic decisions made by senior management. If their interpretation or values are different to that held by senior management, then outcomes can be different to those intended by senior management.

Another perspective that could be considered is the student cohort. The Institute has over 35,000 members, over 22,000 members on Continuing Professional Development (CPD) and between 7,000–10,000 taking exams at any of the three exam sittings each year, in January, May and September. Students do get surveyed routinely after they complete a module from a programme, but a tailored survey, selection of students to interview, a focus group or combination of these methods could be considered to ascertain their views on the innovative endeavours of the Institute.

Scheme of work

This research can stand alone but could be extended to fit within a coherent scheme of work.

- **Banker identities are being challenged**

These people are the Institute's students, working and studying simultaneously. The Professional Education Framework launched by the Institute acknowledges that banking as a profession has changed irrevocably. Banking is no longer perceived as a job for life. Change was inevitable and regulators and customers alike demanded it happen. Throughout this research, numerous respondents referred to the need to be supportive and relevant to the needs of the industry and its students (bankers). I consider that a fundamental understanding of how industry actors (bankers) view themselves and how they are viewed would by various stakeholders would assist in this regard. A practical manifestation is evidenced in many programmes now having Ethics, Corporate Governance and/or Risk Management modules, which previously did not form part of the syllabus. There have been many studies conducted on academic identities changing (Clarke et al., 2013; Clegg, 2008). Applying a similar methodological approach with banking professions could provide both universities and industry

with valuable insights. Many other professions have a code of conduct or declaration they must sign, which refers to how they must serve customers and society at large. This could provide a degree of confidence and begin the much needed rebuilding of trust, upon which banking is predicated.

- **Stakeholder Engagement**

Conducting a comparative analysis on how other professional higher education organisations engage with government, university and industry could assist the Institute in discovering what it does well and what it needs to address or allocate resources to. Respondent eight referred to the Institute needing to engage outside of banking with the wider financial services industry. This would require a commitment and resources to establish new relationships with new industries. From a Triple Helix perspective, it would require the assumption of hybrid identities and the creation of hybrid organisations.

6.5 Final Conclusion

The title of this thesis is: Striving for innovation – A Triple Helix exploration of how one college is pursuing this goal. As the Triple Helix is a network-based conceptualisation of innovation, the research question under investigation was:

In what ways does interaction with university, industry and government actors contribute to the pursuit of innovation within the Institute of Banking in Ireland?

This research highlights that the Institute carefully plans and orchestrates relations with key players in each sphere. Evidence of this is how it gained college status with its university partner, UCD. This enabled it to differentiate itself from its competitors. That was its focus in the past. The nature of the relationship with industry and government is different, as the Institute is more dependent on these actors. In the case of industry, it is to provide students and lecturers, while government actors influence what industry needs. Figure 3, The Institute Stakeholder Map by Triple Helix Category, highlights that for the foreseeable future the Institute will concentrate on developing links with government actors. This, I believe, is an attempt to be proactive, and even to be a thought leader, in order to develop solutions and inform the needs of industry, the group they consider most important.

The novelty and originality of this research is the contribution it makes to the current paucity of research on the Triple Helix Model application in professional education, specifically pertaining to a member-based higher education institution that has undergone significant organisational and environmental change in a rather short space in time. I consider that in addition to higher education producing the necessary scientific and technological knowledge for innovative breakthroughs, it must also educate and prepare students to be able to cope with and manage such innovations. The findings from this research suggest that the Institute concentrates on the latter, the human capital development dimension of the innovation system

It also highlights that in reality organisations behave differently than the idealised Triple Helix conceptualisation of how interaction should occur. The symbolic and inspirational value of the Triple Helix Model is not contestable. It is its ability to apply its full set of prescriptions to the innovation dynamics and sub-dynamics of higher education organisations that do not conform to the definition of an entrepreneurial university that is questionable. There is no question of this normative framework's appeal waning from a policy maker's perspective. This suggests that there is appeal for the Triple Helix at a macro level of analysis.

This thesis applied the Triple Helix lens at a lower level of analysis, on a single institution, the Institute. I found that the model does not adequately account for higher education institutions only engaged in teaching and learning. What is harder to visualise but does occur is innovation from graduates from such institutions when they exit programmes and return to apply the learning in their workplace. Most of the time it may be process improvements that result but some may produce big "I" innovations.

The model can still be used as a tool to understand the importance of networks and the power imbalance between actors in the model. In theory all actors are formally equal yet it is obvious from this research that in reality for institutions such as the Institute, a college with a narrow discipline, no research remit, only engaged in human capital development that government and industry assume stronger and more influential roles when engaging with them.

This research calls for a simplified, re-engineered or extended Triple Helix Model that can adequately provide an analytical framework for organisations that concentrate purely on the provision of the education function of higher education. In its current form, it has limited application. Despite this, there is evidence of Triple Helix processes in the evolving practice of the Institute, resulting in a contribution to innovation, for example the Institute's Professional Education Framework, which was developed in 2013. Whilst this framework itself is not particularly innovative or novel, it is the product of a process that could be considered innovative. The framework was developed in consultation with the banking sector and underpinned academically by its university partner. The cooperation and collaboration between the Institute, industry and university is reflective of behaviours espoused between actors under the Triple Helix Model of innovation.

The emergence of the Triple Helix Twins (Etzkowitz and Zhou, 2006) and the Quadruple Helix (Carayannis and Campbell, 2010 and 2009) highlights the flexibility of the Triple Helix Model as an analytical framework.

A simplified Triple Helix Model would still possess the same characteristics and processes, but the scale of innovative breakthrough would be less. For organisations like the Institute, which only engage in teaching and learning, the creation of new companies is not being considered. New modules, new programmes, curriculum development and efficiencies in programme delivery are the desired goals from interaction with industry and government. An essential element of the Triple Helix Model is the

institutional spheres increasingly being able to assume the role of the other. Under this suggested simpler model, each sphere would possess more knowledge and an ability to assume certain tasks of other spheres, for example companies developing an academic dimension, sharing knowledge and training their employees for higher levels of knowledge (Leydesdorff and Etzkowitz, 1998a, 1998b). Overlapping communication networks would remain, but a reduction in spheres conducting other sphere functions would be a feature of this model. This is in spite of increased knowledge and institutional ability to conduct these tasks. Many respondents were reluctant for the government to assume functions of the universities and vice versa.

The more research conducted into functional networking leading to consensus making between organisations like the Institute with different institutional actors within different spheres, the more refined the Triple Helix Model can become.

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Appendices

Appendix One – Respondent Pack

- Ethical Approval to conduct research from University of Sheffield.
- Mail to respondents inviting them to participate.
- Combined Information Sheet and Consent Form.
- Confidentiality and Anonymity Information Sheet.

Appendix Two – Other policy tests considered to represent the government voice.

Appendix Three – .Interview Guide.

Appendix Four – Colour coded responses to T1Q1.

Appendix Five – David Hyatt's 2005 Critical Literacy Framwork.

Appendix Six – Respondent and interviewer profiles.

Appendix Seven – Characteristics of the pilot and ten other interviews.

Appendix Eight – Summary of key attributes of innovation by word frequency.

Appendix Nine – Ranking of knowledge typologies.

Appendix Ten – Ranking of importance in relationships – past, present and future.

Appendix Eleven – Significant actors by Triple Helix category.

Appendix One: Respondent Pack

Head of School
Professor Jackie Marsh

Department of Educational Studies
388 Glossop Road
Sheffield
S10 2JA

Telephone: +44 (0)114 222 8096
Email: edd@sheffield.ac.uk

Timothy Finbarr Murphy
21 July 2017~~08 May 2017~~

Dear Finbarr

ETHICAL APPROVAL LETTER

Striving for innovation – A Triple Helix exploration of how one Irish college is

pursuing this goal

Thank you for submitting your ethics application. I am writing to confirm that your application has now been approved.

You can proceed with your research but we recommend you refer to the reviewers' additional comments (please see attached).

This letter is evidence that your application has been approved and should be included as an Appendix in your final submission.

Good luck with your research.

Yours sincerely

S. A. Warren

Dr Simon Warren

Chair of the School of Education Ethics Review Panel

cc Dr Vassiliki Papatsiba

enc Ethical Review Feedback Sheet(s)

Approval to name the case organisation

Finbarr

Noting the information stays within a select few persons with Academic standards then I am OK.

Good luck with the work.

Michael

Michael Feeney

Chief Executive

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From: Finbarr Murphy [mailto:finbarr.murphy@acoi.ie]
Sent: 21 July 2015 15:18
To: Michael Feeney <Michael.Feeney@iob.ie>
Subject: Approval

Good afternoon Michael

I'm on to request a favour in a personal capacity. On May 20th I presented myself for my Viva Voce on the doctorate. The outcome was less then favourable but it could have been worse. I have a major rewrite to face and 1 year to do so.

I was devastated but dusted myself off and am now addressing the Examiners' comments. One of their recommendations was to name the institution.

I am seeking approval to name the institute in the body of thesis. One of the recommendations is a whole chapter on describing the case organisation, how it evolved, its different partners, etc.

In my original thesis I had not confirmed organisational anonymity. You and many others kindly agreed to be interviewed. I assured you of anonymity and confidentiality of responses. Respondents were assigned a number. This will remain the case.

In the past I know Anthony signed off on Kate doing a study on the IoB culture for her IMI degree thesis. It will only be seen by my supervisor, internal examiner and external examiner. Thereafter it will be made available in the University of Sheffield library, should I receive the doctorate.

I would be happy to discuss any questions you may have. I look forward to hearing from you. Once I hear from you I can start the task of redrafting the thesis.

Kind regards

Finbarr Murphy BA, HDip, MSc, QFA

Director of Education and Professional Development

Fitzwilliam Hall

Dublin 2

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To learn more about our Education Suite please click here .

E-mail to respondents

Hello X

Thanks for agreeing to be in this study. I attach documentation that you should read prior to the interview. I also attach a copy of the ethical approval I received from the University to conduct my empirical work. Please print off the Information and Consent Form, sign and return at your convenience.

Please note that I will be recording and transcribing the interview. This is for playback and reference purposes.

If you have any queries please do not hesitate to contact me. Thank you again for agreeing to participate in this study.

Kind regards

Finbarr

The University Of Sheffield.

Information Sheet

Title of Thesis: Striving for innovation – A Triple Helix exploration of how one Irish college is pursuing this goal

Innovation is recognised to play a central role in creating value and sustaining competitive advantage. It is the cornerstone of most economic policies. Government departments are wholly dedicated to its pursuit. Most economies now require higher education institutions in addition to its traditional aims to educate and engage in research as now having to contribute to an economy's well-being. This primarily manifests itself in an extension of its research remit to make such research more commercial.

I intend applying the Triple Helix concept of innovation to explore and analyse how my institution, which is undergoing significant change from a professional vocational body to becoming a recognised college, relates with other higher education, government and industry institutions.

The aim of my thesis is to elucidate the issue of how the higher education sector, in particular my own institution, is striving towards innovation.

You have been invited to take part in this study due to your personal experiences in the Irish third-level education system as a member of the Institute, as a lecturer or as an influential stakeholder in this field. You are being asked to partake in this study along with 9 others.

The choice is entirely yours to decide whether or not you wish to take part. If you chose to take part you will be given this information sheet to keep and also be asked to sign a consent form. You can withdraw at any time in the study's data collection and thesis compilation stage. This in no way negates any rights or benefits to which you are entitled from a legal or professional perspective. Should you decline or rescind your permission to utilise your data collected by this study prior to its compilation, no reason will be sought.

Following your consideration and consent to participate in this study, I, the researcher, will interview you face to face on one occasion; a second interview may, in an exceptional or unforeseen circumstance, be required. It is expected that the interview will last approximately 45–60 min. This interview will comprise questions in relation to your conceptualisation of what innovation means, how innovation coalesces with education, and your experience of organisational change, cultures and leadership that foster innovation, with particular emphasis on the prevailing culture in the Institute. Further questions will examine your opinion on how networks facilitate innovation, utilising the underlying concepts of the Triple Helix theory. Leydesdorff and Etzkowitz (1998a and 1998b) proposed the Triple Helix model to describe the dynamics existing in the institutional arrangements involving universities, enterprises and

governments and the relations between them occurring during the processes of innovation (Etzkowitz and Leydesdorff, 2000 and Etzkowitz and Klofsten, 2005). The 'triple helix' is a spiral model of innovation that captures multiple reciprocal relationships at different points in the process of knowledge capitalisation. Interviews will be conducted in October 2012 upon arrangement and at your discretion.

No disadvantages or risks have been identified for participants thus far in the thesis development, but should any unexpected discomfort, moral dilemma or generalised difficulty occur for you during the research process, please bring it immediately to my attention.

Whilst there are no immediate benefits for those people participating in the project, it is anticipated that this work will add to the body of knowledge in education and leadership by developing a constructivist view, relating to instructors' perceptions of how leaders in Irish third-level education can positively influence their development of voice. Should the research stop, for any reason, earlier than expected, you will be made aware of the reason.

Should you have a complaint about any part of this research project, I, the researcher, would be pleased to address your concerns, as would my research supervisor (please see contact details below), should these redress options available not satisfactorily fulfil your concern, The University of Sheffield's registrar and secretary are also available to intervene.

Prior to interview, you will be asked to sign a participant consent form allowing the restricted access, only by named researchers, to interview data collected about you over the course of the project. All data collected will be made anonymous and strictly confidential. Interviews will be recorded using a digital audio device, and recordings will be utilised for the purpose of analysis. No other use will be made of them without your written permission and no one outside the project will be allowed access to the original recordings. The interviewees will be assigned a code in place of a name and the recording of the interview and subsequent voice files/notes kept on a computer, with password, and notes placed in a locked cabinet and destroyed post-research in adherence with the University of Sheffield research data storage policy.

It is anticipated that excerpts of this non-sponsored self-funded research project will be published; it will also be made available online in a collection of doctoral theses available to the public. You will not be identified in any published or online version of the discussion, results or findings. It is possible that findings of this research project may be used for additional of subsequent research.

This research project has been reviewed and approved by the University Of Sheffield Department Of Education Ethics Committee. You will receive a copy of this information sheet and a signed consent form to keep at interview.

I would like to take this opportunity to thank you for considering taking part in this research project and I look forward to meeting and interviewing you in the months to come. If you have any further questions or require any further information about the study I can be contacted using the contact details below.

Researcher: Timothy Finbarr Murphy
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The University Of Sheffield.

Participant Consent Form

Title of Thesis: Striving for innovation – A Triple Helix exploration of how one Irish college is pursuing this goal.

Name of Researcher: Timothy Finbarr Murphy

Participant Identification Number for this project:

Please initial box

I confirm that I have read and understand the information sheet dated 17/05/12 for the above project and have had the opportunity to ask questions. ☐

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. If clarification or questions remain I was invited to please call Timothy Finbarr Murphy 086-1718134 (Researcher). ☐

I understand that my responses will be anonymised before analysis. ☐

I give permission for members of the research team to have access to my anonymised responses. ☐

I agree to take part in the above research project.

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	_____
Name of person taking consent (if different from lead researcher)	Date	Signature

To be signed and dated in presence of the participant

_____	_____	_____
Lead Researcher	Date	Signature

To be signed and dated in presence of the participant

Copies:

Once this has been signed by all parties the participant will receive a copy of the signed and dated participant consent form, the pre-written information sheet and any other written information provided to you the participant. A copy for the signed and dated consent form will be placed in the project's main record, which is kept in a secure location.

Striving for innovation – A Triple Helix exploration of how one Irish college is pursuing this goal.

Information on Confidentiality and Anonymity

Thank you for participating in the study; Striving for innovation – A Triple Helix exploration of how one Irish college is pursuing this goal. This explanation sheet informs you about the issues of confidentiality and anonymity. Please read this information before agreeing to continue with your participation in the research.

Confidentiality

Participation in this study is voluntary and confidential in that the only person who need know that you are participating in this study is you and I; however, if you wish to tell people that you are participating in this study please feel free to do so.

This study specifically focuses on your personal experiences of engaging with higher education and more specifically the case study organisation. Therefore I will be asking you specific questions in relation to your experiences of higher education. Therefore I wish to assure you that all personal information collected will be kept confidential. All information stored on my personal computer is password protected and also any information stored on memory sticks/usb keys and other portable media will also be password protected. All transcripts and tape recordings will be stored within a locked cabinet within a locked office to which I am the only key holder.All information will be destroyed following completion of the study. Information gathered will only be used for the purposes of this investigative study.

Anonymity

All participants will not be named. Participants will be identified by a multi coding system, numerically, by managerial rank for participants within the Institute, mode of association with the Institute. For example, respondent 10 is a senior manager in the Institute. Respondent 11 is a Government representative who liaises with the Institute. The Higher Education institution in which the research is taking place will not be named and an address for the Institution will not be given. All interviews will be tape recorded and as such I can assure participants that no names will be used or recorded to protect anonymity. Interviews that have been recorded will also be transcribed and these transcriptions will have no identifying names but will be coded in accordance with the above criteria.

All research related data will be handled in a manner compliant with Data Protection Acts.

Finally I want to inform you that this study is part of my Doctoral thesis in Education and Life Long Learning. It may be possible to identify the Institute in which the research was conducted; therefore I cannot guarantee institutional anonymity.

If you have any further questions or require any further information about the study I can be contacted using the contact details below:

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Appendix Two: Other policy texts considered to represent the government voice

Ireland		
Policy Text	**Content/context**	**Rationale for not choosing**
Towards 2016 Ten-Year Framework Social Partnership Agreement 2006–2015	**Content –** It is a strategic framework to meet economic and social challenges. It proposed steps to maintain a strategic focus on key national priorities, to create and sustain conditions for employment growth, fiscal stability, restructuring of the economy in an attempt to improve living standards, through both lower taxation and lower inflation, and a culture of dialogue. **Context –** A process known as social partnership was initiated in Ireland in 1987, following a period of high inflation and weak economic growth which led to increased emigration and unsustainable government borrowing and national debt. Strike and wage moderation have been important outcomes of the agreements and was a significant contributor to the Celtic Tiger. This was the 7th agreement in Social Partnership. Each previous agreement concentrated on a particular issue, e.g. competitiveness (1994–1996), inclusion (1997–2000) etc.	Not specific enough, coverage too wide.
National Development Plan 2007–2013 – Transforming Ireland: A Better Quality of Life	**Content** – a €184 billion plan on how to meet the economic and social challenges Ireland	Emphasis on scientific and technology national strategy. Despite this it did identify six development needs which

for All	faces in this period. **Context** – because of the financial crisis a radical transformation of the economy and society is required like that experienced the decade previously when growth and development soared.	required strategic investment in higher education: • Increased participation and improved access. • Encourage a greater flexibility of course offerings to meet diverse student population needs in a lifelong learning context. • Promote the quality of teaching and learning. • Significantly increase PhD numbers (doubling the output) and research activity. • Effective technology transfer. • Safeguard and re-enforce the many roles of higher education in providing independent intellectual insights and in contributing to broader social, human and cultural understanding. Many of these were echoed in the policy I chose to analyse.

EU		
Policy Text	**Content/context**	**Rationale for not choosing**
Europe 2020 Strategy Flagship Initiative – Innovation Union SEC (2010) 1161	**Content –** Communication from European Commission to European Parliament, European Council, European Economic & Social Committee and Committees of the regions about the creation of an Innovation Union in the EU. A	Concentration on developing the research agenda. The Institute does not engage in research. From a higher education

	strategic approach is provided to achieve such a union. **Context –** Global meltdown led to high unemployment in the EU, fiscal and budgetary constraints with an aging demographic presenting numerous economic and social challenges. Innovation is considered by the EU as a key policy area to address the concerns in this domain.	perspective though it did promote the idea of the European Institute of Innovation and Technology as a good model of innovation governance for the EU.

OECD		
Policy Text	**Content/context**	**Rationale for not choosing**
Education at a Glance 2007 OECD Indicators	**Content –** Annual quantitative indicators of how well your education system is performing relative to other OECD member countries. It can also highlight areas for policy reform. **Context –** Enables policy makers and practitioners assess the economic and social returns relative to the investment in education they make.	Only viewed to get an understanding of performance related matters and how Ireland's education system is relative to other OECD countries. It could also highlight areas that require attention and whether they were being addressed in subsequent policy text.
Higher Education to 2030 Series Volume 1 – Demography Volume 2 – Globalisation	**Content –** Quantitative and qualitative analysis. **Context –** Analyses the impact of various contemporary trends in higher education.	These books were read for context purposes. The Globalisation volume highlighted the need for increased cooperation, locally and internationally as market forces evolved and new players, particularly in Asia due to favourable demographics, was changing the global higher education landscape.

The Knowledge-Based Economy: A Set of Facts and Figures.	**Content –** First attempt to statistically examine the notion of a knowledge-based economy. It collected 32 indicators, nine of which specifically measured the knowledge based economy. **Context –** This report supplemented an earlier report from 1996 describing what a knowledge–based economy is.	This research was not quantitative and the dynamics may have changed since 1999. The indicators showed, among other things, that: 1) knowledge based industries have been outpacing GDP growth (up to 50% that of GDP), 2) OECD countries have increased their spend on the production of knowledge (8% of GDP), 3) over 60% of the population aged 25–64 has completed upper secondary schooling, 4) OECD economies invested 7% GDP on ICT, 5) R&D spending and activity was increasing (US$500 billion in 1997), 6) the business sector was the main funder and performer of R&D (over 60%). Many of the sentiments from these indicators were present in the text analysed, e.g. the need to increase R&D spending, multinationals being a main knowledge producer, etc.

Appendix Three: Interview Guide

Question Type

I – Informative

A – Analytical

E – Evaluative

Research Question

To what extent does networking and other forms of interaction form part of the Institute's conceptualisation of innovation?

This research question can be refined further into three sub-questions:

- What are appropriate units of analysis to evaluate a higher education innovation system?
- What are the dynamics of the relationships between the Institute and actors within the Triple Helix model?
- Why is one Triple Helix actor considered more important than another?

Theme 1: How Innovation is defined – core questions, no specific ones

I - Explain what you think 'to innovate' means?

A - Why is it so important now? In terms of your own organisation, what role if any do you think industry/government have had in shaping the innovation agenda?

Preamble to next question:

Madame Edith Cresson said at the Annual Innovation Lecture in 1996 that '*innovation is a social question as much as a question of technologies*'.

A - How do you see innovation and education interacting? Can you give me examples of this?

E - How innovative do you think the case study organisation is? In your opinion does it replicate or proactively innovate?

Theme 2: Culture, leadership and strategy questions

Share with respondents:

Would you agree that infusing the workplace with passion and giving ownership creates an environment conducive for creativity and innovation to flourish?

Companies like Eriksson, IBM and M/S place a strategic emphasis on innovation. This emphasis is supported by its inclusion in the mission statement and a clear message from senior management that all employees contribute to innovation efforts.

Core questions

I - What techniques and incentives are used to achieve innovation in your organisation?

I - Is innovation central to your organisation's growth strategy?

I - Are senior management formally accountable for innovation?

E - Do you think the organisation's culture is conducive to creating a creative and innovative ecosystem?

I - What obstacles, if any, stifle innovation under such a culture?

A and E - In the Institute/organisations where innovation is present, how is it accessed and how can others learn from it?

A and E - When innovation occurs, how do you know it occurred and what indicators are good/used to measure its effectiveness?

I - People are conditioned to believe there is a right answer to a problem. How do you enable people to view problems differently and seek alternative solutions?

I and E - Can you tell me about an innovative solution you developed which solved the initial problem but also provided additional benefits?

Specific Questions

Pilot respondent and respondents 1 to 7

A and E– Significant change has occurred over a relatively short space of time (bank crisis, college status, new Chief Executive). How would you describe the reaction to these changes in the organisation?

Pilot respondent and respondents 1 to 7

A – How have you encouraged learning and development of the employees?

Just respondents 3 and 4

E – How would you think staff would describe your leadership style?

Theme 3: Relationships – Triple Helix Dynamics

Core questions:

A and E - How is cooperation and collaboration encouraged and strengthened to create an innovative infrastructure within and outside of your organisation?

A and E - Which network of relationships is the most important for your Organisation and why? If possible could you please answer referring to the nature of relationships in the past, present and what you anticipate in the future?

For example – guidance to assist respondents, the first letter denotes the helix actor of most importance, U – University, I – Industry, G – Government

U-U	I-I	G-G
U-G	I-U	G-U
U-I	I-G	G-I

E - Which is more important, the business side of the relationship or the underlying quality of the relationship?

Preamble to next question:

Todd Parks – US Chief Technology Officer

He did great work in the US health system. His approach was to treat new governments in power like that of a 'Lean Start Up'. Obviously governments are not start-up companies but set in place initiatives to effect change – best thought of as start-ups with interdisciplinary teams.

E - Governments are now adopting an intermediary role facilitating and providing incentives to promote interaction between industry and university sectors. In your opinion, how effective has this role been?

E - Going forward, which of the following knowledge typologies do you consider the most important in terms of creating an innovative organisation? Please rank in order of most important:

1. 'Know what'
2. 'Know how'
3. 'Know who'
4. 'Know where'

Specific Questions:

Respondents 8 to 10

E – In your opinion do you think Irish higher education institutions are producing graduates adequately equipped to meet an increasingly demanding work place?

Respondents 8 to 10

E - How optimistic are you about the future of the Irish higher education sector, in particular the market that the Institute operates within?

Originally for a different respondent:

Just for respondent 10 – Original respondent 10 did not materialise

A - You were a member of the strategic group who authored the Hunt Report which outlines the National Strategy for Higher Education in Ireland to 2030. The Minister for Education and Skills, Rúairí Quinn, was then in opposition but described the report as having ideas but lacking detail. I think this criticism was levied at the lack of detail on how initiatives should be implemented and a deadline for these implementations.

Do you think this is a fair account of the report?

Appendix Four: Colour coded responses to T1Q1

Theme 1: How Innovation is defined – core question

Attribute
Nature of innovation
Type of innovation
Aim of innovation
Social context
Means of innovation
Stages of innovation

* - Pilot Respondent interview was not transcribed. Field notes were used to illustrate the responses.

Explain what you think 'to innovate' means.	
Pilot Respondent (PR) *	Very contemplative – Originality and novel idea mentioned, **developing solutions to problems**. Market focused and commercially driven. Gave example of medical sciences – techniques, technology and drugs.
Respondent One (R1)	To innovate is to constantly change and update approaches to both internal ways of doing things and external ways of doing things and the correspondent products.
Respondent Two (R2)	R2: In Education is it or in general? Researcher: Generally, what is it to innovate? R2: Well to adopt some new approaches to doing some particular task or even coming up a new task or product or service or whatever you want to call it, so it could be a new product or service or it could be a new process around that, to deliver that or whatever better and it could be from minor change but usually you're talking about something that's reasonably substantial change and maybe if not substantial it will be significant.
Respondent Three	OK, I suppose in very simple terms it's simply change from one existing

(R3)	situation or state of play to another and that can be either organisational in particular, or product focused or in our case educational programme focus. Then I suppose around the educational programmes I'd sub-divide that between new programmes or significant changes to the learning outcomes of older programmes. And then on the other hand the second piece would be about the process of delivery or assessment.
Respondent Four (R4)	I think to innovate is to find new ways to improve learning. Education is all about transferring knowledge. There are lots of barriers getting knowledge into people. Innovation should be all about improving ways of getting people up the curve in their knowledge.
Respondent Five (R5)	Pause – I suppose there are a number of elements to innovation. It could be developing something new or something that's been there before. It could be a new product or a new process or a new system or a new idea. Or it could be looking at something, a process, or product or system that's there already, an existing piece but where we can find a more effective or better way of doing the existing piece in there. So it's developing the new and I would suggest it's improving process that presently exists to deliver whatever function the organisation is involved in.
Respondent Six (R6)	Long pause – In my words it's also based on the classic definition as I know it. Innovation is the development of new customer value through solutions that meet new needs, in articulated needs and old customers or market needs in new ways. Em, I suppose what's important for me when I think about innovation is to clarify what it's not. It's not invention, i.e. the creation of an entirely new idea or method and it's not improvement, doing the same thing better. For me my background is Industry. I think the word 'needs' is absolutely crucial when thinking about innovation. Em. and it's, it's for me it's the development of value through solutions that meet new needs or meet needs that haven't been articulated.
Respondent Seven (R7)	To innovate, I suppose it's to do new things or existing things better. I would guess. They'd be the two dimensions, either more efficiently, cheaper and so on. So that's how I would define it at a guess.
Respondent Eight (R8)	So to innovate to me is to break new ground, to do something that hasn't been done before, to address a concern that hasn't been met before, to try and be at the cutting edge, leading edge of what it is you're doing, in this case the development of education, so that's what I think to innovate means.
Respondent Nine	R9: It could be considered to be product innovation where you

(R9)		create a new product, or it could be process innovation where you find a new way of delivering the same product, delivered more efficiently or manage it better. I suppose in the context of financial markets in which I operate the extent to which new innovative products can be created is actually pretty limited because obviously they have been around for years and years and quite frankly the innovation that is common is actually of a negative variety, people are taking new risks which they couldn't especially manage so from that point of view I'm always a little bit suspicious about innovation in the Financial Markets, unless it's me I always ask myself is it serving a real need because if it's not the chances are it's not very good, in fact more generally innovation in the financial markets should be viewed with a certain amount of scepticism really to the extent where we don't want innovative products let say being created by which they haven't a clear way of managing. The best type of innovation is the one where we can actually find a really way of delivering the product to the individual and a more efficient way of doing it, let's say it's online banking for example versus getting people out of the banks making the whole process more efficient, that's the kind of innovation I'd like to see in the banking sector. There is that concern that generally speaking financial innovation is code for problems frankly.
	Researcher:	In respect of the scale do you see innovation as an incremental process or as a breakthrough in the sense of …
	R9:	I guess in terms of the process delivery, it can be breakthrough in the sense if you suddenly change the rules of the game, we will say in online banking does come to mind, when the ATM came in, that was a revolutionary breakthrough in that it suddenly changed the rules of engagement almost. In the case of other stuff I think, I'd almost prefer to see incremental because I don't like in the sense of especially if it's complex end to end process you have to make sure that you understood it fully from the beginning and make sure you know how to price it and hedge it and see it through to a good conclusion so I think that kind of innovation is best done on an incremental

	basis so you don't end up as I say making a big disaster out of the whole thing.
Respondent Ten (R10)	To innovate, I suppose, is to maybe develop a new way of way of looking at something and to make it better or to develop a totally new concept.

Appendix Five: David Hyatt's (2005) Critical Literacy Frame

Hyatt proposes the following questions, which he refers to as the Orientation Frame, and which need to be answered 'before a more detailed analysis of the text along the themes suggested in the frame could be employed' (p.54).

Question
Is this a typical text of its type?
Who produced this?
Who will read it?
Will everyone understand this text in the same way?
Why was it produced?
What other ways could it have been written?
What is missing from this text?
How does this text reflect the wider society?
What could we do about this text if we disagree with it?

After answering the above questions, Hyatt's criteria for the Critical Literacy Frame, to be applied to texts, is reviewing in the text the use of:

1. Pronouns
2. Passive/Active Forms
3. Time–Tense and Aspect
4. Adjectives, Adverbs, Nouns, Verbal Processes – Evaluation
5. Semantic Prosody
6. Metaphor
7. Presupposition/Implication
8. Medium
9. Audience
10. Visual Images
11. Age, Class, Disability, Gender, Race/Ethnicity and Sexuality Issues
12. Reference to other texts, genres, discourse and individuals.

Appendix Six: Respondent and interviewer profiles

* Pilot Respondent: Senior manager in Institute – White Male, Irish, 40–44 Years, Master's Degree. Over 15 years employment experience in higher education, 13 years in Institute. He started his career (two years) with the university that recognised the Institute as a college. He has lectured in the past primarily on degree programmes. Now his role is more quality improvement focused. He was instrumental in setting up quality assurance practices in the Institute. He is a main point of contact between the Institute and its university partner.
* Respondent One (R1): Senior manager in Institute – White Female, Irish, 40–44 Years, Master's Degree. Over 15 years of employment experience in higher education, seven years with the Institute in various senior administrative roles, ranging from Programme Management to Head of Undergraduate studies. Prior to this she was Registrar of a private college for seven years. Such entities do not receive any government funding. They are heavily market focused. The accreditation body for the degrees the private college awarded were from an English college. She mapped all qualifications to the Irish system prior to the introduction of the Bologna Process. After graduating from college she commenced her career in the university that recognised the Institute as a college. She too is a former lecturer.
* Respondent Two (R2): Senior manager in Institute – White Male, Irish, 55–59 Years, PhD. Over 25 years of employment experience in higher education, 14 years in Institute. Eleven years were spent in two Irish universities where he lectured and became Head of Research in one institution. He now concentrates primarily on programme management, designing new programmes, amending existing programmes and coordinating a group of programme managers.
* Respondent Three (R3): Senior manager in Institute – White Male, Irish, 55–59 Years, PhD. Over 25 years ofemployment experience in higher education, 14 years in Institute. He is a former lecturer, Dean of a Business School of one of Ireland's leading universities. Prior to entering higher education he was a Chief Financial Officer of a large multinational company. He is an honorary fellow of three organisations, a recognition of his contribution to first his profession (Accountancy) and the other two for his contribution to the field of professional education.
* Respondent Four (R4): Senior manager in Institute – White Male, Irish, 55–59 Years, Degree and Professional qualification (Accountant). Over 30 years of employment experience in banking industry, three years in Institute with significant years of experience lecturing at different higher education institutions. Prior to joining the Institute he worked for

the Central Bank of Ireland. He possesses a deep sense of active citizenship compelling him to leave a highly paid position in banking to assist the regulator of the industry. He had been a member since commencing employment. In Ireland the researcher has heard him being referred to as being an 'honest banker'.
* Respondent Five (R5): Senior manager in Institute – White Male, Irish, 50–54 Years, Degree. Over 25 years of employment experience in banking industry, two years in Institute with significant years of experience lecturing at different higher education institutions. He formerly was the Head of Sales for a large multinational banking company.
* Respondent Six (R6): Senior manager in Institute – White Male, Irish, 55–59 Years, Degree and Professional qualification (Accountant). Over 30 years of employment experience in banking industry, two years in Institute with significant years of experience lecturing at different higher education institutions. He was the Deputy CEO of the Irish division of a large European bank.
* Respondent Seven (R7): Former senior manager in Institute – White Male, Irish, 45–49 Years, PhD. Over 20 years of employment experience in higher education. He took a five year sabbatical from his senior lecturing post in the university the Institute is now a recognised college of. The aim of the sabbatical was to assist the CEO of the Institute with the transition from strategic alliance to school status and then eventually to becoming the first externally recognised college of this large Irish university. He also professionalised the education administration staff of the Institute by introducing more academically oriented practices and procedures to ensure compliance between the Institute and its university partner. Since his return to the university three years ago he has been promoted to the Head of the Business School. He is research active and has been published in high ranking peer reviewed journals.
Respondent Eight (R8): CEO, International financial corporation, White Male, Irish, 45–49 Years, Degree and professional qualification – certified. Over 25 years of employment experience in the insurance industry and 13 years of employment experience in higher education. He lectures on programmes from sub-degree up to Master's level. He has authored text books, acted as an examiner, external examiner, technical verifier and programme designer. In addition to formal education he engages in non-accredited training to directors of banks and investment firms. By his own admission education is his first love; the other job pays the bills.

Respondent Nine (R9): General Manager and part-time academic appointments – White Male, Irish, 50-54 Years, PhD. Over 30 years of employment experience in the banking industry and 20 years of employment experience in higher education. He started his career as an engineer and in his late 20s moved to banking after completing his MBA. He is research active and has published extensively across a range of disciplines, all business related, though. He lectures in four universities. He holds tenure as an Adjunct Professor in one such university.
* Respondent Ten (R10): Senior manager in Institute – White Male, Irish, 35–39 Years, MBA and Master's Degree. Over 13 years of employment experience in higher education, nine years in Institute. Previously he engaged in a research role for two years in an Institute of Technology. His field was information technology. He is responsible for automating many processes in the Institute and enhancing the student experience by incorporating interactive elements for content delivery, resulting in more blended learning approaches being adopted that were formerly the traditional essentialist mode of transferring knowledge, lecturer–student.
Researcher/Interviewer: White Male, Irish, 40–44 Years, Master's Degree, over nine years employment experience in higher education, qualified secondary school teacher who taught for a year. Prior to entering higher education he spent 10 years in industry, eight years in asset management and two years in the pensions industry. He commenced the EdD in October 2008. In the intervening years he married, had two children and recently moved employment from the Institute. He is now Director of Education and Professional Development of an organisation that is one of the Institute's education partners. Relationship to Respondents: Respondents 1–7 and 10 are all senior to me. I am a subordinate to them. Clearly defined in organisational terms. Respondents 8 and 9 – Employed by me for lecturing purposes on various postgraduate programmes. Both are considered subject matter experts in their respective fields with significant years of experience lecturing at different higher education institutions.

* – From the Institute

Appendix Seven: Characteristics of the pilot and ten other interviews

			Interview Stats			
Respondent	Number of pages	Word count	Date	Time	Duration	Location
Pilot	n/a	n/a	10 September 2012	2.45pm	75 minutes	Atrium (Common Area)
R1	13	4,094	02 November 2012	2.00pm	40 minutes 42 seconds	Room 2, Institute offices
R2	21	8,587	19 October 2012	2.30pm	55 minutes 11 seconds	Room 2, Institute offices
R3	14	5,041	18 December 2012	12.30pm	51 minutes 56 seconds	Room 3, Institute offices
R4	16	5,678	30 November 2012	2.00pm	45 minutes 57 seconds	Room 2, Institute offices
R5	25	8,877	03 December 2012	3.00pm	75 minutes 44 seconds	Room 4, Institute offices
R6	20	7,435	05 December 2012	9.30am	72 minutes 14 seconds	Room 2, Institute offices
R7	18	5,333	19 December 2012	3.50pm	47 minutes 3 seconds	Smurfit Graduate School
R8	15	5,499	20 November 2012	3.45pm	49 minutes 52 seconds	Room 3, Institute offices
R9	23	9,829	15 October 2012	4.00pm	60 minutes 16 seconds	Room 4, Institute offices
R10	18	7,005	07 December 2012	11.35am	55 minutes 47 seconds	Room 3, Institute offices
	183	67,378			629 mins 42 secs (10 hours 29 mins 42 secs)	

Appendix Eight: Summary of the key attributes of innovation by word frequency

Attribute	**Word frequency count (**see appendix 4 for the colour coded responses).
Nature of Innovation (41)	New – 25 Better – 6 Change – 5 Improve/Improving/Improvement – 4 Update – 1 (only R1)
Type of Innovation (31)	Product – 13 Process – 10 Service – 2 (both by R2) System – 2 (both by R5) Task – 2 (both by R2) Approaches – 2 (R1 and R2)
Aim of Innovation (21)	Needs – 7 (R9 further qualified by stating this as a 'real need') Efficiency – 4 Value – 2 (only R6) Concern – 2 (R8 and R9) Problem – 2 (Pilot and R9) Learning/learning outcomes – 2 (R3 and R4) Risk – 1 (only R9) Cheaper – 1 (only R7)
Social Context (13)	People – 4 (2 by R4 and 2 by R9) Financial Markets – 3 (only R9) Customer – 2 (only R6) Internal – 1 (only R1) External – 1 (only R1) Organisation/organisational – 2 (R5 and R3)
Stages of Innovation (13)	Develop/development/developing – 8 Create/creation/created – 4 Adoption – 1 (only R2)
Means of Innovation (6)	Idea – 3 Market – 2 (Pilot and R6) Invention – 1

Appendix Nine: Ranking of knowledge typologies

	Pilot	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
Know-what	1	1	2	2	1	1	1	1	2	1	1
Know-how	2	2	3	4	4	3	2	3	1	2	2
Know-who	4	3	1	1	2	2	4	2	3	3	4
Know-where	3	4	4	3	3	4	3	4	4	4	3

Appendix Ten: Ranking of importance in relationships – past, present and future

	Pilot	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**
Past	I	I	I	U/G	I	I	U	I	G	I	I
Present	I	I	I	I	I	I	I	I	G	I	I
Future	I	I	I	U/G	I	I	I	I	G	G	I

U – University, I – Industry, G – Government.

Appendix Eleven: Significant actors by Triple Helix category

Triple Helix Category	Actor	Role relative to Institute innovation system	Activity/Rationale for importance
University	University Partner (actual university was anonymised and replaced by this term)	Academic Governance Structure – decision maker and beneficiary	• Accreditation of programmes • Quality Assurance/sharing of best practice
Government	Central Bank of Ireland	Client, driver, veto and beneficiary	• Regulate the industry the Institute represents • Policy making – Fitness & Probity and Minimum Competency Code – Curriculum Development
University	LIA (Life Assurance Association)	Client and beneficiary	• Joint programme offerings • Sharing of best practice
Government	Summit Finuas Network	Client, driver and beneficiary	• Funding mechanism for programmes considered as strategically important in international financial services
Government	CareerStart	Client, driver and beneficiary	• Funding mechanism for three programmes considered as strategically important in assisting job seekers obtain employment