Discourse, Governance and Subjectivity: Interdisciplinarity and Knowledge-Making in Engineering and in Medicine

by

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A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy
Theory and Policy Studies in Education
Ontario Institute for Studies in Education
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Abstract

Governments across the world rationalize interdisciplinarity as an effective strategy for answering complex problems of social importance, drawing on large investments of resources to technical and biomedical sectors. I have identified this rationale as part of specific discursive relations and subsequently troubled its dominance through an exploration of how it has been authorized, and how faculty and administrators negotiate subjectification in engineering and medicine where this discourse dominates. Neo-liberal approaches to knowledge-production are deconstructed and analyzed. An archive was assembled of key texts pertaining to interdisciplinarity including documents produced by the OECD, the Canadian federal and Ontario provincial governments, the University of Toronto (UofT), academics and the popular press. A Foucauldian discourse analysis of these texts provided a specific historical context for interviews conducted with 20 faculty and administrators identified as interdisciplinary knowledge-makers. Subsequently, a
situated analysis of how discourse is embodied and experienced was developed and applied to the whole archive. Four inter-related concepts were identified as making-up the popular discourse of interdisciplinarity: diversify-collaborate-innovate-integrate. According to this narrative, knowledge-makers are expected to diversify through collaboration in order to innovate and produce knowledge that is useful and marketable. From the discovery of insulin to the establishment of the MaRS discovery district, knowledge-making examples from UofT are analyzed to identify the social relations that make the idea possible that researchers should address problems of ‘relevance’. I argue that interdisciplined subjects are ‘facilitated’ to fulfill this popular narrative by management approaches that capitalize on intrinsic notions of ‘making-a-difference’. Concurrently, different narratives of interdisciplinarity are embodied and promoted as individuals negotiate ontological and epistemological issues in their daily practice. This research contributes to the refinement of Foucauldian discourse analysis, and informs scholarship on the effects of neoliberal approaches to knowledge-making and the professionalization projects of engineering and medicine.
Acknowledgments

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Dedication

In memory of my father who used to whisper

“You can do it!” in my ear when I was little.
Chapter 1
Introduction

1 “Canada’s answer to the world’s problems”

In July of 2008, the University of Toronto (UofT) changed its lead heading on its website to read: “This is where Canada answers the big questions. This is UofT” ("This is U of T," 2008). A link took visitors to UofT’s website (current and prospective students, industry, government and society at large) to a series of web pages dedicated to projecting an image of UofT as the ideal-type research-intensive university in the current knowledge economy. Within these pages, one discovers that the “big questions” are synonymous with the “world’s questions.” A few days later, the lead banner changed to read: “Ask the tough questions. Help us answer them” ("This is U of T," 2008). Visitors to this site were thus explicitly invited into the domain of producing new knowledge, historically perceived to be the prerogative of academics. In this way they are constituted as ‘stakeholders’ in the knowledge-making process. Reading the text that followed these headings and exploring the links on the website offered a glimpse of how UofT proposed to solve all the ‘big problems’ of the world: through industry/community partnerships, inter- and intra-institutional collaborations, and interdisciplinary approaches. The University website contained many examples of successful partnerships and collaborations, promoting in the process the idea that interdisciplinary and collaborative approaches to knowledge-making have the capacity to produce solutions to ‘nuanced’ and ‘complicated’ problems. ¹

While the front page of the UofT website and the links described above no longer exist in the form they did in 2008, the image of a highly successful research-intensive institution dedicated to facilitating important scientific discoveries and making a difference through strategic research partnerships persists. The website aesthetics have changed but the central message has not. ‘Stakeholders’ are still told that UofT is “Canada’s answer to the world’s problems” ("University of Toronto," 2010). And prospective students are still told that they can “take classes from some of the world’s top researchers – the same people who are uncovering answers to today’s toughest

¹ Throughout this thesis, my use of single quotation marks (‘’) signifies my problematization of a term or phrase. Double quotation marks (“ ”) signify I am quoting verbatim from a text or transcript.
questions. From climate change to world hunger, this is the place to study if you want to shape the world” (“The university of anything you want to become" 2010).

In fact from 2008-2010 UofT described itself as a place of learning with an international reputation for generating discoveries through collaborative knowledge-making:

Our tradition of innovation and collaboration encourages UofT’s faculty, students and alumni alike to share in the excitement of discovery. In any field of inquiry, some of the world’s biggest ideas start at UofT (“Big ideas that shaped the world," 2008).

Since 1827, students, faculty and graduates at the University of Toronto have been making history and mapping the future. Their contributions – medicine, architecture, literary criticism, political science and many other fields – enrich the legacy of discovery and help to uncover answers to the world’s important questions ("Alumni and our history," 2010).

Citing such major scientific intellectual and medical breakthroughs as the discovery of insulin in 1921, the publication of Harold Innis’s *The Bias of Communication* in 1951, the invention of photodegenerative plastics in 1971, the performance of the first double lung transplant in 1989, and the creation of the War Child Canada not-for-profit humanitarian organization in 2003, Web-Page creators meticulously construct the image of UofT through a long record of “innovations” that together demonstrate the University’s commitment to both intellectual inquiry and social responsibility (“Big ideas," 2010; "Big ideas that shaped the world," 2008). Reading through this long record of discoveries encourages visitors to believe that in UofT’s institutional history, there is continuity in making purposeful contributions to society through discovery and innovation.

What makes it possible for UofT to realize its commitment to “answering Canada’s and the world’s problems”? According to its website, its faculty are heralded as “exceptionally productive researchers” who are ranked “top in Canada for publications and citations,” who “win the most awards from prestigious international bodies than [faculty at] any other Canadian university,” and who attract students amongst “Canada’s best and brightest” ("Canada's answers to the world's questions," 2010). Superlatives such as ‘most’, ‘best’, ‘brightest' help build an image of strength and capacity for discovery and innovation. However, they are also indicative of a culture of measurement and evaluation that surrounds university activity --a need to
continuously account for its ability to contribute socially and economically. In language that rhetorically constructs UofT as an academic leader in comparison to other postsecondary institutions, the following statements found on the Web-Page “Academic Reputation” reinforce the UofT’s self-projected image of excellence and provide ‘proof’ of its academic prowess and capacity to ‘make a difference’:

UofT researchers publish more than all but two other universities in the world…. This proves that professors are at the forefront of developments and innovations in their field ("U of T's Academic Reputation," 2008).

U of T researchers are among the world’s most productive, and give students the extraordinary opportunity to learn from leading minds ("Academic Reputation," 2010).

Around the globe, other academics rely on the work U of T researchers produce --and cite that work in their own research. We have more ISI\textsuperscript{2} Highly-Cited Researchers than any other Canadian university ("Academic Reputation," 2010).

UofT is one of only eight universities in the world ranked by global peers in the top 20 across the broadest range of disciplines ("U of T's Academic Reputation," 2008).

From research discovery to market-ready product: U of T contributes to a prosperous, innovative society. Between 2003 and 2006, U of T researchers created 19 new companies – more than any other Canadian university. We ranked 4th overall for commercialization among North American public universities ("Academic Reputation," 2010).

The activity profiled in the above-cited web pages is clearly selected by its architects to show up UofT’s strengths and to link knowledge-production to innovation and commercialization as a way to demonstrate meaningful impact within Canada but also globally. They construct the institution as sound, strong and prepared to meet the ‘big’ challenges of the world. But is it believable that the world comes to UofT? And that UofT is the premier institution of higher learning positioned to address the ‘big problems’ of society?

\textsuperscript{2} The ISI - the Institute for Scientific Information - specializes in citation research.
A cursory scan of the websites of the G-13, the top research-intensive universities in Canada, shows that UofT is not the only post-secondary institution making such claims about having the capacity to contribute to solutions of pressing global problems through research, innovation, and commercialization. Table 1.1 contains statements found on the websites of G-13 universities. While the various institutions have used different visual and textual rhetorical approaches in constructing their websites, there is clearly a large overlap in the core messages about academic research and its perceived role in Canadian and world economic and social development. As the statements show, knowledge-production is increasingly being touted as a way to address strategic social and economic priorities. Universities are partnering with government and industry to enhance their capacity to contribute. Interdisciplinary approaches are linked with innovation and discovery. Commercialization, a term used 20 years ago to describe the erosion of university autonomy, is now embraced by university websites across Canada and used as a way to document academic strength, relevance and impact. The ease with which I was able to compile the table of statements (it took less than a couple of hours) by browsing through the 13 websites also speaks to the pervasiveness of this perspective. What compels the University of Toronto and the other G-13 universities to project such an image of engaged knowledge-production? Perhaps the most obvious is also the most telling; namely the power of profressing (Hughes, 1994), often used as a marketing tool to attract consumers to a product or service. The knowledge-making enterprise currently seems to be a highly competitive enterprise. Universities are actively competing for resources, for attention and for legitimacy. What is not immediately visible, nor projected through the statistics used to claim success, capacity and potential, is the effort required to maintain a competitive image of prolific social contributions. President David Naylor of UofT noted in a recent address to the Royal Society of Canada that because higher education is currently under-funded in Canada by OECD standards, “every university in this country is scrambling to find a way to recruit and retain outstanding scholars” (2007, p. 4). The term ‘scrambling’ brings to mind a sense of urgency and an image of significant administrative effort. However, this effort is not really foregrounded in the institutional image projected by UofT or by the other G-13 universities. Nor do we know who is scrambling. Is it the researchers, the administrative staff or the university management? What effect does this scrambling have on the way knowledge-makers conduct their work and project their professional identities? What kind of research environment is being created through competition for resources, attention and recognition?
### Table 1.1: G-13 discourse on academic research

**University of Alberta:** U of A researchers have been at the forefront of research innovation for over a century—whether it’s partnering with NASA to measure the wind on Mars, doing world-renowned research on water ecology that has saved thousands of lakes around the world, producing the first full scholarly history of women's writing in the British Isles, or making breakthroughs in treating diabetes and E. coli ("University of Alberta Research," 2010).

**University of British Columbia:** UBC ranks among the top 40 research-intensive universities in the world. This international reputation for excellence is founded on the amazing discoveries and inspired ideas of our researchers, and is supported by strategic efforts to promote funding success, research infrastructure, the recruitment and retention of talented faculty members, and knowledge mobilization…. Many of our 130+ spin-off companies are based in British Columbia and have made a significant contribution to the provincial economy, as well as providing numerous societal benefits in the areas of health care and technology ("Research UBC," 2010).

**The University of Calgary:** U of C is committed to high-quality, relevant research. By attracting more than $254 million per year in research funding, we rank in the top 10 in Canada for research-intensive universities…. In the past few years, the U of C has been building three university-wide interdisciplinary priority areas of expertise, areas where we already are or plan to be world leaders in research: energy and environment, biomedical engineering and public policy. We have built capacity by gathering a critical mass of researchers, attracted significant research chairs, engaged leaders in their fields, created new and innovative learning opportunities, and garnered funding to support new facilities, labs and research ("University of Calgary, V.P. Research," 2010).

**Dalhousie University:** One of Canada's leading universities, Dalhousie is widely recognized for outstanding academic quality and teaching, and a broad range of educational and research opportunities. Located in Halifax, Nova Scotia since 1818, Dalhousie attracts students from around the world. We inspire students, faculty, staff, and graduates to make significant contributions to our region, Canada, and the world ("Dalhousie University," 2010).

**Université Laval** believes that higher education quality teaching must be firmly rooted in fundamental and applied research. Students at all levels are encouraged to get involved in their institution’s research groups and centres. With its 17 faculties and a network of 7 affiliated hospitals, Université Laval boasts more than 1,300 researchers in all disciplines, whose reputation and quality of work position Laval as one of the top research universities in Canada…. Université Laval is the only Canadian university to head three Government Networks of Centres of Excellence – the Canadian Institute for Photonic Innovations (CIPI), Geomatics for Informed Decisions Network (GEOIDE), and ArcticNet. It is also an international player in a number of research fields, including health sciences, environmental studies, geomatics and biofood sciences, optics, photonics and lasers, neurosciences, genomics, screen and sound technologies, and the study of obesity, to name but a few (Laval University, 2010).

**McGill University** has a proud heritage of award-winning, cutting-edge scholarship and discovery. Our researchers cover the spectrum of disciplines, including physical sciences, medicine, engineering, agriculture, law, management, languages and music. They’re affiliated with over 75 major research centres and networks. Partnerships with other universities, government and industry are helping McGill researchers to have an impact ("Research and Innovation McGill," 2010).

**McMaster University** is transforming vacant brownfields and warehouses into a premiere research park, building on the University’s existing reputation as a research centre of excellence. The McMaster Innovation Park houses laboratory, office, teaching, training, and conference facilities, in support of research and development in a number of key industrial areas: advanced manufacturing and materials, nanotechnology, bio-technology, and other areas in which McMaster University has recognized research strengths. These facilities will accelerate the commercialization of research into new and marketable products and services, and create new companies that will provide high-paying, highly skilled jobs in Hamilton ("McMaster Innovation Park," 2010).
1.1 At the intersection of rationales, governance and subjectivity

1.1.1 My problem space

This research explores the intersection of rationales, governance and subjectivity in the context of the current university knowledge-production environment. The discourse of interdisciplinarity is my entry point. There are two reasons for choosing interdisciplinarity as a starting point. First, there are strategic claims in various sectors (economic, social, cultural) about effectively answering complex problems through interdisciplinary partnerships. The term interdisciplinarity is used to connote collaborative forms of knowledge-making that produce innovations.
Underscoring the popularity of collaborative approaches to knowledge-making is the rationale that pursuing knowledge for knowledge’s sake is a luxury that society can no longer afford. In popular discourse, there seems to be little tolerance for supporting an ‘ivory tower’ of thinkers. Demonstrating relevance is part of these discourses in contrast to images of academic institutions in the past, traditionally perceived to enjoy a large degree of autonomy and independence. Reading through the websites for the G-13 makes it clear that today, thinkers must also be doers and that their doing has a framework and structure. This makes interdisciplinarity a very interesting discourse to deconstruct, as it has social, cultural, political and economic dimensions.

The second reason for this entry point is linked to my personal location. In 1987, when I began my higher education, the term interdisciplinarity was rarely used. I studied political science and history and my studies never formally overlapped. But when I returned to school in 2002 for additional graduate work, the term interdisciplinarity was everywhere and the possibilities for exploring a phenomenon collaboratively and creatively seemed endless. I found myself very easily embedded in an interdisciplinary context, working with scholars from a variety of disciplines and professions. I was even able to study concurrently in the Faculty of Education and the Faculty of Medicine at the University of Toronto. However, studying the socio-politics of professional education while embedded in a clinical department was not without its challenges. And it was these challenges related to legitimacy and recognition that spurred my interest to explore the politics of collaborative knowledge-production. As part of this research, I wanted to make sense of my own evolving career as a scholar. What made it possible for someone like me, trained in the social sciences (political science, history, sociology of education) to pursue a fellowship sponsored through the Department of Psychiatry, Faculty of Medicine at the Wilson Centre for Research in Education, an extra departmental unit (EDU), while pursuing graduate studies at the Ontario Institute for Studies in Education? And later, what made it possible for me to successfully negotiate a position with the Department of Paediatrics as an education researcher pursuing critical scholarship? Why was my perspective and expertise perceived relevant by physicians today, when it would not have been 20 years ago? A cursory examination of the demographics of clinical departments in the Faculty of Medicine suggested that my personal career trajectory, while interesting, was not unique; there were scores of others like me with social science backgrounds pursuing interdisciplinary careers (primarily in research positions) in the Faculty of Medicine.
In the process of theorizing about this diversification within clinical departments, I began to link it to broader socio-economic priorities. To do this I found it necessary to study the development of the University of Toronto as a research-intensive university. It was especially important to understand the specific role that interdisciplinary and collaborative forms of knowledge-making have had in the development of UofT’s claim to a highly successful research enterprise. This is because neo-liberal government investment in higher education favours such approaches to research. The following questions guided my exploration:

1. How is knowledge-production currently governed?
2. Which interdisciplinary and collaborative approaches are currently popular?
3. What impact does their popularity have on other forms of knowledge-making?
4. How are universities accounting for collaborative knowledge-making and why?
5. How are interdisciplinary knowledge-makers approaching their work?
6. What does an ‘interdisciplined’ subject look like?

This thesis documents the material effects of the discourse of interdisciplinarity mainly in what I will term its most popular form at one institution through the exploration of relevant texts and the life experiences of 20 participants whom I have identified as “knowledge-makers.” The next sections summarize my approach and give an overview of the structure of this thesis.

1.1.2 My approach

Using a Foucauldian approach (Foucault, 1982, 2006a), I chose to study the formation of ‘interdisciplinarity’—its operation and its effects. Specifically, I planned to explore how the discourse of ‘interdisciplinarity’ became a feature of university governance, contributing in very specific ways to the regulation and formation of subjects in interdisciplinary positions linked to two professional faculties, medicine and engineering, at the University of Toronto (Foucault, 2008). In the process, I also explored the connection between collaborative knowledge-making and globalization, including how discourses of interdisciplinarity relate to neo-liberal knowledge-economy discourse. A critical post-structuralist reading of written and verbal texts (Popkewitz & Brennan, 1998; Tamboukou, 2003b) was undertaken to reveal the constitutive features of this popular discourse and understand how political, economic and social forces shape institutional arrangements and impact faculty experiences and careers (Dehli, 2010; Polster 1998, 2002 & 2007).

The goal was to develop an understanding of how the identity of individuals is shaped by and or recognized through the dominant discourses associated with interdisciplinary knowledge-
production. I planned to explore the experiences of individual faculty members negotiating everyday responsibilities and major turning points in their careers within social relations that enable one form of knowledge-production to dominate over others.

This is important theoretically because much governmental and institutional funding has been invested in exploring ways to increase and encourage interdisciplinary research, yet very little research is focused in studying this process. Furthermore, the organizational structures of higher learning are changing to promote interdisciplinary research throughout North America (Clark, Moran, Skolnik & Trick, 2009; Sa, 2008). Yet there is little reflection by scholars studying the process on how and why interdisciplinarity emerged as a popular way of organizing knowledge-production. My project aimed to deconstruct the social, economic and political relations that encourage, sustain and reinforce ‘interdisciplinarity’ as a popular and prevalent approach to generating answers to research questions that are perceived to be ‘important’ by funding agencies, government organizations, corporations/industry and the public. Following my reading of Foucault’s later work, my research also aimed to explore how scholars negotiate their subjectivity in relation to the discourse of ‘interdisciplinarity’.

1.1.3 Organization of thesis

Figure 1.1 maps out the organization of my thesis. The first half of the thesis uses an archaeological approach to define the discourse of ‘interdisciplinarity’, the conditions leading to its emergence, its regularities, and its limits. The second part of the thesis uses a genealogical approach to explore the material effects of the discourse of ‘interdisciplinarity’, particularly its implications for identity formation. That is, the question, who is affected by this discourse and in what way, is addressed.

Specifically, following this introduction, Chapter 2 describes my theoretical framework and methodological choices. Chapter 3 reviews major epistemic positions on interdisciplinarity and their relationship to the socio-politics and economics of knowledge-production. The discursive structure of the most popular form of interdisciplinarity is outlined in Chapter 4. Chapter 5 introduces the higher education system in Ontario, Canada and describe shifts in the discourse about the role of the university in society. Chapter 6 explores the circulation of the discourse of ‘interdisciplinarity’ in the broader socio-economic system, while Chapter 7 provides a portrait of UofT with an institutional identity as a research-intensive university and describes how
interdisciplinarity relates to its mandate. Chapter 8 deconstructs the ‘interdisciplined’ knowledge-maker and draws out the material implications of projecting an interdisciplinary professional identity. Chapter 9 focuses on how the discourse of ‘interdisciplinarity’ is being resisted, challenged, ignored or modified. Finally, Chapter 10 discusses the conclusions, contributions and implications of this research. The bibliography lists the portion of my archive directly cited.

Figure 1.1: Map of thesis organization
Chapter 2
Methodology

2 Introduction

This chapter describes in detail my theoretical approach and the methodological decisions I made in the course of this research. It briefly outlines what aspects of Foucault’s archaeological and genealogical approach were adopted and then describes the specific theoretical issues encountered and how they affected decisions about methodology. Finally, it describes how I delimited the study, compiled my archive and sampled for participants and ends with a discussion of the ethical issues that relate to this research.

2.1 Theoretical overview: A Foucauldian approach

To claim there is a Foucauldian approach runs the risk of being misinterpreted to mean that there is one definitive way to draw on Foucault’s theories to frame research. On the contrary, I am making no such assumption. There are many core concepts interwoven in Foucault’s work throughout as it evolved over the course of his career. However, Foucault and scholars following his lead have used these core concepts in a variety of ways. For this reason, I will make explicit what I mean by a Foucauldian approach.

As noted in the introduction, my exploration is organized into three sections: Discourse, Governance and Subjectivity (see Figure 1.1). For the first two sections, I have primarily drawn from Foucault’s methods of archaeology and genealogy respectively. For the section on subjectivity, I have also drawn from his last period of writing often referred to as the care-of-the-self literature. I use the term “drawn from” to indicate my awareness that the end product is neither an archaeology nor a genealogy. This was intentional. I entered this research in a very open-ended way. My research questions were broad, and I decided to study a discourse at the level of a concept. This allowed the capturing in broad strokes changing trends in rationales, just as Foucault did for the concept of madness. My approach also suggested links to specific social relations that impact faculty activity today. Discursive concepts have broad influence and I chose to outline this influence rather than trace the history of emergence of any one object, subject-position or process made possible by the discourse of interdisciplinarity. Instead, I have explored
the intersections of rationales, structures, and identity and in the process my goal was to make visible some of the materiality of the discourse of ‘interdisciplinarity’ in its most popular form at a research-intensive university in Canada.

2.1.1 Archaeology

Choosing to study the discourse of ‘interdisciplinarity’ means in effect also studying disciplines and their politics. This made the archive extremely large (details on the archive are provided in a separate section below). Theoretically, I drew on Foucault’s distinction between “connaisance” and “savoir” in order to help me delimit the archive. In his words:

Instead of exploring the consciousness/knowledge (connaisance)/science axis (which cannot escape subjectivity), archeology explores the discursive practice/knowledge (savoir)/science axis. And whereas the history of ideas find the point of balance of its analysis in the element of connaisance (and thus is forced, against its will, to encounter the transcendental interrogation), archaeology finds the point of balance of its analysis in savoir – that is, in a domain in which the subject is necessarily situated and dependent, and can never figure as titular (either as transcendental activity, or as empirical consciousness) (Foucault, 2006a, pp. 201-202, emphasis in original).

The term “connaisance” is used by Foucault to denote an organized body of knowledge, which is legitimized and recognized as a ‘discipline’ or a ‘scientific field’. In contrast the term “savoir” focuses on the discursive conditions that have made it possible to make these claims of legitimacy about a given body of knowledge. When studying the latter, the task is to identify the concepts, practices, procedures, institutions and norms that make possible the body of knowledge to appear as a formal discipline or connaisance.

As my interest was to make visible the ways in which the discourse of interdisciplinarity currently operates and impacts identity formation, it was not useful to study ‘interdisciplinarity’ simply as a formal body of knowledge or discipline (i.e. connaisance). Rather, I needed to distinguish between ‘interdisciplinary knowledge’ (the type of knowledge that was labeled interdisciplinary and the growing body of literature that spoke to enhancing and doing interdisciplinary work in a particular way) and the social relations that make possible the idea that one can approach knowledge-production in an interdisciplinary way (savoir). Taking this
approach would make visible the conditions of possibility for organizing and asserting knowledge in interdisciplinary ways. Furthermore, interdisciplinary research can be associated with a large number of disciplines and fields, each with its own historical specificity. The concept of savoir allowed me to treat all interdisciplinary activity as a loosely associated grouping, at the level of discursive concept--that is the idea that one can pursue interdisciplinary research. Taking this broad approach made it possible to determine overlaps between specific interdisciplinary locations. For example, during the initial exploration of my archive, I looked at rationales for engaging in interdisciplinary activity in a breadth of disciplines and fields such as women’s studies, environmental studies, rhetoric, humanities, civil engineering, psychiatry, education, sociology, economics among others.

The process of finding the discursive practices associated with the dominant discourse of interdisciplinarity involved the following:

1. locating statements about interdisciplinarity that occurred with regularity and that had an inherent logic or system, to identify what was ‘sayable’ or popularized as being interdisciplinary. My initial goal was to identify the discursive statements that make up the most popular form of ‘interdisciplinarity’ in contemporary knowledge-making contexts and specifically at UofT.

2. identifying who was uttering these statements, in what contexts, and for what purpose, to identify the ‘doable’ with regard to producing knowledge in an interdisciplinary way.

3. analyzing the rationales used to legitimize these statements, to identify the broader social logic that makes the discourse of interdisciplinarity possible in this current context.

4. tracing the processes that were made possible by the systematic use of these statements and in the process identifying specific objects, practices, procedures, positions, and institutions that gained visibility in this discourse and also served to reinforce the existence of this discourse.

5. noting non-popular discursive statements of interdisciplinarity by exploring symbols of interdisciplinarity present in epistemic and popular discourse. By symbols, I mean metaphors or representations that are used to describe a particular way of doing and being interdisciplinary.
The results of this analysis are presented in Chapters 3 to 5. Theoretically this analysis was completed using Foucauldian archaeological methods. However, as noted above, my aim here was not to produce a history of the emergence of ‘interdisciplinarity’ as a discourse in any one particular knowledge domain, but rather to identify in very broad terms the general characteristics of the current popularized form of interdisciplinarity.

2.1.2 Genealogy

The second part of this research, a focus on the materiality of the discourse of interdisciplinarity and its impact on the careers of knowledge-makers who were associated with the discourse, necessitated my drawing from Foucault’s genealogical concepts, especially those which pertained to governmentality, relationships of power, and subjectivity (2008). Where “archaeology attempts to isolate the level of discursive practices and formulate the rules of production and transformation for these practices, [g]enealogy concentrates on the forces and relations of power connected to discursive practices” (Davidson, 1986, p. 227). In other words, archeology provides the starting point for genealogical analysis by mapping out the discursive space of knowledge-production, namely, the authority invested in disciplines or bodies of organized systems of knowledge. Archaeology provides a surface analysis and description of what is currently “visible” and “sayable.” But it is through genealogy that the relationships between what is the ‘visible’ and the ‘sayable’ are explored. Such analysis suggests how our current ‘rules’ for acting and doing are historically derived. Genealogy aims to make visible the relationships of power that underlie our current priorities and rationales. It also locates the ideas, objects and activities that are made ‘invisible’ in the process of erecting some ways of thinking as superior to others. Finally, the genealogical approach explores the link between discourse and subjectivity.

A more detailed discussion of how I conceptualized power and subjectivity is articulated in the next sections. Briefly here, I will summarize how the social relations linked to the discourse of ‘interdisciplinarity’ were analyzed by drawing on genealogical methodology. I looked for:

1. relationships between objects, institutions and subject-positions related to interdisciplinarity in medicine and engineering, two major disciplines in the research university.
2. the strategic use of the discourse of interdisciplinarity and the intended and unintended consequences of deploying this discourse.
3. hierarchies and hegemonies linked to knowledge-making and interdisciplinarity and their implications.
4. positive and negative effects of the discourse on the life experiences of individuals associated with interdisciplinarity.

The results of this analysis are presented in Chapters 6 to 8. They provide an overview of the social relations associated with the popular form of interdisciplinarity and the effects of the uptake of this discourse.

2.1.3 Ethics and agency

The exploration of the relationship between discourse and subjectivity led me also to consider how to recognize change and transformation in the context of subject formation (identity). To do this I drew from Foucault’s later body of work that focused on ethics and the relationship of ethics to subjectivity (Davidson, 1986; Foucault, 1990, 2006a). As a theoretical concept, subjectivity is a way of thinking about identity as a social process with political dimensions. A person may experience herself as uniquely ‘individual’ but this is done always in relation to others, social institutions and organizations (Ibarra-Colado, Clegg, Rhodes & Kornberger, 2006).

In his later work, Foucault explored how people constitute themselves as moral subjects of their actions, while at the same time being disciplined by institutions into being certain types of people. The relationships are seen as mutually constituting. As the discourse shapes objects and makes possible subject-positions, the agency and ethics of the subject transforms discourse. For Foucault, “ethics is a conscious practice of freedom” (Foucault, 1984). Specifically, Foucauldian ethics is a strategic deployment of discourse rationalized as a moral imperative. Foucault thus links discourse, governmentality, subjectivity and agency through the construct of ethics:

Although the theory of political power as an institution usually refers to a juridical conception of the subject of right, it seems to me that the analysis of governmentality – that is to say, of power as a set of reversible relationships – must refer to an ethics of the subject defined by the relationship of self to self. Quite simply, this means that in the type of analysis I have been trying to advance for some time you can see that power relations, governmentality, the government of the self and of others, and the relationship of self to self constitute a chain, a thread, and I think it is around these notions that we should be able to connect the question of politics and the question of ethics (Foucault, 2006b, p. 252).
To identify how the ‘interdisciplined’ organization or subject acts ethically, that is, worked to present him/herself as successfully interdisciplinary while strategically working to enhance his/her own ability to define what interdisciplinary means, I used a variety of strategies including looking for:

1. evidence of strategic deployment of the popular discourse by institutions and individuals.
2. examples of rationalizations for knowledge-making which included prescriptions about how knowledge-makers should pursue their work (‘ethics’), how these prescriptions related to broader socio-political considerations and examples of ‘resistance’ or attempts to modify the discourse of interdisciplinarity (‘agency’).

The results of this analysis are threaded through chapters 7 to 9 and more specifically discussed in chapter 9, which theorizes the ways in which ‘resistance’ and ‘agency’ can be conceptualized in a Foucauldian framework.

The next section provides a more detailed discussion of aspects of Foucauldian theory as applied in this research, its limitations, and the specific methodological decisions that were made along the way.

2.2 Theoretical considerations in detail

2.2.1 Power and subjectivity

Researching subjectivity in a Foucauldian framework begins with the deconstruction of the ways in which dominant discourses take hold of and shape activity. Power is not a static possession. According to Foucault:

Power is employed and exercised through a net-like organization. And not only do individuals circulate between its threads; they are always in the position of simultaneously undergoing and exercising this power…. Individuals are the vehicles of power, not its points of application (Foucault, 1976, p. 98).

Individuals occupy positions of power in a web of social relations. Power is a means by which individuals interact. Implicit in this interaction is what has been called by critical scholars the agency of the subject, or his/her ability to engage in a struggle over power. This definition of power has implications for how the relationship of the individual to institutional loci of power is
conceptualized as well as the way technologies such governing, regulating, controlling in the context of socio-political organization operate:

One of the most formative general principles underlying governmentality writings has been the rejection of the identification of government with the state, understood as a centralized locus of rule, and the identification of programmes and practices of rule in micro-settings, including those 'within' the subject. (O'Malley, Weir & Shea, 1997, p. 501)

This is a radical re-conceptualization of power because it moves thinking away from questions of the exercise of power over subjects by other subjects, groups or institutions of governance, to discussions of how struggles of power constitute individuals as both subjects and objects of power (Tamboukou, 2003a, p. 8). In other words, Foucauldian power is simultaneously productive and constraining and people can occupy a number of subject-positions making them simultaneously the recipients and actors of power.

2.2.2 Power and knowledge

To identify the power struggles implicit in the negotiation of social relations related to knowledge-production, it is important to develop a historical understanding of how the production of knowledge facilitates the strategic use of ‘truth making’. By focusing on the micro details of how power circulates rather than the effects of power, Foucault hopes to challenge the primacy of disciplinary authority in contemporary society, particularly as it takes shape in the academy:

We are concerned, rather with the insurrection of knowledges that are opposed primarily not to the contents, methods or concepts of science, but to the effects of the centralizing powers which are linked to the institution and functioning of an organized scientific discourse within a society such as ours (Foucault, 1976, p. 84).

As noted previously, mapping the discursive space of knowledge production is the starting point for understanding how a discourse or a popularized ‘truth’ is implicated in the negotiation of social relations. That is, the mapping shows what is currently “visible” and “sayable.” Also part of the process is discovering knowledge that is ‘subjugated,’ thus my search for non-popular
discursive statements contrasting with mainstream discourses of interdisciplinarity. As Foucault explains:

When I say 'subjugated knowledges' I mean two things. On the one hand, I am referring to historical contents that have been buried or masked in functional coherences or formal systemizations. [In other words, I am referring to] blocks of historical knowledges that were present in the functional and systematic ensembles, but which were masked, and the critique was able to reveal their existence by using, obviously enough, the tools of scholarship. Second…, when I say 'subjugated knowledges', I am also referring to a whole series of knowledges that have been disqualified as...insufficiently elaborated knowledges: naive knowledges, hierarchically inferior knowledges, knowledges that are below the required level of erudition or scientificity (Foucault, 2003, p. 7).

In other words, the goal of discourse analysis is to understand how the hierarchy of knowledge is erected, how this hierarchy works at a given point in time, and what are its possibilities and its limits. The connection between discourse, power, and subjectivity is relevant for understanding contemporary socio-political organization, because the ‘visible’ and ‘sayable’ are the discourses we draw upon to rationalize our actions and which in the process inscribe us with readily identifiable features. In the process of social interaction, discourse becomes materiality or as Mills (2003) put it, it is “within discourse that power and knowledge are conjured” (p. 262). The term ‘discourse’ then is used to “describe particular historical practices that give rise to material ideas such as ‘the body’ or the ‘soul’ (Mills, 2003, p. 262). The same practices, in the realm of knowledge-making, make certain forms of knowledges or expertise more relevant and useful than others, such as physicians for ‘knowing’ the ways of the body and psychoanalysts for ‘knowing’ the human ‘psyche’. In the process, those who are not ‘trained’ in the proper knowledge are not ‘trusted’ socially to heal the body or the soul. That is, discourses are institutionalized pronouncements that are erected and related to in an unproblematized way in the context of everyday practices. They have the appearance of ‘truths’ and are thus largely sanctioned and unquestioned. The challenge is to locate and describe in any given context what strategies are used to systematically maintain and reproduce the visibility and possibility of certain discourses and the material ideas linked to these, and how through this same action or exercise of power, other discourses and material ideas are made ‘invisible’ and ‘unsayable’ (Foucault, 1976, p. 76).
2.2.3 Power and the study of governance

Methodologically this reformulation of power has implications for the way ‘traditional’ sociological and political categories of power are conceptualized and understood, including the concepts of state, government, institution, professional, individual, etc. O’Malley, Weir and Shea identify two interconnected but distinct lines of inquiry that have dominated the governmentality literature during the 1990s. The first approach focuses on “which programmes of government are articulated within broad discourses of rule of political rationalities” while the second focuses “on the technologies and assemblages of practices, materials, agents and techniques that are deployed to put these rationalities, categorizations and abstract programmes into effect” (O’Malley et al., 1997, p. 502). Both threads of research start from the assumption that the process of governing is a de-centered activity that revolves around a “mentality of rule” or “rationalities of ruling” that have material effects. The materiality is made visible at the intersection of what is rationalized as possible and the everyday activity and practices of subjects activating this rationality through their interactions. However, O’Malley, Weir and Shea note that while focusing on the intersection or “nexus of everyday practices and techniques and more abstract technologies and broader political rationalities” makes visible the relational aspects of power, particularly at the level of competing discourses, this approach does not readily lend itself to an analysis of how individuals occupying different subject-positions experience these relationships. This lack of attention to the experiential aspects of discursive relations relates to a broader critique of the post-structuralist approach and will be explored in more detail below.

2.2.4 Power and the study of self definition and agency

As with any research methodology, the Foucauldian approach has its analytical limitations. Foucault allegedly brought about the ‘death’ of the ‘subject’. This comment alludes to the notion that identity is a social construction and that there is thus no such thing as a “stable core,” an “essence,” a central “identity” that researchers can hope to uncover, explore, understand or explain. In the context of my research, Foucault’s theory of the subject also entails that any perceived problems with the way knowledge is organized or pursued is not reducible to the intentions of particular actors. That is not to say that individuals do not self-identify. Rather, according to this framework, the ways in which individuals project their own ‘identity’ and understand or recognize the ‘identities’ of others is historically and contextually dependent and irrevocably linked to social relations. Subjectivity then is a process of ongoing ‘becoming’ and
‘resisting’ and the subject is a conduit through which power is channeled in a myriad of directions simultaneously through interaction. In the process, certain configurations of ‘existing’ or of ‘making meaning’ are made possible. This posits particular methodological challenges for researchers engaged in sociological work, for engaging in research activity is also a process of ‘becoming’ or ‘resisting’. Doing research activates technologies of knowledge-production linked to historically located constructions of what it means to ‘explore’ a phenomenon or to ‘understand’ a problem. Researchers thus become channels through which discursive statements are intentionally or unintentionally used to reproduce, sustain, resist or change dominant ways of knowing. How then do we use a Foucauldian framework to make visible the intricate negotiating process in which discoursing subjects engage? How do we move from a position of understanding social relations to creating new and different possibilities for social organization? Finally, how do we make sense of how people experience ‘discourse’? Foucault chose to do this by ‘problematizing’ the mainstream. But Moon argues:

In spite of his theory’s insistence on everyday, micro-level, non-hierarchical workings of power, Foucault’s methods limited him to looking at such elite productions of discourse as medicine, science, law and education…and sociologists using his methods fall on elite productions of discourse such as published texts, newspaper stories, political speeches, and social movement documents (Moon, 2005, pp. 551-552).

By focusing on ‘elite productions of discourse’, Foucault contributed to a long line of sociological work that studied the politics of science, professions, professionalism and professional identity formation (Abbott, 1988; Freidson, 1986, 2001; Johnson, 1972; Larson, 1977; Merton, Gieryn & Rosenblatt, 1982; Witz, 1992). The next section outlines Foucault’s rationale for choosing to study the ‘elite productions of discourse’, the strengths and limitations of this approach, and my response.

2.2.4.1 Capturing the social relations of self-definition through problematization

The concept of problematization was introduced in Foucault’s later work as a way “to formulate the fundamental issues and choices through which individuals confront their existence” (Gutting, 2005, p. 103). The term problematization, in contrast to the term marginalization, implicitly alludes to the range of opportunities for self-definition that some people enjoy compared to others. The marginalized, as the most dominated of social strata, find redefinition through
struggle, possibly only through collective struggle. However, arguably, mainstream members of society are less constrained, with “available ‘niches’ within society that provide them with room for self-formation on their own terms” (Gutting, 2005, p. 104). Self-formation, as noted above, is an active state of ‘becoming’. Change is not only desired, but also a necessary corollary to being free. To be able to change without struggle is to be amongst the most free; a coveted position in the web of social relations. Thus, concepts of resistance, agency and struggle, embedded as they are in their own discursive history of social relations, can become important points of reference when deconstructing how we come to understand the politics of identity and identity formation.

Could the politics of ‘self’ be linked to the politics of knowledge-production? There seems to be a compelling parallel between Foucault’s theory of self formation and the discursive shift towards innovation. However, it was Foucault’s philosophy that ethics should be grounded in suspicion, constantly challenging beliefs and searching for new configurations of ‘being’. Could the current unproblematized turn towards ‘interdisciplinarity’ as a conduit for ‘innovation’ and for ‘making a difference’, be an example of the mainstream exercising their freedom and agency to imagine new ‘becomings’, and in so doing, reinventing their privilege and eluding the resistance of the marginalized? This question was particularly important for me, as I pondered my own motivations for engaging in critical scholarship within medicine and engineering and a community of elite knowledge producers. Theoretically, the advantage of focusing analysis within a location of elite production of knowledge would be that transformations might be more likely, but also more frequent in the context of everyday practices. However, working within mainstream discourse would also make it very difficult to make ‘visible’ that which is currently ‘invisible’. Given that my goal was to understand both the positive and negative effects of discourse and its materiality, I also studied ways in which I could conceptualize ‘agency’, ‘resistance’ and ‘transformation’ in the context of this research.

2.2.5 Subjectivity, agency and ethics

Within the contours of this theoretical framework, the effects of power on individual persons, while acknowledged, are not analyzed; rather it is the rationales, structures and processes that make the exercise of power possible that are the focus of the research. That is, the focus of this research is the effects of discourses. By focusing on the effects of discourses the limits of possibility and activity are described, but these limits are not attributed to specific actors, groups or institutions. The operating assumption is that while rationales create hierarchical relationships
between actors, groups and institutions, these relationships are co-constituting, always in flux and multi-directional. This may create tension for researchers interested in exploring the process of subjectification and the effect dominant or popular discourses have on people, and the possibilities for resisting subjectification. But, while genealogy strives to make clear the complicity of each individual in erecting, sustaining or changing existing social relations, it limits analysis of resistance to the subject location. If the subject location is the nexus through which power flows, then it follows that resistance should also be defined similarly.

In contrast to ideological Marxist, many feminist, and anti-hegemonic theoretical frameworks that look at collective models of resistance to effect change, Foucault proposes an ethics that formulates resistance as the ways in which individuals strategically exercise power in specific subject locations. The desire, capacity and intent to resist subjectification are assumed to be an individualized activity which in some ways is external to the individual. To move towards resolving this tension it is important to methodologically focus on the productive uses of power looking both at intended and unintended consequences:

What is required to understand the operation of such technologies, then, is not a counter-theory of the subject, but rather, local analyses of the operation of the concrete assemblages of power. Such analyses are directed toward the fabrication of opportunities for resistance, insofar as they have as their aim the identification of points of weakness in these assemblages, and the possibilities of using force against force in order to change them (Mills, 2003, p. 262).

In the context of this research I have theorized resistance as the process of strategic challenges to the popular form of interdisciplinarity. By strategic, like Foucault, I mean a rationalized choice for an action. This choice is deployed through ethical positioning. I agree with Tamboukou and Ball (2003) who argue that resistance is “about continually interrogating the conditions of our lives, problematizing the stories we are told and those we tell…. It is about attempting to become ‘other’ of what we are already. It is about disowning the ways in which we are spoken, about disidentification” (p. 9). I will theorize that some choices and actions are deployed as overt or covert resistance or challenges to the rationale of the popular form of interdisciplinarity, resulting in its modification. I also theorize that individuals do not have to conceptualize their actions as being a form of resistance for the effects of resistance to be observed. By focusing on the
strategic deployment of discourse I should be able to isolate breaks in the discursive structure of interdisciplinarity. For example, while the discourse of interdisciplinarity in its current popular form has numerous technologies for information sharing and collaboration associated with it, at the same time there are whole new fields emerging for information access control, privacy and confidentiality that function on the premise that information needs to be censored, protected and contained. These countervailing technologies are made possible by the statements that make up the discourse of interdisciplinarity, even though in their creation, the structure of the popular form of the discourse is being eroded. Second, through an exploration of the social relations associated with resisting popular forms of knowledge-making, I explore how subject-positions were negotiated. In the process, I was also able to study how discourse was experienced. The next section outlines how I incorporated a focus on the experiences of individuals occupying subject-positions made possible by the discourse of ‘interdisciplinarity’.

2.2.6 Understanding how discourse is taken up and experienced

To incorporate an experiential perspective in my discourse analysis of interdisciplinarity, I combined the analysis of written texts with verbal texts. As mentioned previously, Foucault did not engage in micro-sociological explorations that involved interviewing, so I looked to the broader community of scholars who draw on Foucault’s writing for guidance.

I discovered that I was not the first to combine interviewing with a Foucauldian discourse analysis. There are many examples of combining phenomenological and ethnographic approaches with discourse analysis in the literature. Most recently, Hodges (2009) studied the emergence and spread of a new form of examination used to assess medical students called the Objective Structured Clinical Examination (OSCE), through an analysis of academic literature, interviews with key informants and institutional data. He compiled an archive of verbal, textual and observational texts from these three sources. In the process, he conceptualized that each source, “literature, key informants and institutions”, were “sites where discursive elements could be located and characterized” including “objects,” “discoursing subjects” and “surfaces of emergence” through which discourses are expressed, reproduced, and reinforced (Hodges, 2009, p. 50). Hodges used interviews for three reasons. First, he was able to link specific subject-positions that operated to produce, reinforce and reproduce the discourses associated with the object “OSCE.” Second, drawing on Dorothy Smith (2004), he was able document instances of agency and resistance that characterize the discursive struggles associated with the OSCE.
Finally, he was also able to reconstruct key historical moments in the development and
distribution of this ‘innovation’ by interviewing individuals intimately involved in the
contceptualization, study and operationalization of the OSCE. Quoting from Foucault, Hodges
notes that using interviews “provided a powerful opportunity to explore each discursive
statement” identified from the literature “in the exact specificity of its occurrence” and to further
ask interviewees to help him “determine its conditions of existence, fix its limits, establish its
correlations with other statements that may be connected with it, and show what other forms of
statements it excludes” (Hodges, 2009, p. 56).

While Hodges primarily conceptualized interviews as another source for indentifying and
delimiting a discourse, Middleton (2003) looked towards interviews as a way to combine an
exploration of how individuals make meaning in their lives with an analysis of how
institutionalized ways of knowing and doing impact their lives. She draws on Foucault’s
description of genealogy as “the union of erudite knowledge and local memories which allows
us to establish a historical knowledge of struggles and to make use of this knowledge tactically
today” found in the Power/Knowledge interviews of the 1970s. That is, she conceptualizes
interviews to constitute ‘local memories’(Middleton, 2003, p. 38). In this, her starting point for
studying the career development of PhD students in education is not different from that of
Hodges, who also looked to interviews as a way to ‘know’ a discursive object. However, unlike
Hodges, Middleton explored the motivations and intentions of her participants, as well as their
feelings and experiences within their professional and personal spheres. By connecting the
professional with the personal, she takes the use of interviews one step further than Hodges. She
conceptualizes interviews as an opportunity to explore not only how one rationalizes choices, but
the social and psychological scope and impact of these choices as individuals make meaning of
their lives. She contends that:

[s]ocial-scientific terms such as ‘race’, ‘class’, and ‘gender’ have entered the
administrative apparatus and the commonsense vocabularies of populations, where they
become reified and assume a life of their own.... Many of the interviewees used the terms
‘class’, ‘gender’, ‘race,’ and so on spontaneously to categorize aspects of their childhood
and later educational experiences.... For many these words were not mere statistical
labels but signified deep phenomenological or psychological meaning. For example,
Simon had taken up sociology of education as an adult student. A postwar baby-boom
child, he spoke of a working class family of socialist views. He related this back to his interest in economics in high school. And, linking further back, he traced threads between his economics at school, his family’s class location and socialist politics and his sense of marginality as a working-class boy in a middle-class school…. Economics—and later, ‘leftist’ sociology—‘hailed’ Simon as ‘insider’ (Middleton, 2003, p. 49).

In the above example, Simon is described as using discourse to create meaning for himself. This process of trying to understand how one’s experiences fit into a broader context -- this process of ‘knowing oneself’ -- is linked to Foucault’s notion of governmentality. Through a number of examples such as the above, Middleton demonstrates how interviewing combined with archival discourse analysis provides a viewpoint for studying the micro-effects of discourse, their circulation and how the formation of subjects is implicated in broader socio-political relationships. It also demonstrates why these types of ‘technologies of self’ are effective. For example, Simon described his highschool years as difficult. These difficulties were linked to feelings of not belonging, of being an outsider. An explanation for these feelings was provided by ‘leftist sociology’, which explained Simon’s working class background as clashing with that of the middle class youth that formed the majority of the school. His understanding of class relations was linked to his decision to pursue doctorate studies. His struggle was thus remembered as both painful and productive.

Similar to Hodges and Middleton, I too conceptualized interviews as a site for discursive struggle offering the opportunity to observe ‘resistance’ and ‘agency’ in the context of a specific subject-position. Similar to Middleton, I also envisioned that I could extend my understanding of the micro-processes linked to interdisciplinarity by asking my participants to think of how their rationales for engaging in collaborative knowledge-making related to their ‘ethics,’ or their broader philosophical position on how to lead their lives. In so doing, I was engaging in a co-construction and re-construction of the experiences of my participants. Sometimes this was received unproblematically and other times it caused tension in the context of the interview.

Judith Butler (2005) describes how she interprets Foucault’s construct of critique as a form of self-questioning that puts the subject into a precarious position:

Thus, if I question the regime of truth, I question too, the regime through which being, and my own ontological status, is allocated. Critique is not merely of a given social
practice or a certain horizon of intelligibility within which practices and institutions appear, it also implies that I come into question for myself. Self-questioning becomes ethical consequence of critique for Foucault…. It also turns out that self-questioning of this sort involved putting oneself at risk, imperiling the very possibility of being recognized by others, since to question the norms of recognition that govern what I might be, to ask what they leave out, what they might be compelled to accommodate, is, in relation to the present regime, to risk unrecognizability as a subject or at least to become an occasion for posing the question of who one is (or can be) and whether or not one is recognizable (p. 23).

Being put into a position to account for oneself in the context of a research interview can be seen as activation of power or an opportunity to give definition to one’s sense of self through strategic deployment of discourse. It can also be seen as a ‘dangerous’ position. That is, a position where as participant you would have to make visible your rationales for acting – i.e. your moral code. This externalization of identity can ‘put participants at risk’ of being recognized or not recognized by the researcher with implications for the way they experience the interaction. This makes the research interview a locus of struggle, where power will flow through both researcher and participant with intended and unintended consequences. I thus theorized that paying attention to how participants reacted to my questions would provide one layer of analysis for how discourse is experienced.

As many of the questions posed in the context of the interview revolved around how participants experienced their activities as knowledge-makers, I also needed a way to conceptualize how relationships of power are experienced more generally by subjects in the context of collaborative knowledge-making. The idea to compare the experiences of neo-liberal subjects to interdisciplined subjects (as I have called them) came to me when the connection between neo-liberal knowledge-economy discourse and positions on interdisciplinarity promoted through policy and institutional texts started emerging in my analysis. Drawing on the work of Walkerdine (2006), I used the concept of border crossing to highlight the internal struggles of interdisciplined/neoliberal subjects engaged in projecting or resisting expectations that they possess psychological capabilities that allow them to be ‘flexible thinkers,’ ‘adaptable’ in different contexts and ‘open’ to change so that they can be ‘good’ and ‘productive’ collaborators. The normalization of this type of psychological and conceptual fluidity was captured in the way
knowledge-makers described their experiences as interdisciplinarians, especially when reflecting on what constituted ‘barriers’ to ‘good’ collaborations and other disappointments they experienced while striving to be interdisciplinary. I also drew on the work of Davies and Bansel (2005) who deconstruct the concept of time and the effects of the current work arrangements of academics on the way they experience their activities. The authors argue that ‘time’ is a marker for changes in the intensification of academic work related to neo-liberal practices. They provide many examples to show that fulfilling current work obligations affects knowledge-makers physically and psychologically. In a similar vein, I looked through my transcripts to ascertain if my participants evoked notions of ‘lack of time’ as a way to express dissatisfaction with their current work requirements. I also looked for evidence of impact in their professional and personal spheres.

The next section shifts the discussion to other methodological issues related to the delimitation of the study, including context, sampling strategies and assemblage of the archive.

2.2.7 Theorizing the social relations of knowledge-production and the issue of context

Studying a discourse at the level of a concept made my archive very large. At first I considered delimiting the archive by choosing a specific context to study the uptake of the concept of ‘interdisciplinarity’. This approach, however, did not appeal to me for two reasons. First, it seemed counterintuitive to choose one context to study a concept which seemed to permeate so many different contexts. Secondly, delimiting the study by choosing a very specific context would arguably obfuscate how the experiences of my participants related to broader socio-political relationships, as they might be drawing on similar local examples to explain their rationales for engaging in the activities that they did. I looked for examples in the broader archive of literature on knowledge-production for inspiration as to how to approach a socio-political exploration of a discursive concept.

In a recent study, Albert and Laberge (2007) studied the growing reliance on systems innovation approaches to optimize the transfer of scientific knowledge into the business sector in the Canadian and Quebec context. Their study did not focus on how science policies change over time but rather explored “why employees from the different levels of the public sector come to adopt a given theoretical model” (Albert & Laberge, 2007, p. 3). They argue that the adoption of
system innovation approaches by Canadian federal agencies and provincial agencies in Quebec had less to do with a proven efficacy of these particular approaches and more to do with the prestige and cultural authority of the proponents of the approach, in this case, the OECD and its epistemic scientific circle, and the governance structure that has evolved to operationalize the approach. Particularly interesting is the cycle of dissemination, studied as an administrative process, but shown to be fundamental in affirming the viability of system innovation approaches and in lending legitimacy to the related policies that have ensued in the last 30 years. Albert and Laberge’s study reframes questions of scientific legitimacy. Drawing on constructivist notions of science, which focus on the ways science legitimacy is constructed through social interaction, their study exemplifies how legitimacy is achieved in part through routine administrative processes that encourage and maintain uncritical conformity to a particular way of thinking or acting. This underlines the point that knowledge-production cannot be conceptualized as a process specific only to the academy or to academics. While institutions of higher learning have a significant part to play, it is through everyday interaction that the social relations of knowledge-production are created and also sustained. As Weingart and Stehr put it,

As social organizations, disciplines participate in and contribute to conflicts over, political, economic, legal, and ethical decisions, over the distribution of resources and life chances. In all these functions, scientific disciplines constitute the modern social order of knowledge, and the order of knowledge is in this sense a political order as well. It is therefore self-evident that it is critical to understand the inner workings of this order, the changes that it undergoes as well as their impact on the society at large (2000, p. xi).

While Albert and Laberge did not employ a Foucauldian approach, the nature of their findings impressed on me the importance of looking at how a notion can achieve mainstream appeal through everyday interactions which are dynamically connected to internal and external administrative processes. I theorized, then, that the identity of any individual faculty member in a given institution is not only a product of the immediate context within which s/he works but a complex blend of ongoing negotiations in academic and the public realms. Acceptance and recognition of peers is realized through the many ways the political, economic, social and cultural intersect with the professional.
Conceptualizing knowledge-production as a social process is an evolving methodological approach. In the sociology of science, for example, there has been a concerted shift from thinking about science in terms of what distinguishes it from non-science (demarcation approaches) to critically exploring the construction of boundaries in science, and showing the several ways in which science and scientific knowledge-production and society are related. Such approaches do not construct science outside of social relations. In contrast, they explore questions of power, patronage and authority linked to science knowledge-production. In other words, science and scientific knowledge are deconstructed and analyzed rhetorically making visible the ideological underpinnings of scientific inquiry (Cozzens & Gieryn, 1990).

A similar shift is also necessary in the way we think of university organization and governance, professional academic development, the functional role of disciplines and their intersections, and especially as we consider how the discursive shift to interdisciplinary knowledge-production impacts all these relations. One way to begin this process is to challenge the conception that knowledge-production needs to be functionally and categorically organized. In many ways, this is already happening in practice to the point that some scholars argue that we have entered a new historical period. As Weingart and Stehr express it:

Observers note a growing pluralism both in locations of knowledge-production and in the patterns of initiation, production, and use of knowledge as well as its disciplinary combinations. These observers suggest that one may have to add a postdisciplinary stage to the predisciplinary stage of the seventeenth and eighteenth centuries and the disciplinary stage of the nineteenth and twentieth centuries (Weingart & Stehr, 2000, p. xii).

The above argument, while significant for capturing the current thrust towards interdisciplinary research, still sees knowledge-production as evolving in a linear way. Under such frameworks, the institutional context is included as either an enabler or barrier to interdisciplinary research. This binary or linear approach to analyzing knowledge-production obscures the myriad ways that producers and consumers resist or modify discursive shifts in knowledge-production, thus creating multiple and messy pathways for progress and development that are coexistent. The coexistence of different conceptual frameworks or rationalizations of knowledge-production can take a range of mutually reinforcing or competitive forms, which are coexistent.
When a more constructivist approach is taken, the boundaries between disciplines can be seen as less important than the process of negotiation that makes the erection of boundaries possible. Julia Thompson Klein argues that “interdisciplinarity and specialization are parallel, mutually reinforcing strategies” making the relationship between disciplinarity and interdisciplinarity a productive one, “characterized by complexity and hybridity” (2000, p. 7). Hybridity is located at the intersections of specialties. Drawing on Gerson (1983), Klein describes these intersections of knowledge-production as a system of negotiating contexts:

Most intersections involve techniques, specialized skills, and instruments. Intersections, though, also occur in interpretive phases, from borrowing vocabulary and ideas to theoretical explanations, such as new groundings of ‘valence’ and ‘gene’ in other disciplines (2000, p. 9).

This makes the analysis of institutional context particularly interesting, not for its role in enabling or erecting barriers to certain types of knowledge-production, but rather as a product of intersections and social negotiations with intended and unintended consequences. Where are such intersections located in the formal governance scheme of universities that are still organized around disciplinary units and activity? I will show that in the most fundamental way they are located within the nexus of individual subject-positions, articulated through job descriptions, faculty or administrative appointments, program or project outlines and other material contours of interdisciplinary knowledge-making. Their geopolitical location is secondary. In other words, as a methodological consideration, institutional context is important; however, the point of reference for defining it must always be vis-à-vis specific subject-positions. That is, there is no one right way, or authentic way, to describe the institutional context, for such description is contingent on how its material contours are experienced. The question then, is not what is the institutional context, but rather how does x, y or z individual faculty member experience institutional life and incorporate its defining contours into his/her activities? Context cannot be erased from considerations of subjectivity. However, while context is a reference point, it was not the pivotal point of departure for analyzing social relations in the context of this research. Similar to Lattuca (2001) I assume that
[o]verstating the influence of context can lead to a deterministic view of faculty life, but
inattention to context conceals faculty agency in negotiating institutional, departmental,
and disciplinary realities (p. 252).

Incorporating experiential processes in the analysis of governmentality then entails two
important elements. The first is an exploration of how the exercise of power can have positive,
neutral and negative effects, and context is important for that, for it will provide a ‘framing’ of
sorts that will give definition to the exercise of power. In other words, I provide contextual
information in this thesis to isolate and describe how discourse is used; the intent behind the
discursive statement is of secondary importance in relation to the consequences of using such
discourses in interaction. For example, the original intent behind a particular wording of a policy
document or a job description was less important for me in this research than the intended or
unintended consequences that such documents, and the discourses contained within, had in
specific social interactions. I thus conceptualized subjectivity as a product of these relationships
that simultaneously creates certain possibilities while negating others.

2.3 Delimiting the study

To study the pervasiveness of a discourse, methodologically I began by looking at
‘interdisciplinarity’ across all disciplines. This was followed with a more detailed exploration of
certain sectors. I began this more focused examination of ‘interdisciplinarity’ from within the
Faculty of Medicine and the Faculty of Engineering at the University of Toronto, and worked my
way out again outwards to other locations and backwards historically to the emergence of
‘interdisciplinarity’ as a popular discourse in Canada. The study is thus delimited chronologically
to the period 1960-2008.

Following my initial broad interdisciplinary literature review, an archive was assembled for
analysis. The archive was comprised of documents from four distinct sources: 1) Academic
writing related to the study of the field of interdisciplinarity, 2) Policy documents and gray
literature (reports, guidelines etc) chosen to show how the discourse of interdisciplinarity relates
to broader socio-political activity institutionally, nationally and internationally, 3) Popular press
and other texts available to the general public (newspaper articles, websites, pamphlets,
advertisements etc.) and 4) Transcripts from 20 semi-structured interviews with faculty and staff
at the University of Toronto. Details about each are provided below in section 2.4.
2.3.1 Choosing the setting

Medicine and engineering are locations where interdisciplinary approaches to research have always been present (Bird, 2001; Kay, 1993; Noble, 1977). As disciplines, they are often grouped together in studies that explore knowledge-production because scholarship in both these epistemic fields is linked to understanding the natural world in order to improve service delivery in the broader community (Connell & Wood, 2002). Current discursive shifts towards a more organized and institutionalized approach to collaborative research are rapidly taking hold in these disciplines. In the field of health research, for example, such is the activity and commitment of funders and scholars that medical schools are being propelled to a status of leaders in the hierarchy of research productivity and output (Geiger, 2004; Geiger & Sa, 2005; Slaughter & Rhoades, 2005). Further, there is significant scholarly collaboration between these two epistemic fields, as evidenced by the number of technological applications directly related to the improvement of health in engineering journals as well as the emergence of formal academic units such as the Department of Biomedical Engineering, that aim at formally bridging these two disciplines. There are a number of identifiable structural institutional changes linked directly to this discursive shift, including the emergence of new extra-departmental units (EDUs) dedicated to both enhancing interdisciplinary research and integrating new knowledge into practice. The type of research pursued involves collaboration that spans the disciplinary gamut and draws on resources from different institutional contexts, including government agencies and community organizations.

In addition to the above reasons, my decision to focus this research on medicine and engineering also relates to my location as a researcher. As mentioned in the introduction, when I began this project as part of my PhD studies at OISE, I was also a Research Fellow in medical education at an EDU developed to enhance health professional education research within the Faculty of Medicine at the University of Toronto. My fellowship was sponsored by the Department of Psychiatry. For my fellowship project, which was separate from my PhD thesis, I employed a sociological approach to explore the interface of science and clinical teaching and to develop mechanisms to improve the integration of new knowledge developed within the Department of Psychiatry into its clinical training programs. I thus had the opportunity to draw on my training in political science and the sociology of education and apply this knowledge to practical questions involving faculty development. This fellowship and the funding for this position were...
made possible by the discourse of ‘interdisciplinarity’ as the Faculty of Medicine, University of Toronto, has taken it up. A Foucauldian approach allowed me to see that I occupied a ‘subject’ position within the discursive field of interdisciplinarity. The applied side of my fellowship dictated that I collaborate with physicians and scientists from a variety of disciplinary backgrounds. Focusing my thesis project within Medicine thus allowed me to examine my own location. In the process, reflections on how I negotiate my own professional identity as an ‘interdisciplined’ subject also served as a guide in assembling and analyzing my archive.

However, studying Medicine posed a challenge because it was a context within which ‘interdisciplinarity’ has a strong hold and where discursive statements that reinforce the dominance of ‘interdisciplinarity’ abound. It was also a setting with which I was familiar and I feared this might obfuscate for me the nuanced way individuals negotiated their identity. For this reason, I also interviewed individuals engaged in interdisciplinary work in Engineering, and individuals appointed to departments in the Faculty of Arts and Science linked to medicine and engineering through the focus of their work or the people with whom they collaborated. Conducting research in contexts within which I was not familiar was intended to problematize my own relationship with the discourse of ‘interdisciplinarity.’

Finally, I also spoke to both non-faculty and faculty administrators to develop a sense of how institutional leaders were reproducing or resisting the interdisciplinary discourse and the effects these activities had on the way the University of Toronto projected its institutional identity.

2.4 Assembling the archive

2.4.1 The archive

Consistent with a Foucauldian approach, understanding the emergence of a particular discursive structure involves creating an ‘archive’ and capturing and analyzing the statements contained within it in order to begin deconstructing the social relations that make these statements possible in a given context. As my interest in interdisciplinarity was an entry point to looking at how discourse shapes the subjectivity of researchers, I did not limit my analysis to written texts as Foucault did, but included verbal texts (semi-structured interviews and fieldnotes).

As noted above, as an organizing principle, I looked at written texts published from 1960s onwards (the period which coincides with the emergence of interdisciplinarity as a popular form
of knowledge-production in many disciplinary fields) unless otherwise prompted during the
course of my interaction with participants. I also reviewed texts written in or translated into
English. There was no geographic delimitation of the texts. It is worth repeating that my archive
was very large. For example, during my preliminary analysis of interdisciplinarity across
disciplines, I reviewed thousands of abstracts of texts employing an interdisciplinary approach,
suggesting ways to enhance interdisciplinary research, explaining the role of interdisciplinary
research, attesting to the challenges of conducting interdisciplinary studies etc. Because of the
size of the archive, I have only been able to draw into the analysis a very small portion of it
relevant to my exploration of interdisciplinarity, the governance of higher education and the
knowledge economy.

2.4.1.1 Written texts

The collection of written texts took place over the course of three years and was ongoing even as
the writing of this thesis was taking place. The interview process also shaped the collection of
texts. For example, prior to interviewing a participant, I reviewed documents pertaining to their
particular professional location such as governance documents, strategic plans, websites, popular
press articles, government reports, and so on to generate a ‘mini-archive’ on each participant.
Specifically, I conducted an Internet search using the participant’s name within the UofT
directory and more broadly on the Internet using the Google search engine. Web pages, articles,
and other information making reference to the participant as well as texts produced by the
participant were read and analyzed prior to the interview to detect dominant and non-dominant
discourses in operation. In addition to the above, participants were also asked to recommend
materials for inclusion in the archive prompted by questions that asked them about texts they
considered influential to their professional or personal development; texts which they have
produced that are considered influential by colleagues and/or peers; and institutional documents
which they consider important either as enabling or creating ‘barriers’ for their work (e.g. job
descriptions, policies, protocols, etc.). The contribution to the archive by participants was
optional, but many participants contributed to the archive, some without being prompted.

2.4.1.2 Verbal texts

Participants for this study were chosen for their discursive relationship to ‘interdisciplinarity’.
They were all affiliated with the University of Toronto and most were connected with the Faculty
of Medicine or the Faculty of Engineering, either through their appointment or through their knowledge-making activities. I defined knowledge-maker to mean anyone engaged in the production of new knowledge. Thus, included in the list of participants were also administrators who did not hold faculty positions but who were involved in research activities either in a supportive capacity, or whose activities impacted the context within which new knowledge was produced. The institutional or professional context of participants varied. Twenty semi-structured interviews 1.5 to two hours each were conducted with academic and non-academic knowledge-makers using a modified life history approach. The interviews were transcribed into text for analysis.

2.4.2 Participant recruitment

I choose the initial 10 participants in consultation with my supervisor on the basis of my preliminary analysis of institutional texts. To identify the initial participants I used the following criteria for inclusion:

1. May have been attached at one point to an interdisciplinary research unit, or EDU unit within the Faculty of Engineering or the Faculty of Medicine, University of Toronto;
2. May have published on a topic related to interdisciplinarity;
3. May self-identify either through research focus or context either as a proponent or an opponent of interdisciplinary research;
4. May have experience with interdisciplinary collaborations;
5. May have experience with administrative processes to enhance interdisciplinary research;
6. May be engaged in knowledge-production outside the university which draws on interdisciplinary discourse and which links back to the Faculty of Engineering or the Faculty of Medicine, University of Toronto.

Subsequent participants were recruited using a combination of snowball and theoretical sampling techniques. All participants interviewed were asked to identify potential candidates who they thought might offer perspective on how interdisciplinarity processes shape professional identity. Almost all of my initial participants made recommendations of potential participants, and so I continued to use a snowballing sampling approach until I reached 20 participants. Periodically, I would seek out specific individuals to offer insight on my evolving understanding of the processes under study. To minimize any potential conflicts of interest during the interview phase,
individuals who had a direct working relationship with my supervisor or myself were not recruited to participate in this study. (Saturation was not an issue, as the goal of the interviews was not to generate a representative analysis of a social phenomenon). As mentioned earlier, the interviews allowed me to probe how academic and non-academic knowledge-makers project their professional identities in relation to popular discourses associated with interdisciplinarity and identify some of the ways the discourses are currently experienced in the context of the UofT.

2.4.3 Interview protocol

Draft questions for the interviews were generated after an initial review of related literature. The questions were grouped in three parts (see Appendix 1). Part 1 asked all participants for demographic and educational experience. Part 2 explored aspects of participant institutional location and specific knowledge-making activity. Each participant was asked a few questions from each of the subheadings in this part. Answers to these questions helped suggest how participant experiences converged and diverged with regard to academic processes currently associated with ‘interdisciplinarity’. Such comparison allowed me to conduct a more nuanced analysis of how context-specific processes (e.g. hiring practices, collaborative research or teaching activities) relate to the ways in which interdisciplinary subject-positions are inscribed. Part 3 was designed to explore aspects of the discursive structure of interdisciplinarity. This allowed me to explore how individuals embrace, ignore or resist the discourse of interdisciplinarity when speaking about valued aspects of professional activity.

As mentioned previously, before each interview, I compiled a mini-archive on each participant. I read and analyzed each archive prior to the interview, leading to additional questions for participants that related directly to the way I perceived their identities projected in the public domain. This process personalized the interview and had a number of unexpected effects. Some participants were flattered that I had spent considerable time getting to know their work and their activity. Others considered this a marker of rigour and were pleased that I was prepared. Some were perplexed by the conclusions I had drawn in the context of my preliminary analysis about the way their professional work is perceived and validated or contradicted my original conclusions. These points in the interview were productive and enlightening for me. At times I became aware of the way I was ‘inscribing’ my participants using the discourse of interdisciplinarity. Some found this reassuring, as they liked to be recognized as ‘collaborators’
and ‘innovators’. Others used these moments to distinguish their ‘true’ identity from the one projected in texts and the internet, with comments such as “I am not really interdisciplinary” or “that was put in the report but it doesn’t really reflect what I do.”

The mini-archive also exposed me to the broader networks of activity of my participants’ activity, which I would not have otherwise come across had I not conducted the archival search. My participants may have not brought up the entire scope of their work in conversation for various reasons. For example, participants used their knowledge-making skills outside the University by participating in various community associations and I came across their names in websites listing memberships or in community newsletters. This information inspired me to ask about their community involvement, allowing participants the opportunity to reflect on how their academic work relates to their community service. Methodologically then, compiling the mini-archive on participants allowed me to develop what I experienced as a strong rapport with participants; to work through issues faster in the course of my interviewing; and to evolve a broader understanding of how knowledge-making activities at UofT intersect with other activities and locations. This textual analysis both contributed to the interviews with 20 participants, but also broadened and deepened the archive database for analysis. Having conducted previous interview-based studies, I am convinced that I would not have otherwise been able to glean similar insights about a social phenomenon from relatively short interviews with only 20 participants (For some demographic descriptors of participants, please see Appendix 2).

2.5 Analysis of the archive

The metaphor I used for myself, when I wanted to resist the familiar and comforting pull of encapsulating thinking in tight well-structured boundaries, was that of painting over an already-painted canvas. Previous thinking, rationales and experiences are like old layers of paint; some of these layers form pictures, others create impressions or stir emotions. In attempting to cover these older layers with paint, I can never truly make them invisible or avoid their impact on my own creation. My strokes cannot be smooth, for the knots of thickened paint from previous compositions will trip my brush and send its bristles troping in unexpected directions. The theoretical assumption I have made in the writing of this thesis is that the texture of the strokes
that caressed the canvas before me will poke through my current composition and will enrich and deepen the colours of my work.

Analysis of the archive began as soon as I started compiling it. Following the initial broad literature review, an analysis of epistemic positions on interdisciplinarity and the discourse structure for what I will call the popular form interdisciplinarity were generated. This constituted the first phase of analysis. The second phase of analysis consisted of a discursive reading of the participant mini-archives prior to each interview and an iterative reading of all interview transcripts and field-notes using the method of meaning condensation (Kvale, 1996).

When reading the interview texts, I was looking specifically to answer the following questions: Are there contextual patterns in the way the discourse has emerged through the experiences of participants and the researcher, drawing attention to institutionalized processes related to knowledge-making? Who are considered dominant voices in the discursive space created by the discourse of interdisciplinarity institutionalized through governance arrangements at the University of Toronto? What types of knowledge-making are foregrounded and which are backgrounded in the current knowledge-making governance arrangements? The third phase consisted of re-reading institutional and interview texts, for the purpose of isolating distinctive experiential information related to how subject-positions are formed and shaped by dominant discourse and how their struggles produce transformation and change.

2.5.1 Limitations of the interview protocol and implications for analysis

As I approached individuals to take part in my study, I became keenly aware of the constitutive power of the study protocols, especially the information sheet and the letter of invitation. One individual, whom I had identified in my search as a potential candidate, and who was also referred to me by several other participants as “a good person to speak to” and “someone who really engages in this interdisciplinary stuff,” called back to refuse participation in the study for the very specific reason that s/he does “not collaborate with others.” The comment was in direct reaction to my use and activation of the discourse of interdisciplinarity as a form of collaborative research production in the letter of recruitment (see Appendix 3). It states:

Have you ever wondered, during the course of your career, why certain types of research are valued over others at any given point in time? I propose to study just that in the
context of today’s push towards collaborative research projects that propose to address strategic problems by drawing on expertise from various disciplines. (Letter of recruitment p. 1)

My attempts at modifying the authorizing tone of the discourse, with my opening question that alluded to the many ways of conducting research, did not succeed in this case because I had projected a very clear delineation of what constituted interdisciplinary research in the sentence that followed with the phrase, “today’s push towards collaborative research projects.”

I was also made aware, especially during the interviews, that there was a shared understanding amongst participants of an ideal type ‘interdisciplinarian’, in the Weberian sense, which I could also see projected in much of the policy and gray literature (reports, strategic plans, etc.) of the University, as well as the forms participants used to secure funding. This was taken into consideration in the analysis of the transcripts. Finally, to compensate for a skewing effect of a self-selecting sample, I specifically sought out a couple of participants whose identities were very much rooted in non-main-stream projections of interdisciplinarity.

2.6 Ethical considerations

This research was reviewed and received ethics approval by the University of Toronto Research Ethics Board in June 2007 (renewed in 2008, 2009 and 2010).

I made the methodological decision to openly refer to the University of Toronto as the institution under study. To do otherwise would have compromised my analysis of how institutional governance arrangements are impacted by popular discourses and broader socio-political and economic considerations. UofT is easily distinguished in the Canadian setting by its size and breadth of programming. Many of the policies under review are unique to the University of Toronto. For this reason, it would have been impossible to disguise the identity of the University without eliminating key policies from the archive. I did, however, limit the document analysis to public domain policy and gray literature produced by the UofT which were easily accessible online. Accordingly, I received administrative consent to undertake the study at UofT from the office of Vice President and Provost and the office of the Vice President Human Resources and Equity.
In contrast, I decided to protect the identities of my participants by presenting their life experiences in a way that did not completely locate them. Participants were informed about the nature of the study and their participation, assuring them that they could refuse to answer any question and could withdraw at any time from the study with no negative consequences. They were also informed that they might contact the ethics review office if they had questions about their rights as participants. Participants were assured that no value judgments would be placed on their responses and that they would have the opportunity to request a copy of the summary of results of the study. All identities were kept in confidence; that is, participants were not identified by name in the analysis and dissemination of the study results, and care was taken in the presentation of the results such that participant identities were not revealed in the context of describing their work circumstances. However, given the nature of the study, it was necessary to reveal some information related to the places at which participants work. For example, reference to the University of Toronto and the Faculties of Medicine and Engineering were made as well as the specific departments or research units, but not in ways that link specific participants to specific units. Both of these Faculties have a combined faculty that numbers in the thousands, which helped to keep participant identities confidential.

While texts authored by participants were incorporated in the analysis of the archive and used to make sense of the social phenomenon under study, these texts were never referred to as belonging to or having been authored by a specific participant in the presentation of the results. There are texts included in the bibliography that have been authored by University of Toronto faculty, but no direct association with participants is to be attributed, as individuals who took part in the study did not author the majority of these texts. On a couple of occasions I have included seminal texts that have been authored by participants, but only after receiving their explicit permission and their assurance that they did not mind if they are recognized through this text.

2.7 Summary

My objective for this research was not to study the “internal configuration” or “secret contradictions” of interdisciplinarity, although these were made visible in the process of my analysis. Rather, as Foucault suggested, I examined what discursive statements make up interdisciplinarity
long enough to ask myself what unities they form; by what right they can claim a field that specifies them in space and a continuity that individualizes them in time; according to what laws they are formed; against the background of which discursive events they stand out; and whether they are not, in their accepted and quasi-institutional individuality, ultimately the surface effect of more firmly grounded unities (Foucault, 2006a, p. 29).

I then followed this discursive analysis with a critical reading of the intended and unintended consequences of exercising power in this space in order explore how those in various subject-positions experienced their location. As my interest was also to make visible the various ways subjectivity could be affected by organizational processes, I also explored organizational practices and their material effects. Specifically, I combined my discourse analysis of written texts with semi-structured interviews with 20 knowledge-makers. Following a broad exploration of interdisciplinarity across disciplines, I focused the study on medicine and engineering and I explored the experiences of knowledge-makers within the Faculties of Medicine and Engineering who I theorized would be most closely aligned with the popularized discourse of interdisciplinarity. I then worked my way outward again to other locations within UofT, speaking to individuals trained and working in disciplines outside medicine and engineering in an effort to incorporate reflexivity into my analysis.
Chapter 3
The social relations of epistemic positions on interdisciplinarity

3 Introduction

As Salter and Hearn argue, “a study of interdisciplinarity could, quite conceivably, encompass most aspects of the production, authorization and organization of knowledge” (Salter & Hearn, 1996, p. 8). While such a study is beyond the scope of this work, this chapter will indeed focus in an analytical way on how collaborative knowledge-production is currently epistemically authorized. In other words, I use this chapter to explore how ontology (theories about what can be known about the world) and epistemology (theories about how we can know the world) are implicated in the social relations that perpetuate contemporary rationales for interdisciplinary knowledge-making. In order to do this I problematize the role of the ‘literature review’ in my writing.

The process of conducting a ‘literature review’ can typically serve a number of purposes. It can serve to summarize what is known about a particular topic (including debates and tensions amongst scholars), the degree of importance ascribed to a topic by the epistemic community, the approaches taken to study the given topic (i.e. the theories, methodologies and methods applied to the topic) and aspects of the topic that have yet to be studied, pointing thus to opportunities for future research and ‘novel epistemic contributions’. A review of the literature often precedes a description of the rationale or justification for engaging in a particular course of inquiry and helps delimit the research findings presented. The ‘literature review’ also allows scholars to link their own research, theories, and opinions of a given topic to a broader epistemic community, engage in debate and critique and/or advocate for change. Finally, in the context of professionalization, a review of the literature demonstrates to members of the scholarly community that a scholar has ‘mastery’ of a topic.

From a Foucauldian perspective, the ‘literature review,’ as described above, can function as a regulatory technology in academic knowledge-making. It can discipline academic inquiry to a pursuit of ‘new’ or ‘relevant’ knowledge as a way to document progress. It can serve to reinforce and reify normalized approaches to knowledge-making by forcing scholars to ‘fit’ their work to the ‘key debates’ or to ‘extend’ what is known of a given topic in order to get published. The
process can also serve to reproduce the discourse of ‘expertise’ through a routine academic activity that includes demonstrating knowledge of a field and positioning oneself within the field.

What role then should a ‘literature review’ chapter play in research that deconstructs contemporary knowledge-making practices? I use this section of the thesis as a way to interrogate how the epistemic community engaged with studying interdisciplinarity has historically contributed to the development or perpetuation of specific forms of interdisciplinarity. I also explore the theoretical choices of scholars who are considered ‘authorities’ or ‘experts’ in the field of interdisciplinarity and how these theoretical positions relate to their working definitions of what constitutes interdisciplinary research.

As discussed in the previous chapter, methodologically speaking, it was not useful to study ‘interdisciplinarity’ simply as a formal body of knowledge or discipline (connaissance). For this reason I use this chapter to introduce how epistemic positions on interdisciplinarity relate more broadly to the social relations that make possible the idea that one can approach knowledge-production in an interdisciplinary way (savoir). I group all academic interdisciplinary activity loosely together at the level of discursive concept--that is, the idea that one can pursue interdisciplinary research and the rationales and processes that make possible the idea. Taking this broad approach allows me also to determine overlaps between specific interdisciplinary locations.

During the initial exploration of my archive, I analyzed academic literature looking for congruence and divergence amongst rationales for engaging in interdisciplinary activity in a breadth of disciplines and fields such as women’s studies, environmental studies, rhetoric, humanities, civil engineering, psychiatry, education, sociology and economics among others. It immediately became clear that the similarities and differences amongst positions related to differences in the ontological orientation of the authors or the disciplines they were writing about. While this point might seem almost not worth mentioning, its implications are broad. In contemporary knowledge-making activities, an expert is expected to have the capacity to harness understanding of a given field and use this understanding to solve ‘relevant’ and ‘important’ problems. However, when ontological debates, tensions and differences are foregrounded, the notion of who counts as an ‘expert’ is not only decided by who knows more about a given subject, but also about how the expert has come to know something about a given topic. In this
chapter, I will argue that the theoretical underpinnings of the discourse of ‘interdisciplinarity’ are a product of struggle and are reflective of the broader politics of “what is knowledge,” “how can we know” and “who gets to decide what is worth knowing.”

Specifically, a brief exploration of the politics of classifications will frame a discussion of epistemic debates and tensions regarding defining and classifying interdisciplinary activity. A discussion of how OECD positions on interdisciplinarity relate to these epistemic debates, and the implications of this association will follow. The analysis of the links between epistemic positions on interdisciplinarity and the broader social relations of contemporary knowledge-making will continue throughout the remainder of this thesis.

3.1 The politics of classifications

Foucault prefaces his book *The Order of Things* with a taxonomy he encountered in a short story written by Jorge Luis Borges, which “shattered…all the familiar landmarks” of his thinking—that is, the thinking through which we have came to know about life and the living (2002, p. xvi). The passage which caught Foucault’s attention is supposedly excerpted from a Chinese encyclopedia that divides animals into:

a) belonging to the Emperor, b) embalmed, c) tame, d) sucking pigs, e) sirens f) fabulous, 
g) innumerable, h) drawn with a very fine camelhair brush, i) et cetera, j) having just broken a flower vase, k) those that from a long way off look like flies (2002, p. xvi).

This example is used by Foucault to demonstrate how the “charm of another system of thought” makes visible the “limitations of our own, the stark impossibility of thinking that” (2002, p. xvi). For Foucault, Borges’ classification allows him to question the ontology behind the classification of life and living organisms, including humans as generated in his own socio-historical context. It is the beginning of his critique of the ‘life sciences’ in western knowledge-making and the delimitations of human possibility created through epistemic activity in these fields. Drawing on Ancient Greek philosophers, he argues that the science of classification is fundamentally

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3 While Borges’ taxonomy is considered fiction by some, Tu Youxiang argues that it is “partly verifiable and partly fiction” and is linked to the “ancient Chinese idea about the myriad of things” which stipulates “that the natural order of things can not be put into any pre-established taxonomy, and even though an artificial classification system is imposed on things, it will eventually return to the entirety of the natural order, the Hun Dun (Chaos)” (2007, pp. 310-311).
different than the science of mathematics, or the representation of natural laws such as in mathematics. As Foucault writes:

[U]nderstood in the strict sense, mathesis is a science of equalities, and therefore of attributions and judgments; it is the science of truth. Taxinomia on the other hand treats of identities and differences; it is the science of articulations and classifications; it is the knowledge of beings. [T]axinomia establishes the table of visible differences…treats of signs in their spatial simultaneity, as a syntax…. In relation to mathesis, taxinomia functions as an ontology confronted by an apophantics…. It defines, then, the general law of beings, and at the same time the conditions under which it is possible to know them (2002, pp. 81-82).

In other words, taxonomies rest on assertions; that is, statements about the objects under study that carry embedded assumptions about what can be known and how it can be known, but which are nevertheless portrayed as natural or self-evident. Taxonomies then, according to Foucault, are inherently political. They are also linked to discourses in that they help create the epistemic conditions for the application and reproduction of truth statements about life and living. The most basic assertion underlying this method of classification as applied in contemporary scientific work is that organisms can be classified and separated through the application of “empirically observable and measureable characteristics.” While taxonomies are generally used in the biological sciences, “taxonomic methods” have been and continue to be “employed in many disciplines” by scholars who accept and work under the assumption that ontologically “objects have empirically observable and measurable characteristics” (K. Smith, 2002, p. 381).

This ontological assumption is very different than that underlying other forms of classification (such as typologies) prevalent in academia, particularly in the social sciences. In the social sciences, typologies are generally used to classify ideas, processes, social groups and policies. Elman notes (2005) that a variety of labels have been used to describe typologies in general on the basis of their function, including: extreme, polar, ideal, pure, empirical, classificatory, descriptive, constructed, and heuristic. In fact, the proliferation of typological work in the social and natural sciences have led scholars to consider ways to develop typologies of typologies (Elman, 2005, p. 295). The critique of typologies from proponents of taxonomies is that the categories of classification used in typologies are “neither exhaustive nor mutually exclusive, are
often based on arbitrary or ad hoc criteria, are descriptive rather than explanatory or predictive, and are frequently subject to the problem of reification” (K. Smith, 2002, p. 381). Kevin Smith (2002), for example, argues that the key characteristic of a typology is that its “dimensions represent concepts rather than empirical cases and are based on the notion of an ideal type” in the Weberian sense (2002, p. 381). This critique articulated by Smith, while projected as applicable to all typologies, in fact centres on one particular type. The critique was launched as a way to articulate a “better” way for classifying policies--namely a taxonomic approach. The debates around best practices with regard to classification demonstrate the inherently political negotiations taking place amongst scholars. Typologies and taxonomies both carry the potential of ‘ordering’ activity and social processes; in other words, they have a materiality. However, current hierarchies of knowledge place more ‘value’ on the explanatory capacity of classification systems. Thus critics of typologies often construct their critique from an ontological and epistemological position that posits that both natural and social phenomena can be measured with some accuracy. Authors of typologies that respond to such critiques will place effort in establishing the usefulness of the typology. In the process, they adopt techniques and processes used to measure and control rather than describe and understand. The same holds true for critiques of taxonomic approaches. In other words, different positions about how to organize knowledge of objects, processes, organisms and nature are a product of negotiation and thus when deconstructed, can reveal the social relations that made them possible.

How does Foucault’s critique of systems of classification such as taxonomies and typologies help us discuss the savoir of interdisciplinarity? Because interdisciplinarity is a process of knowing, definitions and typologies of interdisciplinarity are an entry point for understanding how we have come to think that engaging in interdisciplinary activity is possible. It is also a way to document what is currently possible when the discourse of interdisciplinarity is activated in a given context. Drawing on Burke, Julie Thompson Klein (1990) makes a similar acknowledgement:

Any nomenclature, Kenneth Burke once pointed out, acts as a “terministic screen” that filters, directs, and redirects attention in certain directions rather than others. Thus terminology is not only a reflection of reality but, by its very nature, also a selection and a deflection of reality. Much of what we take to be observations about reality may well be the “spinning out of possibilities implicit in our particular choice of terms” (1990, pp. 55-56, emphasis in original).
With the above comment, Klein, who has made a career out of studying, classifying, defining and articulating the value and effects of interdisciplinary scholarship, speaks reflexively of the politics implicit in the scholarly work in which she is engaging. The problematization of the classification processes engaged by scholars such as Klein in the context of studying interdisciplinarity serves to make visible the possibilities and limitations of certain definitions of interdisciplinarity. The epistemic negotiations within the field of interdisciplinarity are also reflected in the debates around typologies and taxonomies. Twenty years after she made the above statement, Klein (2010) writes:

Taxonomies classify entities according to similarities and differences, whether they are animal species, artistic genres, or medical symptoms. Since the late nineteenth and twentieth centuries, taxonomies of knowledge in the Western intellectual tradition have been dominated by a system of disciplinarity that demarcates domains of specialized inquiry. Over the later half of the last century, though, the system was supplemented and challenged by an increasing number of interdisciplinary activities. This proliferation gave rise, in turn, to new taxonomies that registered expansion of the genus interdisciplinarity, propelled by new species of integration, collaboration, complexity, critique, and problem solving…. This chapter distinguishes Multidisciplinarity and Interdisciplinarity (ID) then describes the species Methodological ID and Theoretical ID, Bridge Building and Restructuring, Instrumental ID and Critical ID. After that, it defines major trend lines in the current heightened momentum for Transdisciplinarity and closes with the most recent typologies and reflections on the problem of taxonomy (p. 15).

In the above excerpt, Klein positions herself as an expert in interpreting the field of interdisciplinarity and with the above work, an actor in constructing the demarcations of the field through engaging in systematic classification not only of interdisciplinary scholarship but through a meta-analysis of the typologies and taxonomies of other scholars. She also uses the terms typology and taxonomy interchangeably, which may be seen as a rhetorical device to harness the legitimating effects associated with taxonomic approaches as opposed to typological approaches in the context of boundary work. That is, she may be demarcating the knowledge domain that should be associated with interdisciplinary studies (Cozzens & Gieryn, 1990; Klein, 1996).
The remaining sections of this chapter introduce some of the politics of classification by describing ways in which scholars have approached the issue of definition, discussing differences in classification approaches and deconstructing some of the social relations linked to making sense of the ‘genus’ interdisciplinarity.

3.2 The politics of ambiguity: Should we, could we, would we define interdisciplinarity?

Defining interdisciplinarity has been a preoccupation of scholars from the 1970s onwards from a variety of disciplines. Epistemic differences are highlighted implicitly throughout this section through identification of the scholarly backgrounds of the various authors cited. While there is broad congruence about some aspects of interdisciplinarity, generally speaking, the topic of definition is still being discussed by scholars across epistemic domains. The proliferation of interdisciplinary scholarship of recent years has also made the definition of this form of knowledge-making a preoccupation of funding agencies, institutions and scholars who wish to operationalize interdisciplinarity in research as well as appropriately value and promote ‘worthy’ interdisciplinary activity (Huutoniemi, Klein, Bruun & Hukkinen, 2010, p. 79).

The projected desire/need to define interdisciplinarity can be contrasted with scholarly positions which focus on understanding interdisciplinarity in context, for exploring the politics and materiality of interdisciplinarity, or studying who gets to define what is interdisciplinary and how we can account for the popularity of some forms of interdisciplinary scholarship over others. This thesis is engaged in the latter form of inquiry.

Discussions about how to define interdisciplinarity often begin with reference to how difficult it is to actually do so. The claim may be made that the difficulties are related to ambiguity, or to complexity. Nevertheless, efforts to define interdisciplinary knowledge-making persist despite the fact that “decades-long scholarly work on the concept” has not yielded an “interdisciplinary indicator” which is generally accepted (Huutoniemi et al., 2010, p. 79).

Geoffrey Bennington, a writer in modern French thought (1998), claims that linguistically, the term itself is ambiguous and thus can mean several things. In his words:

‘Inter’ is an ambiguous prefix, which can mean forming a communication between and joining together, as in ‘international’ and ‘intercourse’, or separating and keeping apart,
as in ‘interval’ and ‘intercalate’. This ambiguity is partly reflected in the slipperiness of the term, ‘interdisciplinary’. It can suggest forging connections across the different disciplines; but it can also mean establishing a kind of undisciplined space in the interstices between disciplines, or even attempting to transcend disciplinary boundaries altogether (as found in Moran, 2002, p. 15).

The dominant reaction to the issue of ‘ambiguity’ with regard to what makes something interdisciplinary is the argument that a lack of effort to agree on definitions and attributes allows the term to be used for too many different process and activities, making it almost devoid of meaning (Dogan & Pahre, 1990). Apologists for this position agree that defining and outlining the characteristics of interdisciplinarity is not easy. However, despite the inherent difficulties, they promote the need and urgency for doing both in order to effectively capitalize on the potential that interdisciplinary perspectives offer. This perspective can be seen in the following excerpt from an article authored by Kyle Whitfield, in the field 4 of planning and Collen Reid and associates, working in the field of environmental studies. They state:

Population health has a strong interdisciplinary foundation, representing such disciplines as epidemiology, medicine, nursing, psychology, biostatistics, biology, environmental studies, women’s studies, planning and so on…. Defining interdisciplinarity is not an easy task, and clearly outlining its characteristics is equally difficult…. Both the literature and our experiences suggest that too many people are promoting interdisciplinary public health research (IPHR) without addressing even the most basic conundrums involved in attempting to do it…. [W]e identified the need for population health researchers and the CIHR to be more deliberate in their approaches to IPHR by strategically and meaningfully embracing the disciplines involved, thus furthering our knowledge in health and human issues and ultimately leading to improved outcomes in health research (Whitfield & Reid, 2004, pp. 434, 436)

4 The terms discipline and field are part of contemporary classification systems used to connote a hierarchy with regard to degree of organization, coherence and legitimacy associated with specific bodies of knowledge. Sometimes the terms are used interchangeably and sometimes disciplines are distinguished from fields as having greater internal coherence in terms of focus, approaches and practices. Unless otherwise specified, I use the term ‘field’ in this thesis generally to refer to a knowledge area/domain and not to distinguish this knowledge area/domain from a discipline or to connote a degree or level of internal organization or coherence. For a discussion on the differentiation of knowledge into disciplines and the implication for interdisciplinarity see Weingart (2010).
The above example illustrates how the debate about definition/classification is internalized by an interdisciplinary knowledge domain: population health research. Researchers in this field draw upon epistemic domains commonly grouped as life sciences, with a couple of social science fields also drawn into the mix (women’s studies and environmental studies). The authors acknowledge that to date the field has primarily responded to the solution of problems by bringing different expertise together to solve population health problems (i.e. instrumental interdisciplinarity), but argue that for the field to evolve, it must work towards ‘conceptual interdisciplinarity’, that is, the integration of a number of perspectives. And in order to do this, the field would need to contend with disciplinary politics, hierarchies, and so on. According to the above authors, who are also proponents of developing good classification systems, clarification on what is interdisciplinary research, its unique features, and identification of the different potentials embedded in doing certain forms of interdisciplinarity, could allow individuals, groups and whole fields to systematically ‘progress’. They suggest that ambiguity around the term interdisciplinarity, if it exists, should not be tolerated. An underlying assumption of this position is that the spectrum of interdisciplinarity has directionality and that when this assumption is also linked to notions of progress, the classification approach applied to the spectrum becomes value laden. This involves some forms of interdisciplinarity being constructed as more representative of ‘progress’ than others.

Also contending with the issue of ambiguity, the arguments is made that, as a term, ‘interdisciplinary’ is a catch-all for anyone disgruntled with disciplinary rigidity. This position can be seen in the following statement made by Robert Frank located in English Literature:

‘Interdisciplinary’ has something to please everyone. Its base, discipline, is hoary and antiseptic; its prefix, inter, is hairy and friendly. Unlike fields, with their mud, cows, and corn, the Latinate discipline comes encased in stainless steel: it suggests something rigorous, aggressive, hazardous to master; Inter hints that knowledge is a warm, mutually developing, consultative thing (1988, p. 100).

Frank’s not too subtle critique of the disciplines and their preoccupation with methodology and rigour is contrasted with a liberating and feel-good experience with working outside the boundaries of the ‘stainless steel’ encasing of disciplines. In his writing, he deliberately attributes a metaphorical personality to interdisciplinarity’s ambiguity. Ambiguity in this excerpt is a good
place to be in. The process of generating new knowledge is “warmed” up. Ambiguity is not stifling but provides productive tension to loosen creativity—it is “a mutually developing, consultative thing.” However, for Frank this also makes the term impossible to define, or devoid of meaning: “if it has something to please everyone.” But positions that claim interdisciplinarity cannot be defined are continually resisted. For example Klein (1996), from the humanities/interdisciplinary studies, argues that

> the problem is not that the word is devoid of meaning. It is replete with meaning—conflicting meaning. The concept is plural, because the idea of interactions between disciplines involves differing tasks on numerous human and categorical levels. These differences surface in disputes over terminology…. At one end, instrumentalism posits interdisciplinarity as an empirical problem. At the other end, epistemology posits interdisciplinarity as a theoretical problem (p. 10).

The issue raised by Klein suggests contextualizing interdisciplinarity across two dimensions: what it is used for and how to engage in it. While this position does not preclude forms of interdisciplinarity which challenge the authority of disciplines, it also does not explicitly draw attention to these politics.

Critical theoretical approaches, which incorporate praxis in their epistemology, are employed by individuals who occupy the subject-position of an interdisciplinarian who choose to work outside disciplinary boundaries as a form of protest, activism or critique. As Elizabeth Bird, with a background in sociology and women’s studies, notes, “interdisciplinarity was part of a radical politics…. There was hostility towards the established disciplines…[and] there was an excitement about how the politics of gender and interdisciplinary work was creating new knowledge” (2001, pp. 467, 470). Definitions or classifications that do not capture this form of interdisciplinarity inadvertently or intentionally pass judgment on the merits of engaging in research that is overtly political. This point is also made in Tripp and Muzzin’s (2005) introduction to a collection of writings by feminist scientists and social scientists. Their authors agree on the importance of bridging conceptual divides through interdisciplinary scholarship in order to bring attention to issues and problems that are otherwise marginalized or neglected. However, Tripp and Muzzin argue that while it is possible to draw parallel conclusions in social science and scientific fields on equity and environmental issues, for example, very few single
authors can develop the expertise to bridge the divide between the social and the scientific in their projects. This they attribute to “academe’s tradition in dividing knowledge” and creating distinct pathways for education and professionalization along these divisions. They also suggest that “indigenous knowledge scholars are located at a place where the social and the scientific are not divided and so their contributions are models for bridging this divide” (2005, p. 17). This argument implicitly critiques Klein’s division between instrumental and epistemological forms of interdisciplinarity. For Tripp and Muzzin, ontological starting points affect rationales for engaging in interdisciplinarity, the methodological choices linked to these rationales and the capacity of the scholars to fulfill their projected rationales. In other words, much of the debate about definitions of interdisciplinarity can be seen to be a proxy for a much deeper issue, which has been attributed to Eurocentric ontological blinders by many scholars (Haraway, 1988; Harding, 1988, 1992). That is, the scientific, natural, rational and objective are continuously constructed in opposition to the hermeneutical, emotional, spiritual and subjective. Tripp and Muzzin’s observations raise the following question: how can scholars come to a consensus about interdisciplinarity when their scholarship is constructed within ontological frames which by default perpetuate fragmenting and dividing practices?

Considering how difficult it has been to evolve definitions of interdisciplinarity that resonate broadly, the ambiguity of the term could also be perceived as a positive phenomenon, for it allows scholars the freedom to imagine different ways of engaging in knowledge-production without having to conform to a legitimized, and delimiting, classification. Lattuca, working in the field of higher education, builds on this notion by offering the following explanation as to why it is difficult and perhaps unnecessary to agree on a definition. As she expresses it:

Interdisciplinarity has been hard to define because it takes on so many guises and because it is a moving target that responds to expansions and contractions in the disciplines themselves. Grounded definitions of interdisciplinary scholarship enhance our understanding of interdisciplinary scholarship because they capture interdisciplinarity in practice. And, since practices evolve, our understandings of interdisciplinarity must also evolve over time (2001, p. 261).

Lattuca thus tropes the discussion away from ambiguity and towards fluidity. Her position suggests that the term interdisciplinarity can and should mean different things to different people
and in different contexts. This would serve as an invitation to scholars that conversations about definitions should not be avoided, but thoroughly negotiated in practice and on an ongoing basis.

Newell, in the field of interdisciplinary studies, tries to reconcile the opposing camps around definition. In the following excerpt, he describes how the debates about interdisciplinarity are taken up in the context of the Association for Integrative Studies in the USA:

There has always been a faction of members [of the Association for Integrative Studies] who caution against definitional closure for interdisciplinarity on the grounds that settling on any definition excludes as well as includes; they prefer to let a thousand flowers bloom. Arrayed on the other side of the of the debate have been members seeking credibility for interdisciplinary studies through conceptual clarity and, ultimately, through standards for judging its quality (2001, p. 6).

Newell then goes on to advocate for a theory of interdisciplinarity that “offers conceptual clarity while embracing a wide diversity of approaches” premised on the structure and behaviour of complex systems. He acknowledges that creating a theory of interdisciplinarity will necessitate excluding some positions but argues that these exclusions “emerge naturally from the epistemology of interdisciplinarity” (Newell, 2001, p. 6). Newell’s assertion that there is a ‘natural way’ of including or excluding certain forms of knowledge-making under the umbrella term interdisciplinary, in contrast to critical scholars, constructs the process of theoretical consensus building as neutral. As a result, the politics of knowledge-production are not addressed, because according to Newell, the diversity of perspectives he proposes to bring together, are united in a single epistemology of interdisciplinarity.

Peter Weingart and Nico Stehr, both working in sociology, reframe the problem of definition and focus on the social relations linked to interdisciplinarity. They assert that in years past, interdisciplinarity was somewhat “eclipsed” and that now it has “re-emerged as a pervasive term,” popular in both science and policy contexts because it “has become a label almost synonymous with creativity and progress, signaling reform and modernization in science and scientific institutions” (2000, p. 1). Weingart and Stehr note that today in some settings, “the desired and the real developments of interdisciplinary research are almost unanimously taken to be superior to the traditional disciplinary pursuit of knowledge-production” without there being evidence to support these claims. (2000, p. 1). Therefore, tracing the emergence of
interdisciplinarity as a popularized form of knowledge-making might ground, as Lattuca suggests, but also problematize the epistemological tensions referred to by Klein, Tripp and Muzzin (and to some extent Newell) which occur when scholars from different disciplines try to agree on a single definition of interdisciplinarity or attempt to reconcile divergent understandings of interdisciplinarity. Weingart and Stehr’s observation urges us to go beyond discussions of definition to explorations of politics and negotiations. Accordingly, the next section explores the politics of classifications in the context of studying interdisciplinarity.

3.3 The politics of clarity: Tracing the emergence of contemporary definitions of interdisciplinarity

3.3.1 Typologies of interdisciplinarity

Some discussions of interdisciplinarity trace the term back to antiquity while others claim interdisciplinarity can only be discussed after the advent of disciplines. The latter argument is based on the idea that it was only recently that the need to counter the focused and specialized approaches to knowledge-making brought in by disciplinary organizational structures arose (Lattuca, 2001, p. 4). Lattuca identifies the social reforms of the 1960s as especially important in the way interdisciplinarity has emerged in contemporary knowledge-making. Her focus on social reforms foregrounds interdisciplinary approaches which strove to transform disciplinary boundaries or which openly challenged the authority of disciplines to define what could and should be studied. Klein (1990), on the other hand, also traces the emergence of contemporary interest in interdisciplinarity to the 1960s, but foregrounds the importance of the Organization for Economic Cooperation and Development (OECD) in influencing the way interdisciplinarity was ultimately popularized in contemporary knowledge-making. Klein states:

Identification of interdisciplinarity with reforms of the sixties and seventies is so strong that many people are inclined to associate the very concept of interdisciplinarity with that remarkable era…. During this period general awareness of interdisciplinarity was heightened by major funding…. It was, however, the OECD that was to have the greatest influence on how the concept is currently defined (1990, pp. 35-36).

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5 In Chapter Six I will show how OECD is intimately implicated more broadly in the dissemination, reproduction and reinforcement of globalization and neoliberal knowledge economy discourses. In this chapter, I will introduce the organization’s role in establishing the popularity of one particular definition of interdisciplinarity.
As Klein describes, in the late 1960s, the OECD’s Centre for Educational Research and Innovation (CERI) organized “the first international investigation of the concept of interdisciplinarity” based on a survey\(^6\) of member states (Klein, 1990, p. 36). Following this study, a seminar on interdisciplinarity and the problems of teaching and research in universities was organized by CERI in collaboration with the French Ministry of Education in 1970. The results of the survey and the papers delivered in this seminar were subsequently published in 1972 in a book entitled *Interdisciplinarity. Problems of Teaching and Research in Universities* (OECD, 1972). Klein, writing in 1990, argues that the appearance of this OECD book influenced markedly the contemporary international uptake of interdisciplinarity:

> It was a “preliminary balance sheet.” a “working tool” that did indeed become “the starting point for new thought and action.” Even now, this book remains the most widely cited reference on the subject of interdisciplinarity because it “channeled” hitherto sporadic, dispersed discussions of interdisciplinarity. Across the disciplines, teachers and scholars began reflecting on their own interdisciplinary activities aided by a new theoretical framework and typology of definitions for “multidisciplinary.” “pluridisciplinary.” “interdisciplinary” and “transdisciplinary” work (1990, pp. 36-37).

William Mayville had earlier remarked on the influence of the OECD on what scholars, funding agencies and institutions understood as constituting interdisciplinary scholarship in interdisciplinary studies. He noted that the OECD “definitions frequently have provided the nucleus for subsequent definitions of these terms” (1978, p. 9).

As Table 3.1 shows, the OECD definition of interdisciplinarity is part of a typology of knowledge-making describing disciplinary interactions. This definition preserves the integrity of the role of disciplines in organizing and managing knowledge-production. It also affirms the importance of expertise without making an explicit prerequisite that interdisciplinary research needs to be collaborative in nature. This however, poses difficulties for individuals who cross disciplinary boundaries for the purpose of engendering breadth in their perspective, as breadth is

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\(^6\) Canada was one of the countries which participated in the survey, submitting a total of 19 questionnaires. Six of these were returned by faculty engaged in or coordinating interdisciplinary programs in the Faculty of Arts and Science at the University of Toronto, namely G. Paysant, D. H. Pimlott, B. Brainerd, D. B. King, W. R. C. Harvey, and J. Lemon.
often equated with superficiality. (This point will be addressed directly in Chapter 8 which explores participant experiences with interdisciplinarity.)

**Table 3.1: 1972 OECD typology of knowledge-making**

<table>
<thead>
<tr>
<th>Type</th>
<th>Definition</th>
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<tbody>
<tr>
<td><strong>Discipline</strong></td>
<td>A specific body of teachable knowledge with its own background of education, training, procedures, methods and content areas</td>
</tr>
<tr>
<td><strong>Multidisciplinary</strong></td>
<td>Juxtaposition of various disciplines sometimes with no apparent connection</td>
</tr>
<tr>
<td><strong>Pluridisciplinary</strong></td>
<td>Juxtaposition of disciplines assumed to be connected</td>
</tr>
<tr>
<td><strong>Interdisciplinary</strong></td>
<td>Interaction between two or more different disciplines…ranging from simple communication of ideas to the mutual integration of organizing concepts, methodology, procedures, epistemology, terminology data etc</td>
</tr>
<tr>
<td><strong>Transdisciplinary</strong></td>
<td>Establishing a common system of axioms for a set of disciplines</td>
</tr>
</tbody>
</table>

(reproduced from: OECD, 1972)

It also does not explicitly acknowledge the perspectives of interdisciplinarians who advocate for transformation or change in the way knowledge-making is organized or who do not believe in the unity of science and knowing.

Later in the decade, following a 1976-78 survey of relationships between the university and the community in their member countries and a 1980 international conference on the subject, the OECD expanded its classification of knowledge-making. Klein summarized the conclusions derived from this body of OECD work:

The OECD concluded there is increased demand for interdisciplinarity outside the university. As a result, they surmised, *interdisciplinarity exogenous to the university* must now be given more weight. Exogenous interdisciplinarity originates in the continuous momentum provided by “real” problems of the community, enriching and interrogating *endogenous university interdisciplinarity*, which is based on the production of new knowledge with the aim more or less explicit, of realizing unity of science (1990, pp. 37-38, emphasis in original).
The OECD’s 1982 reformulation of what constitutes interdisciplinarity and the importance placed on exogenous forms in effect challenged the authority of higher education institutions to set the agenda for contemporary knowledge-making. (This point will be further substantiated in Chapter 6.) Employing the rationale that universities can only fulfill their social mission by addressing “real” problems in the local, national and international “community” within which they operate, the OECD used the definition of exogenous interdisciplinarity to critique the disciplines on the basis of the artificial demarcations they apply to social issues (Centre for Educational Research and Innovation, 1982; Klein, 1996).

Since the publication of the OECD definition of interdisciplinarity, scholars from different fields have begun their process of making sense of the field of interdisciplinary studies by indicating how interdisciplinarity relates to disciplinary studies, often locating themselves explicitly or implicitly vis-à-vis the OECD definition. For example, Sabine Massen, a sociologist, consistent with the OECD definition and writing from the perspective of science studies, argues that “interdisciplinarity…is primarily a matter of preparing the grounds for communication among a variety of specialized discourses to occur” (Massen, 2000, p. 177). Massen thus implicitly aligns herself with the OECD premise that the pivotal point of departure for interdisciplinarity is disciplinary interaction.

A similar orientation to the OECD can be seen in the work of Klein. In 1990, Klein made the following observation:

> Interdisciplinarity is usually defined in one of four ways: 1. By example, to designate what form it assumes; 2. By motivation, to explain why it takes place; 3. By principles of interaction, to demonstrate the process of how disciplines interact; and 4. By terminological hierarchy, to distinguish levels of integration by using specific labels (Klein, 1990, p. 55).

All four dimensions cited by Klein are present in the OECD definition. Also implicit in the above cited statement is an acknowledgement that interdisciplinarity and disciplinarity are interdependent. Thus, while Klein does not explicitly label the OECD definition as her starting point, a large part of her epistemic activity has revolved around clarifying and consolidating the OECD definition of interdisciplinarity. I have summarized this effort in Tables 3.2-3.4.
Table 3.2 summarizes Klein’s perceptions of the field of interdisciplinarity as organized thematically in terms of disciplinary interaction. Organizing her review of the literature this way also serves to make visible and to clarify the diverse terminology that has emerged as scholars engage in epistemic discussions about what constitutes interdisciplinarity. Table 3.2 provides a snapshot of a spectrum of this diverse and broad activity, much as my analysis in the previous section of the lack of consensus around definitions of interdisciplinarity revealed. Within this spectrum, OECD positions are clearly encompassed (as in the notion of degrees of interaction with disciplines articulated in rows 1 and 2 labeled limited/transitory and borrowing) as well as in row three which describes interdisciplinarity as problem solving (capturing thus the OECD version of exogenous interdisciplinarity). The unity of science philosophy which is also part of the original OECD typology is reflected in rows 3 and 4. Klein’s representation, however, is a

### Table 3.2: Klein’s 1990 classification of different kinds of epistemic interaction

<table>
<thead>
<tr>
<th>Type of Interaction</th>
<th>Terminology used in literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited or Transitory</td>
<td><strong>Multidisciplinarity</strong>/ <strong>Crossdisciplinarity</strong>/ <strong>Indiscriminate interdisciplinarity</strong> (additive not integrative juxtaposition of disciplines – disciplines neither changed or enriched through limited and transitory interactions)</td>
</tr>
</tbody>
</table>
| Borrowing | **pseudo interdisciplinarity** (borrowing of analytical tools)  
**auxiliary interdisciplinarity** (borrowing of disciplinary methods)  
**linear interdisciplinarity** (one discipline “legalized” by a law belonging to another discipline)  
**method interdisciplinarity** (methods that can be used by other disciplines)  
**concept interdisciplinarity** (model/concept supplements model/concept in other discipline) |
| Solving problems | **composite interdisciplinarity** (instrumental solution of a problem)  
**restrictive interdisciplinarity** (restricted interactions of disciplines focused on concrete object)  
**problem interdisciplinarity** (addressing complex problems not answerable by a discipline) |
| Increased consistency of subjects or methods | **supplementary interdisciplinarity** (partial overlapping of disciplines of similar fields, usually in borderline areas of a discipline)  
**unifying interdisciplinarity** (increased consistency in subject matter i.e. biology reached subject matter of physics creating biophysics)  
**border interdisciplinarity of interdisciplinarity of neighboring disciplines** (two disciplines that have approached each other to the extent that an overlapping area is created – both disciplines can contribute to new area but do not have sufficient concepts, methods, tools to do so alone) |
| The emergence of an interdiscipline | **Unifying interdisciplinarity and structural interdisciplinarity** (interactions leading to the creation of a new body of laws forming the basic structure of an original discipline) |
| Dialectical synthesis | **Transdisciplinary, Nondisciplinary, Metadisciplinary, Supra-disciplinary, Omnidisciplinary, Trans-specialization** (transcending the dynamics of a dialectical synthesis to grasp the total dynamics of reality as a whole) |
| Antidisciplinary | **Antidisciplinary, Critical interdisciplinarity, Transdisciplinarity, Integrative interdisciplinarity** (terms denoting a starting point that is scornful of disciplines and is focused on overturning disciplinary hegemony) |

(adapted from: Klein, 1990, pp. 64-67 and 106)
much more sophisticated reading of academic positions than reflected in the original OECD category of transdisciplinarity. In the last row, Klein also represents anti-disciplinary positions; however, unlike in my analysis, only their opposition to disciplinary organization is highlighted. In the process the varying starting points of critical and radical interdisciplinary scholarship are not foregrounded. The reader assumes that disciplinary critique is all encompassing, and the situated political projects (including degrees of interaction with disciplinary scholarship) of critical interdisciplinarians are obfuscated in the process.

In Table 3.3, Klein’s typology of interdisciplinarity categorizes gradations of epistemic integration, and also works to further clarify and delimit the OECD definition of interdisciplinarity. Here the spectrum is described in terms of degrees of integration between scholars from different epistemic positions. Arguably, implicit in this typology is progression towards “unity” and “simplicity” of knowledge. Thus while complexity motivates integration, the goal is to achieve “simplicity.”

Table 3.3: Klein’s gradations of epistemic integration

<table>
<thead>
<tr>
<th>Type</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Instrumental Interdisciplinarity</em></td>
<td>Bridging epistemic fields</td>
</tr>
<tr>
<td><em>Epistemological Interdisciplinarity</em></td>
<td>Restructuring a former approach to defining a field</td>
</tr>
<tr>
<td><em>Transdisciplinarity</em></td>
<td>Movement towards coherence, unity &amp; simplicity of knowledge</td>
</tr>
</tbody>
</table>

(adapted from: Klein, 1996)

The process of working towards integration can thus be theorized as a consensus building process. In this typology, perspectives that assume that there are multiple ways for pursuing integration are not adequately or effectively represented.

Finally, in Table 3.4, Klein’s position on how to classify interdisciplinary knowledge by intellectual aim is recognizable as a reproduction of the OECD 1980 definition. In this classification, academic work is presented in terms of a binary – knowledge-making in the service of society versus knowledge-making in pursuit of enlightenment (represented here as a normative goal of achieving unity of science). Exogenous Interdisciplinarity speaks to academic approaches from both the left and the right, which are inspired by contemporary problems and
issues. Problem solving is incorporated into methodology. While the goals can be different, the ultimate purpose of this type of interdisciplinarity is performative; that is, to make knowledge-makers accountable to their ‘stakeholders’. What are not captured in this typology are the struggles associated with identifying and pursuing what are the “real” problems of society. Who are the ‘stakeholders’ and who gets to define what problems are worth pursuing?

Table 3.4: Klein’s classification of interdisciplinary knowledge by intellectual aim

<table>
<thead>
<tr>
<th>Type</th>
<th>Aim</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exogenous Interdisciplinarity</strong></td>
<td>Knowledge-making that addresses the “real” problems of society and the demand that universities perform their full social mission</td>
</tr>
<tr>
<td><strong>Endogenous Interdisciplinarity</strong></td>
<td>Knowledge-making that aims to realize the unity of science</td>
</tr>
</tbody>
</table>

(adapted from: Klein, 1996)

Klein’s typologies can be used interchangeably to classify and distinguish between forms of interdisciplinary scholarship as they are all mutually reinforcing. This is exemplified in the following statement by Aram working in the field of interdisciplinary studies (2004). Aram made this statement in the context of engaging with the literature on interdisciplinarit more broadly as a way to frame his research. He says:

Accepting that interdisciplinarians aspire to create knowledge, questions remain, first, about persons’ definitions of interdisciplinairty in terms of the depth of integration of the disciplines, second, about the extent they seek to create endogenous versus exogenous knowledge, and third about whether the type of knowledge one seeks to create is codifiable and generalizable in the sense that ‘publicness’ is inherent in its status as knowledge (2004, p. 385).

Applying Klein’s typologies to make sense of interdisciplinary studies allows one to answer all of Aram’s questions embedded in the above statement. However, Aram argues, classifications and definitions, which use disciplinarity as a starting point (and he uses a definition from Klein
and Newell to describe the field of interdisciplinary studies to make this point⁷) “appear to shy away from making knowledge-claims for interdisciplinarity” (p. 381). He goes on to ask the following questions:

Is it left to the disciplines to generate knowledge or “insights” while interdisciplinary work aspires solely to develop a comprehensive perspective? (2004, p. 381)

Aram’s questions highlight the materiality associated with foregrounding certain forms of interdisciplinarity over others. If the OECD definition and Klein’s typologies of interdisciplinarity represent mainstream thinking in the field of interdisciplinarity, work conducted by scholars who do not identify with any one discipline, or who operate from a position which aims at critiquing disciplinary organization would not be included or considered.

However, there are a number of ways to relate back to the OECD definition that do not involve completely reproducing its logic. For example, Moran, writing from a cultural history perspective, notes:

We cannot understand interdisciplinarity without first examining the existing disciplines, since interdisciplinary approaches are always an engagement with them and the modes of knowledge that they exclude by virtue of their separation from each other…. [I]nterdisciplinarity interlocks with the concerns of epistemology – the study of knowledge – and tends to be centred around problems and issues that cannot be addressed or solved within the existing disciplines, rather than the quest for an all-inclusive synthesis (Moran, 2002, pp. 2, 15).

While affirming a role for disciplines in any consideration of what constitutes interdisciplinarity, Moran here implicitly critiques the OECD typology, which rests on the assumption that all knowledge-making is mutually reinforcing and aims towards a unity of science. Moran rests his definition of interdisciplinarity on the assumption that organized knowledge-making sets boundaries through its organizational structure, which are by necessity delimited. Hence a process has evolved, namely interdisciplinarity, which works outside of disciplinary

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⁷ The Klein and Newell definition cited by Aram is: “a process of answering a question, solving a problem, or addressing a topic too broad or complex to be dealt with adequately by a single discipline or profession…. Interdisciplinary Studies draws on disciplinary perspectives and integrates their insight through construction of a more comprehensive perspective” (Aram, 2004, p. 382)
delimitations and carries the torch of creativity and innovation. But Moran’s definition does not address the hierarchies of knowledge-production and the role interdisciplinarity has in critiquing dominant forms of knowledge-making.

This critique is, however, made by other scholars. For example, Salter and Hearn begin by identifying what they think is the most common way of speaking of interdisciplinarity:

The study of interdisciplinarity is thought to be the study of the scholarly and institutional relationships among various branches or fields of knowledge and an exploration of how these fields might be brought together when the subject matter or the intellectual or political project of the researcher demands it (1996, pp. 10-11).

They position their definition in direct contradiction to what I have identified as the mainstream position, which is very closely associated with the 1972 OECD typology, because the OECD version fails to problematize why intellectual divisions are created and sustained in the first place. Salter and Hearn argue that an examination of interdisciplinary research requires an “exploration of the emergence and status of knowledge and of the relationships between various kinds of knowledge” and for this reason they “have chosen to view interdisciplinarity as reflecting any challenge to the limitations or premises of the prevailing organization of knowledge or its representation in an institutionally recognized form” (1996, pp. 10, 43).

Thus, when Salter and Hearn’s summary of their perception of the key debates surrounding interdisciplinarity are tabulated across ontological and epistemological differences (see Table 3.5), an interesting distinction between Klein and Salter and Hearn’s work appears. While Klein (Tables 3.2-3.4) and Salter and Hearn (Table 3.5) both summarize the key scholarly debates regarding what constitutes interdisciplinarity, they project a different sense of the field. Tables 3.2-3.4 (Klein’s typologies) revolve around three assumptions: that interaction between disciplines contributes to the “unity of science”; that anti-disciplinary and critical positions are concerned primarily with critiquing and overthrowing disciplinary organization but are not concerned with issues of epistemic interaction or integration; and that working towards fulfilling
Table 3.5: Salter and Hearn’s classification of debates about interdisciplinarity

<table>
<thead>
<tr>
<th></th>
<th>Instrumental interdisciplinarity</th>
<th>Conceptual Interdisciplinarity</th>
<th>Transdisciplinarity</th>
<th>Critical Interdisciplinarity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrumental interdisciplinarity as problem solving</td>
<td>Interdisciplinarity dependent on disciplinarity</td>
<td>Interdisciplinarity as a challenge to disciplinarity</td>
<td>Transdisciplinarity</td>
<td>Critical Interdisciplinarity</td>
</tr>
<tr>
<td><strong>Description of Activity</strong></td>
<td>Borrowing across disciplines dictated by specific problem (relevant to government and/or industry)</td>
<td>Interdisciplinary field as form of specialization – selective integration within disciplines</td>
<td>Search for unified realm of knowledge (epistemological unity)</td>
<td>Strategy of inquiry taking into account content, form and processes of knowledge/education – without reification of knowledge – striving for freedom of inquiry, innovation and integration</td>
</tr>
<tr>
<td><strong>View on Disciplinarity</strong></td>
<td>Supportive of disciplinary organization – but no overall synthesis of concepts or analyses is attempted</td>
<td>Supportive of disciplinary organization - Disciplines considered interdependent for checks on validity</td>
<td>Profound opposition to disciplinarity - desire to comprehend each discipline from perspective of suprascientific search for meaning</td>
<td>Profound opposition to disciplinarity - quest for transformative knowledge since transdisciplinarity has failed</td>
</tr>
<tr>
<td><strong>View on Specialization</strong></td>
<td>Specialization perceived as conduit for interdisciplinarity</td>
<td>Specialization perceived as necessary for achieving competence</td>
<td>Specialization seen as fragmentation and distraction from real social concerns/human thought</td>
<td>Specialization seen as fragmentation and both cause and effect of dislocation of human existence</td>
</tr>
<tr>
<td><strong>Key Characteristics</strong></td>
<td>Researchers do not have to have competence in other specialties in order to engage in this form of interdisciplinarity</td>
<td>Reciprocity between disciplines cultivated (staying current, borrowing responsibly) - Multimodality believed necessary to address complex problems</td>
<td>Researchers’ critique of disciplinary control of knowledge as linked with politics and power that maintain status quo</td>
<td>Researchers critique viewpoints that hold knowledge as an “object” of learning-residing between disciplines which can be acquired by assimilation</td>
</tr>
<tr>
<td><strong>Proponents</strong></td>
<td>Pilet, Berger, Sinaceur</td>
<td>Campbell, Klein</td>
<td>Kockelmans</td>
<td>Gusdorf, Kroker, Kavaloski</td>
</tr>
</tbody>
</table>

(adapted from: Salter & Hearn, 1996, pp. 30-37)

Society’s mission is distinct from engaging in intellectual goals of synthesizing epistemic positions. Salter and Hearn in Table 3.5, also incorporated distinctions based on the degree of interaction and integration of epistemic starting points. They list two forms of interdisciplinarity, one focused on problem solving and the other forming new disciplines, both of which are
supportive of disciplinary organization. They also list two forms of challenges to disciplinarity: transdisciplinary searches for epistemological unity beyond disciplines; and critical interdisciplinarity that replaces the search for meaning with a quest for transformative knowledge. According to Salter and Hearn’s summary, critique of disciplinary organization does not preclude engaging in epistemic efforts to synthesize different epistemic positions or to conceptually engage in fulfilling society’s mission. Transdisciplinarity, in Salter and Hearn’s framework, is conceptualized as a critique of disciplinary administration of knowledge-making, for the unity of science makes disciplinary divisions unnecessary.

A third reformulation of the OECD and other mainstream interpretations of interdisciplinarity is presented by Lattuca (2001). Lattuca’s typology of forms of interdisciplinary scholarship (see Table 3.6) emerges from grouping scholarship on an ontological/epistemological basis.

**Table 3.6: Lattuca's typology of interdisciplinarity**

<table>
<thead>
<tr>
<th>Type of scholarship</th>
<th>Teaching</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informed Disciplinarily</td>
<td>Disciplinary course informed by other discipline(s)</td>
<td>Disciplinary questions requiring outreach to other discipline(s)</td>
</tr>
<tr>
<td>Synthetic Interdisciplinarity</td>
<td>Courses that link disciplines</td>
<td>Questions that link disciplines</td>
</tr>
<tr>
<td>Transdisciplinarity</td>
<td>Courses that cross disciplines</td>
<td>Questions that cross disciplines</td>
</tr>
<tr>
<td>Conceptual Interdisciplinarity</td>
<td>Courses without a compelling disciplinary basis</td>
<td>Questions without a compelling disciplinary basis</td>
</tr>
</tbody>
</table>

(reproduced from: Lattuca, 2001, p. 81)

In Column 2 – Teaching, Lattuca acknowledges the current dominant role of disciplinary organization by differentiating between types of interdisciplinarity in terms of how they relate back to disciplines in order to construct learning objectives and course curricula. For example, while what she calls informed disciplinarity involves teaching a discipline informed by other disciplines, synthetic interdisciplinarity makes links between disciplines, transdisciplinarity crosses disciplines and conceptual interdisciplinarity does not refer to disciplines. However, Column 3- Research in the typology reflects on forms of interdisciplinary research categorized on the types of questions pursued. As a result, different ontological and epistemological positions on how to generate knowledge are incorporated without foregrounding one form as more central.
than the other. Lattuca’s typology speaks to Aram’s concern that mainstream categorizations of interdisciplinary activity put disciplinary scholars metaphorically in control of setting the research agenda for interdisciplinarians by demarcating what they are willing and comfortable researching within the boundaries of disciplinary research activity. Lattuca’s typology, on the other hand, suggests that scholars will ask questions from their respective ontological positions. Unity of science is not assumed nor projected as an imperative. And this distinguishes Lattuca’s typology from the OECD definition. Academic curiosity and stakeholder interests are both incorporated. In Lattuca’s formulation the form the research question takes will dictate the epistemology employed. In the process the scholar can chose to work within or outside disciplinary organization.

Lattuca’s typology does not foreground the politics of interdisciplinarity in the same way that Salter and Hearn’s typology does. For example, Salter and Hearn’s category of critical interdisciplinarity is subsumed in Lattuca’s category conceptual interdisciplinarity. Conceptual interdisciplinarity assumes that certain questions cannot be answered in the current organizational configuration of disciplines, so that the starting point of scholars will not have a “compelling disciplinary basis.” However, that is not the same as saying that all these scholars are in opposition to disciplinary organization and are working towards dismantling hegemonic epistemic processes. In this way, Lattuca incorporates a post-structuralist reading of power, and as a result, disciplines are not theorized as necessarily hegemonic; interdisciplinarians are presumed to strategically use mainstream discourses related to expertise, knowledge, and rigour, to progress their own interdisciplinary agenda.

The fourth and final example a typology of interdisciplinarity examined here is the Mode 1 and Mode 2 knowledge-production distinction articulated by Gibbons et al. (1994). This typology does not specifically claim to classify interdisciplinary activity, but it does implicitly relate to the OECD and Klein categories of endogenous and exogenous interdisciplinarity. Gibbons and colleagues (bringing together expertise from the epistemic fields of science policy, public policy, sociology, political science and education) describe a shift in the organization of knowledge-production, which they label Mode 2, to distinguish it from what they perceive to be a previously dominant form, Mode 1. Mode 2 has not replaced Mode 1 they argue but rather has developed outside of and in parallel to Mode 1. Table 3.7 summarizes the differences between Mode 2 and Mode 1. Gibbons et al.’s classification of contemporary knowledge-production shifts discussion
away from the unity of science debate to pragmatic considerations related to the organization of knowledge-production and the role it plays in various sectors.

Table 3.7: Gibbons et al’s typology of contemporary scientific knowledge-production

<table>
<thead>
<tr>
<th>Form of knowledge-production</th>
<th>MODE 1 – Modern Scientists</th>
<th>MODE 2 – Knowledge Producers/Practitioners</th>
</tr>
</thead>
<tbody>
<tr>
<td>A complex of Newtonian inspired ideas, methods, values, norms – that has spread to other fields of enquiry. Compliance with what is considered sound scientific practice is enforced.</td>
<td>Practiced by a wider (than Mode 1) and more temporary, heterogeneous set of practitioners collaborating on a problem defined in a specific and localized context governed by a distinct set of cognitive and social practices.</td>
<td></td>
</tr>
<tr>
<td>Problems are set and solved in a context governed by the largely academic interests of a specific community or discipline</td>
<td>Knowledge is carried out in a context of application since knowledge is intended to be useful to e.g. industry, government, society etc.</td>
<td></td>
</tr>
<tr>
<td>Disciplinary</td>
<td>Transdisciplinary</td>
<td></td>
</tr>
<tr>
<td>Characterized by homogeneity</td>
<td>Characterized by heterogeneity</td>
<td></td>
</tr>
<tr>
<td>Is hierarchical and tends to preserve its form</td>
<td>Is heterarchical and transient</td>
<td></td>
</tr>
<tr>
<td>Accountable to academically constructed rules of practice</td>
<td>More socially accountable and reflexive than Mode 1</td>
<td></td>
</tr>
</tbody>
</table>

(Adapted from: Gibbons et al., 1994)

Resembling the modified OECD definition of interdisciplinarity, Mode 2 knowledge-production brings the ‘social’ closer to knowledge-production. It explicitly describes problem solving that is applied and context-specific. Knowledge practitioners evolve in situ a distinct but evolving framework to guide the problem solving effort. The framework used in Mode 2 research is integrated so that it cannot be easily reduced to disciplinary parts. A contribution to knowledge is made but not necessarily to disciplinary knowledge. The results of this form of knowledge-making are communicated to those who have participated in the research during the course of that participation. On the other hand, Mode 2 transdisciplinarity is described by Gibbons et al. as a dynamic problem solving process which generates discovery without necessarily building on previous or future discoveries (1994, pp. 4-5).

Gibbons and colleagues use the Mode 1 and Mode 2 typology to argue that knowledge-making is increasingly becoming diffused with consequences for the way the academic sector is supported,
valued and applied. In their model, all the variations of disciplinary interaction and integration, which other scholars have used to describe different forms of interdisciplinarity, are collapsed. The core distinguishing feature between collaborative forms of knowledge-making in the Gibbons et al. typology is the context within which the scholarship is evolved and the goals of the research. Interdisciplinarity that is not grounded in context specific inquiry for the purpose of serving a specific community other than the scientific community would fall under Mode 1 production. This distinguishes the category of Mode 2 knowledge-making from the exogenous research category in the previous typologies discussed, as it does not make the assumption that disciplinary methodological approaches and markers of rigour will frame the research process.

3.3.2 The construction of the OECD definition

The above discussion was intended to serve two purposes. It has described and summarized the key debates related to defining and classifying interdisciplinarity, and it has identified some of the key voices in these epistemic debates. This section will continue drawing out the political implications of these debates by looking more closely at how the OECD definition was generated. It is theoretically important that the OECD’s definition as constructed makes visible the social relations of knowledge-making that marginalize ‘radical’ or ‘critical’ forms of interdisciplinarity in policy making forums.

The OECD influential volume which contains the typology that has provided the “nucleus for subsequent definitions of these terms” opens with the following introductory disclaimer:

The following study of the problems of interdisciplinarity in higher education makes no claim whatsoever to be exhaustive or systematic. It is based upon limited and relatively arbitrary information:

- limited in that it is valid only for the countries involved in the OECD, and in fact we do not have information for all of them, only 12 countries have supplied information;

- arbitrary, in that this survey…did not cover all the universities which it would have been useful to contact (OECD, 1972, p. 23).

How can we reconcile the above disclaimer made by the authors of this study with the reported influence the book had on interdisciplinary efforts around the world as described by Klein and
Mayville? At the very least, we are reminded of how little rigour there can be in the take up of our knowledge-making activities. However, there is another rationale worth exploring in the context of this thesis, namely that social relations make some definitions more powerful than others. How is it possible that the OECD can have an epistemic opinion on how interdisciplinarity should be conceptualized? To answer this question it is first necessary to explore how the organization of the OECD facilitates the construction of ‘expertise’.

The OECD grew out of the Organization for European Co-operation (OECC), which was established with support from the United States and Canada to oversee the implementation of the Marshall Plan for the reconstruction of Europe following the second world war (OECD, 2008c). The OECD took over from the OECC in 1961 and was established as an economic counterpart to the North American Treaty Organization (NATO). Thirty member countries constitute the OECD. It is interesting to note that all of the Group of Eight countries (major industrialized states), with the exception of Russia, are OECD members. There are two basic criteria for membership in the OECD: “commitment to a market economy and a pluralistic democracy” (OECD, 2008e, p. 8). Sharman (2005), drawing on Escobar (1995), describes the constitutive effects of having membership in this organization:

> Its membership roll is a conventional measure of which countries have ‘arrived’, in terms of being credited with the status of *developed* rather than developing nation and joining the club of the most *advanced* and *prosperous* states (my emphasis, p. 6).

The OECD thus plays a significant role in defining what constitutes ‘progress’, ‘success’ and ‘excellence’ in a variety of economic, social, cultural and political processes with implications for institutions within the states that hold OECD membership as well as the people that make up these states. Developing categories of subjectification such as developed/underdeveloped, advanced/basic, prosperous/poor is a dividing practice which serves to reinforce the activity of those states that qualify as ‘developed’, ‘advanced’ and ‘prosperous,’ with OECD membership. The process is facilitated by the way the organization is set up.

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8 The 30 countries that currently make up the OECD are: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom and the United States.
The OECD is funded through national contributions by its member countries. The contributions are based on a formula that takes account of the size of each member’s economy. The largest contributor is the United States, which provides nearly 24% of the budget, followed by Japan (OECD, 2010). Organizationally, the OECD Council is made up of one representative of each member country and a representative of the European Commission. The Council determines priorities and sets the agenda of operations. A number of studies have shown that the influence that specific national governments exert over the OECD is reflective of the general power position the country holds in international politics (Porter & Webb, 2007, p. 4). The OECD Secretariat, made up of “2500 staff, including about 700 economists, lawyers, scientists and other professionals,” fulfills the work mandated by the Council (OECD, 2008e, pp. 11-12). Agenda setting thus is a political process and an opportunity for powerful states to influence the topics researched. The predominance of professional economists amongst the Secretariat staff is reflective of the importance member states place on the type of knowledge produced by the discipline of economics, with implications for the way recommendations are substantiated, articulated and applied. Jim McNeill, who once worked as an OECD environmental official, has made the following analogy: “the OECD is to classical economics what St. Peter is to Christianity. I mean, it’s the keeper of the keys” (cited in Porter & Webb, 2007, p. 2). The OECD’s commitment to liberal economic ideas and the methodologies that generate these ideas is another way in which the organization’s activities serve to delimit what is possible.

The Secretariat staff are mainly based in a dozen substantive directorates, set up to conduct research and analysis in key fields, including economics, education, employment and labour, the environment, tax policy and administration, trade and agriculture, science, technology and industry, etc. The mandate of the organization is to promote economic growth and development in countries around the world. More specifically, it provides a forum through which] member states work together to address the economic, social and governance challenges of globalization as well as to exploit its opportunities…where governments can compare policy experiences, seek answers to common problems, identify good practice and co-ordinate domestic and international policies…where peer pressure can act as a powerful incentive to improve policy and which produces internationally-agreed instruments, decisions and recommendations in areas where
multilateral agreement is necessary for individual countries to make progress (2008e, p. 7).

This commitment to harmonize economic and social policy is not limited to member states alone. Throughout its existence, the OECD has promoted ‘best practice’ on a breadth of issues and has encouraged non-member states to subscribe to the formal treaties and agreements it implements.

It is worth noting the manner in which the organization pursues its mandate. ‘Peer pressure’ and ‘surveillance’, terms used by the OECD to describe its approach, are key features of governmentality as described by Foucault (2008) and these technologies are intimately linked to rationalizations validated by ‘expert’ knowledge. The operations of the OECD facilitate the “production, accumulation, circulation and functioning” (Gordon, 1980, p. 93) of dominant discourses strategically deployed by the West to safeguard their power and location within the world economy. There is a large bureaucratic enterprise developed to promote the knowledge-making activity that authorizes the OECD to perform surveillance but also to apply peer pressure on powerful autonomous states to comply with ‘best practices’ on economic and social policies. The organization describes how this process works:

Mutual examination by governments, multilateral surveillance and a peer review process through which the performance of individual countries is monitored by their peers, all carried out at committee-level, are at the heart of our effectiveness (OECD, 2008f, par. 3).

The process is well established and warrants further analysis. Given the scope of its operations, the OECD has been referred to as “a think tank, a monitoring agency, a rich man's club and an unacademic university,” but the organization holds that none of these terms fully reflects what the OECD does (OECD, 2008e, abstract). Sharman (2005) argues that the influence of the OECD rests in large part on the particular identity it has projected since its creation as that of an impartial, apolitical technocratic institution (p. 2). The intellectual work undertaken by the OECD secretariat constitutes the knowledge-making activities of the organization and are closely linked with policy-making initiatives:
The OECD’s way of working consists of a highly effective process that begins with data collection and analysis and moves on to collective discussion of policy, then decision-making and implementation (OECD, 2008e, p. 13).

The data collected and analyzed is in large part made available to governments, academic institutions and the general public in paper or electronic format. Currently, the OECD describes itself as one of the world’s largest publishers in the fields of economic and public policy, producing 250 new titles a year as “one of the world’s largest and most reliable sources of comparable statistics, and economic and social data” on member and non-member countries (OECD, 2008a, par. 2). Its publications are widely cited and regularly used in government reports and academic research produced within institutions of higher learning. The authority of the organization to make truth claims is such that the statistical interpretations of the complex economic, social and political phenomena that the OECD studies are rarely “checked” through replicating studies.

Because of the large scientific enterprise operated by the OECD, the organization is often perceived as a highly technical research organization with little significance for world politics (Porter & Webb, 2007). Yet, scholars working to make explicit the social relations within which the OECD operates, argue that the OECD in fact “orchestrates” global governance knowledge networks that influence the way states project their national identity (Porter & Webb, 2007; Sharman, 2005). More explicitly:

The knowledge produced in these networks is not just a summation of data and lessons from the past, but also a guide to future directions in the reproduction and development of the practices that shape an increasingly harmonized global political and economic system. It also involves the ongoing development of a sense of identity for members as it develops policy prescriptions appropriate for liberal-democratic countries that see themselves as world leaders, and the aspirations of member states (and some non-member states) to that identity gives the OECD considerable influence despite its lack of formal powers (Porter & Webb, 2007, p. 1).

OECD countries become a category of analysis for comparative studies looking at geopolitics, economic development, socio-cultural differences amongst states, etc. While membership in the OECD is exclusive, access to OECD research, policy recommendations and best practices is very
accessible to academics, policy-makers, students, and the public at large. For example, when the University of Toronto library system is searched with the term OECD, close to 5000 titles appear. Access to OECD publications, newsletters and press releases is also freely available online for the UofT academic and student community through the organization’s website. Sharing of information in this context helps build the authority of the OECD. The more its research is cited, the more its reputation and the influence it exerts on policy-making increases. The huge technological apparatus which comprises the OECD is set up to collect, database, analyze and disseminate information on the attitudes, behaviours and actions of the populations that make up each member state.

Member states submit to this form of scrutiny and analysis willingly. Consistent with Foucault’s observations of contemporary political arrangements, member states of the OECD willingly adopt self-regulatory practices on the unproblematic assumption that committing to an objectification exercise of their experiences and activity will yield solutions that will benefit all member states equally, and potentially non-member states also. Thus OECD member states share information with the collective membership, often making transparent and thus taking responsibility for their failings, by working to achieve the ‘ideals’ projected in the OECD policy documents. In this configuration of power relations, states operate as geographic delimiters for statistical analysis in a similar way that individual bodies became constructed as discrete units of analysis by states. It is worth reiterating here that the resulting material effect of this activity is an obfuscation of difference and a stifling of the imagination with regard to what constitutes prosperity, well-being and success\(^9\). The assumption that the policy directives developed through this process are generalizable to the whole membership is rationalized on the democratic ideals of voluntary participation and consensus building.

\(^9\) For example, I find myself challenged to come up with an example of a currently accepted ‘successful’ state that does not incorporate the ideals promoted through OECD literature; such is the pervasiveness of this discourse. Arguably, Margaret Thatcher’s much quoted statement from the 1990s, “there is no alternative” to neoliberal economic policies (commonly referred to as the TINA syndrome), has taken on contours of a syndrome with symptoms of inertia and a sense of inability to develop attitudes and engage in routines and practices that go against the status quo.
3.3.3 How OECD organizational processes contribute to the construction of a mainstream definition of interdisciplinarity

To this point, I have established claims of influence associated with OECD publications. But how is it possible that a definition promoted from a single study has endured and continues to underlie contemporary rationales of interdisciplinarity?

The 1972 book referred to above was a product of an international effort, organized through a forum invested in promoting global economic policies of mutual benefit to member states. The Organization’s mandate assumes that since member states are committed to supporting and sustaining a global ‘market economy’ and are invested in adhering to the ideals of a ‘pluralistic democracy,’ they will productively harmonize social and economic policy on many levels through democratic processes. This assumption is validated with every study completed by the OECD, which relies on consensus building and collaboration to accomplish its work. While state-specific differences are often cited within OECD studies, overarching policy directions are abstracted from context-specific considerations, diversity is smoothed over with classifications that foreground congruences and recommendations are offered with the expectation that all member states will gain if they harmonize to the negotiated goal. So while the explicit purpose of the 1972 OECD publication was not to report on the “state of interdisciplinarity in higher education or to supply a rigorous description, or to write a history,” it did offer a “forward looking…functioning model for the university” wishing to engage in interdisciplinary teaching and learning, thereby creating a target or goal for which institutions could reach.

The authors of the 1972 OECD volume began to explore the topic of interdisciplinarity from a theoretical/epistemological perspective. Arguably, the resulting abstracted categorization of forms of interdisciplinarity that was the outcome of this work, through discursive technologies of circulation and reproduction, developed into a ‘working definition’ or a starting point for higher education administrations interested in ‘correcting’ the problems associated with overspecialized training approaches. The Director of CERI, J. R. Gras, writes in the Foreword:

Indeed it may be argued that one of the reasons for the tarnished image of science is public reaction to its power to produce specialized applications of knowledge, without a corresponding development of the synthesizing framework, which can illuminate their side-effects and long-term implications. Interdisciplinarity is not a panacea for change in
the universities, but it is a vantage point from which a good deal of critical and healthy reflection on the inner workings of the university can be stimulated. It is hoped that this report will promote such self-examination by the universities, and as such provide a stimulus for further research and innovation (OECD, 1972, p. 10).

Was the rationale behind this research effort sponsored by the OECD to develop an approach to counter disappointment with overspecialization, fragmentation, and other critiques of disciplinary teaching and research? Universities are reported to have felt “pressured to change” in the face of 1960s “student unrest” and a general feeling “that the current type of education may no longer be relevant” (OECD, 1972, p 101). Interdisciplinary approaches were thus promoted as ‘vantage points’ for self-reflection about issues of broader purpose. This focus on searching for common purpose (as demonstrated in my analysis of definitions earlier in this chapter) is intimately linked with current discourse speaking to the need to keep focused on the ‘complex’ problems that affect everyone and that need expertise from all disciplines to resolve. Promotion of interdisciplinarity as a cost effective strategy for ‘unifying’ or ‘capitalizing on’ scientific efforts has broad implications. First of all, agenda setting becomes a locus for the strategic deployment of power. We might ask: Who defines what the pressing problems are? Who decides how to go about resolving them? Who will reap the associated rewards?

Lattuca locates the 1972 OECD publication within broad theoretical movements in the social sciences. In her words:

In 1972, when the Centre for Educational Research and Innovation published *Interdisciplinarity: Problems of teaching research in universities*, general systems theory and structuralist thinking provided the theoretical foundation for the contributors’ claims. In the social sciences and humanities of the 1960s and 1970s, structuralism and semiotics defied disciplinary boundaries in their search for underlying systems or forms that would unify theory in disparate areas (2001, p. 10).

The theoretical underpinning described by Lattuca is most clearly visible in the explicit distinction between interdisciplinary and transdisciplinary activity made by the authors of the 1972 OECD book. Lattuca further elaborates on how evolving theoretical schools in the social sciences later shifted epistemological definitions of interdisciplinarity within their own fields of inquiry:
In the 1970s and 1980s, poststructuralist approaches that rejected the search for unity, systems, and underlying forms as illusory and futile became influential. Feminist theory trained attention on how difference, reflected in the form of gender, ethnicity, class, and power influences the social world. Postmodernists reacting to what they interpreted as a failed Enlightenment project, taught, wrote, and researched in ways that repudiated scholarly attempts at objectivity, neutrality and generalizability. Interdisciplinarity was, and is, evolving, and definitions of the adjective *interdisciplinary* reveal its various guises (2001, p. 10, emphasis in original).

While Lattuca’s review of the academic literature leads her to conclude that definitions of what constitutes ‘interdisciplinary’ are shifting and evolving, my review of policy reports reveals a different trend. As I have noted, during the course of the radical philosophical debates described by Lattuca, the OECD revisited its 1972 definition and expanded its categorizations to include a distinction between endogenous and exogenous interdisciplinarity. Specifically, the OECD argued that endogenous interdisciplinarity primarily took place within the university and was concerned with the unity of science. Most appealing to the OECD was the other form of interdisciplinarity, which it categorized as exogenous. The OECD argued:

> The requirement that the university should perform its full social mission by multiplying its exchanges with the community means that more weight now has to be given to the development of *interdisciplinarity exogenous to the university*, in other words, the interdisciplinarity whose origins are in the continuous momentum provided by the real problems of the community (Centre for Educational Research and Innovation, 1982, p. 130, emphasis in original).

Thus, by claiming that the overarching goal of endogenous interdisciplinarity was realizing a unity of science, the theoretical and epistemological work conducted during this period by feminists, post-structuralist and postmodernist scholars described by Lattuca in the earlier citation, were obfuscated from consideration in the 1980 OECD reformulation of interdisciplinarity. In so doing, the situated and political outreach activities by scholars of these disciplines were also made invisible in policy development forums.

Within the 1982 OECD publication, a chapter entitled “Communities have problems, Universities have departments” appears. Two things were accomplished with this chapter. The
first was to reconstitute the 1972 OECD definition as relevant and the second was to construct the exigency for restructuring universities as active players in a global economy of knowledge-production. In the opening paragraphs of the chapter, the following argument is made:

Already in 1965, M. Weinberg in *Science* wrote “the mission of society is to solve its variety of problems, virtually none of which could be resolved by the application of a single discipline. The universities, on the other hand, rather than being “mission-oriented” are “discipline-oriented.” In addition to this, the rapid increase in knowledge is tending to lead to an ever-increasing degree of fragmentation and specialization which in turn is leading to ever-increasing difficulties in communication, which could in time mean that the universities could virtually lose contact with the society which supports them…. So interdisciplinarity is not just a new approach to education and research but the key to the change in the missions and social status of the university. For this reason interdisciplinarity emerged as a major subject at the OECD Conference in February 1980 and is again a subject of various international meetings and conferences (e.g. the UNESCO Bucharest Colloquium of November 1981 on Interdisciplinarity) (Centre for Educational Research and Innovation, 1982, p. 127).

The chapter proceeds in its formulation of a model for restructuring the knowledge-production activities of the university. First the reader is oriented to the “terminological and conceptual clarifications” used by the OECD, which are in fact the 1972 OECD definitions of discipline, multidisciplinary, pluridisciplinary, interdisciplinary and transdisciplinary. The value and authority of these definitions is then established by making reference to two recognizable markers of rigour, namely methodology: “in-depth epistemological analysis”; and expertise: “contributions from various scientists at the OECD Seminar in 1970” (Centre for Educational Research and Innovation, 1982, p. 128). The chapter then proceeds to draw upon reports about a number of educational projects in OECD member states that are claimed to demonstrate the effectiveness of orienting curricula around broad problems rather than disciplines. The text states:

The unifying element or elements both inside the university and in its relation with the community then become structures oriented towards *the study of one or more problems*. The choice of problems must be sufficiently wide so as to promote to the maximum a
concerted and integrated approach involving the various disciplines and sufficiently practical to be recognized immediately by the surrounding communities. Examples are energy, transport, urban planning, technology, the environment and health. If the problem leads on to highly varied professions, research at the heterogeneous level and direct action in the community itself, a post-secondary structure needs to be set up wholly and exclusively for the subject. There are fairly numerous examples of “universities” or university centres (combining long and short-cycle courses, fundamental research and applied research), focused on technology, health and the environment. It is important to note that all these institutions by the very nature of the subject chosen give practically equal – or almost equal – importance to natural and human sciences (Centre for Educational Research and Innovation, 1982, p. 135, emphasis in original).

This reformulation of interdisciplinarity to include knowledge-making activities taking place outside of the university arguably contributed to the uptake of a consolidated OECD approach to knowledge-production, which inevitably became closely linked to economic imperatives. And it is important to notice that the 1972 OECD definition of interdisciplinarity has not disappeared. In fact, it continues to permeate academic and policy writing documents. For example, recently I came across the following statement in a paper written in 2005 for the Council of Ontario Universities (COU) reviewing the key issues related to interdisciplinarity as they are currently playing out in Ontario institutions. The COU document states:

Although there is no universally accepted definition of interdisciplinarity, Liora Salter and Alison Hearn’s 1996 Canadian-based study on interdisciplinary research draws on the following distinctions cited in the groundbreaking report of the Centre for Education Research Innovation (CERI), *Interdisciplinarity: Problems of teaching and research in universities* (1972), which still can serve us well (Shailer, 2005, p. 1).

The paper goes on to elaborate on the OECD 1972 definition of interdisciplinarity. My analysis of this passage demonstrates how discourses become institutionalized through reproduction and reinforcement. Drawing on the epistemic authority of feminists Salter and Hearn rhetorically reinforces the OECD version of what constitutes interdisciplinarity and the role it should play in economic development, even though these writers were contrasting the mainstream definition with other definitions, including feminist ones. Selective citation makes invisible the arguments
of Salter and Hearn, and reinforces the OECD definition and its relevance to the Canadian context 25 years after it was first published by the OECD. Furthermore, Shailer’s use of the adjective “groundbreaking” to describe the 1972 OECD publication as well as her affirmation of the continued ‘relevance’ of the definition with the phrase “still can serve us well” reinforces the truth-making abilities of this definition. A few paragraphs later in the text, another example of how discourse travels through knowledge-making activities appears, where Shailer states:

Julie Thompson Klein, one of the foremost contributors to the international discussion of interdisciplinarity, draws a distinction between endogenous interdisciplinarity, which is “concerned with the production of new knowledge” and exogenous interdisciplinarity, which “interrogates the disciplines on the demarcations they apply to ‘real’ life and demands that the University fulfill its social mission” [421, as cited in Salter and Hearn, 28] (Shailer, 2005, p. 3).

This passage is strikingly similar to the one I cited a few pages ago to elucidate the change in the OECD position on interdisciplinarity. However, Shailer attributes this passage to Klein, through an indirect pathway by referencing Salter and Hearn. The OECD is not visible in this reconstruction. While Shailer’s paper, as part of the COU working papers series, does not constitute COU policy, it does constitute a node in the strategic deployment of discourse related to knowledge-making that can be linked back to the OECD. That is, ideas permeating OECD literature do not just appear out of thin air, and often draw directly from the scholarship developed by the very institutions they study. The point to made here is that the OECD does have a political position on education with considerable authority to act out this position because of its international institutional status and because of the authority ‘consumers’ of OECD products afford these. Analyzing how OECD positions are taken up provides a starting point for mapping out the contemporary discursive configuration of interdisciplinarity as it is currently institutionalized in UofT policy. As I will argue, the effects of this discourse are far reaching; their power is not in the direct regulation of activities of knowledge-makers, but in the re-interpretations and rationalizations given to these activities. As I have suggested, every time the rationale is reproduced intentionally or unintentionally, the power of the discourse increases and the underlying assumptions that make it up are further obfuscated. This derives from activity that is normalized in the everyday practices of knowledge-makers.
Lattuca considers why the 1972 OECD definition of interdisciplinarity continues to hold appeal, even though the philosophical assumptions of a unified science have been heavily critiqued. She argues that the definition does not exclude the postmodern turn; however, it suggests an unproblematic continuum of knowledge rather than a multiplicity of ways of knowing. As she explains,

[t]he definition clearly assumes a disciplinary basis for interdisciplinarity, but it does not exclude post-modern interdisciplinarity in which the disciplines are not central to modes of inquiry. It also recognizes a wide array of interdisciplinary work; rather than establishing a fixed point at which interdisciplinary integration occurs, the definition suggests that interdisciplinarity exists on a continuum. On one end of this continuum is the informal communication of ideas, such as might occur in a conversation between colleagues from different disciplines; on the other end is formal collaboration, such as research or teaching teams comprised of one or more faculty from different disciplines (2002, p. 712).

More insidious is the uptake of the 1982 reformulation of interdisciplinarity as endogenous or exogenous. As categories for organizing analysis related to interdisciplinarity, Klein, or others quoting Klein, use it in their work to describe the impact that ‘external expectations’ have on knowledge-making. When the OECD reformulation of interdisciplinarity is taken up in mission statements and institutional policies, the explicit commitment is made to make academic knowledge ‘relevant’, or to make universities socially accountable. The problem with this, as mentioned earlier, is that the embedded definitions of what constitute ‘relevant’ knowledge-making are clearly delineated to mean improving technological advancement, generating consumable products to promote a robust economy and providing cost-efficient solutions to expensive problems.

3.4 Conclusion

To summarize, this chapter has analyzed literature on interdisciplinarity in order to identify the social relations which make possible the idea that one can and should engage in interdisciplinary knowledge-making. I have argued that systems of classification, such as taxonomies and typologies, are inherently political in that they are constructed on ontological and epistemological positions that emerge in the context of debates about how to define value and
reward the objects being classified. In the process of reviewing definitions, typologies and taxonomies of interdisciplinarity I have described how the epistemic community contributes to the construction, circulation and reproduction of dominant perspectives regarding what constitutes knowledge and how we can know what we know. I have also shown how academic debates relate to broader socio-political and economic imperatives, introducing in the process features of contemporary knowledge-making governance arrangements.

The next chapter presents an analysis of the broader archive of texts to show how these epistemic positions have contributed to the emergence of a ‘mainstream’ form of interdisciplinarity, deconstructing in the process the discursive statements that make up what I label the popular discourse of interdisciplinarity in contemporary knowledge-making. Theoretically, I have fixed this discourse, treating it as an object in order to track its circulation, scope and effects. Thus, whenever I use the term discourse in the singular in this research I am making reference to this one version of interdisciplinarity which is the object under study. In this way, I distinguish the popular discourse of interdisciplinarity from other discourses of interdisciplinarity also currently active but less visible in contexts where the current popular version dominates.

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10 By popular I mean dominant and pervasive. Both these terms I also considered, but chose popular in the end because participants that took part in this study referred to this specific form of interdisciplinarity as “currently popular”. As a term, I also felt it captured the positivity of my participants when they described their experiences as collaborative knowledge-makers engaged in making-a-difference.
Chapter 4
The discourse of interdisciplinarity

4 Introduction

I observe interdisciplinarity now, in 2004, as being taken in a representational way, as standing for other values, and as a goal to be striven for – an end, not just a means (Strathern, 2005, p. 128).

This chapter continues the exploration of my archive to demonstrate how I came to identify the discourse of interdisciplinarity and the statements that make it up in its most popular form. While the analysis of the mainstream epistemic positions of interdisciplinarity outlined in Chapter 3 documents the variability in thinking and activity that academics attach to the label interdisciplinary, it only partly describes the popular discourse of interdisciplinarity. Like Foucault, I am assuming that interdisciplinarity constitutes a “unity” of “discursive statements” (that is a multi-layered rationale that makes certain objects, processes and subject-positions possible in its application). Epistemic positions, or theories of interdisciplinarity (such as those I have described in Chapter 3) help to authorize certain combinations of discursive statements and contribute to the coherence of what I label as the popular discourse of interdisciplinarity in contemporary knowledge-making. I am also assuming that it is possible to delineate how these discursive statements constitute a field of operation that is readily recognized as the process of being ‘interdisciplinary’ with material consequences for those operating within the discourse, by exploring how knowledge-makers approach interdisciplinary work. I am thus making a distinction between the voices that theorize about interdisciplinarity and the individuals who take up the subject-positions authorized by popular interdisciplinarity. While there is overlap between the two groups, is helpful at least to initially distinguish between those who study interdisciplinarity as a field and those who practice or perform interdisciplinarity in order to deconstruct the relationship between truth-knowledge-power as it applies to contemporary knowledge-making.

In previous chapters, I have described how authors have observed the growing popularity of the term interdisciplinarity in science and policy contexts (Albert & Laberge, 2007; Lisa R. Lattuca, 2001; Thompson Klein, 2000; Wooley, 2006), specifically drawing attention to the many ways
the term has been linked to innovation. What is less studied and discussed is the consequence of taking up interdisciplinarity in a ‘representational way’, to borrow the words of Marilyn Strathern quoted above. To do this would involve examining the web of social relations that have made possible the rise of one form of interdisciplinarity as a popular form of knowledge-making. As Weingart and Stehr (2000) suggest:

To look at the discourse on interdisciplinarity, therefore, provides an insight into the interpretive framework in which interdisciplinary knowledge-production is situated, socially sanctioned, and unfolding. The view on the discourse is yet another perspective on the fundamental changes of the social order of knowledge (2000, pp. xv-xvi).

This chapter thus draws from my broader archive of texts and my participant experiences explored through 20 semi-structured interviews in order to a) identify the popular ‘story-line’ of interdisciplinarity b) describe how the discourse has been taken up by knowledge-makers who practice and perform interdisciplinarity, rather than study it, and c) continue to describe the broader sociopolitical context that makes possible the operations of the discourse.

4.1 The popular story line of interdisciplinarity

As I constructed my archive, I began to work through texts grouping commonly used statements to identify the popular story line – the narrative most often projected through statements associated with interdisciplinarity. The four inter-related statements outlined in Table 4.1, appeared repeatedly in the archive, almost like a mantra. These statements make up what I label the discursive structure of popular interdisciplinarity. These statements are used to delineate the boundaries of my analysis of how interdisciplinarity operates discursively within the University of Toronto.

Table 4.1: Discursive structure of interdisciplinarity

<table>
<thead>
<tr>
<th>Collaborate to Diversify</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diversify to Innovate</td>
</tr>
<tr>
<td>Innovate to make a difference</td>
</tr>
<tr>
<td>Make a difference by integrating innovations into practice</td>
</tr>
</tbody>
</table>
The storyline of the most popular form of interdisciplinarity is very simple. It goes something like this: We need to forge collaborations in order to diversify our thinking. Diversifying our thinking will lead to innovation. We then have the opportunity to make a difference by harnessing this innovation to answer the complex problems plaguing society, and produce relevant applications. This storyline captures the basic resonance of ‘interdisciplinarity’ as a popular discourse.

It is hard to miss the link between what I have identified as the popular storyline and the OECD rationale for engaging in exogenous interdisciplinarity as described in the previous chapter. I became aware of this association only after identifying what I thought was the popular discourse of interdisciplinarity from a broad analysis of my archive, and turning to what was written about interdisciplinarity by ‘experts’. Specifically, the link became clear when I began analyzing epistemic positions on interdisciplinarity and the emergence of mainstream thinking as to what constitutes interdisciplinary scholarship. I noticed that many of the experts on interdisciplinarity were referring back to the OECD classifications. Having made this connection, I began exploring the circulation of the discourse and mapping its limits by tracing the reproduction of OECD positions on the role of the university and knowledge-production in society more broadly in Canadian policy forums and within the University of Toronto. The results of this analysis will be described in Chapters 5 to 7.

First, however, I will demonstrate how the popular storyline permeates every day rationales for knowledge-making more broadly. In the process, I will begin problematizing the storyline of interdisciplinarity in its most popular articulations. That is, I will show how it is projected as a rationale for making a difference through knowledge-making, without reflexive consideration of who is actually benefiting from this activity. I will also show that the term is used to connote collaborative knowledge-making that spans disciplines but also contexts.

4.1.1 Identifying the popular storyline

Discursive statements echoing the popular storyline of interdisciplinarity (summarized here as collaborate-diversify-innovate-integrate) are plentiful and can be located in many different institutional contexts outside the University of Toronto (governmental, corporate, educational, hospital, etc.). Appendix 4 draws from my extensive archive of texts and charts some recent examples of such discursive statements in this broader context, an excerpt of which I will be
examining below. The examples cited in Appendix 4 were identified through a search on the internet under the terms “interdisciplinarity,” “integration,” “innovation,” “collaboration” and “diversification.” These examples, as I will argue below, clarify that rhetorical devices to sell products can also be rationalizations for advancing new modes of research or for evolving educational practice. As some authors have argued, knowledge-driven economies are literally ‘banking’ on ‘thinking’ (Olssen & Peters, 2005; Peters, 2003).

In the last two decades, people have been able to access with growing facility highly specialized information thanks to information sharing technologies such as the Internet. This has allowed non-academics to directly engage in negotiating knowledge-production, challenging, in the process, longstanding constructs such as ‘expert’ and ‘expertise’. As the statements cited in Appendix 4 reveal, the term ‘innovation’ can be used as a synonym for applied discovery, which can be commercialized. Change is expected to be rapid so that new knowledge can be exploited more effectively. The push towards diversification is directly linked to breaking down barriers to information sharing: epistemic barriers in education to inspire creativity and innovation, and market ‘barriers’ in the economy to push the resulting new products into the market for quick profit turnover. See for example the following statements extracted from Appendix 4:

*Retail solutions from IBM: Integrate to innovate.... Information exposes all – Consumers are becoming incredibly empowered during their purchasing decisions through the ability to access information how, where and when they want it. Mega retailers break the boundaries...partnering becomes pervasive.*

*Natural Science Foundation – Where discoveries begin. ...[S]uccessful outcomes depend on interactions among diverse individuals. Something new happens in the process of integrating the different intellectual skills, experience and perspectives of partners. A dynamic emerges that creates a whole greater than the sum of the parts.*

The focus both in the market and in the academy (as Chapter 3 showed) is on diffusing restrictive boundaries through the creation of strategic and flexible partnerships, allowing for a pooling of resources, further maximizing potential epistemic, social or economic ‘benefits/profits’ from new discoveries.
There also is a sense of urgency linked to the rationale behind adopting interdisciplinary research approaches and this urgency is being articulated simultaneously by authors across disciplinary locations, culminating in calls to reform the university as a site for knowledge-production. This is exemplified in the following citation from an academic paper in my archive:

It is time to find constructive ways to accommodate wide and deep interdisciplinarity in our universities.... One way ahead may be to frame this in terms of organizational innovation, and to consider if interdisciplinary programs can point the way for the university…. Universities today need to find new ways to accommodate what may be one of the most dynamic, flexible and responsive parts of their organization: groups whose practice is grounded in teamwork and collaboration, who are in touch with their disciplinary depths, yet bridge these differences, and also connect with the broader community (Moore, 2003, p. 18).

Analysis of the archive also revealed that in Canada at this point in time, in order for scientists to have their work recognized by funding agencies, they must reorient their research questions to target areas perceived to have immediate applicability in key strategic domains. For example, in a recent report outlining the strategic priorities for the Social Science and Humanities Council of Canada (SSHRC), the organization elaborated the rationale for funding research in the social sciences and the humanities, linking broader Canadian socio-economic priorities to knowledge-making activities:

During the past decade, the Government of Canada has recognized the key role research plays in a competitive, global, knowledge-based society and economy. As a result, the federal government has helped create a more research-intensive university environment by supporting world-class research excellence and training through the attraction and retention of outstanding researchers, the use of partnerships and multidisciplinary approaches, and the provision of state-of-the-art infrastructure. Investments in the granting councils, the Canada Foundation for Innovation (CFI), the Canada Research Chairs Program, Canada Graduate Scholarships and the Indirect Costs of Research Program have considerably enhanced the research environment in Canada. For instance, SSHRC’s ability to support research on complex topics that transcend the capacity of any one scholar or discipline is now complemented by the support of the CFI for research
infrastructure. Moreover, the Canada Research Chairs Program attracts and retains the very best minds, and encourages individuals to address research questions from diverse perspectives and through multiple approaches (SSHRC, 2008, p. 5).

Current strategic domains identified by the Canadian government as crucial areas of study are linked to health care and health-related technologies, thus identifying medicine and engineering as institutional loci of power. Within the same document quoted from above, the following statements show how partnerships across disciplines (relevant to engineering and medicine) are considered important in the context of making social science and humanities research work for the “greater good of Canadian society”:

These three ambitions now characterize SSHRC’s vision: to enhance the quality of, and support for, research and research training in the social sciences and humanities; to enable connections among disciplines, including those in engineering and the natural and health sciences, as well as between research and the larger community, in Canada and in the rest of the world; and to increase the impact of research and research training for the benefit of society. (SSHRC, 2008, p. 3).

As more and more researchers across all disciplines emphasize the need to put people in the picture, new strategies for advancing knowledge are reflecting the human dimensions of topics that were once considered to be strictly technological or scientific. In addition, partnerships between researchers and members of the larger society continue to be actively sought. These collaborations bring research strengths to bear on societal challenges and opportunities, and open doors to fresh perspectives, innovative research methods and unique opportunities for knowledge mobilization (SSHRC, 2008, p. 9).

SSHRC is only one of the institutions making these claims. As I have suggested above, interdisciplinarity is currently a heavily sanctioned form of knowledge-making in Canada, a member of OECD. This is evidenced by the proliferation of government, university and industry policies, mission statements and strategic plans that have taken up the discourse of ‘collaboration’. Arguably, terms starting with the prefix “inter” --such as interdisciplinary and interprofessional -- have come to connote a collaborative process evoked through structural configurations such as ‘teams’, ‘partnerships’ and ‘cooperatives’ that will lead to ‘more innovative’, ‘more effective’ and more ‘productive’ approaches and solutions to problems. For
example, scholars in my research who engaged in collaborative knowledge-making often used the terms interdisciplinary, interprofessional and institutional partnerships together and/or interchangeably as a way to express a knowledge-making process which incorporates thinking and expertise from diverse epistemic perspectives and which bridges the public, professional and academic spheres. In medical articles the term interdisciplinarity is also used to describe approaches to managing the health of patients:

Terms such as *interdisciplinary*, multidisciplinary, *transdisciplinary*, and interprofessional, which further delineate and describe teams, teamwork and collaboration, have evolved over time. The earliest and most commonly used term was *interdisciplinary*. In academic discourse, interdisciplinary was the term used to indicate the combining of two or more disciplines, professions, departments, or the like, usually in regard to practice, research, education, and/or theory (Alberto & Herth, 2009, p. 2 emphasis in original).

In engineering texts, I found that the term interdisciplinary was often used to describe large-scale inter-institutional research projects that combined expertise from a number of disciplines but also involved industry or government partners.

My University of Toronto participants had all observed an increase in collaborative knowledge-making approaches and all agreed that collaboration was valued in their context of work. One participant who held a senior administrative position in a teaching hospital noted that in the last decade, there had been an increase in large collaborative projects involving different professions and different institutional settings, which he gleaned from the increase of “collaborative projects that were coming through the Research Ethics Board.” Here is an example from government discourse. In the most recent federal government science and technology policy, under the sub-title “Fostering S&T Advantages”, the following commitment is made:

The Government of Canada will support S&T collaborations involving business, academic, and public sectors, at home and abroad. Partnerships are essential to lever Canadian efforts into world-class successes and to accelerate the pace of discovery and commercialization in Canada. Through partnerships, the unique capabilities, interests, and resources of various and varied stakeholders can be brought together to deliver better outcomes (Canada. & Canada. Industry Canada., 2007, p. 12)
The notion that ‘partnerships’ result in ‘better outcomes’ is articulated in the above excerpt as an uncontested truth. Problematized, the phrase can be understood as a sanctioning statement that carries authority and weight through its reproduction in institutional text after institutional text. Echoing this sentiment, consider the following statement from one of my participants who held a faculty appointment and a senior administrative position:

[T]here is practically no problem of significance to society today that can be solved in one domain only. In other words, the production of a new fuel is not an issue of chemistry only, because sure, maybe you can devise a new substance that you can burn and produce more energy with than you could from burning oil...but will it pollute for example -- what would be the residues, what will be the aftereffects on nature and on human health and so on? So all these things will have to be considered. So we need to have the bigger picture before we actually specify the solutions.

Through the process of funding research, collaboration becomes a favoured way of doing things when taking a collaborative approach results in material advantage for those able to align their priorities with the strategic priorities articulated by government and reproduced by institutions and organizations. For example, if members of a research project are able to demonstrate to federal funding agencies that they encapsulate the current strategic priorities (or in the words of the above participant, the “problems of significance”), and are able to secure funding, then they will have a material advantage over researchers who have not made similar explicit connections. The material advantage creates further support for its efficacy as a process when projects funded receive public attention and press. Again, what may be lost in this exchange is the delivery of the outcome. In disseminating their research, researchers speak less explicitly to how the collaborative process affects both the study design and the meaning making process. Upon closer examination, there is also very little evidence offered to support the claim that collaborative approaches work better and deliver better solutions to major social problems. Furthermore, there is little consideration as to what happens when a knowledge-maker or a knowledge-making institution fail to “make a difference.”

Various technologies have emerged to enable, assist, and enhance the collaborative activity of researchers or the intellectual convergence of disciplines to target strategic areas of research. John Wooley (2006) captures this shift in a recent paper introducing a model that will create
computing and information technology that enables a research environment to exist upon a
cyberstructure. The declared motivation is to increase international collaboration but also to
‘harmonize’ efforts. Here is Wooley’s rationale for creating such technological infrastructure:

As we enter the 21st century with enthusiasm and revitalized sense of purpose for science
and technology, the conduct of science itself, and not just the understanding that we have
now achieved about nature, reflects complexity…. Both intellectual and economic
pragmatism have accelerated the trend toward large group efforts, or larger scale
collaborations. The costs for research itself, such as contemporary advanced
instrumentation, as well as the requirements for training a new generation, on one hand,
and the nature —in simultaneous breadth and depth — of the expertise required to probe the
challenges inherent in the complexity of nature, on the other hand, have led in turn, to a
distinctly different environment for the research community. Following the dictate that
nothing succeeds like success, pragmatism has inspired partnerships (even among
previous competitors) to emerge from the vigorous individualism of academic researchers
and the robust rigor engendered through achieving commercial survival. Ever larger
teams from diverse disciplines have arisen as senior individuals, previously distant—in
expertise and often in geography — from each other, have been driven or inspired to
collaborate (p. 16).

As research institutions are urged to accept the need to enhance collaborative efforts through
restructuring or the adoption of network technologies, there is also a counter push to remain
grounded in highly specialized disciplinary domains. This position was clearly operationalized in
the development and implementation of the policy of interdisciplinarity recently adopted at the
University of Toronto. The policy is analyzed in a subsequent chapter, but it is important to note
here that while interdisciplinarity is supported, its institutional definition in this document
positions interdisciplinary work as dependent on disciplinary expertise:

The University remains strongly committed to fostering strength and excellence in the
disciplines, as strong disciplines are the basis for strong interdisciplinary work
(University of Toronto Governing Council, Feb. 2007, par. 2).

As one participant in my study put it, when looking at an image purportedly depicting ‘thinking
outside the box’, “within an institution [speaking about UofT] people are collaborating and, if
they’re thinking outside the box, they’re each thinking about their own thing.” Their own thing being their expertise, disciplinary values and culture, sense of rigour and purpose for knowledge-making. Furthermore, the disciplines continue to define departments and departments control faculty and student recruitment, tenure and promotion processes. Thus, while the policy for interdisciplinarity acknowledges interdisciplinary activity and provides guidelines for the establishment and oversight of extra-departmental units, it can also establish an organizational dependency between extra-departmental units and departments.

This emphasis on the priority of disciplinarity in the context of engaging in collaborative forms of knowledge-making appears in so many documents that I have called it the most popular form of interdisciplinarity. Making disciplinarity central to the way one rationalizes interdisciplinarity is also consistent with mainstream epistemic positions including the OECD classification as discussed in the previous chapter. In other words, the starting point for interdisciplinarity in its most popular form reaffirms the importance of disciplinary focus and specialization. Thus, while integration is part of the discursive structure of interdisciplinarity, it is there more often than not as a rationale for ‘bridging’ the theoretical and the applied than for bridging the conceptual. Thus, as I have argued above, the popular discourse does not readily foreground the critical and transformative rationales for engaging in interdisciplinary knowledge-making argued for by scholars such as Tripp and Muzzin, Salter and Hearn and Lattuca. More specifically, the popular form of interdisciplinarity (dominating outside of but also within the University of Toronto) is primarily the pooling together of expert knowledges and resources to tackle questions, which when answered, are perceived to have broad social, economic etc. application. It is a model for collaborative knowledge-making. This parallels the way collaboration and networking has also been taken up in the context of business (Pittaway, Robertson, Munir, Denyer & Neely, 2004). Technologies for networking have inspired collaboration but have not eliminated competition. The intent is to harness innovation for competitive gain. The “vigorous individualism” which Wooley alludes to, is also ever present in what Lattuca (2001) labels “instrumental” forms of interdisciplinarity. But, as academic research is still valued in terms of individual effort/productivity and not in terms of group productivity, this has created unique tensions for individuals engaged in interdisciplinary research, particularly those who engage in it in order to critique the dominance of disciplinary knowledge-making, or to evolve new conceptual models for knowledge-making, as I will argue in the following chapters.
4.2 Identifying non-popular story-lines related to interdisciplinarity

The dominance of a particular discourse, according to Foucauldian thinking, does not have to be taken as indicating a hegemonic exercise of power, although the link between the popular discourse of interdisciplinarity and OECD thinking around the role of knowledge-making in economic prosperity might suggest such a relationship. Rather, it could be regarded as a socio-political normalization of a way of thinking that makes some forms and/or some aspects of knowledge-production more popular, and thus more visible than others. From my research, it became clear that, despite its simplicity and pervasiveness, there are many different ways the popular interdisciplinary story line can be taken up or ignored altogether. I looked for these variations to the above storyline when analyzing my archive of texts as well as when I explored the experiences of the participants in this study.

In comparing the projected rationales for engaging in interdisciplinarity to the classifications of interdisciplinarity I described in the previous chapter, I noticed a congruence and overlap of reasoning. Individuals who were not studying the phenomenon of interdisciplinarity but rather were engaged in interdisciplinary activities expressed rationales (or symbolic representations of interdisciplinarity) that could be linked back to specific epistemologies for engaging in interdisciplinarity. That is, the forms of interdisciplinarity that surfaced in my locating of ‘typologies’ or definitions of interdisciplinary research were also present in the discourse of knowledge-makers generally and my participants specifically. This suggests that despite the perceived complexity and ambiguity of the term and the epistemic debate about how to classify and value interdisciplinary activity, the various theoretical positions seem to be grounded in lived experiences and continue to be operationalized; validating and authorizing specific activity and subject-positions. That is, just as a mainstream position emerged in the analysis of epistemic positions, so did a mainstream position emerge in the analysis of rationales of performers of interdisciplinarity. This mainstream rationale is the articulation of the uptake of the popular discourse of interdisciplinarity, which, as argued in the previous section, is conceptualized as collaboration that leads to innovation, where innovation is a marketable and useful product. In this discourse, interdisciplinarity is also looked upon as a form of problem solving, which uses the collaborative process to bring different expert perspectives to the solution of a common complex problem.
However, in the uptake of the popularized discourse, the less popular discourses of interdisciplinarity are not completely obscured. For example, still present with a very specific materiality grounded in everyday practices is the rationale for interdisciplinarity projected as a form of epistemological innovation, when collaborators embedded in the collaborative process experience an imperative to rethink starting points and develop an integrated or different way of approaching knowledge-making than the popular form. Here interdisciplinarity may be articulated as a form of activism, or a way to critique dominant forms of knowledge-making that perpetuate social, political and economic injustices, by working outside the rules of disciplines. (see for example: Salter & Hearn, 1996; Tripp & Muzzin, 2005). Evidence for the operation and circulation of these less popular discourses emerged in the analysis of my broader archive, including my interview transcripts. In exploring the diversity of rationales in my participant experiences, I noticed that the popular discourse and the less popular discourses (which competed with the popular discourse) were in operation in the same contexts. This co-existence of competing discourses created unique challenges for performers of interdisciplinarity, a topic I will explore in detail in Chapters 8 and 9.

The next section briefly outlines the symbols present in the discourse of contemporary interdisciplinarians (including my participants), drawing out their relationship to each other and to the popular form of interdisciplinarity which is most important in medicine and engineering. It is intended as a brief introduction to the different ways the discourse is taken up and put to work, as a way to both frame and to foreground in more detail explorations of the materiality of the popular discourse of interdisciplinarity presented in the chapters that follow.

4.2.1 Symbols of interdisciplinarity

Consistent with Foucault’s approach to symbolic analysis, I examined the statements of my participants that referred to interdisciplinarity to see if there existed certain links both with the way interdisciplinarity was represented but also the expectations and effects associated with the process of being interdisciplinary and doing interdisciplinarity. This aspect of archeological analysis investigates not only the meanings associated with statements but also the materiality of statements within and beyond the context in which they are uttered. Foucault offers a description of what this analysis looks like and how it differs from other forms of symbolic analyses that aim to expose the causal effects of statements and meanings:
Archaeology situates its analysis at another level: the phenomenon of expression, reflexions, and symbolization are for it merely the effects of an overall reading in search of formal analogies or translations of meaning; as for causal relations, they may be assigned to the level of the context of the situation and their effect on the speaking subject; both, in any case can be mapped once one has defined the positivities in which they appear and the rules in accordance with which these positivities have been formed.

The field of relations that characterizes a discursive formation is the locus in which symbolizations and effects may be perceived, situated and determined (2006a, p. 181).

Isolating the symbols of interdisciplinarity present in the discourse of interdisciplinarians including my participants, made possible an explanation of how the discursive structure of the popular form of interdisciplinarity operates in the web of social relations, including its limits and its possibility. It also allowed me to connect this popular form of interdisciplinarity to a discursive formation; that is a grouping of discourses, which bear similarities to one another either in content or in function.

Following a brief description of some of the dominant symbols of interdisciplinarity projected by interdisciplinarians broadly and my participants specifically, I will discuss the significance of the convergence and divergence of statements about interdisciplinarity in more detail. The two different discursive structures identified in my analysis will then be connected to the broader discursive formation within which they operate.

As will be shown, the symbols of interdisciplinarity present in the discourse of my participants are not mutually exclusive. When these statements were analyzed to determine their constitutive boundaries, a theoretically interesting overlap was revealed. While the statements of participants are for the most part aligned to the popularized story line described above as collaboration-diversity-innovation-integration, also present in the statements of participants are other discourses that are drawn in either to affirm or to specifically modify or resist the popular discourse, such as those of ‘expertise’, ‘accountability’ and ‘knowledge-translation’. Of particular interest are the last two symbols (described below) which challenge the dominant approaches to knowledge-making on the basis of who gets to define the ‘questions.’ These statements draw in discourses such as ‘social accountability’, ‘advocacy’ and ‘feminism,’ and
deploy their opposition to the popular discourse of interdisciplinarity through the strategic use of a different set of unity of statements, namely, collaboration-diversity-integration-activism.

4.2.1.1 Problem solving

Rationales for engaging in interdisciplinary research are often constructed with statements that speak to the growing complexity of topics, phenomena and problems. Some of the complexity is self-generated, as in the following rationale where the authors nuance their research question in order to effectively provide an answer to two discrete questions in one study:

Combining methodological approaches from architectural history and health sociology, the intentions and uses of central features of the hospital atrium are examined (Adams, Theodore, Goldenberg, McLaren & McKeever, 2010, p. 658).

Several of my UofT participants also referred to problem solving as a central feature of interdisciplinary research as in “he is interdisciplinary in the sense that he’s bringing different experts in to solve one problem” and “[being interdisciplinary means] being able to link a variety of perspectives and points of view and concepts together into a more uniform understanding.” In the process, they also evoked the rationale of the popular form of the discourse. Specifically, many participants felt that today’s problems were too complex to be answered by any one discipline:

There is probably no problem of significance to society today that can be solved in one domain.

I think there are…important problems for our society that can not be solved actually in one area, one discipline only.

I find it interesting to note that when I’m thinking about research, I really need to delve into a number of different disciplines in order to find answers.

Similar rationales were projected by interdisciplinary scholars writing about their own work as in the following account:

In this scenario, only interdisciplinary research that fully integrates biology, biochemistry, medicine and materials science can provide a springboard for the
development of suitable therapeutic tools, not only for the treatment of Alzheimer's and Parkinson's diseases but also, prospectively, for a wide range of severe neurodegenerative disorders (Glordano et al., 2009, p. 836).

Evident in the above rationales is an internalized imperative that the problems that should be addressed today by scholars are complex. Incorporating complexity in academic scholarship is projected as a structural re-alignment of academic focus towards real life concerns.

The expanded argument is that the complexity of the problems and the social desirability of seeing these problems solved makes ‘knowledge-makers’ accountable to their ‘stakeholders’ for showing that they are collaborating and pooling expertise for the resolution of social priorities. Thus the symbol of interdisciplinarity as problem solving also evokes the discourses of ‘expertise’, ‘specialization’, ‘complexity’ and ‘accountability.’

4.2.1.2 Conceptual breadth

Another distinguishing feature of interdisciplinarity is that it aims at conceptual breadth. In one scholarly account the need to think across disciplines in order to evolve new understanding is made in the following statement:

The vast amount of biological information that is now available through the completion of the Human Genome Project presents opportunities and challenges…. [A] challenge for genomics research is to understand the relationships between genomics, race, and ethnicity in genome research and the implications of uncovering these relationships…. Interdisciplinary research teams are needed in which psychologists, as well as other social and behavioural scientists work collaboratively with geneticists and other natural scientists (Bonham, Warshauer-Baker & Collins, 2005, p. 9)

This notion of thinking across disciplines was also described by my participants who argued:

[Interdisciplinarians are] people with a broader appreciation of the varied fields of research.

But I feel that from the perspective of interdisciplinarity… what you have is a group of people who come from a wide range of disciplines [to learn from each other]
Also evident in the above rationales is the need to collaborate in order to conduct “interdisciplinary research.” In the process, specialized ‘expertise’ linked to well defined disciplines, is affirmed. When such a model of collaborative knowledge-making is institutionalized or popularized, individuals with interdisciplinary training, or individuals trying to work across disciplines with little formal training in the fields or disciplines they are drawing from, are not validated.

Not surprisingly, I also noticed that conceptual breadth was not always perceived to be a good thing. Consider, for example, the statement made by an engineer about one of his colleagues who s/he felt had tried to make a career out of following “trends” in granting agency funding, rather than focusing in a specialized domain: “He is interdisciplinary in the sense that he’s spreading himself all over different areas.” This comment was followed with negative judgments regarding the quality of such research. Not surprisingly, some of my participants were wary or critical of trying to incorporate too much breadth in knowledge-making because breadth was conceptualized as being attained at the expense of depth. And without depth, a knowledge-maker could not be perceived as an ‘expert’, as this participant argued:

I can’t keep up with the discipline in my own area, let alone trying to do it in all the areas I’m trying to function in some sort of professional context. And so in most of these areas I have a glimmer of a formal background but I am not in any way an expert.

Thus when referring to interdisciplinarity as conceptual breadth, the discourses of ‘expertise’ and ‘specialization’ were also evoked as part of what I have called a discursive structure. In the process, disciplinarity was affirmed.

4.2.1.3 Diversity of perspectives

Some participants considered themselves ‘experts’ at working in an interdisciplinary field. For them, interdisciplinarity was equated with a diversity of perspectives. As one remarked, “actually nowadays our discipline, kinesiology, is extremely interdisciplinary and it should be because it does reach across different disciplines.” Another scholar articulated the following about his field:

Molecular imaging is an emerging technology at the life science/physical science interface, which is set to revolutionize our understanding and treatment of disease. The diverse nature of molecular imaging requires knowledge from both the life and physical
In this symbolic representation, the discourse of ‘expertise’ is present but it is not troubled. That is because individuals (such as those quoted above) understand their field of inquiry to be interdisciplinary, but their personal training to be highly specialized. Also, working to affirm the discourse of ‘expert’ is the sense of belonging to a ‘discipline’, often used as a referent for ‘expertise.’

4.2.1.4 Creating new knowledge across disciplines

Interdisciplinarity was also perceived as a process for “creating new knowledge across perspectives.” Similar to the symbols of interdisciplinarity as ‘problem solving’ and interdisciplinarity as ‘diversity of expertise’, the symbol, ‘creating new knowledge across disciplines’ evoked dynamic images of pooling of expertise and of bridging disciplines such as in the following comments of participants:

What I hoped for were the kinds of conversations between disciplines that create something new; that create a new field of inquiry and that create new kinds of knowledge.

The seminars are really…interdisciplinary sharing of knowledge… in preparation of having to think about how to take [a] research project and discuss it and present it in a way that was understandable across disciplines.

However, a unique element of this symbol is the primacy it gives to the ‘discovery’ of new knowledge and new ‘fields’. The outcome driving the collaboration in this symbol is not to solve a problem, but rather to innovate conceptually. This distinction is evident in the following statements:

The practice of law is increasingly demanding interdisciplinary knowledge and collaboration between those trained in law and a broad range of scientific and technical fields. Public health law provides a model for the substantive integration of law with science and the way practitioners work (Goodman et al., 2002).
We have used different methods and mechanisms for investigating and interpreting these new ideas from medical science. These have included mathematical modeling, simulation and visualization as well as a series of art pieces that have resulted from looking at the overall nature of our combined multidisciplinary attempt to investigate new theories of biological organization…. Our premise is that artists can conceptualize scientific theories without the standard discipline-specific constraints, and thereby potentially influence the development of scientific theories, their mathematical formulation; and their associated aesthetics (d'Inverno & Prophet, 2005, p. 49)

Another important discourse operating in the statements quoted above is the embedded notion that knowledge-makers should work towards ‘translating’ concepts in a way to facilitate their uptake across disciplines.

4.2.1.5 Researching between or outside disciplinary boundaries

A prominent symbol of interdisciplinarity present in the discourse of my participants was the notion of ‘interdisciplinarity’ as the activity of ‘researching between or outside the disciplinary boundaries’ of one’s training, such as in the comment “doing research outside the field of your training.” This symbol, as do other symbols, affirms the importance of disciplinary training and expertise in the context of engaging in interdisciplinary work. For example, one participant argued that “before you can have interdisciplinarity, you do have to have a core training.” Another suggested:

interdisciplinary to me means that you actually have grounding in a discipline. And so if you do it at the undergraduate level you sometimes run into problems because people have no grounding in any one methodology, for instance.

An underlying assumption of this symbol is that expertise in a discipline connotes more than specialized knowledge of a particular content area. That is, instead, ‘expertise’ is a skill-set and a capacity. The assumption is that if you are an expert in one domain, you can quickly learn what you will need to learn in order to work outside your area of expertise. A participant argued:

And so we are highly adept, I think, with respect to interpolation without formalism in areas where we’re working interdisciplinarity. Basically I often don’t know the theories and the backgrounds in particular areas, but I’ll say give me the ideas, give me the
essence of that, and then we start to develop an understanding in those areas and from that understanding you move forward, often without the formalism of, you know, explicit consideration…. But what I find intriguing is that it doesn’t take a huge amount of time before you can start having intelligent conversations with people who are experts. And then you use them to bridge you into areas where you’re lacking a formal background.

In the above quote, learning to bridge disciplines for this participant entailed learning to speak enough of the language of the domains of other experts so that s/he may ask them to ‘translate important concepts from their fields’ in a way that would allow him/her to incorporate them into his/her knowledge-making unproblematically. In other words, participants who used this symbol to speak about interdisciplinarity also evoked the discourses of ‘knowledge translation’ and ‘expertise’.

4.2.1.6 Working in different academic/professional contexts

‘Interdisciplinarity’ was also equated with academic or professional activity, which required participants to “work in different academic or professional contexts,” as in the following examples:

I don’t see myself as an interdisciplinary sort of person. I guess I am, but implicitly. Because I wear varying kind of hats. I do varying things. And I work with varying kinds of people. So by definition, it’s interdisciplinary but it’s not [how I think about] what it is I do.”

So there’s a coherent sequence to what I’ve done and in terms of interest in interdisciplinary work it was across an array of disciplines. It involved learning as I went [along] and it involved a situation where I was always the outsider in a new field as I changed positions.

Along the same lines, scholars described bridging or integrating non-academic knowledge sources with academic sources such as in some of the examples cited above where authors, for example, described incorporating knowledge of “routine laboratory needs” and “everyday experiences of lawyers” in their scholarly work, and treating these sources of knowledge on par with knowledge derived from ‘scientific’ work (Feldhaus, Buscher, Kleine-Benne & Quevauviller, 2002; Goodman et al., 2002). Linking academic activity to public and professional
practices may also account for some of the conflation of terminology I observed in the texts I analyzed.

Using this symbol of working across different contexts and with individuals from a variety of contexts, interdisciplinarians (including my participants) projected an identity of a ‘flexible’ worker, someone with the capacity to engage in ‘multi-tasking’ and to ‘learn’ continuously along the way. In other words, when this symbol was used, the discourses of ‘life-long learner’ and ‘multi-tasker’ were also evoked.

4.2.1.7 Innovation that makes a difference

Interdisciplinarity as ‘innovation that makes a difference’ was a popular way of thinking about collaborative knowledge-making amongst my participants, one of whom commented: “collaboration and interdisciplinary connections only lead to more profound discovery and research that has real impact.” A second observed of a colleague that just his influence in stressing the importance of interdisciplinary research …has really been the biggest influence on the way I’ve done my research and the way I’ve shaped my career…. I would see that he would involve these people [from other disciplines and the community] and the success that he was having in terms of getting products out there that would actually work and be useful.

A third mused:

Well, I don’t know what comes first or second, but definitely I think the end goal is to make a difference, in my mind. Or to make a greater difference, make more of an impact. And I think working together with the various disciplines, we can make a bigger impact, a greater impact than if we were working in isolation. There’s no doubt in my mind about that.

This notion, as discussed throughout this chapter, was present in my broader archive. The following is an example extracted from an academic article:

The importance of monitoring trace-element species is increasingly recognized. Such methods are needed for assessment of many potentially hazardous substances…. To develop new analytic methods and procedures for element speciation, interdisciplinary
research is required…. Analytical chemists and physicists from several European
institutes and two industry companies co-operated in this project. As a result, the
continuous exchange of scientific results and practical experience, combined with
consideration of the needs of routine analytical laboratories, led to the development of an
industrial prototype for trace-element speciation work (Feldhaus et al., 2002; Goodman et
al., 2002).

It is important to note that those who foregrounded the notion of interdisciplinarity as ‘making a
difference through innovation’ also evoked the discourses of ‘social accountability’ and
‘collaboration’ in the process.

4.2.1.8 Reflexivity

Rationalizing interdisciplinarity as a form of reflexivity both at the personal and the epistemic
level also appeared in my archive. The following statement projects this rationale in the context
of gender studies:

The paradox of gender studies is that they have tried to institutionalize themselves as an
interdisciplinary discipline. The paradox can be explained by the transversality of male
domination and also by the epistemological rupture effectuated by the entry in the
academy of a social movement claiming to be at the same time the subject and the object
of analysis. While institutional discourse encourages interdisciplinarity, economic
pressures push towards specialization. In this context, gender studies scholars have also
tended to become more specialized either in their specific branch or in feminist
metadiscourse. Thus interdisciplinarity could be conceived as a critical evaluation of
concepts and methods that transgress disciplinary boundaries and thus lead to a higher
level of reflexivity in feminist studies (Chaponnière, 2004)

Similarly, one of my participants described being interdisciplinary as being ‘reflexive’. That is,
actively questioning your assumptions and starting points. As s/he said,

there’s a certain ethos of respecting what’s brought to the table by other disciplines and
also being ready to critique the kind of knowledge-making we do and to ask questions
about your questions.
This is a departure from the other symbols discussed thus far and was not the dominant view amongst my participants. Two things to note are that in both of the above statements, collaborative knowledge-making was not assumed as necessary to interdisciplinarity and there was an active problematization of the discourse of ‘expertise’. In the process, the discourse of ‘ethical inquiry’ and ‘social accountability’ were drawn in order to problematize the popular form of interdisciplinary knowledge-making.

4.2.1.9 Activism

I discerned two inter-connected critiques in my analysis of my archive that arguably are constructed from different ontological locations but which both reflect the symbol of interdisciplinarity as activism. On the one hand, there is a frustration expressed with the limitations of always working within the theoretical and methodological prescriptions evolved through disciplines because this inhibits creativity and imagination. Such critiques of disciplines are linked to calls for “thinking outside the box” or “diversifying in order to innovate” but do not challenge modernist notions of ‘discovery’, ‘knowledge’, ‘truth’, ‘objectivity’ and ‘progress’. I have implicitly included this form of activism with all the previously discussed symbols.

On the other hand, there are also accounts that embed praxis in knowledge-making so that the goal of the research is not only to evolve new understanding but to draw attention to the limitation of established ways of doing and knowing and to effect positive change for subjugated perspectives. The praxis can take many forms, but a distinguishing feature is to avoid entrenchment into ‘traditional’ or ‘mainstream’ or ‘dominant’ ways of doing things, as in the following example:

Drawing from collective analysis and interdisciplinary research, I propose interdisciplinary strategies of mentorship and support, intellectual exchange, and political engagement outside of the academic context as ways to address disciplinary isolation for women of color in the field. I argue that these strategies can offer crucial alternative entry points into intellectual and political projects and can open up the discipline itself by destabilizing its structural and intellectual hierarchies and expanding the scope and relevance of geographic research (Liu, 2006, p. 39).
The critique evolved through such forms of interdisciplinary scholarship problematizes systemic bias inherent in categorizing knowledge and knowledge-making into disciplines founded on white, male, Eurocentric ways of knowing. Consider, for example, the following statement made by interdisciplinary theorist and artist Danielle Boutet, who was commissioned in 1996 by the Canada Council to write a paper on "Reflections on Interdisciplinary Practices in Canada":

Non-disciplinary artists, when they do not simply give up on asking for institutional aid, must translate their true intentions into disciplinary language, and lost in this translation are often the most interesting and innovative aspects of their projects. Their practice can even be denied acknowledgement as an artistic practice, on the pretext that it doesn’t correspond to the traditional criteria of what constitutes art. This is the case of engaged art, which is an example of non-disciplinary practice. There are others, and I would cite practices of non Western origin in general (storytelling, for example, or arts associated with spiritual practices, related to rites or shamanism), artistic practices from cultures where disciplinary divisions are non-existent, or at least different from those of the dominant Western division (Boutet, 1996, par. 7).

In other words, knowledge classification systems have a materiality and this materiality can take the form of patriarchy, racism, sexism, classism, and so on (Hunter, 2002). One of my participants also made this point in describing his/her rationale for engaging in interdisciplinary research:

So even though you might be focusing on a common problem from different perspectives, there’s an activism that’s still in there, in that you’re challenging notions of a unified way of developing the questions to research as well as the notion that we’re all striving for one sort of truth. There are multiple points of view which have a reference point, grounded in real problems like the environment or women’s issues.

This symbol of interdisciplinarity as activism, closely related to the notion of interdisciplinarity as ‘reflexivity’, was used to resist dominant forms of knowledge-making. For example, one participant rationalized her involvement in interdisciplinary inquiry as having emerged out of her desire to improve the way the academy studied women’s issues. In the process, the discourses of ‘feminism’, ‘social accountability’ and ‘advocacy’ were also evoked.
4.2.2 Contextualizing competing discursive structures

To understand what makes possible challenges to or deviations from the popular story line, I further analyzed my archive to place the discourse of ‘interdisciplinarity’ into a broader socio-political context. As shown in Table 4.2,

<table>
<thead>
<tr>
<th>Discursive formation/ Overarching Socio-Political Discourse</th>
<th>Globalisation &amp; The Knowledge Economy</th>
<th>Global Justice Movement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discursive structure of Interdisciplinarity</td>
<td>collaboration-diversity-innovation-integration</td>
<td>collaboration-diversity-integration-activism</td>
</tr>
<tr>
<td>Discursive Statements related to interdisciplinarity</td>
<td>“I find it interesting to note that when I’m thinking about research, I really need to delve into a number of different disciplines in order to find answers”</td>
<td>“[T]here’s a certain ethos of respecting what’s brought to the table by other disciplines and also being ready to critique the kind of knowledge-making we do and to ask questions about your questions.”</td>
</tr>
<tr>
<td>Subject-positions affirmed or made visible by the discourse of interdisciplinarity</td>
<td>the expert, the collaborator, the team player, the innovator, the academic entrepreneur, the industry partner, the research manager, the research facilitator</td>
<td>the interdisciplinarian, the academic as activist, the conceptual innovator, the philosopher, the community partner</td>
</tr>
<tr>
<td>Objects made possible by discourse</td>
<td>open space work environments, information sharing devices/search engines, interdisciplinary literature reviews, mixed-methods, bibliographic meta-analysis, knowledge as currency</td>
<td>participatory action research, social movements, knowledge as pathway to agency, reflection diaries – transformative learning</td>
</tr>
<tr>
<td>Institutional locus of power (using UofT examples)</td>
<td>MARS and commercialization office, interdisciplinary programs, research institutes and centres in Engineering and Medicine (Health Care, Technology and Place, the Wilson Centre, Bell University Labs etc), the ‘research team’</td>
<td>interdisciplinary programs, research institutes and centres in Arts and Science and the Humanities (i.e. women’s studies, environmental studies etc.),</td>
</tr>
<tr>
<td>Theoretical choices</td>
<td>Neo-liberalism and Laissez-faire economic theories</td>
<td>Marxist/socialist economic theories, critical feminisms, anti-colonialism, indigenous knowledges, anti-racism, post-modern critique</td>
</tr>
</tbody>
</table>

this analysis confirmed the obvious point that interdisciplinarity in its popular form is intimately linked to the discourse of ‘globalization and the knowledge-economy’, also strongly projected through international policy forums such as the OECD. The analysis itself and the nature of this connection are detailed in the chapters that follow. However, Table 4.2 provides a quick comparison of the discourse of “globalization” and the counter movement (which is often referred to as the “global justice movement”).
A by-product of using a table to put some structure to a phenomenon that is very complex is that the two discourses look as if they are two poles of a spectrum of activity. However, my intent was not to create a dichotomized view of the social relations that make the discourses of ‘interdisciplinarity’ possible. For this reason I drew the lines delimiting the different discourses as permeable, and included a third column sketched in gray. The gray space is there to signify both the multiple possibilities which I have not foregrounded, but also the configurations that are not made possible in the context of working within this ‘dichotomy’.

Theoretically, the most interesting aspect of the relationship between the two columns is that the discursive representations of interdisciplinarity both under globalization/knowledge economy and the social justice movement have the same starting points; namely, collaboration-diversity. Integration is also present in both configurations. I used Table 4.2 as a heuristic to organize the discussion of the material and constitutive effects of the discourse of ‘interdisciplinarity’ within the context of the University of Toronto as expressed through the experiences of the participants that took part in this study. The remaining portion of this thesis will be devoted to illustrating these material effects both in the context of the governance of knowledge-production and the experiences of those who produce knowledge.

4.3 Conclusion: contending with competing story lines

In this chapter analysis of rationales for engaging in interdisciplinary activities was expanded to include sources such as government, business, and discoursing subjects. In the process I showed how the discourse of interdisciplinarity can be identified in its current popularized configuration. This chapter, along with a review of the epistemic literature, shows that despite evolving socio-political configurations that promote interdisciplinarity as a pathway towards economic innovation, there are many different ways that interdisciplinarity can be conceptualized, rationalized and approached by knowledge-makers. In other words, the popular story line of interdisciplinarity does not preclude alternative story lines.

In this chapter, I also described the emergence of interdisciplinarity at UofT through an analysis of participant rationales for engaging in interdisciplinary activity. Dominant symbols of interdisciplinarity currently visible at the University of Toronto and also present in my broader archive were introduced, showing how the popular discourse has been embodied or challenged by knowledge-makers at UofT. I have ended the chapter with a short description of the broader
sociopolitical context within which interdisciplinarity operates by introducing the discursive formation that the popularized discourse is associated.

The next chapter will explore the role that the popular discourse of interdisciplinarity plays in the governance of knowledge-production more generally. In the process, I will analyze changes in the perceived role of the university in society and the implications for the way the university functions in a broader system of knowledge-production.
Chapter 5
The discourse of governance

5 Introduction

In the previous chapter, I noted a connection between the popular discourse of interdisciplinarity and the discursive formation of globalization and the knowledge economy. This chapter will expand my mapping of the social relations associated with interdisciplinarity by looking at the current role interdisciplinarity plays in the governance of knowledge-production. As an entry point I will reflect on how the role of the university, and its function in a broader system of knowledge-production, has changed historically. In the process, discontinuities in use of the dominant symbols linked to knowledge-production will be documented. The goal of this chapter then is to describe the emergence of the neo-liberal globalization movement and knowledge economy discourse (the discursive formation to which I have linked the popular discourse of interdisciplinarity) in Canadian higher education by describing shifts in rationales for governing and supporting higher education. However, the focus of this chapter is not to develop a genealogy nor a history of the discursive statements associated with interdisciplinarity. Rather, the goal is to develop a context for understanding the experiences of the University of Toronto participants who took part in this study in relation to the dominant contemporary discourses operating within UofT. For this reason, the list of texts analyzed in this section is by no means exhaustive. Rather, this section traces in very broad strokes dominant shifts in social thinking (i.e. discursive relationships) which affected the way government rationalized its relationship with the university sector. In the process, I identify significant moments in the socio-economic history of Canada that relate to knowledge-production, governance and university restructuring.

Governance is used here loosely to denote organized arrangements that guide and order approaches to knowledge-making. The term is chosen specifically for the primacy it has as an approach to university administrative organization, and its link to accountability and transparency. The dual commitment to ‘accountability’ and ‘transparency’ is a distinct characteristic of contemporary Western societies (Mulgan, 2000) and there are growing examples of how such practices have affected university organization (Etzkowitz, 2003) and culture (Strathern, 2000). Since these discourses were also present in the discourses of my participants (as shown in chapter 4), I have looked for how they are implicated in the
organization of the university more generally and how they are linked to the discursive formation of globalization and the knowledge economy and the discursive structure of the popular form of interdisciplinarity more specifically.

I have drawn from academic sources that have studied these relationships as well as government, special commissions, and national organization reports, UofT gray literature (policies, guidelines reports etc.), and popular press articles. Whenever possible I have drawn from scholarship produced by faculty members of the University of Toronto as a way to identify dominant and marginalized voices within the institution. In terms of organization, the first half of the chapter describes in very broad strokes the governance of higher education in Ontario, documenting shifts in rationales for supporting and regulating higher education through the public sector. This is followed by a brief description of the dominant shifts in social thinking (discursive relationships) that affected the way the university’s role in society was perceived. Specifically, a brief description of the emergence of human capital theory, its relationship to the discourses of diversity, ethics and accountability and the implications this relationship has had for higher education more broadly and the University of Toronto specifically will be discussed. Finally, I will argue that the popular discourse of interdisciplinarity is linked with discourses of equity, diversity, and accountability in such a way as to align knowledge-production activity with market interests.

5.1 The governance of higher education in Ontario

This section briefly outlines the formal structural relationships between Canadian universities, government and society in general and in Ontario specifically and makes visible major turning points in these arrangements. In the process I have identified changes in the discourses used to rationalize governance in the higher education sector.

5.1.1 Federal and provincial roles in higher education

In Canada, the provinces have direct legislative and financial responsibility for education. Higher education institutions “operate under provincial charters, are coordinated by provincial bodies and legislation, and obtain the majority of their operating and capital support through direct provincial grants” (Jones, 1991, p. 574). The federal government also supports education, albeit indirectly. Pathways for this support have included transfer payments to provinces earmarked for education, as well as the creation and funding of the three current major granting councils
(NSERC, SSHRC and CIHR) which provide direct support for research and graduate scholarships, the operation of a variety of programs which support vocational and technical training, bilingualism and research, and finally, the provision of financial assistance to students through a loans program (Fisher et al., Rubenson, Bernatchez, Clift, Jones, Lee, MacIvor, Shanahan & Trottier 2006; Jones, 1991).

Federal and provincial relations around education have been historically shaped. Scholars have listed war, demographic changes and economic factors as having influenced this relationship. While provinces have constitutionally derived responsibilities for education, it is the federal government that has overarching responsibility for concerns of national interest, equality of treatment and opportunity, economic development, and Aboriginal peoples and lands reserved for First Nations (Fisher et al., 2006). As social thinking around educational issues has evolved to incorporate concepts related to ‘equality of opportunity’, nation building, human resource development, innovations, etc., the federal government has changed the degree and the nature of involvement it has had in educational planning, organization and development, particularly in the postsecondary education (PSE) sector:

Federal governments have used their spending powers both as a means of channeling funds directly to federal priorities and as levers for realigning the behaviour of provincial legislatures (Fisher et al., 2006, p. 2).

Tracking shifts in federal government policy (and contextualizing changes that took place in Ontario and the University of Toronto specifically) helps elucidate discontinuities in the history of knowledge-production activity and signal shifts in dominant discourses related to research, teaching and the role of the university in society.

In the academic literature, there is agreement that the foundations of the contemporary arrangements between government and the higher education institutions of Ontario were laid in the 1960s (Fisher et al., 2006; Harris & Ontario College of Education, 1966; Jones, 1991; Ontario Advisory Panel on Future Directions for Postsecondary Education, 1996). Until then, the public universities in the system had been created not as a result of a master plan, but rather were the outcome of bilateral negotiation between individual colleges and their community supporters and the provincial government (Ontario Advisory Panel on Future Directions for Postsecondary Education, 1996). By the 1960s, the Ontario government began contemplating how to coordinate
the growing numbers of universities in order to fulfill its stated policy of supporting and ensuring that all students wishing to pursue higher education in Ontario could afford to do so and could be institutionally accommodated. This commitment to providing accessible education, coupled with post-war demographics, made the development of a concerted approach to managing higher education a provincial governmental imperative (Ontario Advisory Panel on Future Directions for Postsecondary Education, 1996).

At the same time, universities, especially the English-speaking ones, pushed for greater involvement of the federal government in educational issues as a way to more securely finance expansion, resulting in the introduction of a number of educational programs affecting the way research production was governed that continue to impact knowledge-production today (Cameron, 1997). Cameron argues that “it was the Second World War and its aftermath which opened the floodgates to the federal invasion of provincial jurisdiction over higher education” creating the precedent for future federal involvement in higher education (Cameron, 1997, p. 11). In 1945, the Veteran’s Rehabilitation Act was passed, after a plan was worked out with the National Conference of Canadian Universities (NCCU), the precursor to the contemporary Association of Universities and Colleges of Canada (AUCC). The NCCU lobbied the federal government to enlist their help in financing the educational needs of returning military service personnel. The Veteran’s Act provided funding to the universities in the form of tuition fees for all veterans enrolling in university as well as a $150 additional grant per veteran. The collaboration between the NCCU and the federal government extended to the point that the NCCU took on the distribution of the $150 grant. The collaboration was so successful that Fisher and colleagues describe this period of federal engagement with university affairs as having solidified a mechanism for how the federal government could intervene successfully in education, even though it was clearly an area of provincial jurisdiction in the constitution (2006, p. 39).

To get around the constitutional division of powers, the federal government rationalized its engagement with the training of veterans not as an explicit educational policy, but rather as policy designed to support individual veterans to attain the necessary skills to successfully compete in an increasingly skills-centered economy. This type of rationalization was also used in future federal government ventures including the establishment of the research granting councils, the student loans programs, and so on. Two points are important here. As noted above, the
division of powers between federal and provincial governments separates education from issues
related to national interests and equality of opportunity. This separation, while reflected in formal
governance relations for the PSE sector, has and continues to be challenged at the level of policy
making, especially as the discourse of ‘accountability’ begins to emerge as an organizing
principle in government, university, professional and public relationships. In the 1960s, for
example, federal and provincial governments took up the notion that public education, including
PSE, should be accessible to all Canadians as a way to demonstrate responsiveness to growing
public awareness that changing demographics would challenge the existing educational
infrastructure. The federal government rationalized a more active involvement in PSE as part of
its social responsibility to provide equality of opportunity for all Canadians. Having worked
closely together with the federal government to finance and provide efficiently for the training of
war veterans, university representatives, senior federal officials and politicians also pressed for a
more “activist federal role in post-war reconstruction” (Cameron, 1997, p. 11). Federal programs
assisted university expansion efforts in a number of important ways:

Grants for capital construction in the humanities and social sciences were introduced via
the Canada Council in 1957. Subsidized mortgage financing for student residences was
added in 1960. The Canadian Student Loans Program was introduced in 1964. Grants for
massive expansion of facilities in medicine, dentistry, and related health professions were
initiated in 1966 through the Health Resources Fund following release and acceptance of
the Hall Royal Commission report and in anticipation of a national medical insurance
scheme (Medicare) (Cameron, 1997, p. 12).

Getting around the separation of powers by focusing on the needs of the individual learner, the
federal government has pushed policies over the years that have cumulatively evolved into an
educational approach that assumes the learner is a ‘consumer’, the researcher a ‘broker’ and each
university a ‘sector’ of the knowledge economy market. To benefit from federal policies
intended to boost the PSE sector, universities have had to compete on the basis of how many
students they can attract, and researchers on the basis of how fundable their work is (increasingly
on criteria that are linked to perceived relevance and application and that promote the popular
form of interdisciplinarity). Finally, students compete for financing on the basis of need and
merit. And so, while structurally, the PSE system has remained relatively stable, culturally, PSE
education has changed through policies that individualize the learning process and assume
individuals can, if given the opportunity, benefit equally from a system that functions on competition and merit. The focus is placed on individual effort and systemic failings are ignored or made invisible. This form of rationalization has been labeled by Foucault (2008) but also academic critiques from the left as ‘neo-liberalism’. As later sections will demonstrate, neo-liberalism has had broad implications for the way education is approached both by institutions of learning and the ‘stakeholders’ who invest in this learning (Magnusson, 2000). Discursively, ‘neo-liberalism’ promotes the process of individualization, the material focus on the needs of the worker, the subject-positions of lifelong learner and collaborator, etc., in a rational and seemingly apolitical way. In the process, it discourages collectivization and obfuscates systemic mechanisms that impose what Pierre Bourdieu describes as “an over involvement of work (and not only among management) and work under emergency or high stress conditions” (Bourdieu, 1998, par. 8). As argued in previous chapters, interdisciplinarity is implicated in neo-liberal rationalizations for capitalizing on the production of new knowledge. It can also be perceived theoretically to function as a technology to manage and regulate knowledge-production by using government funding agencies to strategically bring together individuals with expertise to stimulate the economy. The next section will further discuss the link between neo-liberalism and the popular discourse of interdisciplinarity by exploring changes in the organization of higher education in Ontario that took place in the 1960s.

5.1.2 ‘Revolutionizing’ higher education in Ontario

The 1960s not only placed post-secondary education in Ontario on a trajectory of enormous growth in student demand, they marked a turning point in public expectations. Attitudes toward higher education underwent a transformation and demand for access to postsecondary education exploded (Ontario Advisory Panel on Future Directions for Postsecondary Education, 1996, Appendix B, p. 12)

As the above citation claims, during the 1960s, the post-secondary sector in Canada underwent significant change. At the same time scholars such as Readings (1996) consider the social reforms that took place during the 1960s especially important in the way interdisciplinarity emerged in contemporary knowledge-making. Theoretically, the same rationales that contributed to the restructuring of the PSE sector in Ontario also relate to the emergence of interdisciplinarity in its popular form. This relationship will be explored next, using the restructuring of higher education in Ontario as an entry point.
Glen Jones (1991) describes the 1960s as a “structural revolution” for the system of higher education in Ontario, a period during which “universities struggled to expand” in order to meet the “demand for their services.” Such was the demand that “an entire system of institutions designed to provide vocational and manpower training for a highly industrialized province” was created in the span of a few years. By the end of the 1960s, new universities had been built, existing ones had been generously supported through their expansion, and new colleges of applied arts (CAATs) had been developed (p. 573). The contemporary structure of the higher education system in Ontario thus emerged, consisting of primarily two inter-related but distinct sectors, one highly centralized (CAATs) and the other fairly autonomous (universities). For the purpose of this chapter, only the university sector will be further described and explored.

Two complementary notions thus created the rationale for the current structure of governance of the university sector in Ontario. The first, as mentioned previously, is a high level of autonomy for universities relative to the CAATs and the second is the notion of equitable treatment of institutions by government; this is a notion also shared by the federal government, as its preoccupation with enhancing the educational capacity of the nation as a whole began to take hold at this time (Fisher et al., 2006).

The autonomy of universities is structurally delimited through their legal status and their governance system. Universities are considered corporations, controlled by an administrative board and an academic senate, except for UofT\(^{11}\), which has a single governing council responsible for both administrative and academic matters. The bicameral system of governance has roots in the recommendations made by the Flavelle Commission of 1906, which created the rationale for distancing government from involvement in the operations of the university as a response to public concerns that the University of Toronto was being used as a forum for “petty patronage” (Jones & Skolnik, 1997, p. 278). The bicameral system, Jones and Skolnik (1997) have argued, can be viewed as “as a response to demands for external accountability within the context of reaffirming the importance of institutional autonomy” (p. 279).

\(^{11}\) UofT reverted to a unicameral system in 1972. See Friedland (2002) for an extensive discussion of the events leading up to this decision and the implications of these changes.
With regard to the notion of equitable treatment of institutions by government, a funding formula was adopted in 1967 that rationalized the allocation of operating support in terms of student enrollment. From 1967 onwards, the funding mechanism included some “allocative formula or competitive component, usually based on the recommendations of the intermediary body, which are designed to equalize and depoliticize the allocative process” (Jones, 1991, p. 576). According to Shanahan and Jones (2007), this funding approach persisted with minor modifications until 1995 when the then Liberal government reduced significantly financial transfers to the provinces for health, education and welfare as part of a broader strategy to reduce the federal deficit (p. 32). As they describe it:

The provinces lost $14 billion. At the same time, the government created a new mechanism to transfer funds called the Canada Health and Social Transfer (CHST), in place from 1996/97 – 2004/05. This program aimed at further reducing the federal government’s spending and the provinces lost another $6 billion. Finally, in an effort to provide greater accountability and transparency for federal funding, the CHST was split in April 2004 into the Canada Health Transfer (CHT) and the Canada Social Transfer (CST) covering post-secondary education and welfare. Health receives 62% of the transfer funds, while post-secondary education and welfare share the remaining 38% of the transfer (p. 32).

Fisher (2006) further contextualizes federal cutbacks in higher education during this period. He argues that in the last two decades, “the federal government has used its spending powers to reduce indirect transfers to PSE and to channel that money into direct funding to universities for research, research chairs, research infrastructure, and the ‘indirect costs’ of research” (Fisher et al., 2006, p. 2). Several of these funding schemes were directly linked to large-scale collaborative research projects, rationalized as providing solutions to pressing social problems. Thus, while universities maintain relative autonomy regarding the way they manage their internal affairs, both the federal and provincial governments have arguably steered from afar, using targeted funding strategies to initiate policy change within the sector. For example, the very mechanisms and structures employed to coordinate the growth of the university and college sectors in the 1960s were employed in the 1970s “to constrain or control system growth” when Canada was hit with the impact of the 1973 Oil Crisis. During this time, the government shifted into a period
of fiscal constraint and the federal government began operating under the premise that there was a limit with regard to public return on its investment in education:

Government began to recoil from an open-ended commitment to financing growth in the post-secondary sphere in the early 1970s, even as individuals were becoming more aware of the personal and economic benefits associated with a postsecondary education in an increasingly competitive and global economy. Colleges and universities continued to expand (Ontario Advisory Panel on Future Directions for Postsecondary Education, 1996, Appendix B, p. 12)

Jones argues that despite dramatic changes in the economic sector, the higher education system in Ontario has essentially remained stable. Any changes in the system have been primarily registered at the level of policy and have not affected the overarching structural arrangements between the institutions and government. Structurally, this continues to hold true today. However, as I will document, a relatively stable structural higher education system does not mean that policy shifts are without impact.

As noted above, in more recent years, the federal government’s policy with regard to PSE has been hallmarked by a clear emphasis “on research leading to the creation of applied knowledge” and this emphasis is “clearly set within and has contributed to the emergence of the knowledge society” (Fisher et al., 2006, pp. 1-2). Wolfe (2002) notes that while the federal government reduced its indirect transfers to PSE, in 1996 it in fact made significant new investments in research and development linked to the government’s innovation strategy. As he describes it:

The [federal government’s] return to a stronger fiscal position that coincided with the second mandate in 1997 was followed by the introduction of new spending programs on research and development. Among the initiatives introduced in the past five years are the Canada Foundation for Innovation, increased funding for the research granting councils and the National Research Council, the formation of the Canadian Institutes for Health Research, increased support for the Networks of Centres of Excellence, Technology Partnerships Canada, stable funding for the Canadian Space Agency, the creation of the Canada Research Chairs, and the formation of Genome Canada (pp. 1-2).
This dramatic shift in funding strategy employed by the federal government in the last two decades has changed the way research is approached, supported and evaluated within institutions. As described throughout the past chapters, large scale collaborative forms of knowledge-making linked to the popular discourse of interdisciplinarity are not only promoted as providing relevant solutions to pressing problems, but are also conceived to be a more cost-effective use of expertise and resources.

It is theoretically important to note that the rationale used by federal governments in recent years (to actively pursue economic priorities through educational policy) has been national concern over “human resource development and maintaining educational and occupational standards that ensure citizens’ inter-provincial mobility and equity” (Fisher et al., 2006, p. 3). What made it possible for the federal government to use this rationale successfully, and circumvent negative reactions to what could be perceived as policies which were constitutionally encroaching on provincial jurisdiction?

To answer this question, and to place the university generally and interdisciplinary knowledge-making specifically into this context, I will now explore in broad sweeps some of the dominant shifts in social thinking (discursive relationships) that affected the way the university’s role in society was perceived. These shifts, I will argue, changed how educational policy was conceptualized, developed and projected. As the above analysis shows, the period of the 1960s not only was significant for Ontario but there was also a discursive shift in the rationales for federal government engagement in the higher education sector. This is my starting point for analyzing how shifts in public perceptions of the role of universities in society in the Canadian context have introduced a very specific rationalization for engaging in interdisciplinary knowledge-making.

5.2 Discursive shifts

5.2.1 The turn to market metaphors

During the 1960s, human capital theory re-merged as an economic approach, largely popularized by Gary Becker (1962). Human capital theory had dramatic implications for the way education was subsequently conceptualized. As a concept, human capital can be traced back to Adam Smith (1723-1790), who argued that there are four types of fixed capital: useful machines and instruments of the trades, buildings as the means of procuring revenue, improvements of land
and human capital. Broadly defined as skills, dexterity (physical, intellectual, psychological) and judgment, human capital as a concept incorporated thinking about the individual as an integral part of a nation’s wealth and resources (Smith & Dickey, 1993). What Becker did was to try to accumulate empirical evidence for the potential of investing in human capital development. His program of research was greatly facilitated by the technological advances in data-basing and information sorting that were taking shape in the 1960s and which have served to simplify and augment the proliferation of longitudinal population studies. It should be noted that similar technology has also facilitated interdisciplinary knowledge-production, a topic which will be discussed in more detail in Chapter 8.

Gary Becker was awarded a Nobel Prize in 1992 “for extending the domain of micro-economic analysis to a wide range of human behaviour and interaction” (“Nobel Prize Press Release,” 1992, October 12). Reflecting on his work during his Nobel Lecture, Becker writes:

Human capital is so uncontentious nowadays that it may be difficult to appreciate the hostility in the 1950s and 1960s toward the approach that went with the term. The very concept of human capital was alleged to be demeaning because it treated people as machines. To approach schooling as an investment rather than a cultural experience was considered unfeeling and extremely narrow. As a result, I hesitated a long time before deciding to call my book Human Capital, and hedged the risk by using a long subtitle. Only gradually did economists, let alone others, accept the concept of human capital as a valuable tool in the analysis of various economic and social issues (1992, p. 43).

What is currently an unquestioned approach to economic and educational planning, then, started off as a controversial discourse (further suggesting that the 1960s marks a discontinuity in the history of knowledge-production in Canada).

Becker began his work on human capital with the goal of calculating the private and social rates of return to men, women, Blacks and other groups from investment in different levels of education. He later considered how education relates more generally to labour markets and the economy at large. The ‘evidence’ began accumulating with regard to the economic benefits of schooling, and as Becker recalls,
[t]his promoted the importance of human capital in policy discussions. This new faith in human capital has reshaped the way governments approach the problem of stimulating growth and productivity (1992, p. 45).

Today, human capital theory is considered one of the most empirically applied and supported theories in economics. As the economic rationale of incorporating educational development as part of policy planning for national returns on investment took hold, there was a marked increase in federal involvement in supporting research and development (Cameron, 1997). Fisher and colleagues (2006) document how human capital theory entered the Canadian education policy scene:

Canada’s centenary year, 1967, brought the first major shift in the principles for federal involvement in PSE. In the face of massive public demand for postsecondary access that promised to outstrip the system’s resources, the AUCC had commissioned its own enquiry into higher education financing in 1965. The Bladden Commission’s call for a more consolidated federal role in PSE was realized in part by Ottawa’s creation, in 1967, of a single contact point for PSE, housed in the Education Support Branch of the Department of the Secretary of the State…. Two other reports provided a cogent rationale and avenue for the federal government to increase its contribution to PSE. The Royal Commission on Health Services (Hall Report, 1964) recommended massive expansion of training of health care professionals, including physicians, and called for national financial assistance to provinces for carrying out the recommendation. The Economic Council of Canada’s Second Annual Review (1965) used human capital theory to argue in favour of federal government funding for PSE, citing individual and collective economic benefits of education (2006, pp. 25-26).

In this account can been seen the interests and needs of universities projected through an organized national body, the AUCC. There is also a coalescence of support for social service such as the delivery of health care (also officially activated through a Royal Commission, a body of authority imbued with the public’s trust to direct policy in a rational and non-partisan way). Finally, the theory justifying the shift, the vital ingredient for truth-telling and the construction of discursive practices, is evoked through another national body of authority, the Economic Council of Canada. Set up as a crown corporation and reporting directly to the Prime Minister, the
Economic Council of Canada’s role was to assess medium and long term prospects of the economy, to consider ways of strengthening Canada’s international financial and trade position and to study the effects of economic growth and technical change on employment and income. All these reports, cited in the above quote, are vehicles for the transmission of discourse and the proliferation of a particular configuration of organized activity for knowledge-making that targets educational processes as the mechanism through which ‘social problems’ can be alleviated. The rationale for investing in higher education as a way to increase both individual and economic benefit affects all forms of knowledge-making, including interdisciplinarity.

5.2.2 Ethics and accountability: paving the way for managerialism

During the same period, a discursive shift towards university accountability in Canada took shape. While the notion of institutional autonomy and social accountability were used earlier in the 20th century to rationalize separation of government from the affairs of universities, in more recent years, the discourse of accountability has been operationalized in such a way as to allow more direct involvement of federal as well as provincial governments in the affairs of the university.

Accountability as a discourse has become especially popular in academic writing about governance published in the last 25 years. This coincides with a broader economic, social, and political focus on structuring administrative relationships between and within organizations and institutions in such a way as to ensure ‘transparency’ for their operation and allow for public scrutiny of their activity (Ackerman, 2004; Burke, 2003; McLaren, 2004; McLendon, Hearn & Deaton, 2006; Strathern, 2000). In some ways it can be perceived as an approach to curtail the politics of institutional relations -- a way to rationalize decision-making and to strip institutional practices of ‘bias’ that reproduce social inequities. Justification for such restructuring and policymaking can be found in academic literature, primarily in the social sciences. For example, in the academic literature on the sociology of the professions, the notion of accountability permeates the writing of researchers in a variety of ways. Scholars shifted from observing and studying the ‘function’ professions played in society to analyzing the ability and power professionals wield in the social, economic and political arena, and the implications of the control they hold over specifically delineated divisions of labour (Abbott, 1993; Finn, 2008). Critical scholars made visible power relations implicit in processes of professionalization and held professionals accountable for reproducing social inequities in their everyday practices,
including their approaches to training (Beagan, 2003; Johnson, 1972; Krause, 1996; Muzzin, 2001; Muzzin, Lai & Sinnott, 1999; Witz, 1992). Yet while the idea of accountability opened up the possibility to challenge power relations, scholars also showed how accountability as a rationale was increasingly being used as a way of ‘disciplining’ the activity of institutions, individuals and knowledge-making in general (Baert & Shipman, 2005; Blackmore & Sachs, 2007; Evetts, 2003; Strathern, 2000).

The tension created by the public mistrust of corporate, social, professional and political institutions and their power within society, and the desire of institutions to safeguard their autonomy has had material implications for individuals. It is this very paradox of seemingly eliminating ‘repression’ (in this case the unchecked autonomy of institutions) that “affirms the positivity of their power and its effects” (Foucault, 1990). Arguably, the more focus on restraining the ‘autonomy of institutions’ through accountability, the more the discourse of accountability proliferates, with immediate implications for the autonomy of individuals, particularly with regard to decision making (see Chapter 8).

Furthermore, as the previous chapter showed, the discourse of accountability is often evoked in the context of rationalizing pursuing collaborative knowledge-making that makes a difference (part of the mantra of the popular discourse of interdisciplinarity). Through arguments of accountability to diverse ‘stakeholders’, interdisciplinary knowledge-production is ‘disciplined’ into being primarily a collaborative knowledge-production process that aims to fulfill mandates for relevant and socially engaged research. This point has been aptly described by Marilyn Strathern (2004), summarized in Table 5.1.

**Table 5.1: Strathern’s nexus of three virtual moments**

<table>
<thead>
<tr>
<th>Description</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Accountability as an index of society</strong></td>
<td>Evidence that society has been taken into account lies in practices of accountability themselves</td>
</tr>
<tr>
<td><strong>2. Interdisciplinarity as an index of accountability</strong></td>
<td>Interdisciplinarity works as rhetorical evidence for disciplinary success</td>
</tr>
<tr>
<td><strong>3. Problem solving as an index of interdisciplinarity</strong></td>
<td>Axiomatic evidence of the need for multiple perspectives and collaborative work</td>
</tr>
</tbody>
</table>

(reproduced from: Strathern, 2004a, p. 80)

Table 5.1 suggests that in contemporary knowledge-making, accountability processes (reporting findings, showing outcomes, demonstrating impact, etc.) are all practices designed to
demonstrate that institutions (including universities) take into account the ‘needs of society’ as a collective and do not operate to fulfill the interests and mandates of specific groups. In this matrix of holding institutions accountable to ‘stakeholders’, interdisciplinary knowledge-making becomes a technology for accounting. Interdisciplinarity allows experts trained in disciplinary knowledge-making to demonstrate that they have successfully contributed to ‘society’ by assisting in the generation of solutions to socially important complex problems. As a process of accounting, interdisciplinarity also generates the evidence for supporting the claim that engaging in collaborative work that bridges diverse perspectives generates ‘better solutions’. These three ‘virtual movements’, which Strathern describes, are not considered corollaries, but rather mutually reinforcing relationships evidenced in contemporary knowledge-making.

The emphasis on ‘measuring’ faculty and faculty work in the context of making institutions accountable is discursively operationalized through a focus on academic ‘excellence’ and in projecting the material value of pursuing a university degree, or in demonstrating the ‘relevance’ of university activity through outcome-based indicators. The next section speaks to the material effects embedded in this pursuit of ‘excellence’ in the mandate of universities as part of broader socio-political considerations, specifically highlighting the University of Toronto and its current projected institutional identity. My entry point for this analysis is Readings’ book, *The University in Ruins*.

5.2.3 The quest for excellence: New packaging for a tarnished enlightenment

In a seminal book published posthumously in 1996, Readings reacts to the effects of the application of human capital theory to the rationalization of the role of education in Canadian society. While he does not claim to be an ‘expert’ studying interdisciplinarity (such as Klein or Lattuca), he does advocate for interdisciplinary knowledge-making as a way to counter the ‘disciplining’ effects of globalization. I chose this book to introduce some of the material effects of discursive shifts in the governance of higher education in general and knowledge-production specifically for three reasons. First, Readings worked at a Canadian university, the Université de Montréal, and his perceptions of how the university’s role in society has changed, I believe, are based as much on his personal observations as experiences as they are a product of his research. Second, the changes he discusses reflect a displacement of the humanities in the hierarchy of knowledge-production, a shift that members of the University of Toronto administration commented on and said they tried to resist (as discussed in a subsequent chapter). And third,
Readings wrote the book while the term ‘interdisciplinarity’ was gaining popularity but arguably when various configurations were still competing for prominence. Comparing Readings’ proposal for using interdisciplinarity to reform contemporary knowledge-making to the way interdisciplinarity has been implemented at UofT helps foreground the particular contours of current knowledge-production arrangements.

Readings traces the history of the university from Kant to the present time and argues that there are three distinct phases or forms: the university of ideas (Kant), the university of culture (Humboldt) and the university of excellence (based on measuring quality). His central thesis is that the role of the University in previous phases was to sustain and reproduce the ideology necessary to support the work of the nation-state. As the role of the nation-state is challenged by globalization and internationalization discourses, so too is the role of the University as the producer of ‘ideology.’ As Reading expresses it:

> Within modernity, the University held a central place in the formation of subjects for the nation-state, along with the production of the ideology that handled the issue of their belonging to that nation-state (culture). Its internal organization was meant to reflect the structure of belonging or community in which a general culture of conversation held together diverse specialties in a unity that was either organic (Fichte), societal (Newman), or transactional (Habermas) (1996, p. 167).

Readings argues that with the rise of ideology-critique as a methodology inside the University, the ideology-production functions of the university declined. This shift, Readings argues, has had implications for the way the university is organized. First of all, it no longer needs a grand narrative to function. Released from the expectation of creating an overarching raison d’être, “the University as a bureaucratic institution of excellence” can “incorporate a very high degree of internal variety without requiring its multiplicity of diverse idioms to be unified into an ideological whole” (1996, p. 168). That is not to say that there is no unification in the diversity of activity characterizing the modern university, but rather that unification is a matter of the “exchange-value” these activities hold in “an expanded market” rather than a matter of being linked by a unified, and presumably negotiated, sense of purpose. The implications are debilitating to collective activism:
The non-ideological role of the University deprives disruption of any claim to automatic radicalism, just as it renders radical claims for a new unity susceptible to being swallowed by the empty unity of excellence (Readings, 1996, p. 168).

Readings argues that the operative principle of the university is now "excellence," a concept that replaces the previous guiding concept of "culture," which itself succeeded the Kantian vision of "reason." But the characteristic of the University of Excellence is that it lacks any concrete referent: "excellence has no concept to call its own" (1996, p. 24); "excellence is clearly a purely internal unit of value that effectively brackets all questions of reference or function" (p. 27).

Whereas the University of Culture was tied to the nation state and to national culture as its object and the national subject as its product, the University of Excellence is contextless and its students merely "consumers" (p. 53); the university's goal is now that "of producing a subject who is no longer tied to the nation-state, who can readily move to meet the demands of the global market" (p. 49). At the same time, therefore, ideology is replaced by administration: "the University is no longer primarily an ideological arm of the nation-state but an autonomous bureaucratic corporation" (p. 40). Accounting becomes the sole measure of accountability: "the language in which global discussions are to be conducted is not that of cultural conflict but of economic management" (p. 30).

Readings argues that just as academia is making huge strides in the development of radical new programs, this success is being "achieved in direct proportion to the reduction in the general social significance" of these programs. He cautions that university reform needs to be conceptualized in the context of "rethinking the categories that have governed intellectual life for over two hundred years" (1996, p. 168). In fact, Readings offers a model for collaborative knowledge-making that transcends the "unthinking institutional life of disciplinary" activity. He calls for an opening up of disciplinary spaces, allowing these spaces to have a short term of operation, regardless of their success. He thus critiques generalized interdisciplinarity and argues for a kind of "rhythm of disciplinary attachment and detachment." Put another way, Readings proposes an "abandonment of disciplinary grounding" that in fact "retains structurally the question of the disciplinary form that can be given to knowledges" (1996, p. 177).

While Readings critiques the current dominance of managerialism, references to the University of Culture and the University of Reason at times sound nostalgic and appear unproblematized.
However, there is an important observation he makes that is helpful in deconstructing the effects of current arrangements of knowledge-making. His observation of the erosion of the ideological base for collective mobilization and social change is linked to the rise of the audit culture, managerialism, and technocratic approaches to university governance (Wagner, Acker, & Mayuzumi 2008; Strathern, 2000). The next section will explore this link in the context of faculty relations, showing in the process how rationales that affect knowledge-making broadly also hold implications for faculty relations and equity politics specifically.

5.2.4 Rethinking institutional identity: The beginnings of an embodied version

At the University of Toronto, the discursive relationship between commitment to excellence and commitment to equity creates many challenges. Those interested in ‘making a difference’ by effecting change at the cultural level must grapple with the way knowledge-production is conceptualized and approached. A focus on increasing participation of the designated groups is in many respects simply a focus on diversifying our numbers. Accounting logic has provided the rationale and opportunity, for example, for women to pursue academic careers and leadership positions within UofT at greater numbers than ever before. However, this focus on ‘making our numbers look good’ does not automatically translate into efforts to ‘make a difference; through the eradication of cultural and political dimensions of discrimination (Martimianakis, 2008b).

Nor does it interrogate processes that are historically linked to dominant forms of knowledge-making, with implications for the way interdisciplinarity is conceptualized, approached and rewarded (Tripp & Muzzin, 2005). The message to members of the designated groups working at UofT, as in many other North American universities, is clear; there is an opportunity to ‘make it’ in institutions built on white, male, western constructions of ‘success’ so long as you meet the white, male, western markers of ‘quality’ (Tonso, 2001; Wagner, Acker & Mayuzumi, 2008).

One of the most common forms of backlash against the equity and diversity requirements incorporated into the selection and promotion process at UofT is that hiring from designated groups can affect the ‘quality’ of the institution (Martimianakis, 2008b). One participant who was a faculty administrator trained as an engineer provided an explanation for why this perception exists:

Sometimes things we say create their own momentums and you end up with something that is supposed to be politically correct, but not necessarily correct. [I]f
interdisciplinarity happens to be the politically correct thing to say, in the same way we say diversity, then it probably has lost its meaning. Because diversity is more of a gimmick now...perhaps to indicate that we [the institution] are now all encompassing, accepting and whatever.

Diversity (as in improving the condition of designated groups) is, according to this participant, a “gimmick” in that the institution is perceived to engage in this activity as a form of social accountability (demonstrating in other words that its knowledge-making has ‘made a difference’), without taking into account how, for example, demographics differ from Faculty to Faculty or whether the goal of equity has really been achieved. When I asked the participant to elaborate on what s/he meant in terms of diversity, asking if s/he was referring to diverse approaches to knowledge-making, s/he noted that, at UofT, we do not have “diversity in knowledge-making” because that would actually be evidenced in a greater focus on interdisciplinarity. S/he was using the Faculty of Engineering as his/her point of reference and implying that in engineering departments there is very little focus on interdisciplinary research (meaning collaborative research that incorporates epistemological expertise from fields in the social sciences and the humanities). This is an important distinction that I will address in the chapters that follow. What Lattuca has termed instrumental forms of interdisciplinarity are common in engineering, where participants insist that “collaborating with colleagues from other science departments and from industry is the norm”. But this participant used a conceptual definition of interdisciplinarity to argue instead that at UofT, the term diversity is used to talk about “bringing in all the races,” the assumption being that “if you have more of an open door policy in terms of who you choose to educate” and if you “choose the best, without looking at the colours and the origins...then you will have a better crop and you will achieve more things.” This effort to attract the ‘best expertise’ from around the world can be associated with globalization and the internationalization of knowledge-production, not anti-racism. As the colour blind popular discourse goes, attracting students from across the world gives UofT access to a broader sample of the “best and the brightest.” However, according to this participant, “not looking at the colours,” or where the colours have concentrated, has actually created a unique situation for the Faculty of Engineering, given that over half the students are now members of visible minority groups. S/he argued that “to keep talking about increasing diversity today is not the same as what people were thinking about when they spoke of diversity in the past”. The
participant emphasized that having pockets of visible minorities concentrated in certain parts of the University is not evidence that UofT demographics are appropriately reflective of the social and cultural diversity of Toronto. When I asked whether women and Aboriginals were included in underprivileged groups when discussing diversity in Engineering, s/he noted:

[F]or women, the argument is accepted…. Aboriginals don’t even appear anywhere. I mean they are mentioned a lot but they are not really very competitive in most cases. Occasionally we meet some of them who can make it to the University; unfortunately we don’t have enough of them.

In other words, the experiences of this participant have led him/her to conclude that the University is interested in attracting the ‘best’ students and the ‘best’ scientists (pursuing a mandate of ‘excellence’) and that this supersedes their commitment to ensuring that multiple epistemologies reflect the cultural diversity of Toronto. The reason for quoting the above excerpt is not to make the point that cultural stereotypes are pervasive with implications for the way people experience their professional environment. Or that people conflate equal opportunity with equity. Rather, it is to make visible the complexity of social relations linked to discourses such as equity, diversity, making a difference and accountability that are currently so prominent in the governance arrangements of the university. While the demographics have changed, the standards used to select students have not been ‘compromised’, implying that it is not because of any effort to meet equity numbers that these demographics have changed; but rather that racial diversity has come about because there has been a steadfast commitment to selection of the ‘best’. This commitment is also linked to the discourse of ‘making a difference’. Instrumental forms of interdisciplinarity assume, as argued in the previous chapters, that solutions to pressing problems can be achieved when experts work together. If the experts brought together are the ‘best’ experts in their respective fields, then this can improve the final ‘product’ of the collaboration. This is how the discourse of ‘excellence’ achieves material effects. Aboriginal students do not make it into engineering, because (as individuals) they are “invisible,” namely “not competitive” -- not in the ranks of the “best.” Similarly, “native Anglo-Saxons” currently form a minority group at the Faculty of Engineering because they do not make the ‘cut’, not because they may differ epistemologically from mainstream faculty. The irony is that while there is an assumption amongst proponents of equity policies that increasing numbers of the designated groups will indeed increase institutional success and ultimately promote cultural
change (including a tolerance for epistemological differences), the criterion of ‘success’ is not necessarily open for negotiation. This is similar to the way critical and radical forms of interdisciplinarity are treated in mainstream typologies. There is an assumption that they can exist and compete with mainstream approaches if the definition of interdisciplinarity is broad enough to include both conceptual and instrumental forms of collaborative knowledge-making. However mainstream typologies do not account for the politics of ‘relevance’ created by historically enduring hierarchies of what counts as knowledge. This has implications for the way critical and conceptual interdisciplinarians are valued (a topic explored in detail in Chapters 8 and 9). Furthermore, participation in contemporary knowledge-making activities is subject to merit driven agendas that require demonstration of outcomes that ‘help the nation grow economically’. But what is actually being platformed on discourses of equity and diversity, as the next chapter will show, is a way to prepare the Canadian workforce to function on a global level and exploit opportunities for economic development and growth around the world. This too holds implications for the way interdisciplinarity is operationalized, supported and valued at UofT.

The way the popular discourse of interdisciplinarity intersects with the discourses of equity, diversity and accountability allows for the reproduction of a techno-rational approach to knowledge-making to permeate institutions of higher learning in alignment with the ‘knowledge-economy’. In the process, some forms of knowledge-making are made ‘invisible’ or seen as ‘uncompetitive’. The following excerpt is from an interview with a social science faculty member at UofT who has held senior administrative positions outside the Faculties of Medicine and Engineering and who has pursued interdisciplinarity as a way to make a difference for women socially:

(Interviewer: So UofT has embedded currently within the policy of interdisciplinarity, this notion that the disciplines still hold a very primary role in the organization of the university and that interdisciplinarity is not there to challenge disciplines perse)  
Participant: Right, that’s why we went the other way because that’s exactly wrong…. We were there [women’s studies program], because all of us wanted to change our disciplines but the way knowledge in general was created. Then of course the actual position of women in society was all mixed up also with social action, right? And the two actually are and should be inter-linked as far as I’m concerned. If you don’t challenge the
discipline, then what’s the point in doing it? Like if all the disciplines totally remained the way they are, like innovation, like the model you just gave me, should be something that affects the various disciplines that have participated in this cooperation and if they don’t, well what’s the point, right? (Interviewer: So how would you get credit for innovation in conceptual work in the context of UofT?) Well social sciences and humanities get the shaft because [the sciences] don’t see it as innovation. They don’t see new concepts or something like that, as innovation because it’s not patentable and you don’t make money. And look where the buildings go up. They go up for medicine and they go up for business administration and they don’t go up for the other disciplines, and look at who gets how much money from the Government of Canada in terms of SSHRC, CIHR and NSERC, and look at the same in terms of what UofT does. We get shafted.

The reaction of this participant is a strong admonishment of the “lip service” paid by government, university and funding agencies to the role the social sciences and humanities should play in solving the way we understand and solve the ‘world’s big problems’. Similar to Readings, interdisciplinarity is conceived of by this participant as a political process, an opportunity to critique the dominance of disciplines in generating ‘expertise’ and ‘knowledge’ that purposefully or inadvertently marginalize the same groups over and over again (intent is less important here than the resulting effect). The focus of this participant is the status of women in society, but the critique has also been made from a variety of perspectives, including by anti-racist, anti-colonialist and Aboriginal scholars. For example, from an anti-racist perspective, Scheurich and Young (1997) argue that epistemologies and their related ontologies evolve out of the socio-historical experiences of civilizations and smaller groups, and for this reason different cultures, societies and civilizations end up evolving unique epistemologies that are context specific (p. 8). Similarly Hunter (2002) argues:

All research questions arise from previously existing ways of knowing about race and racism that limit or make possible ways of understanding the problem. This in itself is not a problem. In fact, it is probably desirable to have research from many different perspectives on race, often referred to as epistemological diversity. The problem arises when one epistemology dominates academic discourse on a topic, and consequently, dominates the process of constructing research questions, and producing knowledge. In
the academy, and particularly in sociology, the neo-liberal positivist epistemology has dominated knowledge-production and precluded alternative ways of knowing (p. 131).

Under the guise of ‘making a difference’ through a commitment to ‘excellence,’ institutions of higher learning are currently promoting forms of knowledge-making intimately linked to the “neo-liberal discourse.” as discussed earlier, and a techno-rational approach to knowing that is very specific to the way epistemology has evolved. According to this discourse, ‘true’ knowledge, is knowledge derived through an objective scientific approach. The approach is ‘open’ to anyone that chooses to create knowledge without ‘colouring’ it with the bias of emotion, subjectivity and positionality. As Hunter puts it: “In fact, this is the one epistemology that does not acknowledge the existence or influence of epistemologies at all” (2002, p. 130).

Subsequent chapters will provide evidence that the popular discourse of interdisciplinarity and the statements that make it up (such as diversity, innovation, and collaboration) are operationalized at the University of Toronto in such a way as to, on the one hand, encourage new ways of knowing through the integration of diverse perspectives in knowledge-making activities, while at the same time reproduce historically entrenched inequities in what counts as knowledge, success, impact and outcome under the auspices of “making a difference” and “offering solutions” for the “world’s problems.”

5.3 Conclusion

This chapter explored how knowledge-production in general, and interdisciplinary research specifically, is currently governed in Ontario and within the University of Toronto. I have argued that knowledge-production is currently implicated in a number of socioeconomic processes, which align academic activity with corporate interests (Etzkowitz, 2003; Slaughter & Leslie, 1997; Slaughter & Rhoades, 2004) and which use the discourse of ‘making a difference’ to obfuscate the corporate interests embedded in current knowledge-production activity, as well as the effort involved in maintaining such levels of output. I have also introduced how these governance relationships are seen by faculty engaged in collaborative knowledge-making both in terms of how they perceive their role in current knowledge-making configurations, and also in how they project their professional activity. These relationships will be explored in more detail in Chapters 8 and 9.
The next chapter analyses the popular discourse of interdisciplinarity as a commodity in the knowledge-economy. Through an exploration of key institutions in higher education and their activities, I will show how the popularized discourse has been reproduced and institutionalized, aligning in the process higher education activity with economic priorities.
Chapter 6

Interdisciplinarity as a commodity in the knowledge economy

6 Introduction

In the previous chapter I showed how the system of governance for higher education, within which the University of Toronto operates, has remained essentially stable in terms of structure following a period of intense change in the 1960s. At the same time, higher education was restructured under a rationale of ‘accessibility’. The social welfare discourse, characterizing Canadian social policy at the time, held that education was linked to personal prosperity and was an essential ingredient for democratic citizenship. Offering access to higher education was made part of an overarching agenda to provide for Canadian nation building. However, the perceived role of education in society, as I have argued, has shifted in recent years. It is becoming less about ‘preparing’ populations for successful civic life, and more about ‘training’ populations to meet the demands of the knowledge economy. This shift is most visible in the policy rationales and vision statements of government, in university reports and in statements, and declarations made by individual occupational associations, media and other ‘stakeholders’. For example, the European Union in 1996 described three basic impulses for globalization: “These three impulses are the advent of the information society, of scientific and technical civilization and the globalization of the economy. All three contribute to the learning society” (European Commission, 1998, p. 21). Education is being ‘platformed’ as an economic imperative, and directly linked to the ability of states, including Canada, to compete internationally in a global economy that relies on increasingly more pervasive digital and communication technology (Kelly, 2009; Magnusson, 2005). According to many authors, the change in rationale is creating a very different context for learning and producing new knowledge, characterized most notably by the way research is becoming increasingly formalized and regulated (see e.g. Shaw, Boynton & Greenhalgh, 2005, p. 496).

This chapter continues the archeological tracing of interdisciplinarity as a discursive event by drawing from the broader archive of texts with examples of how the knowledge economy discourse promoted through the OECD has been operationalized in the Canadian context. By analyzing key institutions and their activities, I will explore the changing social expectations regarding the role of the university in society, using interdisciplinarity as an entry point. In the
process I will deconstruct how the popular discourse of interdisciplinarity is activated in ways that help transmit and reproduce techno-rational approaches to knowledge-making.

Specifically, I will first describe and outline how the OECD promotes globalization and the knowledge economy and discuss the implication of specific OECD policy recommendations about Canada’s capacity to leverage its educational programming to implement a successful innovation strategy that mobilizes its workforce and contributes to the country’s prosperity. Subsequently, I will show how OECD positions permeate the Canadian educational policy context by exploring federal and provincial positions on the role of higher education, interdisciplinarity and innovation. Finally, I will discuss how universities have responded to these changing social relations related to knowledge-production, drawing out the materiality of shifting rationales in the process.

6.1 The OECD promotes the knowledge economy

In an increasingly globalized world, the Canadian educational experience is affected by worldwide interrelated processes and institutions (Spring, 2008, p. 330). This interrelationship is captured in comparative studies that find congruence among educational agendas of Western states that include investing in education to develop a more productive workforce and to promote economic growth. This perspective is particularly exemplified in OECD texts. In Chapter 3, the ideological underpinnings for OECD activities were described through an exploration of its mission statement, its organizational structure and its role in perpetuating a certain position on the role and usefulness of interdisciplinary knowledge-making. In this chapter, I will not repeat the OECD’s position on interdisciplinarity, but will explore how this position is linked to a broader discursive web of social relations that drive harmonization with overarching capitalistic free market goals. OECD rationalizes this activity with cultural, social and political institutions committed to celebrating difference, creativity and innovation. A brief exploration of two recent OECD reports pertaining to Canada make evident how the knowledge-maker as a subject-position is constituted through self-disciplining technologies operationalized through international collaborative associations such as the OECD.
6.1.1 The nuts and bolts of making a knowledge economy work: developing the workforce according to the OECD

In 2004, the OECD released a report entitled *Developing highly skilled workers: Review of Canada*. The foreword indicates that this peer review exercise was undertaken as a follow-up to “the OECD Growth Study” which determined that “governments need more effective policies for developing human capital and releasing its potential in order to increase productivity and growth” (OECD, 2004, p. 2). Concurrently, peer review of policies of member states were also undertaken for the purpose of increasing access to venture capital, the diffusion of information technology to business, and enhancing public/private partnerships for research and innovation. The Committee on Industry and Business Environment conducted the peer review of Canada in March of 2004 and the Report represents a compilation of recommendations for “policy actions based on the strengths and weaknesses observed in the Canadian policy approach to developing highly skilled workers to fulfill future industry requirements.” The foreword also explains that “once a critical mass of peer reviews is conducted, a cross-country comparative synthesis report will be prepared with a view to identifying common good policy practices” (OECD, 2004, p. 2). The foreword concludes with a statement indicating that Günseli Baygan of the OECD Secretariat prepared the Report, which was published under the responsibility of the Secretary-General of the OECD. The above description of the process undertaken to study these issues serves to rhetorically reinforce the authority of the OECD to elevate recommendations to ‘best practices.’

The Report begins with the following statement: “Canada has the highest stock of human capital in terms of educational attainment in the OECD,” with over 40% of the adult population having tertiary education (over half holding university degrees and the rest college diplomas). When vocational training is excluded (i.e. practical/technical/occupationally-specific programmes) Canada ranks around the OECD average (OECD, 2004, p.6). The growth of tertiary education in the 1990s and the “remarkable” growth in female participation witnessed over the last two decades are attributed to the recession in the early 1990s as well as the “structural changes in the Canadian economy towards more knowledge-intensive industries” (OECD, 2004, p. 7). These structural shifts, according to the Report, have created the impetus for significant “upskilling in various sectors,” a trend that is expected to continue and expand to the “creation of new occupations with special skill requirements.” The Report also notes that “Canadian universities
are increasingly offering combined degree programs to meet demands for new multi-disciplinary skills” (OECD, 2004, p. 7). This is the first indication in the Report that universities have shown responsiveness to market demands and needs and it is interesting to note that interdisciplinarity is not directly evoked; rather, reference is made to the structural shifts in the delivery of training as a collaborative effort between disciplines.

The Report documents areas where Canada lags behind in terms of developing the capacity to fully engage in the knowledge economy. First, “Canada lags behind leading OECD countries in terms of graduation rates at a PhD level” and secondly, “produces fewer researchers and technical personnel than many other OECD countries.” According to the Report, this poses a problem for Canada. Referencing directly the 2002 Government of Canada publication, Achieving Excellence: Investing in People, Knowledge and Opportunity: Canada’s innovation strategy, the OECD reinforces the projections that “firms will be looking for more research personnel – technicians, specialists, and managers – to strengthen their innovative capacity, and that the public sector needs to replace the large number of professors, teachers, researchers and administrators, reaching retirement age.” The OECD Report acknowledges that the “education sector is under increasing pressure to meet these changes in a cost-effective way” (2004, pp. 7-8). It then goes on to discuss the discrepancy between large investment in higher education with limited private returns for this investment as indicated from trends in employability and earning potential of the highly skilled. This is explained as follows:

The high unemployment rate at the aggregate level masks the surge in demand for highly skilled workers in certain occupations…. The coexistence of unemployment and high vacancy rates with regard to skilled workers indicates allocational problems in the Canadian educational system and labour market. While educational attainment is an important element for successful labour market entry, there has been insufficient emphasis on research and technical skills in Canada and on the combination of technical and business skills now needed in industry. In addition, labour market adjustment mechanisms have been generally slow to respond to rising skill shortages through higher wages, on-the-job training or higher mobility. After the next decade, demographic shifts will start to have an impact on the skill structure of the Canadian workforce. An ageing population and high retirement rates are expected to slow the long-term growth of the labour force, with immigration increasingly filling the gap (OECD, 2004, p. 9).
The overarching issue thus becomes economic restructuring. Human capital development emerges as a central component in contemporary economic activity that centres on the consumption of expertise. The production of knowledge products is assumed to be enhanced through free market arrangements where the exchange of ideas increases opportunities for innovation. This rationale, as the previous chapters have shown, is also embedded in the popular discourse of interdisciplinarity. Scientific and technological knowledge/expertise are more popular and thus more visible in contemporary economic arrangements because the translation of such knowledge into consumable products operationalizes more readily the industrial but also conceptual complexes in place from previous capitalist configurations. For example, calls to make knowledge-production more socially relevant provide the ideological rationale for investing in knowledge translation exercises. The accountability discourse creates the regulatory infrastructure for steering translation exercises. Demonstrating a return of investment is much easier when solutions to ‘pressing’ social concerns such as finding a cure for cancer, or improving our environmental footprint by developing ‘cleaner’ modes of transportation are generated. For example, health care systems operating on biomedical models of health can more readily absorb a ‘cure’ in the form of a procedure or drug than a ‘prevention’ which requires mass attitudinal shifts in life-styles and the elimination of all carcinogenic products and processes currently in use. Furthermore, developing ‘cures’ does not threaten the social, political and economic power currently concentrated in such subject-positions (e.g. physician, health care provider, pharmaceutical producer, medical equipment industrialist, etc.) making the return in investment much less risky than solutions that call for a complete re-conceptualization of how we devise and implement solutions to problems. Similarly, products that clean the environment without eliminating the technologies already in place are seen as profitable investments because they will not require major restructuring for their up-take, nor will they challenge the status quo.

The rest of the Report targets specific policy areas that are implicated in facilitating the required shifts to knowledge-intensive technological production. The following table reproduced from the Report summarizes both progress and recommendations concerning policies for highly skilled workers in Canada as assessed by the OECD-coordinated peer-review committee. The categories included in the table reflect the popular discourses currently pervading OECD visions of what is sayable and doable with regard to human capital development. To highlight the operating discourses which relate to my evolving analysis of interdisciplinarity, I have placed an
additional column at the end of the original OECD table. As Table 6.1 shows many of the discourses associated with interdisciplinarity such as (collaboration, facilitation, accountability, expertise, innovation) are also embedded in the logic of OECD economic development planning.

As the last two rows suggest, the intersection of equity and knowledge-production is particularly important in considering how interdisciplinarity and collaborative modalities are invoked as pathways to innovation. For example, one of the overarching assumptions embedded in the OECD Report regarding innovation is that the pathway to innovation is through increased research production and development of human capital, specifically the development of women. Two inter-related dimensions of Canada’s innovation strategy and the OECD’s recommendation for improving this strategy are especially important to the way the discourse of interdisciplinarity is being operationalized in knowledge-production. These are: the role of women in the workforce and the forms of knowledge-making that are considered important in revenue generating schemes in the knowledge economy. Both of these dimensions will be discussed in detail below.

The second last row of Table 6.1 speaks specifically to the need to increase workforce participation of highly skilled women. Canada has reported that in this area, it plans to provide enhanced parental benefits, extended parental leave and strengthen childcare supports, in order to allow more women of childbearing age to stay in the workforce. The OECD recommends that in addition to these measures, the government should also structurally address wage gaps between men and women. A number of underlying assumptions are made in the context of this policy discussion. The role of the government is perceived to be both ‘facilitative’ and ‘regulatory’. Its policies must strive to facilitate women in entering and staying in the workforce but also regulate employers so that discrimination in terms of compensation does not persist. The other assumption is that all women, regardless of economic and cultural background will benefit equally from these policy initiatives. Thus, in the process of acknowledging progress in the area of increasing the workforce participation of ‘highly skilled’ women in Canada, and in making policy recommendations for further enhancement of this domain, the OECD also evokes discourses of equality, facilitation and accountability. As I have been arguing thus far, these discourses are also evoked in the context of interdisciplinary knowledge-making as applied in its popular form and this has material effects for individuals interested in pursuing other forms of interdisciplinarity.
The link between neo-liberal rationales for increasing human capital development and interdisciplinarity is even stronger when exploring strategies for enhancing innovation (see the last row of Table 6.1).

Table 6.1: OECD progress and recommendations concerning policies for highly skilled workers in Canada (with discourses identified in the last column)

<table>
<thead>
<tr>
<th>Area</th>
<th>Recent/planned action</th>
<th>Recommendations</th>
<th>Discourses in operation related to interdisciplinarity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monitoring supply and demand of the highly skilled</strong></td>
<td>Sophisticated labour force monitoring system using skill-based data and participation of stakeholders through Sector Councils.</td>
<td>Enhance co-ordination of labour market forecasting and analysis at different government levels.</td>
<td>Accountability, Expertise, Knowledge as consumable product, Collaboration</td>
</tr>
<tr>
<td><strong>Measures to increase enterprise and individual training</strong></td>
<td>Education tax credit for individual learning account (ILA) projects, and small firm training schemes.</td>
<td>Implement co-financing schemes with firms and unions to stimulate more enterprise and individual investments in training.</td>
<td>Expertise, Knowledge as consumable product, Facilitation, Collaboration, Partnerships</td>
</tr>
<tr>
<td><strong>Measures to increase national worker mobility</strong></td>
<td>Barriers to geographic mobility reduced through 1995 Agreement on Internal Trade (AIT); professional standards and qualifications accepted through provincial mutual recognition systems.</td>
<td>Extend mutual recognition system to all occupations and ensure implementation at provincial level; accelerate programmes to foster accreditation and portability of training.</td>
<td>Accountability, Facilitation, Expertise</td>
</tr>
<tr>
<td><strong>Measures to adjust to international worker mobility</strong></td>
<td>Immigration policies modified to address short-term cyclical skills shortages, including issuance of temporary work visas.</td>
<td>Accelerate initiatives to eliminate impediments to the recognition of foreign credentials and enhance integration of skilled immigrants into the workforce.</td>
<td>Globalization, Expertise, Facilitation</td>
</tr>
<tr>
<td><strong>Measures to increase workforce participation by highly skilled women</strong></td>
<td>Enhanced parental benefits, extended parental leave and augmented childcare supports.</td>
<td>Address discrimination-based wage gaps between men and women.</td>
<td>Equality, Facilitation, Accountability</td>
</tr>
<tr>
<td><strong>Measures to develop human resources in science and technology (HRST)</strong></td>
<td>2002 Innovation Strategy has a focus on increasing R&amp;D and developing HRST, particularly female enrolment in science and engineering programmes.</td>
<td>Enhance S&amp;T education at all levels; improve job prospects and salaries for S&amp;T workforces through intensified efforts to develop innovation capabilities of private sector.</td>
<td>Expertise, Innovation as consumable product, Technology as social development</td>
</tr>
</tbody>
</table>

( table adapted from OECD, 2004, p. 5)
Canada is seen as having invested in the development of a number of innovation building strategies:

A comprehensive reform agenda has been introduced backed with a set of specific targets to be attained over the next decade. New measures to increase support for university research infrastructure, commercialization of public research and the adoption of new technologies have been adopted to improve the productivity and innovation performance of the Canadian economy…. The Canadian government has also initiated programmes to help small firms hire skilled workers and enhance the labour force participation of highly skilled women, particularly in science and technology fields. Temporary work permits for skilled immigrants… are being introduced to address specialized technical shortages in the long run (OECD, 2004, p. 10).

According to the OECD, a number of ‘obstacles’ remain before Canada and can make effective use of its “highly skilled” labour force:

Labour market adjustment mechanisms to deal with skill imbalances could be improved through better integration and application of knowledge regarding emerging skill needs. Remaining barriers that limit geographic mobility, such as occupational licensing requirements and accreditation of skills, need to be addressed. Better use could be made of the stock of Canadian human capital through higher labour force participation, particularly by skilled women, and fuller integration and retention of skilled immigrants\(^\text{12}\). Particular emphasis should be placed on increasing levels of job-related training and enhancing the overall innovation capabilities of the Canadian economy (OECD, 2004, p. 10).

The issue of female participation in the workforce is interesting on many levels. While Canada has one of the lowest gender employment gaps (listed at 10% in 2000), and one of the highest labour force participation rates of women (at 72% compared to an OECD average of 65%), it continues to have one of the largest wage gaps in the OECD between men and women working

\(^{12}\) This issue (the integration and retention of skilled immigrants) raises another important dimension of the effects of globalization on contemporary knowledge-making, namely the phenomenon of “brain-drain.” I would argue that in this context, OECD policy is supporting the ‘draining of expertise’ from underprivileged countries by ‘rich’ nations, such as Canada, further exacerbating the economic gap between ‘developed’ and ‘developing’ nations commonly highlighted in OECD reports.
full-time (measured at about 30%). Drawing from statistics generated by the Canadian government, these discrepancies are explained from an economic perspective as follows:

The difference in occupational choices and the relatively high incidence of part-time work among women relative to men negatively affect their wages. While women are over-represented in certain disciplines, e.g. they constitute over two-thirds of graduates in the humanities, arts, education, health and welfare, they are scarcer in engineering, computer science and other technology-related fields. There were no technological fields in the top three growth disciplines among female university graduates in 2000. Research has also shown that differences in work history and job tenure act to depress women’s earnings. As women have increased their tertiary qualifications in Canada in the last decade, younger women are recording higher relative earnings than women overall (OECD, 2004, 18).

Issues of equity are thus reframed as ‘obstacles’ to growth and prosperity. Also evident in the above quote is the materiality of contemporary hierarchies of knowledge. Some types of knowledge and the associated skills and training garnered through this knowledge are considered more profitable than others. This of course has implications for all of knowledge-making but especially for collaborative knowledge-making that brings together different sectors and expertise from different disciplines, the preferred modality for harnessing knowledge-production in order to innovate for OECD states. Thus, as women find themselves under-represented in the knowledge fields that are currently considered most relevant to growth and prosperity, their status in the workforce is compromised, as is their capacity to take advantage of the resources invested in promoting innovation.

The Report goes on to cite specific improvements in government support of work-family balance issues including increasing maternity and parental leave and childcare expenses; modifying Canada’s tax structure to increase the incentives for spouses to work by reducing tax rates on second earners; and strengthening support of children and families through such programs as the Canada Child Tax Benefit, the National Child Benefit, and the National Children’s Agenda. Despite these improvements, the Report notes that Canada (along with the US) are among countries with very low rates of public spending on childcare (OECD, 2004, p. 19). Most problematic is the slow decrease of the gender gap in terms of wages in comparison to the United
States, attributed to “different stages of development in gender equality” (OECD, 2004, p. 19). To tackle this issue, the OECD report makes the following recommendation:

Females should be encouraged to change their fields of study to more technical and industry-relevant areas and to improve their relative qualifications to counterbalance changes in the wage structure, which may work against them. Policy initiatives to promote wider occupational choices and more equal wages are warranted. To the extent that discrimination contributes to the wage gap, it will continue to be a drain on increasing Canada’s productivity performances through the fuller integration of highly skilled women (2004, p. 19).

The above recommendation highlights the degree to which individuals are expected to ‘make’ the system work for them through personal ‘change’ that requires huge investments of personal time and resources (retraining and re-credentialing for the ‘right’ fields). Highlighting some of the embedded assumptions in this recommendation makes visible how this reframing is accomplished. It is claimed that:

1. Women often choose to study less relevant disciplines and hence hinder their capacity to perform the ‘relevant’ and ‘desired’ work implying that this does not have anything to do with discrimination or lack of opportunities;
2. Technical and industry-relevant work constitute ‘relevant’ and ‘desired’ work and should be rewarded better than other types of work;
3. Discrimination does contribute to the wage gap and affects Canada’s growth prospects; and
4. Creating policies to encourage wider occupational choices and wage equality will alleviate discrimination.

The above-embedded assumptions accomplish the following neo-liberal strategy: a) women, the victims of wage-inequality, are charged with fixing the problem by ‘making better choices’ and b) re-dressing wage inequality does not put in question overarching economic policies that create an over-dependence on technological and industrial work, nor does it allow the evocation of pro-equity solutions. The focus is on increasing female participation and not on how female workers experience the work force, for discourses that help rationalize collective challenges to the system
such as those of ‘equity’ are appropriated and neutralized in rationalizations of individual freedom and agency (Martimianakis, 2008b).

What will happen to engineering if more women are attracted to the profession? An answer might be found in the example of medicine. In the past 20 years the number of women in medicine has grown, particularly in specialties such as family practice and paediatrics. Proponents of this trend, such as Michel Gordon a member of the UofT Joint Centre for Bioethics and Professor of Medicine, argue that “the steady increase of the number of female academic physicians has resulted in strength, creativity, alternative perspectives and leadership that has clearly been demonstrated over the 15 or 20 years this has occurred” (Gordon & Hugi, 2006, Jan. 10, par. 4). There is also strong opposition to the feminization of traditionally male dominated professions. The counterpoint to the above argument posited by Gordon, is offered by Maria Higu, an ER physician practicing in Vancouver:

I could live with a medical school comprised of 30% to 40% females but I get nervous when the numbers are higher. I fear incomes may plummet. Jobs dominated by women are usually poorly paid. Look at what has happened to reimbursement for general pediatrics in the U.S. It is chiefly a female specialty, and the lowest paid…. Recently, newspapers reported that in 2005, 60% of our new medical graduates were women. Apparently 52% of physicians younger than age 35 are women. On average, female physicians work nine fewer hours a week than their male counterparts. Since taxes fund our medical education, it is not cost-effective to fill our medical schools with women. Yet 60% of the candidates currently getting into medical school in Canada are female. The taxpayer is definitely not getting a bang for his/her buck…. I agree there is more to the profession than high incomes. But a lot of its exclusivity is tied up in getting paid well. In countries where physicians are poorly paid, the quality of care is poor. For example, the overwhelmingly female physician force in Russia has no political clout or income, and I wouldn't want to get sick there (Gordon & Hugi, 2006, Jan. 10, par. 5, 7 and 14).

Sociological work in the area of professional development concurs with the observations made by Hugi above. Feminized professions, such as nursing and teaching, have had significantly less clout politically and have not been as well paying as male dominated professions. Recalling the observation of the faculty-administrator of engineering in the previous chapter (who noted that at
the University of Toronto, students of visible minorities make up the majority of the student population in the Faculty of Engineering), the socio-political question raised is whether the growing numbers of ‘visible minorities’ in technical fields such as engineering and the growing feminization of male dominated professions such as medicine may also signify a shift in the division of labour where previously high paying jobs with significant prestige in society are becoming less coveted as markers of success. This brings to mind a personal anecdote. A few years ago at a family gathering my mother observed a young boy at play, building complicated structures with his Lego blocks. Having raised a son who became an engineer who had showed similar inclinations as a young boy, she noted to the parents “he might grow up to be an engineer.” The father responded, “why would I want that, I have dozens of engineers working for me…. I would much rather he became an entrepreneur.” But, while becoming an engineer or a physician may not hold the same prestige as it did 100 years ago, professions capitalizing on technical and scientific expertise generally continue to reward better economically than professions that draw on the ‘soft’ sciences such as social sciences and humanities.

The next sections explore the above intersection of power and knowledge by looking specifically at how collaborative forms of knowledge-making, as operationalized through the popularized discourse of interdisciplinarity, leave intact hierarchical reward systems just as in the above example. These reward systems favour techno-rational approaches to ways of knowing and doing with implications for the way knowledge-makers execute and promote their work.

6.1.2 Making education work

In a 2008 OECD report entitled *Tertiary Education for the Knowledge Society*, the role of the OECD in promoting a shift to a techno-rational approach to knowing and doing is evident. The headline announcing the publication of the Report reads “Be more purposeful in guiding tertiary education, OECD tells governments.” The announcement opens with the following statement:

> In today’s knowledge-driven global economy, countries need to build on tertiary education to generate innovation, sustain competitiveness and boost economic growth. A new OECD report…offers policy recommendations to meet these goals. (OECD, 2008b, par 1)
The Report compiles an analysis of 24 in-depth country reviews conducted during the period 2004-2008. Canada was not one of the participating countries. However, Canadian experiences, along with those of other non-participating states for which the OECD has longstanding data, have also been incorporated into the analysis and are reflected in figures, tables and charts when appropriate.

The problem space for this Report is articulated as an inherent tension between the autonomy of tertiary education institutions (TEIs) to establish knowledge-making agendas and their responsibility as publicly funded institutes to demonstrate that they are efficiently and responsibly fulfilling economic and social goals. The implication is that TEIs can not be trusted to fulfill societal expectations of their own accord. The resolution of this tension is presented as the responsibility of the ‘educational authorities’, i.e. governments:

In the governance of tertiary education, the ultimate objective of educational authorities as the guardians of public interest is to ensure that public resources are efficiently spent by TEIs for societal purposes. There is the expectation that institutions are to contribute to the economic and social goals of countries. This is a mixture of many demands, such as: quality of teaching and learning defined in new ways including greater relevance to learner and labour market needs; research and development feeding into business and community development; contributing to internationalisation and international competitiveness. There is a tension between the pursuit of knowledge generation as a self-determined institutional objective and the statement of national priority as defined in the aims and goals of the tertiary system. The objective, from a governance point of view, is then to reconcile the priorities of the individual institutions and the broader social and economic objectives of countries. This entails determining how far the former contributes to the latter as well as clarifying the degree of latitude the institution has in pursuing its own self-established objectives (OECD, 2008d, p. 4).

Within institutions this imperative to harmonize state and institutional priorities through governance arrangements has implications with regard to the way knowledge-makers are expected to organize their work and account for their accomplishments. The parallel scenario is that TEIs must develop governance approaches that facilitate the reconciliation of possible tension between institutional and individual priorities. Appendix 5 summarizes in a table the
OECD’s view of the “main challenges in tertiary education.” I have added a third column to this table to indicate how these challenges also have embedded assumptions about what institutions should be working towards. For example, working across the first domain of “steering tertiary education,” it can be seen that government and TEI’s interested in assuming leadership in the current knowledge economy must develop processes that ‘organize’ and ‘align’ research productivity to national economic interests. This alignment includes a demonstration of ‘responsiveness’ by engaging in problem solving activities that correspond to issues of broad social appeal.

Often these issues are reflected in strategic priorities of funding agencies and reflect the political choices of governments as to where to invest public funds. One mechanism for TEIs to demonstrate responsiveness is to develop strategic priorities that articulate a desire to support nation-building. As seen in previous chapters, shifting articulations of what role universities play in nation-building correspond to shifting funding arrangements. Scrutiny of Appendix 5 makes it clear that that the current modality for governing knowledge-production is to steer from afar. The corollary arrangement for TEIs (as indicated in the third column) would be to use consensus-building exercises to ‘steer’ faculty in taking up strategic priorities that are in alignment with the current socio-political and economic priorities of the government, without compromising their sense of choice or control over their work.

The role of partnerships and collaborative modalities for knowledge-making but also for developing consensus are very prominent in the recommendations of this Report. Managerialism is affirmed as the primary approach to building organizational capacity. Mechanisms to track, profile and report productivity through regular audits are encouraged. The accounting logic promoted through current rationales for making a difference, construct ideals such as the commitment to ‘excellence’ as individual pursuits and rewards. In other words, evidence of ‘excellence’ will be looked for at the level of the individual faculty member and at the level of individual units/programs through tabulation of awards and other markers of recognition such as publications, presentations, patents, spin off companies generated, and so on. Finally, collaborations and partnerships are encouraged that allow for resource sharing, as with research (Appendix 5, third and fourth rows of table).
The focus thus shifts, as Walkerdine (2006) has argued, on creating ‘flexible thinkers’, or ‘flexible knowledge-makers’ for the knowledge economy and for aspiring to develop solutions to the ‘big’ problems in society through the generation of innovations. One participant reflected on the implications of this approach, articulating an important unintended consequence, namely that, in the process of trying to make TEIs more relevant, a blurring of accountability is accomplished. The excerpt begins in a discussion of how the University must show responsiveness to government science and technology strategies. The faculty administrator noted,

So, from a provincial point of view, [we hear] let’s align our priorities to economic interests. And you’ve seen the same thing in the federal Science and Technology strategy. And then you go, well, why aren’t we seeing more impact? And the analysis suggests two or three things. One, we actually don’t fund research to the point where it’s commercially viable so we have to bridge the gap between discovery and application. So you get new money being loaded into commercialization support, money that otherwise might have gone to augment the research base. You also get a heavy emphasis in that regard on priorities that speak to products and processes that can be used economically. And then there is the counterview that … you get a sort of opaque sense that the real value of post secondary institutions might well lie, not in what they produce in terms of commercializable products, but in terms of the graduates. Mike Lazaridis is absolutely crystal clear on this, and he can be, given his role in the world with his company Research in Motion. Tech transfer, according to Mike Lazaridis, happens twice a year at universities – spring convocation and fall convocation. (Interviewer: So, it’s the people.) It’s the people. But the problem is, from the public policy point of view, if you look at the structure of funding for research and the structure of funding for post secondary institutions, they tend to be disaggregated in a lot of provinces, including Ontario, and the federal government has no responsibility for base funding for institutions but has for research funding. So the debate around commercialization happens independently, more often than not, from the debate around the mission and mandate of universities in contemporary society. It happens in the context of economic determinants…. Part of the problem around that is that, without evidence-based analysis and without comprehensive economic development strategies or policies, commercialization programmes and commercialization imperatives from government become a surrogate for economic
development policy, and they pick up a lot of baggage in the process. (Interviewer: And do they then put the blame on the university if it fails?) Yes.

Three interesting observations can be made in the context of this interaction. The participant is keenly aware of the shifts taking place in the university through personal experience navigating government and university relationships. S/he believes these shifts to have occurred as a by-product of the way government pursues its economic agenda. S/he describes the shifts as a series of alignments to strategic priorities and while s/he does not trace these shifts back to the OECD, this connection has been made in my analysis of their documents. It is of interest that the participant attributes the strategy of capitalizing on innovations in order to boost national economic productivity as a government of Canada approach. The universities in the above interview discussion are portrayed as dependent organizations having to show responsiveness in order to secure the funding necessary to continue their operation. Concerns about the effect of commercialization strategies on the mission of the university, according to this participant, do not factor into consideration. Strategies for economic advancement happen outside of discussions of the mission and function of the university. While the reader may interpret that these discussions ‘do not matter’ or are deemed ‘unnecessary’ in the context of economic planning, the participant in fact is only describing the process. It is not that these discussions do not matter; it is just that government departments do not speak to each other. Policy development suffers from the same critique as academia does. It is highly compartmentalized and specialized as the same faculty administrator can attest from personal experience, having once worked as a government official. As s/he continues,

[w]hen I think about life in a big government now, you’ve got so much going on that you don’t speak to people in the next unit within your division, within your ministry, much less speak across ministries unless you really, really, really have to. But there’s this attribution about the degrees of freedom that others have which sort of says, well, they should be collaborating, when in fact people are under the same constraints everywhere, when you look at teaching loads, when you look at research performance requirements, just to stay ahead of the game or with the game in your discipline. And you look at the administrative overburden that’s being imposed. One of the great sea anchors to innovation in scholarship and research these days is…the onerous character of the reporting requirements.
In theorizing this dependent relationship between government and the university, the participant articulates an implicit critique of the way the science and technology agenda is operationalized. S/he notes that there are very important factors impeding innovation. One is the notion that innovation is wrongly equated with commercial products, especially within the universities. The participant’s reference to Lazarides and convocation implies that s/he believes the university’s greatest marketable innovation is its graduates; the flexible, dependable, techno-savvy graduates that can work in a variety of settings to come up with marketable products. If accounting practices continue to measure and profile innovation within the university as number of patents and number of commercial ventures, the university will not receive credit for the ‘real’ contribution it makes to innovation, namely the training of students. The second point made is that managerialism and accounting logic has permeated university work to the point that it is impeding innovation. Universities spend more time ‘accounting’ for innovation than in ‘engaging’ in innovation. Finally, the participant implicates the notion of collaboration in the context of discussing innovation and accounting practices. S/he notes that many make the attribution that everyone can and should be collaborating. There is an implicit assumption in this attribution that everyone not only should be collaborating, but that they also have the freedom, autonomy and the capacity to collaborate.

The next section looks at ways in which OECD discourse has permeated the Canadian context. In this exploration I will show how the popularized discourse of interdisciplinarity travels through institutional contexts.

6.2 Canada embraces the knowledge economy

Knowledge society discourse is well established in Canada and has been authorized by a number of documents produced at the national and provincial level by various organizations. The following sections provide some examples of the way the OECD neo-liberal discourse of globalization and the popular discourse of interdisciplinarity have been taken up by federal and provincial governments in the context of promoting a role for the university sector in the knowledge economy.

6.2.1 The Council of Ministers of Education, Canada

The Council of Ministers of Education, Canada (CMEC) is an intergovernmental body founded in 1967 by ministers of education to serve as a forum to discuss policy issues; a mechanism
through which to undertake activities, projects, and initiatives in areas of mutual interest; a
means by which to consult and cooperate with national education organizations and the federal
government; and an instrument to represent the education interests of the provinces and
territories internationally. Currently all 13 provinces and territories are members. As an
organization, CMEC provides leadership on educational issues both at the national and
international level (Council of Ministers of Education Canada, April 2008).

In 1993, the CMEC developed a ‘cooperative action plan’ as a way to promote a national
approach to education without compromising the legal jurisdiction individual provinces had over
education. The goal was to establish shared and relevant goals applicable to all Canadians.
Justification for this level of planning was provided in the following statement:

Education is a lifelong learning process…. [T]he future of our society depends on
informed and educated citizens who, while fulfilling their own goals of personal and
professional development, contribute to the social and economic, and cultural
development of their community and of the country as a whole (Council of Ministers of

In 1999, the CMEC published a report called “Public Expectations of Postsecondary Education,”
a product of the cooperative action plan developed in 1993 (Council of Ministers of Education
Canada, Feb. 1999, p. 3). Within this document, the above statement is also repeated as a way to
frame the rest of the Report as an outcome of an ongoing effort to strategically address
overarching educational issues at the federal level, while provinces maintain constitutional
control of education (Magnusson, 2005, p. 122). In the process, the statement is modified
slightly. In the 1993 statement, ‘lifelong learning’ is listed as a desirable trait in individuals to
promote robust participation in civic life. Individuals are expected to prioritize their learning
objectives and in the process “contribute to the social, economic and cultural development of
their community and country.” In 1999, ‘life-long’ learning becomes a social imperative that
requires systematic and institutionalized approaches to education and learning. This modification
is achieved by introducing the following concept right after having quoted the above 1993
statement:

Canadians must commit themselves to learning throughout life. This requires a healthy,
responsive postsecondary education system that offers opportunity and challenge through
teaching, research, and community service delivered by diverse and distinctive institutions (Council of Ministers of Education Canada, Feb. 1999, p. 3).

Two things are thus achieved. The 1999 Report is framed as a consolidation of public ‘needs’ and ‘wants’ related to education. It is designed to demonstrate government responsiveness during a period when “governments face competing fiscal demands and pressures for fundamental changes in public policies and institutions” (Council of Ministers of Education Canada, Feb. 1999, p. 3). At the same time, it makes institutions of higher learning directly responsible for contributing to achieving the social welfare agenda Canadians have culturally, socially and economically invested in since World War II. This point is later explicitly made within the same documents with the following statement:

Postsecondary education is not only about meeting the needs of learners, advancing, interpreting, and adapting knowledge, and providing an essential public service, important as these functions are. Education is also an investment, both prudent and visionary, in health and in combating poverty, crime, and unemployment. It is a major source of social cohesion and mobility, and is essential to the development and continued prosperity of Canada and all of its regions (Council of Ministers of Education Canada, Feb. 1999, p. 4).

Furthermore, the Report speaks with the authority and public support necessary to link educational policy planning directly to economic imperatives:

There are profound forces for change in society that affect and are influenced by PSE institutions and their communities of learners and researchers. The revolution in information and telecommunication technologies is helping drive economic restructuring, globalization, and political and social change (Council of Ministers of Education Canada, Feb. 1999, p. 3).

Couched in the discourse of ‘the knowledge society’, information exchange is the new hot ‘commodity’. Safeguarding diversity (as a way to encourage innovation) while creating overarching strategies for education (to streamline resource allocation) are contextualized as current ‘requirements’ if Canadians are to compete in a global economy in which the generation of wealth is linked to the generation and exploitation of new knowledge. The Report spends
considerable time discussing the changes required in the governance of research and learning to ensure that Canada ‘exploits its strengths’ and ‘creates a competitive advantage in the global knowledge economy.’ Fundamentally, research and training are linked to national systems of innovation, “the set of institutions and flows of knowledge, including the creation of knowledge, its diffusion and application, that are understood to play a crucial role in innovation and economic progress” (Council of Ministers of Education Canada, Feb. 1999, p. 11). Because this link is made, dominant models for supporting organizational innovation are embedded in the rationale for restructuring the postsecondary education sector. As the OECD documents, at the systems level there is commitment to both depth and breadth in evolving research capacity and an active promotion of partnerships in funding and performing research among institutions, governments and the private sector. At the institutional level, there is a commitment to diversity of research and a valuing of Boyer’s four tenets of scholarship, discovery, integration, education and application, as well as a commitment to knowledge transfer and commercialization of research (Boyer, 1990). At the individual level, faculty are expected to network and collaborate, constantly forging new links in Canada and abroad, across disciplines and institutions.

The 1999 CMEC Report thus creates the necessary platform for the discursive take-up of the popular discourse of ‘interdisciplinarity’ as a sanctioned approach to knowledge-production. Under the section Key Areas of Expectations, six overarching themes are articulated, representing the consolidation of public expectations into a loose framework for strategic planning. I have italicized the relevant sections for interdisciplinarity encompassed within each theme to show how the currently institutionalized form of interdisciplinarity is connected to the ‘knowledge society’ discourse:

A. Quality: Governments and institutions work in partnership as appropriate, to ensure high quality educational outcomes and intellectual environments in teaching and learning, research and scholarship, community service and management of intellectual and physical resources. Institutions and the sector as a whole emphasize creativity and innovation.

B. Accessibility: Postsecondary education is accessible throughout life…. [I]nternational students are received by institutions in recognition of the fact that the integration of international students serves both individual learners and the broader community.
C. Mobility and Portability: Students obtain credit for prior learning as they transfer between programs, institutions and the labour market. Governments ensure that there are no barriers to inter-provincial mobility that unreasonably inhibit access.

D. Relevance and Responsiveness: Postsecondary education gives the learner the opportunity to acquire relevant and diverse knowledge, competencies, and skills for a complex social environment and labour market. It promotes the productive connection of learning, work, and civil society.

E. Research and Scholarship: Research and scholarship contribute to the cultural, social, and economic development and health of communities and regions, Canada as a whole, and the global community to the development of a highly educated workforce, a new generation of researchers and people who can access the research of others; and to the broad education of citizens.

F. Accountability: PSE institutions and governments are openly accountable to the public in relation to mandates and outcomes and for reassuring citizens, and students in particular, that resources are allocated to achieve maximum value and sustainability of postsecondary education (Council of Ministers of Education Canada, Feb. 1999, p. 6-7, my emphasis).

Recalling the basic story line of the popularized form of ‘interdisciplinarity’ described in the Chapter 4, it can be seen how the above planning document, produced through the collaborative efforts of all the provincial Ministers of Education, lends authority to the institutionalization of an instrumental form of interdisciplinary research. The link is not directly made to interdisciplinarity. However, promoting processes and rationales that are integral to instrumental forms of interdisciplinarity (such as partnerships between government and institutions, educational outcomes, innovation that leads to products, integration of diverse knowledge and the production of scholarship that is relevant for the cultural, social and economic development and health of communities, etc.) contribute to truth-making in the Foucauldian sense. That is, the rationales are repeated and reproduced with frequency and consistency. Their ‘truth’ is neither questioned nor problematized.

The CMEC continues in 2010 at the time of writing to work towards transforming the Canadian education system with a coherent strategy linked directly to economic and social imperatives. Most recently, the organization released “Learn Canada 2020,” the framework to be used by the
provincial and territorial ministers of education “to enhance Canada’s education systems, learning opportunities, and overall education outcomes.” Through “Learn Canada 2020,” the CMEC articulates the collective vision to provide “quality lifelong learning opportunities for all Canadians.” In doing so, the CMEC “recognizes the direct link between a well-educated population and (1) a vibrant knowledge-based economy in the 21st Century, (2) a socially progressive, sustainable society, and (3) enhanced personal growth opportunities for all Canadians” (Council of Ministers of Education Canada, April 2008, p. 1). The document confirms that the governance of research and teaching at the post-secondary level, for the explicit purpose of maximizing Canada’s competitiveness in a global economy, will continue well into the next decade.

The next section will briefly discuss how federal government funding strategies operate as Foucauldian technologies that discipline institutions and knowledge-makers according to neo-liberal rationales for education.

6.2.2 Regulating knowledge-making through funding strategies

As noted in Chapter 5, the federal government has historically supported higher education through a number of strategic funding programs. The federal government currently funds research through the National Research Councils of Canada (NSERC, SSHRC, CIHR), the Canada Research Chairs program, the Networks of Centres of Excellence program and the Canada Foundation for Innovation. In a similar fashion, the Ontario government has also promoted interdisciplinarity as a pathway to innovation through the Ontario Centres of Excellence and the Ministry of Research and Innovation. As Appendix 4 details, interdisciplinary approaches to knowledge-making are promoted through all of these funding mechanisms and other organizational structures in an attempt to strategically harness the research productivity of Canadian knowledge-makers for the improvement of Canada’s and Ontario’s economic performance respectively. As an illustrative case, a brief analysis of how the popular discourse of interdisciplinarity is reproduced by the Canadian Foundation for Innovation and the Ministry of Research and Innovation of Ontario will show how both levels of government are strategically deploying the popular discourse of interdisciplinarity, contributing in the process to the creation of a hierarchy of knowledge, with implications for epistemic fields that are not technologically oriented.
6.2.3 Canada Foundation for Innovation

In 1997, the Government of Canada established the Canada Foundation for Innovation (CFI) as an independent corporation. The stated mandate of the CFI is “to fund research infrastructure and strengthen the capacity of Canadian universities, colleges, research hospitals, and non-profit research institutions to carry out world-class research and technology development that benefits Canadians” (Canada Foundation for Innovation, 2008a). According to its website, the CFI has committed $5.3 billion in support of 6,800 projects at 130 research institutions in 65 municipalities across Canada since 1997. The CFI can be seen as an example of an institution made possible by the popular discourse of interdisciplinarity. Clearly designed to encourage cross-sector partnerships, the CFI funding formula is set up to fund up to 40 percent of a project’s infrastructure costs. It assembles multi-disciplinary committees to assess proposals. The composition of the committees is balanced in terms of language, gender, geographic location, economic sector, field of study and type of institution. CFI funds are only invested in partnership with eligible institutions and their funding partners from the public, private, and voluntary sectors who are expected to provide the remainder of the funds necessary to see the project to completion (Canada Foundation for Innovation, 2008a). The CFI is a clear conduit for the transmission of OECD positions on how to capitalize on educational investment. This can be discerned from the following statement made by the CFI and found on its website:

Support from the CFI enables institutions to set their own research priorities in response to areas of importance to Canada. This allows researchers to compete with the best from around the world, and helps to position Canada in the global, knowledge-based economy. CFI support is intended to: strengthen Canada's capacity for innovation; attract and retain highly skilled research personnel in Canada; stimulate the training of Highly Qualified Personnel through research; promote networking, collaboration, and multidisciplinarity among researchers, institutions, and sectors; ensure the optimal use of research infrastructure within and among Canadian institutions. The research enabled by CFI support is also creating the necessary conditions for sustainable, long-term economic growth, including the creation of spin-off ventures and the commercialization of discoveries, and supporting improvements to society, quality of life, health, the environment, and public policy (Canada Foundation for Innovation, 2008a).
The CFI clearly promotes research that is perceived to directly contribute to economic growth. According to its website, three criteria are used for ranking proposals: the quality of research and need for infrastructure; the potential contribution to strengthening the capacity for innovation; and the potential benefits of the research to Canada. It states:

The CFI supports all areas of the research and development spectrum while encouraging the collaborative relationships that lead to innovation. We know that innovation results in increased competitiveness and productivity, and that leads to prosperity. (Canada Foundation for Innovation, 2008a).

While the CFI promotes itself as supporting research and development across the disciplinary spectrum, the delimitation for supporting infrastructure costs such as “state-of-the-art equipment, buildings, laboratories, and databases required to conduct research” makes the CFI biased towards scientific research (Canada Foundation for Innovation, 2008a). UofT is a regular recipient of CFI awards. In a recent CFI competition, for example, “nine projects ranging from mental health and addictions to breast cancer” were funded totaling an investment of $1,486,122 dollars (Fraumeni, 2009, par. 1). Only the disciplines of the principal investigators of these projects were listed in the announcement of these awards: psychology, immunology, medical biophysics, mental health, ecology and evolutionary biology, medicine, physics and anthropology. All the projects funded are for technologically driven initiatives. For example, one of the projects led by an anthropologist proposed to erect a molecular biology laboratory as the project title suggests: Molecular Anthropology and Primatology Laboratory for the Study of Evolution. The article announcing the awards ends with the following comment:

In thanking the CFI, Professor Paul Young, U of T’s vice-president (research), noted that the investment has a positive impact in many ways. "Look at the research that is being supported with these awards. It focuses on issues that have a direct impact on society, such as cancer and understanding the human brain. It also has immediate and future impact on the economy by providing hands-on opportunities for U of T to train the next generation of leading-edge researchers and innovators.” (Fraumeni, 2009, par 4).

From the above discussion and examples, it can be seen that while not making researchers in the social sciences and humanities ineligible for competing for the funding, the only way someone
with a humanities or social science background can secure funding is if they engage in research that is technologically enabled. Very little research conducted in the social sciences and the humanities requires technology or lab work. Thus, CFI funding creates and reinforces structural hierarchies in knowledge-making. The criteria of relevance used to judge funding proposals submitted to the CFI, for example, favour research currently conducted in engineering and in medicine. In addition, institutions compete for CFI grants on the basis of their track records in obtaining granting council funding resulting in an increase in the traditional importance of research grants to institutions and academics. This disadvantages social science and humanities departments where securing large grants has not been traditionally mandated or expected (Polster, 2002, 2007).

There is prestige associated with winning a CFI grant. Such an award gives researchers able to attract such funding material advantage in their career advancement over researchers deemed less competitive. It also increases the competitive advantage of the research-intensive universities. Through the CFI, the federal government is able to selectively contribute to education. Setting up the fund as a merit-driven competition, the federal government is absolved from distributing the 5.3 billion equally to all universities across Canada. This strategy is a significant shift from previous approaches, as discussed in Chapter 5. Not surprisingly, the capacity to attract CFI funding has now been incorporated as part of annual university performance indicators. The graph below published on both the CFI website and the University of Toronto website summarizes the results of CFI competitions for the research-intensive universities, showing UofT in the lead. Given the size of the university and its longstanding track record in obtaining granting council funding, UofT’s capacity to capitalize on CFI funding is not surprising.

Figure 6.1: CFI funding 1998-2007

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13 To increase their competitive advantage in securing targeted research funds such as CFI awards, universities have established administrative processes designed to facilitate grant proposal writing and submission (Dehli, 2010). In turn, faculty have experienced an intensification of academic work across disciplines associated with applying for grants and managing research funds (Dehli 2010; Polster 2007). Both of these topics will be discussed in more detail in Chapter 8 in the context of participant experiences with popular interdisciplinarity at UofT.
Such profiling of instrumental forms of collaborative knowledge-making help authorize rationales for striving to ‘make a difference’ through interdisciplinary innovation that produces a marketable product.

In 2008, the CFI published a report accounting for some of the impact of its investments. One of the indicators used to measure this impact was spin-off companies created as an outcome of the research generated through CFI funded proposals, or spin off companies that used science developed through CFI funded projects. CFI said:

The CFI-linked spin-offs tend to be in new, knowledge-intensive niche areas where industrial receptor capacity is low: life sciences (including biotechnology, pharmaceuticals and medical devices), ICT, and electronics – consistent with Canadian spin-offs generally. There is a high degree of sectoral convergence between the private and CFI public funding of the projects and spin-offs, with life sciences leading the way. About 18% of the CFI-linked spin-offs are fast-growing “gazelles,” that is, they have doubled their employment within 5 years to at least 20 people. Most of the CFI-linked spin-offs (69%) are in Montreal, Toronto and Vancouver (Canada Foundation for Innovation, 2008b, p. 4).
The above excerpt highlights the ways in which universities are implicated in commercialization and the degree of influence that the federal government has in directing research through strategic investment strategies such as the CFI.

The next section briefly describes the Province of Ontario’s role in regulating and supporting education to show how OECD and Government of Canada strategies for leveraging education for economic development are reproduced in local contexts.

6.2.4  The Ministry of Training, Colleges and Universities of Ontario

In Ontario, the Minister of Education and the Minister of Training, Colleges and Universities is responsible for the administration of laws relating to education and skills training. Specifically, through the Ministry of Training, Colleges and Universities, the Province of Ontario develops policy directions for universities and colleges of applied arts and technology, plans and administers policies related to basic and applied research in this sector, authorizes universities to grant degrees, distributes funds allocated by the provincial legislature to colleges and universities, provides financial assistance programs for postsecondary school students and registers private career colleges. The Ministry thus has the power and the authority to “shape Ontario’s postsecondary education, employment and training systems” (Ministry of Training Colleges and Universities, 2008). A review of the Ministry’s latest published strategic plan demonstrates the degree to which Ontario has taken up neo-liberal globalization discourse in rationalizing a synergistic approach to education and economic planning.

The Ministry’s 2009-2010 results-based plan opens up with the following vision statement:

The ministry's vision is that Ontario has the most educated people and highly skilled workforce in the world in order to build the province's competitive advantage and quality of life (2009, p. 1).

In language that is very close to the language of OECD reports, the Ministry makes a direct connection between a highly skilled workforce and the Province’s capacity to compete for market share. This capacity is then directly associated with “quality of life.” In another statement, it reiterates the importance of investing in the educational development of people:
Ontario's edge – its competitive edge – is its people. The province is at its best when people have opportunities and tools to reach their full potential. In today's knowledge-based economy, education and skills are essential to individual success and are the cornerstones for the future growth and prosperity of the province (2009, p. 1).

To fulfill this vision, the Report goes on to describe the Ministry as working towards ensuring education is accessible “to all qualified candidates through tuition regulation, student assistance, targeted funding and accountability mechanisms” (2009, p. 1). The Ministry’s self described goal is to make Ontario more competitive so we will be prepared to compete economically when the current global economic challenges settle. We plan to create jobs now and position Ontario for growth in the future. The result will be a stronger economy that will spur job growth and a green economy as we come out of the global recession (2009, p. 1).

According to the Ministry, its goals are pursued through two key initiatives: Employment Ontario and Reaching Higher in Postsecondary Education. These plans were designed to work together and are described as “the operational delivery mechanisms that support the implementation of the ministry's longer-term policy and operational plans” for Ontario (2009, p. 1). Having outlined the link between education and economic growth, the Ministry goes on to describe its role as working towards removing barriers to training and strengthening the links between training and employment. Its success will be measured in its capacity to ensure that the education system of Ontario is “is responsive, flexible and able to accommodate future demands [of the workforce].” goals which are recognizable as being consistent with OECD and Government of Canada positions on how to ensure education serves society. And through a number of evolving mechanisms, educational institutions are held accountable by the Province to demonstrate how the investment of public funds has contributed to Ontario’s growth.

While education generally is supported through the Ministry of Training, Colleges and Universities, areas of knowledge-production which are considered strategic and essential to the Province’s economic planning and development are supported through another Ministry, the Ministry of Research and Innovation, discussed in the next section.
6.2.5 The Ontario Ministry of Research and Innovation

As I have argued thus far, the popular discourse of interdisciplinarity is operationalized at various levels of government and by a number of institutions through programs and activities designed to bring together different sectors to work towards both inspiring innovation and capitalizing on the creation of new innovative products that can be commercialized. This rationale is evident in the approach taken by the current Ontario government.

The Ministry of Research and Innovation was created in 2005. Its stated mission is to “foster a culture of innovation and showcase Ontario, nationally and internationally, as a place where innovation is happening” (Ontario Ministry of Research and Innovation, 2009, p. 2). Its role is described by the Ontario Genomic Institute, one of the institutions that have benefited from funding from this Ministry, as follows,

The government wanted MRI to reflect its understanding that research and innovation are crucial to the province’s economic future and to the health and well-being of Ontarians. It supports and capitalizes on stellar research and development to generate socio-economic impact (Ontario Genomics Institute, 2010).

Similar to the Canadian Foundation for Innovation, the Ontario Ministry for Research and Innovation provides funds to be used for leveraging more funds to support research useful to specific commercial sectors. Knowledge-makers are broadly defined to include experts from a variety of sectors coming together to innovate for commercial gain. The Ministry operationalizes its innovation agenda through a number of programs including:

*Early Researchers’ Awards:* funding of up to $100,000 for promising, recently appointed researchers to help them build their research teams of graduate students, post-doctoral fellows, and research associates.

*Innovation Demonstration Fund:* Financial support of up to 50% of eligible costs to help Ontario companies with the commercialization and initial demonstration of their innovative technologies.

*Health Technology Exchange:* Helps Ontario's scientists, engineers, and entrepreneurs commercialize their ideas into innovative medical and assistive technology products.
International Strategic Opportunities Program: Funding of up to $150,000 over three years, for new strategic international collaborations.

Ontario Centres of Excellence: Bridging the gap between academia and industry, these centres bring universities, industry, and government together to help turn science and technology into successful business endeavours.

Ontario Emerging Technology Fund: Will co-invest — with qualified venture capital funds and other private investors — directly into companies working within the focus areas defined by Ontario’s Innovation Agenda.

Ontario Institute for Cancer Research: An independent, not-for-profit organization bringing together multi-disciplinary, multi-institutional collaborations focusing on translating research findings into programs, technologies, and therapies.

Ontario Network of Excellence: An innovation system that is responsive to the needs of Ontario’s world-leading researchers, entrepreneurs and innovation-based companies. It is designed to provide a comprehensive suite of programs and services across the full continuum from idea-to-market. These programs will be provincially supported and regionally delivered, ensuring that everyone in the province has access to the same high quality resources and expertise, regardless of location.

Ontario Research Fund: funding for project operating costs such as researcher’s salaries.

Ontario Tax exemption: Aimed at supporting innovation in Ontario’s economy by encouraging the commercialization of intellectual property which has been developed by qualifying Canadian universities or colleges. OTEC applies to newly established corporations in priority areas, offering a refund of corporate income tax and corporate minimum tax paid for a qualifying corporation’s first ten taxation years.

Research Excellence Program: Promotes research excellence in Ontario by supporting transformative, internationally significant research of strategic value to the province (Ontario Ministry of Research Innovation, 2009).
Evident from the above brief description of its funding and incentive programs is the bias towards technologically oriented research linked to medicine and engineering. Also evident is the degree of effort and commitment to bringing closer together the university, industry, government and business sectors. While the overarching mandate of the Ontario government is to provide accessible education and training to everyone with the skills to pursue this training, and while it is the right of each citizen within Canada to choose to pursue education and specialization in his/her area of choice, the investment in certain strategic sectors in fact generates disproportional growth in particular fields perceived to be most relevant to the Province’s economic prosperity.

In the most recent report published by the Ministry, the social sciences and humanities are also mentioned as having an important role to play; however, this role is constructed in a very delimited way to evolving products with marketable appeal:

The arts, humanities and social sciences are essential components of a creative, knowledge-based economy. A vibrant culture is not just the hallmark of a prosperous society, it is a key element that attracts innovators in all disciplines and a driver of economic growth on its own. The arts and humanities underpin the success of creative industries. One clear example is the digital media sector, but many other innovative ventures benefit from the creative and intellectual stimulation that the liberal arts can provide. And the work of artists, writers, performers and musicians can contribute to economic activity on its own. The Toronto International Film Festival, for example, is a major draw that brings thousands of people from the film and other industries to Toronto. Its impact on the province’s cultural scene includes numerous creative spin-offs such as Hot Docs, a festival focusing on documentary films, and the ImagiNative aboriginal film festival. Government can do much to encourage the rich and rewarding interplay among economic, social and cultural innovators through support for the arts, leadership in recognizing cultural and social innovators and showcasing Ontario’s cultural strengths as well as its economic strengths (2008, p. 17).

The above citation demonstrates the degree of disciplining taking place as the discourse of interdisciplinarity in its most popular form is being operationalized. While the social sciences and the humanities are considered “essential component of a creative knowledge-based economy” the only examples of contributions listed are linked to the popular publishing industry and the performing arts, because these are the only ‘products’ recognizable as profit generating
(hence good for Ontario society). Thus, not only is funding and investment streamlined primarily to the basic and applied sciences, the social sciences and the humanities are also encouraged to evolve commercialization ethics. To this effect, the Report goes on to state that universities have an important role to “ensure that students in all disciplines will be open in their future careers to opportunities to translate new knowledge into social and economic benefits.” (2008, p. 19). However, to borrow an expression from one my participants lamenting the lack of support for social science research, the above small mention of the social science and humanities in the Report is just paying ‘lip service’ to these fields. Within the same Report, under a section celebrating Ontario’s history of innovation, the reader is told what counts as relevant knowledge:

To compete globally for investment and innovation talent, Ontario must tell its story at home and abroad. We must continue to celebrate our successes at every opportunity and promote Ontario’s innovation excellence to the world. Ontario is the birth place of Research in Motion’s BlackBerry, which has revolutionized wireless communication. Ontario is where insulin was discovered, where the pacemaker was developed and where 3D imaging techniques originated. Stem cells were discovered at the Ontario Cancer Centre in 1961. While initial research studied effects of radiation, today stem cell research promises treatments and cures for numerous conditions. The first successful childhood meningitis vaccine was developed at the National Research Council (NRC) in Ottawa by Dr. Harold Jennings. The Toronto Stock Exchange Group is second only to NASDAQ in the listing of life sciences companies. In 2005 Gerhard Hauck of the University of Waterloo produced the world’s first multi-point theatrical performance streamed onto the web. Participants 1,300 kilometres apart staged a live, interactive performance of scenes from Strindberg’s A Dream Play to a worldwide audience. Ontario is home to one of the most highly-published and highly-cited biomarker researchers in the world, Dr. Eleftherios P. Diamandis of the University of Toronto. The Waterloo Pump created in 1976 by Alan Plumtree and Alfred Rudin (both from the University of Waterloo) is an inexpensive, easy-to-repair pump that still supplies clean drinking water to millions of people in developing countries today. The Geographical Imaging System was created in Ottawa in a partnership between Roger Tomlinson and IBM. It has since become an indispensable tool world-wide for geographical and land use planning. The Institute for Quantum Computing houses one of the world’s largest computing devices.
The 12-qubit (quantum bit) device represents a big step towards the realization of actual quantum computers (2008, p. 11).

I have cited the entire section to illustrate this point about what “counts.” Not one example of a contribution made by researchers in the humanities or social sciences is commemorated as evidence of Ontario’s innovation talent. The Ministry goes on to rationalize this discriminating focus in investing strategically in certain technologically oriented knowledge sectors as a cost efficient strategy that builds on the Province’s current strengths:

An economy the size of Ontario’s cannot compete globally in every area. Public investments in research and innovation need to be focused to achieve maximum value, to be relevant to economic growth and to support Ontario’s areas of greatest academic strengths and greatest economic potential. This new focus grows from a better understanding of what innovation really means: to reap benefits for society by ensuring that the ideas triggered by research need will move to where people can put them to use. This happens fastest when researchers understand what society needs. And very often this means a stronger focus on markets, customers and the other end-users of new ideas, products and services. Through the innovation agenda, Ontario’s government has highlighted specific areas of the economy – bio-economy and clean technologies, advanced health technologies, pharmaceutical research and manufacturing and digital media and information and communications technology – for initial strategic investment. These are areas of strong growth where Ontario already holds a position of global importance or can quickly mobilize existing resources and skills to do so. The agenda will be adaptive to new and emerging economic opportunities (Ontario Ministry of Research and Innovation, 2008, p. 12).

Thus the Ministry of Innovation operates as a facilitative government organization that brings together primarily basic science, engineering, health and commercial sectors to leverage opportunities and ‘make a difference’ to Ontarians by providing solutions, products and services ‘where they are needed’ in an efficient manner. In the process, it channels neo-liberal knowledge economy discourse and embodies instrumental forms of interdisciplinarity as a way to capitalize on knowledge-production.

The next sections explore national and provincial university organizations that project
responsiveness to changing expectations with regard to the role of education in society as they compete for resources both at the federal and provincial level.

6.3 University organizations respond to changing social economic priorities

6.3.1 The Association of Universities and Colleges of Canada

Since 1911, the Association of Universities and Colleges of Canada (AUCC) has “represented the interests of Canadian universities” nationally and internationally (2009, p. 1). What initially began as a meeting of university presidents has now evolved into a formalized group with specific criteria for membership “that considers academic freedom, depth of program offerings, and a commitment to scholarship and research” (AUCC, 2009, p. 7). Since there is no formal accreditation organization for higher education institutions in Canada, membership in the AUCC, combined with appropriate provincial legislation, stands as a marker of quality (AUCC, 2009, p. 6). The AUCC is a non-governmental, not for profit organization led by a board of directors made up of 12 university presidents and the CEO of the Association. A number of standing advisory committees and other forums also inform policy discussions. The activities of the Association are coordinated by the Secretariat located in Ottawa. The Association defines its role as providing “a strong collective voice for our member institutions” and delivering “leadership in the development of public policy on higher education and university research” (AUCC, 2009, p. 1). It works to raise the profile of higher education in Canada and provides “information and advocacy on the contributions of Canadian universities to economic growth, cultural richness and vital communities in Canada and round the world” (AUCC, 2009, p. 2).

The AUCC currently represents 90 public and private not-for-profit universities and degree granting colleges across Canada. Member institutions participate in AUCC forums through their executive heads. Thus discourses promoted through the AUCC reflect dominant and established positions on higher education in the Canadian context. Its self-defined role of ‘advocate’ for Canadian universities is facilitated by a number of processes similar to those I explored in the context of discussing the operations of the OECD. Reviewing how the AUCC’s role as advocate is realized shows how discourses are reproduced not only as ideas, concepts and rationales, but also as processes and technologies. In order to ensure Canadian universities are internationally competitive, the AUCC tries to influence the federal government by “seeking to position higher
education as a key priority in the national public agenda.” According to the AUCC, competitiveness will be ensured because:

1. Universities have the capacity to offer a research-enriched and internationalized high-quality education to a growing number of students
2. Canadian universities have the resources to conduct top-tier research and to attract and retain the faculty researchers and graduate students required for Canada to compete in a knowledge economy
3. No qualified individual is denied access to higher education because of financial circumstances (AUCC, 2009, p. 4).

To exert its influence, the AUCC has established information collection, analysis and dissemination processes that establish the organization as an ‘authority’ or ‘expert’ on issues related to higher education. The Association projects itself as an “authoritative and trusted source” of “university facts and information” (AUCC, 2009, p. 5). It publishes a range of materials including reports on strategic topics, media articles, directories, and the magazine *University Affairs*, which the Association advertises as “Canada’s magazine on higher education and the most relied-upon source of news, information, and academic career opportunities for universities” (AUCC, 2009, p. 6). The AUCC, similar to the OECD, monitors, analyzes and disseminates information on issues such as enrollment, research, knowledge transfer, funding and international education. It also provides forums for a ‘unified’ voice to emerge on key issues, allowing for ‘collective action’. In their words,

> Bi-annual meetings are coordinated and hosted by AUCC for university executive heads, providing opportunities to discuss issues of common concern and share information. Similarly, a seminar for new university presidents is offered regularly, where participants can share experiences and discuss key issues that confront presidents early in their mandate. Separate sessions are also offered throughout the year on a range of educational issues, such as *international research collaboration* and preparing students for a *global future* (AUCC, 2009, p. 4, my emphasis).

Part of the organization’s international collaborative initiatives includes the management of scholarship programs that include fellowships, internships and exchange programs on behalf of governments, foundations and private sector companies. This form of facilitation of educational
exchanges is also extended through formal partnerships with other organizations like the Canadian International Development Agency.

Given the role the AUCC plays in developing institutional consensus with regard to strategic priorities for universities in the Canadian context, it can be assumed that the discourse embedded in its documents offers insight into the dominant positions on these topics in specific historical periods. A brief exploration of some of these documents undertaken below will show the way the discourse of ‘interdisciplinarity’ is taken up in Canada and its connection to discourses knowledge economy discourses.

6.3.1.1 Financing the university industrial enterprise

The language and associated social relations of globalization and the knowledge economy, articulated and analyzed throughout this chapter, are embedded in a recent report published in the series *Trends in Higher Education* on the topic of financing (AUCC, 2008c). In the opening paragraphs of this Report, the material and intrinsic value of the university sector is articulated (in that order) as follows:

> Canadian universities serve more than 1.5 million full- and part-time students in various degree and continuing education programs and employ more than 150,000 fulltime faculty and full- and part-time professional, technical and support staff. Universities have a significant impact on the Canadian economy, both nationally and locally. Nationally, universities are a $26 billion enterprise – larger than the pulp and paper industry, the oil and gas extraction industry, the utilities sector, the combined arts, entertainment and recreation industries and such prominent manufacturing industries as aerospace, motor vehicle, metal fabricating, furniture and plastic products.

However, the impact of universities on our country, on our communities and on individuals extend well beyond these financial impacts. Through the three core activities that characterize every university – teaching, research and community service – universities have a direct impact on our identity, our productivity, our social, physical and economic well-being, and our quality of life. They broaden our horizons culturally, philosophically and intellectually (AUCC, 2008c, p. 7).
The first paragraph makes a clear statement that the university sector contributes to the Canadian economy and has material worth. This is accomplished by first elaborating on the size of its market share (number of students), followed by the number of jobs it creates and livelihoods it sustains (full and part-time employees,) ending with a comparison of its size to that of other industries that contribute to the country’s gross national product. The second paragraph introduces the context for analyzing the cultural, social and philosophical contributions that universities make through their activity. These contributions are not assigned a monetary value because they are not linked to economic imperatives. The contributions are also unspecified (that is, no concrete examples are offered), leaving the concept of materiality and value ambiguously open ended. As a result, a specific tone is set for the rest of the Report and the take-up of its arguments. In the Report, the monetary benefits are fore-grounded as more important. The projected institutional identity of universities in Canada, through this Report, is that of neo-liberal responsive institutions, willing and capable of meeting the expectations created by investment in a knowledge economy, as long as governments hold up their end. This strategic use of knowledge economy discourse is evident in the press release for the above report:

The latest volume of *Trends in Higher Education*, released today by the Association of Universities and Colleges of Canada, shows overall revenues to support teaching and research per student at Canadian universities have fallen significantly since the 1980s and have remained virtually unchanged since 2000. Canadian universities had $2000 per student more than their US public peers in 1980-81 and now have $8000 less per student to fund teaching and research.

“This funding disadvantage is a potential quality disadvantage for Canadian university students,” says Claire Morris, President and CEO of AUCC. “It also has implications for the competitiveness of Canada’s universities and their ability to attract and retain faculty and to produce graduates capable of competing in a global knowledge economy.”

(AUCC, 2008d)

Employing existing processes for measuring research output developed so that Canada could provide information to the OECD, the AUCC makes the following point in the context of analyzing the relationship between investments, teaching and research:
Statistics Canada has developed a methodology to estimate the unfunded research costs that universities subsidize so they can estimate the Higher Education Research and Development component of Canada’s aggregate research efforts and report them to the OECD. Based on AUCC’s current estimates, universities would, at a minimum, need to spend close to $3.4 billion to support those research programs at internationally competitive levels. (AUCC, 2008c, pp. 25-26).

Using the very devices that produce the imperative for competitive knowledge-making activities linked to economic determinants (which I analyzed in the previous section on the OECD), we see the AUCC deploying rationales for greater government investments in higher education. In other words, Canadian universities, through the AUCC, project an identity of competitive business enterprises, while they argue for greater public financing.

How does the AUCC activate the discourse of interdisciplinarity? In the Report related to financing, the word interdisciplinary is never used. All activity related to discovery is subsumed under the term ‘research’ and this I argue is intentional. While the AUCC wants to demonstrate responsiveness to changing socio-economic and political imperatives, my analysis of its recent reports leads to the conclusion that their support of interdisciplinary approaches to knowledge-making are to a large degree opportunistic (i.e. to take advantage of current funding opportunities) and are not necessarily linked to a firm belief that ‘creativity’ and ‘innovation’ occurs at the ‘crossroads’ of disciplines. As part of my analysis, I reviewed all their “research files,” (the short publications researched and produced by “AUCC’s policy specialists”) which “challenge popular beliefs and preconceived notions by providing hard evidence, sound data, and in depth analysis” (AUCC, 2008b). Of the 13 reports in this series written between 1995 and 2000 on topics such as indirect costs, economic impact of research, performance indicators, undergraduate enrollment, class size and quality of education, academic freedom, collaborative research, the infrastructure of academic research, etc., the term ‘interdisciplinary’ was used only in one report, entitled “Revitalizing universities through faculty renewal” and in the context of describing the changing landscape of higher education:

Another noticeable Canadian trend in institutional renewal is the rising significance of interdisciplinary studies and research. Interdisciplinary studies have existed for a long time, but enrolments have traditionally been small and research dollars scarce. There has
been movement in the past few years, however, to try to bring interdisciplinary studies into mainstream academic programs. In the current debate on undergraduate education, many experts identify interdisciplinary studies as a key learning objective. They see tremendous benefit in exposing students to the application of knowledge of one discipline to another. On the research front, the merits of the interdisciplinary approach resonate with both researchers and research funding agencies. The soon to-be created Canadian Institutes for Health Research were designed to integrate Canadian health research and break down barriers between the different health sectors. The challenge for universities, then, is to generate this type of enthusiasm and support for interdisciplinary studies on the educational front (Elliott, 2000, p. 6).

The trend towards more interdisciplinary forms of knowledge-making is presented as a given. Experts, researchers and funders agree that encouraging interdisciplinary approaches to learning and researching is ‘beneficial’. The only concern raised in the above report is the ability of universities to create this shift through student program choice in the student population as well as the activities of teaching faculty more broadly (who are rhetorically separated from the ‘experts’ and ‘researchers’ who think this is a good idea).

Since 2000, the AUCC also activated the discourse of ‘interdisciplinarity’ through a recent report on research and knowledge mobilization. This time the take-up is closer to the OECD discourse:

As knowledge advances and becomes more complex, researchers probe more deeply within their disciplines, but also find new ideas and perspectives at the intersections with other disciplines. New arenas and modes of research are opening up to expand the range of possibilities for traditional fields of inquiry. This trend, combined with growing public expectations that research problems be explored more holistically and globally, leads to greater emphasis on interdisciplinarity…. Canadian universities have also established a number of educational programs on an interdisciplinary basis, with a view to enhancing coordination of research, as well as providing students with solid grounding in the relevant fields. Interdisciplinary studies are driven both by a strategic perspective (themes and priorities) and by a sense, on the part of the researchers, of emerging opportunities. Some of the most interesting possibilities are found at the intersection of disciplines. For example, cognitive science (the study of intelligence in living beings and artificial
systems) draws particularly upon psychology, linguistics, philosophy and computer science. (AUCC, 2008a, pp. 47-48)

The first couple of sentences describe knowledge-making as a linear activity with a natural progression towards complexity. The current popularity of interdisciplinary approaches is presented as a product of the two contingencies: the “development of new modes of inquiry” and the “growing public expectations” that research problems are approached “more holistically” and “globally.” The link between public expectations and preparing students for the workforce is not explicitly made. Rather, the Report describes how interdisciplinary programs contribute to the education of students through “solid grounding in relevant fields.” Who defines what is relevant? In the context of interdisciplinary studies, the authors of the Report claim it is a combination of strategic alignment with national priorities and genuine research curiosity that steers research towards the intersection of disciplines. Within the same report, the following observations are made with regard to the ways in which universities have changed in order to accommodate the growing popularity of interdisciplinary approaches:

Throughout the world, university research administration offices and services are becoming increasingly professional and accountable in providing support for research and in tracking multidisciplinarity than ever before. This, in turn, promotes a greater focus on educating future researchers and supporting current faculty both at the intersection of disciplines and across disciplines, as they research problems and topics in ever greater depth.

In recent years in Canada, the three federal granting agencies have made problem-focused research a priority, with a view to developing integrated solutions that usually draw on more than one discipline.

Universities support interdisciplinary research in a number of ways. At the most general level, in their strategic research plans, they identify themes and priorities which cut across disciplines and which require complementary and coordinated efforts in different disciplines. This in turn helps to guide investments on their part, for example, in faculty recruitment and hiring, as well as facilities and equipment. To this end, universities have
established a wide variety of interdisciplinary research centres and institutes, ranging from small to very large in terms of physical size and the number of disciplines covered (AUCC, 2008a, pp. 47-48).

The shift to capturing and profiling research “at the intersections” of disciplines is presented as a recent trend and as a demonstration of the responsiveness of higher education institutions to stakeholder demands for more problem focused research. Equating interdisciplinarity with problem-focused research makes it an issue of importance for the applied disciplines (engineering and medicine for example) and acknowledges the growing importance of these disciplines in the broader system of knowledge-production. However, the reader gets the impression that while Canadian universities support interdisciplinary activity they do not consider it their main activity.

6.3.2 Council of Ontario Universities

At the provincial level, a similar organization to the AUCC exists that brings together Ontario universities under one collective forum called the Council of Ontario Universities (COU). COU was originally known as the Committee of Presidents of the Universities of Ontario (CPUO), an organization formed in 1962 to support the educational reform and expansion of the Ontario education sector described in Chapter 5. In 1971, the committee changed its name to the Council of Ontario Universities. The Council is populated by two representatives from each member and associate institution: the executive head (a university president or principal) and an academic colleague appointed by each university's senior academic governing body (Council of Ontario Universities, 2008). The COU, like the AUCC, does not have a specific position on interdisciplinarity. However, discursively, I did find evidence of the COU encouraging and participating in cross-sector collaboration, one of the forms the popular discourse of interdisciplinarity promotes. This was directly associated with increasing the capacity of Ontarians to innovate and to capitalize on their innovations, also a rationale associated with the popular discourse of interdisciplinarity. The following discussion will articulate in more detail the ways in which the COU channels OECD positions on the role of knowledge-production.

In its 2006-2008 biannual report, the COU describes its current purpose as advancing higher education “through advocacy, research and policy development in collaboration with our
member institutions” and its role as strengthening “the ability of our universities to foster the
talent, research and innovation essential to the economic and social well-being of Ontario and
Canada” (2009a, cover page). Within this report, the Association articulates responsiveness to
the federal and provincial government calls for strengthening the role that university activities
have in economic development, while advocating for increased public funding and resourcing.
For example, Peter George, the then Chair of the Council, stated,

We are living in an increasingly competitive global environment where the stakes are
intensifying and the challenges are multiplying. Organizations across all sectors must
constantly reinvent themselves, evolve and refine their operations to compete and thrive.
Our universities are no exception. Countries around the world are boosting their
investments in higher education and research to attract not only their own graduates but
also ours. Quite simply, we have to raise our game while remaining true to our core
values of educating the populace and advancing frontiers of knowledge through research
(Council of Ontario Universities, 2009a, p. 1).

With the above statement, COU positions Ontario universities as ‘stakeholders’ in the
development of economic policy, both acknowledging and accepting the responsibility of having
to “raise the game,” that is, improve research and training outcomes in order to meet the needs of
Ontario. George follows this acknowledgment with a request for “concerted action across all
sectors,” making other ‘stakeholders’ equally responsible for ensuring cross-sector collaboration
works:

In the short term, Ontario’s universities face a big challenge in delivering more talent.
Our operating grants have not kept pace with the demand for university spaces in recent
years. In their report titled Ontario in the Creative Age, Roger Martin and Richard
Florida stated that creativity is the ultimate economic resource because it drives
innovation and raises productivity and living standards. Universities are a nucleus for this
creativity. But becoming the jurisdiction that succeeds in tapping most deeply into this
creativity will require concerted action across all sectors. While we can continue to renew
our programs to meet the needs of our transformative world, business will also need to
help deepen the skills of their workers and build partnerships with researchers.
Governments have to help optimize the talent with sufficient long-term investments in
research and teaching. Remaking the future of our province and our country is a truly collaborative effort, and Ontario universities stand ready and willing to do their part (Council of Ontario Universities, 2009a, p. 1).

In this document, COU provides a forum to strategically deploy the discourse of popular interdisciplinarity and the knowledge economy more broadly, to advocate for more funding as well as to establish shared responsibility for the outcome of collaborative knowledge-making. It also pools the accomplishments of its member institutions to account both to government and the public for the education sector’s activities as well as to justify more resources. It publishes reports on special topics regularly, through which it articulates a clear position on what the Ontario education sector needs to succeed both locally but also internationally. This form of accounting is not undertaken from a position of dependency. Rather, COU shows evidence of the strategic deployment of discourse. For example, in a recent report, the organization argues that “more advanced degree holders are needed” in order for the Province to “boost its human capital advantage” (Council of Ontario Universities, 2009b, p. 1). It rationalizes this argument first by speaking to the current socio-economic context where “global competitiveness is driven by talent and innovation,” stating that this explains “why the demand for advanced degree holders has accelerated in the past two decades and is expected to increase for many years to come” (Council of Ontario Universities, 2009b, p. 1). It then goes on to specifically describe the role advanced degree holders play in the knowledge economy:

Advanced degree holders are critical to our economy because they transfer knowledge from universities to many other sectors of society. They conduct cutting-edge research, replenish faculty ranks, address the human resource needs of both the private and public sectors, and translate innovation into commercial activity (Council of Ontario Universities, 2009b, p. 1).

Advanced degree holders, then, are the flexible works of the knowledge economy Walkerdine (2006) and others have described. They produce, transfer and translate knowledge across sectors, pollinating creativity and innovation. However these flexible workers cannot be produced on mass without considerable investment on the part of the other sectors that stand to gain from their work. This is the case constructed by COU to advocate for more funding. The wording
presents a case constructed from a position of strength rather than dependency. The Report concludes with a series of specific recommendations summarized in the following excerpt:

To ensure that Ontario is able to capitalize on its reputation and seize the opportunities that this growing pool of undergraduate students offers, the provincial government and our universities need to act boldly to expand graduate education to meet the needs of the future in the next phase of Reaching Higher.... The government’s multi-year funding plan will need to provide...[a] long-term plan for increased funding to expand the graduate student base beyond the 2011-12 targets. Additional capital funding to finance new labs, libraries and classrooms to support graduate expansion. (When combined with the capital needs to support undergraduate enrolment growth, the total capital required for new construction to 2020 is $9.4 billion). An enrichment of $33.4 million [in scholarship funding] to boost graduate enrolment (Council of Ontario Universities, 2009b, pp. 2-3).

The above discussion shows that COU, just as AUCC at the national level, channels OECD discourse related to the knowledge economy, accepting thus the new role educational institutions are called to play in society. While socio-economic priorities are purportedly creating new and different demands on higher education institutions, universities are portrayed as collectively working to enhance their positions by engaging in ‘evidence based’ advocacy and participating in policy development.

The next section will explore how research-intensive universities themselves also strategically deploy contemporary discourses to further garner advantage in the competition of resources.

6.3.3 Group of Thirteen research-intensive universities in Canada

In the opening chapter, the commercialization ethic of contemporary Canadian research-intensive universities was captured in Table 1.1. In this section, I will briefly outline the establishment of an informal grouping of these universities. In 1991, the 10 university heads of top research-intensive universities in Canada began meeting biannually to discuss issues related to enhancing research. As of April 2006, three more universities began participating in these meetings. Since then, the group has been commonly referred to as the G-13. The following universities make up this group: The University of Alberta, University of British Columbia, University of Calgary, Dalhousie University, Université Laval, McGill University, McMaster University, Université de
Montréal, University of Ottawa, Queens University, University of Toronto, University of Waterloo, and University of Western Ontario. The primary activity of the G-13 is in exploring joint research programs. The chairmanship of the G13 rotates among the executive heads of the 13 universities. The group does not have an official website, although other institutions have began relating to them as an institutional entity.

The G-13 universities have the largest endowments among Canadian universities. Their current combined enrollment is approximately 428,000 students. The advantage of coordinating research initiatives among the most active universities of Canada in producing knowledge is articulated on a government website describing the advantages of studying in Canada:

> The group of thirteen which stretches right across the country from sea to sea incorporates the differing opinions and lifestyles that each of these regions embodies. By working together on research projects, students and researchers can optimize results and reduce the amount of time their research takes. Whether the initiative of the researchers is to find out more about bipolar disorder in Hamilton, Hull or Halifax, or assessing the rates of a fixed mortgage in Toronto, Canada or London, England, working with schools across the country to compare and trade data will yield greater results at a much quicker rate. This is a huge advantage for medical science and all sorts of other research projects as well (Government of Canada, 2010 par 4).

Seen as a forum for enhancing inter-institutional coordination and cooperation for knowledge-production, the G-13 epitomizes a forum with increased visibility in contexts where the popular discourse of interdisciplinarity dominates. It is not surprising that the two examples used in the above citation to describe the advantages of coordinating research across knowledge-producing institutions are linked to medicine or the finance sector. Consistent with knowledge economy discourse, the sharing of information is described as a cost-effective strategy to maximize output and gain for Canadian society.

The G-13 is also increasingly interacting within policy forums advocating for research-intensive universities. For example, in a recent submission to the Competition Policy Review Panel on *Sharpening Canada’s Competitive Edge*, the G-13 expressed their combined thinking and position on the role of research intensive universities in Canada, and positioned themselves explicitly as conduits for enhancing Canada’s competitive edge in the knowledge economy.
(Executive Heads of G13 Universities, 2008). This position paper shows how the group deploys the neo-liberal discourse of globalization to stake a claim on government resources. The paper opens with a reaffirmation of the importance of thinking critically about the role of education in the context of planning for enhancing Canada’s international competitiveness. They then proceed to position their group as having a significant role to play in enhancing Canada’s competitiveness in the knowledge economy:

Canada’s 13 research-intensive universities are internationally recognized for excellence, and poised to build on this excellence to make Canada a global leader in innovation and competitiveness (Executive Heads of G13 Universities, 2008, p. 1).

Having positioned themselves as ‘stakeholders’ in this strategic planning exercise, the Group responds to specific points raised by the Competition Policy Review Panel discussion paper that relate to post-secondary education, namely how to make Canadian universities a destination for talent, and how to evolve Canada into a global leader for innovation. Both of these goals, the G-13 acknowledge, are “critical precursors to a highly productive and competitive economy” (Executive Heads of G13 Universities, 2008, p. 1). The Group then proceeds to make a number of recommendations regarding how to evolve a supportive policy framework that will enable universities to perform at their best. Amongst these recommendations, a number of requests for increasing public investment in universities are made. For example, the Group asks the federal government to help them attract and train more PhD students in “innovative and emerging sectors,” citing OECD statistics showing that Canada has 7.2 researchers per 1,000 employees, while the top performer (Finland) has 16.5. They request that the federal government increase public funding to universities (at a level that is competitive to international counterparts) and in addition, increase the funds they provide to cover the institutional costs of research. They also acknowledge the importance of strategically focusing federal funds on targeted research areas which promise high commercial yield but then proceeded to make a case for also supporting basic research to ensure long term growth and innovation. The Group did not limit themselves to asking for increased support and financing of education. They also included a number of recommendations to improve the capacity of Canadian universities to attract talent from outside Canada. These include: developing a public policy framework that encourages the efficient movement of highly qualified people, removing policy and institutional barriers to improve the efficiency of the immigration; and making the recognition of professional credentials more
efficient. Finally, the group draws on the popular discourse of interdisciplinarity to ask for a number of federal supported initiatives that would improve the capacity of universities and industry to engage in collaborative knowledge-production. Amongst these recommendations are considering regulatory and tax reforms that would encourage better linkages between Canada’s research-intensive universities and international leaders in industry; developing programs and tax-based incentives for industry and business to recruit and retain masters’ and PhD graduates; establishing industry internships for graduate students and post-doctoral students; creating programs to facilitate sabbatical-length placements of industry researchers in universities, and university researchers in industry; establishing funding for international research projects and partnerships; and supporting new models of partnership to better convert university discoveries into results, including establishment of separate commercialization agencies and infrastructure amongst others (Executive Heads of G13 Universities, 2008, p. 3).

A number of processes are evident in the above discussion. First, research-intensive universities are striving to show responsiveness to mainstream rationales. These rationales maintain that universities have a significant role to play in the nation’s economic development. As they are linked into discussions of policy development in sectors outside of education, universities are also expressing positions and opinions on topics outside of education such as immigration and tax policy, for example. They are also proactively positioning themselves as ‘stakeholders’ with a voice and specific interests to safeguard, including lobbying for better financing of basic research at a time when applied research is more in vogue. Finally, the discourse of interdisciplinarity is deployed in the context of this policy discussion in its most instrumental form, the bringing together of different sectors (government, industry, university) to share resources, information and talent.

6.3.4 Group of Five, Canada’s largest research intensive universities

As the previous section showed, the strategic deployment of discourse is not only channeled through formal associations, but also through informal groupings of institutions that share common characteristics. Throughout this chapter, I have been highlighting the materiality of contemporary discourses related to knowledge-production, interdisciplinarity and innovation. While interdisciplinarity, even in its most instrumental form, is promoting collaboration across sectors and disciplines, a side effect of attaching an economic agenda to this type of knowledge-making has been an increase in competition for resources, productive alliances and so on. In the
process, arguably, the popular discourse of interdisciplinarity is generating dividing practices. This is perhaps most evident in a recent example of five research intensive universities (UofT, UBC, UofA, Université de Montréal, and McGill) getting together to work outside of established forums to gain competitive advantage over the other research intensive universities of Canada.

In August 2009, the presidents of Canada’s five largest universities (G-5) “opened up a can of worms in their attempt to highlight the debate over the country’s stalled innovation agenda” (G. Klein, 2009, p. A5). According to Klein, writing for the Saskatoon StarPhoenix, “the presidents of the G5 approached Maclean’s magazine with the idea that Canada should establish a super-university category capable of competing internationally for the best and the brightest of faculty and students” (2009, p. A5). As Church, writing for the Globe and Mail, put it:

The roles of Canada’s many universities have come to the forefront this summer with the leaders of five research-intensive schools arguing that the country needs an elite group of postsecondary institutions focusing on research and graduate education. International competition and the increasing need to innovate require such measures, they say (August 25, 2009, p. A1).

Klein noted that it was UofT president David Naylor who actually argued for a differentiated system of universities, “with the big getting bigger and the rest left to pick up the pieces” while the President of the University of Alberta, Indira Samarasekera, actually favoured a continuation and strengthening of the current competitive nature of grants, showing that the G-5 were not in complete agreement (2009, p. A5). The proposal to differentiate funding is made using the same rationale government has been using to foster innovation, that is, to concentrate funding strategically in epistemic sectors that will yield the most commercially viable products. The rationale for differentiating the system of universities, now argued for by UofT and some of the other research intensive universities, is to finance strategically key institutions with proven research success, and to bolster their research activity by allowing them to primarily train graduate students, while turning some of the less productive universities (in terms of research) into undergraduate teaching and training institutions (Rock, September 3, 2009). This idea has also been articulated by a group of scholars (two of whom working at the University of Toronto) studying education governance who say:
We suggest that the one-size-fits-all funding mechanism that has been in operation [since the 1960s] has militated against the kind of institutional differentiation that has evolved in many other jurisdictions and that we believe, would better meet Ontario’s current and future needs (Clark et al., 2009, p. 4).

Understandably, this idea of differentiation has been met with reactions from other universities. President Jim Turk of the Canadian University Teachers Association, has been quoted as saying,

This is a really short-sighted approach. Canada cannot afford to discourage great scholars from doing their work. Canada has important pockets of excellence which would be endangered under the model put forth by the five university leaders (Church, August 25, 2009, p. A1).

Also vocal about the impact of the G-5 (and specifically the UofT proposal) was Alan Rock, President of the University of Ottawa, who wrote:

But is it sensible to confer special status on a handful of universities, as the G5 now proposes, while excluding others that are also conducting world-class research? For a number of reasons I would suggest not. In the first place, the process of selecting the five is artificial. University rankings can change from year to year…. Second, the G5 suggest that research and teaching are separate. They want to focus on research and graduate training while the rest of us emphasize classroom instruction for undergraduates. This approach ignores the reality that the best teachers draw upon their current research to enrich and shape undergraduate teaching…. Third, the G5 proposal undervalues the immense contribution to Canadian innovation made by many of the campuses that fall outside their select circle (September 3, 2009, p. A11).

Following along the lines of this critique, I have argued above that more broadly, government innovation strategies favouring competitive collaborative knowledge-making in the basic and applied science and engineering sectors threaten the viability of disciplines and interdisciplines in the humanities and the social sciences to engage in graduate training and research, as they are seen as less relevant to the type of research currently promoted, encouraged and supported.

The above G5 incident was spurred by institutions struggling to maintain the growth and productivity demanded of them by the current knowledge economy discourse. The innovation
policies pursued by both the Federal and Ontario governments as described in previous sections have assumed that investment in key epistemic domains would materialize from the private sector that would capitalize on their investments with a return of new products (co-generated with universities) developed for quick commercialization. However, private sector investment has not materialized at projected levels. This has been attributed variously to complicated government funding programs, which are administratively difficult to navigate; or to the downturn of the global economy which began in 2008 and continues to this day. Whatever the reason, the lack of investment from the private sector has resulted in university organizations (such as the AUCC and COU) lobbying government for a greater investment of public funds in education, so that universities can meet social expectations (expectations which I have argued have been growing in very specific directions for the past 20 years). Competition amongst institutions has increased, and eager to protect their current share of the market, some institutions, such as UofT, use their clout outside of existing forums to strategically deploy the knowledge economy discourse for their institutional gain.

On the issue of institutional competition and how it affects governance arrangements, one senior UofT faculty administrator made the following observation to me:

You have the demographics that drive student related issues. You have the reaction of governments to various social and economic trends, driven more by globalism than anything else, that are driving public policy and funding attention. You have positioning for competitive advantage, both domestically and internationally, that are driving the universities. And you have the almost professional sports-type competition for scarce ‘star’ resources and researchers that are driving the allocation of resources within the university and the related organizational issues as a way of building and supporting the franchise. So all of those are in dynamic tension and hard to predict. You can predict the relative strengths of particular themes and patterns and currents, but I think it’s hard to say that those themes and patterns and currents are shaped by informed strategy.

Competition permeates many levels and many sectors. And this competition actually limits the capacity of any one university to pursue a long-term strategy for growth. Arguably, while the popular form of interdisciplinarity is promoting collaboration amongst sectors and disciplines as a cost effective strategy for producing new knowledge and marketable innovations, in the
process, it also increases competition amongst institutions of higher learning as they vie to make strategic alliances in order to safeguard, protect or increase their market share in the knowledge economy. Socio-economic priorities, changing societal values and demographics, and availability of resources at any given point in time, affect decision making and complicate the governance of knowledge-production. Thus, while theoretically, we can speak of popular or dominant discourses, the materiality of these discourses will always be situated in specific contexts and specific times.

6.4 Conclusion

This chapter has explored the broader social relations of knowledge-production within which the popular discourse of interdisciplinarity finds articulation. I have shown how discourses circulate and are authorized by institutions at international, national, and provincial levels, making mainstream particular positions on the role of knowledge-production in society both in their articulation and their application. I have also foregrounded the materiality of contemporary innovation agendas which rationalize knowledge produced by basic and applied science and engineering fields as ‘more relevant’ to Canadians than knowledge produced in the social science and humanities fields. Also discussed is the way in which universities, through collective organizations/associations or independently, strategically deploy knowledge economy discourse in order to safeguard their interests and secure more resources and funding.

The next chapter will continue exploring the social relations that are part of the discourse of interdisciplinarity in its popular form by specifically examining how the University of Toronto’s institutional identity has been shaped by knowledge economy politics.
Chapter 7  
A profile of a research intensive university in the global economy

7  Introduction

The previous chapter has traced how neo-liberal framing of the role of education in society has permeated policy forums at all levels, including international, national and provincial, and contingently, the popular discourse of interdisciplinarity. This chapter will continue the exploration of how discourse travels and circulates by showing how it is part and parcel of institutional processes, using the University of Toronto as a case study. I will argue that collaborative knowledge-making that brings together government, economic and social sectors has become a defining feature of contemporary knowledge making. This conception of collaborative knowledge making needs problematization. Specifically, I show that research-intensive universities such as the University of Toronto have evolved sustainability planning that strategically uses the discourse of interdisciplinarity as an accountability tool, or a way to demonstrate ‘responsiveness to social needs.’ As discussed in Chapter 1, universities in general and UofT specifically have evolved administrative approaches that facilitate the bridging of sectors and expertise in order to capitalize on opportunities to secure government funding in educational sectors considered high product/outcome-yielding, such as engineering and medicine.

Drawing on my broader archive and participant experiences, I will first describe what popular writers and scholars have extracted as important markers of competitiveness for both businesses and universities striving to succeed in the knowledge-economy. Previous chapters have focused at national provincial and international levels, and this chapter provides an institutional focus starting with a brief genealogy of how the University of Toronto has constructed its identity as a ‘successful’ research-intensive university. The iconic discovery of insulin will serve as an entry point. In the process, I will examine how the component discourses of popular interdisciplinarity --collaboration, expertise, making a difference, accountability and excellence-- have shaped contemporary academic experiences at UofT, allowing it to capitalize on the popular discourse of interdisciplinarity and compete in the knowledge economy. This will be followed by a description and analysis of the UofT policy on interdisciplinarity. As an example of the materiality of the strategic uptake of discourse at the institutional level the chapter ends with a
description and analysis of an object made possible by the popular discourse of interdisciplinarity, namely, the not for profit corporation Medicine and Related Sciences (MaRS).

7.1 How to compete in the knowledge-economy

In 2006, Don Tapscott and Anthony Williams published a book directed to a general audience entitled, *Wikinomics: How mass collaboration changes everything* (Tapscott & Williams, 2006). The authors argue that while hierarchical systems in corporations and organizations have not disappeared, “the global economy” has “given rise to powerful new models of production based on community, collaboration, and self-organization rather than on hierarchy and control” (p. 1). Facilitated and intimately linked to the rise and mass up-take of new digital technologies, Tapscott and Williams argue that the premise for production has shifted from gaining competitive advantage through control of information, to sharing knowledge and collaborating in order to get ahead:

Employers drive performance by collaborating with peers across organizational boundaries, creating what we call a “wiki workplace.” Customers become “prosumers” by co-creating goods and services rather than simply consuming the end product. So-called supply chains work more effectively when the risk, reward, and capability to complete major projects—including massively complex products like cars, motorcycles, and airplanes— are distributed across planetary networks of partners who work as peers. Even ardent competitors are collaborating on path-breaking scientific initiatives that accelerate discovery in their industries (p. 1).

Tapscott and Williams describe this shift in romantic terms (the co-creation of goods, networks of partners who work as peers, ardent competitors collaborating for mutual benefit) without problematizing the implications of using ‘collaboration’ to obtain a competitive edge, nor discussing who controls the agenda or how this shift implicates higher education institutions.

From the academic realm, Alice Lam (2007) explores the ‘Wiki phenomenon’ from an organizational point of view, eliciting testimonials from technical managers and scientists working in the information and communication and pharmaceutical industries. She describes how large firms in the high-technology sector have indeed “capitalized on collaboration” by
“breaking away from the limitations of maintaining internal research and development (R&D) divisions” and forging “close institutional ties with their university partners” to develop “network career structures in order to engage academic scientists in joint knowledge-production” (Lam, 2007, p. 993). Lam’s rationale for this shift, consistent with Tapscott and Williams, relies on the mantra of collaboration-diversification-innovation-integration. Her argument is familiar: diversification is thought to increase innovation. Given the fast-moving nature of scientific and technological change, investment in corporate/industrial R&D is not seen as profitable, as the scientists hired for current R&D needs may have inappropriate expertise in the future. Lam point to how many large firms are thus downsizing internal R&D divisions, and diversifying their internal knowledge base through a network model. Lam argues that firms are trying to create long term partnerships so that they may “extend their human resource and knowledge boundaries into the established internal labour markets of the universities with which they collaborate, leading to the formation of a pool of joint human resources with work experiences and careers patterns straddling the two sectors” (Lam, 2007, pp. 993-994).

While Tapscott and Williams’ work attests to the popularity of the discourse of collaboration in the corporate/industry setting, Lam’s research suggests the industry/corporate motivation for ‘partnerships’ with the university sector: the hope that research-intensive universities could become the new R&D labs of industry. Specifically, Lam’s interviews make visible the degree of effort industries go to in order to control their research agenda through “deep and trusting relationships” with their university partners “so that [they can] have early access to the best ideas and trusted access to the best people”; and as her pharmaceutical participants stated, you can then use these relationships to “‘influence what those PhDs do’ and to get them to ‘work on particular research areas of interest to the company’” (Lam, 2007, p. 1002). If the corporate and industry sectors are changing the way they relate to universities, what effect does this have on the way universities relate to these sectors? Scholars have theorized the changing relationships between business and higher education sectors as an indication of the increasing corporatization of academic knowledge-making (Geiger, 2004; Slaughter & Rhoades, 2004). Concurrently, the relationship between government and the higher education sector is also changing. As noted in previous chapters, the corporatization of higher education can be linked to a shift towards more targeted government funding (Dehli, 2010; Polster, 2007). I have argued in previous chapters that these changes are related to a more general shift in how the role of the university in society
is rationalized in the context of globalization. Kathryn Mohrman and colleagues (2008) argue along the same lines noting that this shift in rationale has created in a subset of research institutions, a restructuring of objectives and practices captured, in what the authors term the Emerging Global Model (EGM):

EGM universities are engaged in worldwide competition for students, faculty, staff, and funding; they operate in an environment in which traditional political, linguistic, and access boundaries are increasingly porous. These top universities look beyond the boundaries of the countries in which they are located to define their scope as transnational in nature. Their peers span the globe. The EGM further suggests that investment in human capital is good for society and that new knowledge leads to a better world. In this model, nations can harness a rational process of knowledge-production through public investment in the research university. Thus higher education, and especially the EGM institution, becomes a key ingredient of the recipe for managed social and economic progress sponsored by the nation-state (Mohrman et al., 2008, p. 21).

The EGM assumes collaboration as a cost-effective approach to knowledge-making. But arguably, as in the case of the G5 discussed in the previous chapter, EGM encourages, in the process, competition amongst institutions of higher learning as they vie for industry and government partnerships to secure market share in the new global knowledge economy. There are eight characteristics of the EGM identified by the author, touching on the now familiar mantra of collaborate-diversify-innovate-integrate:

1. EGM universities see their mission as transcending the boundaries of the nation-state, educating for global perspective and advancing the frontiers of knowledge worldwide.
2. EGM institutions are increasingly more research intensive with the use of scientific methods in disciplines outside the sciences.
3. Faculty members, as producers of new knowledge, are assuming new roles, shifting from traditional independent patterns of inquiry to becoming members of team-oriented, cross-disciplinary, and international partnerships, with research directed more often than before toward real-world problems.
4. The research enterprise is extremely costly. Universities are going beyond government support and student contributions to diversify their financial base with funding from
corporation and private donors, competitive grants for technology innovation, and creation of for-profit businesses as spin-offs of research enterprises.

5. New relationships are being created among universities, governments, and corporations to advance economic development and to produce knowledge for the social good.

6. These universities are adopting worldwide recruitment strategies for students, faculty and administrators.

7. EGM institutions require greater internal complexity directed toward research, such as interdisciplinary centres, integration of research elements in student training programs, and greater technological infrastructure for discovery.

8. Universities participate with international non-governmental organizations and multigovernmental organizations in support of collaborative research, student and faculty mobility, and validation of international structure (reproduced from: Mohrman et al., 2008, p. 21).

Similar descriptions of research intensive universities have been given by several authors engaged in tracking the phenomenon of the increasing commercialization of knowledge-production (B. Clark, 1998; Etzkowitz, 2003; Geiger, 2004; Geiger & Sa, 2005; Slaughter & Leslie, 1997; Slaughter & Rhoades, 2004).

The University of Toronto is actively trying to become an EGM, to compete globally with other elite research institutions for a larger share of the knowledge-production industry. Institutional reports pick up the popular discourse of interdisciplinarity and the many discursive concepts that make it up. This current pervasive constellation of terms focusing on ‘collaboration’, ‘diversity’ and ‘innovation’ act as organizing principles in the governance of knowledge-making. The following excerpts are from two strategic planning reports, one developed in Engineering and the other in Medicine at UofT. Both excerpts have embedded key elements of the EGM, demonstrating the pervasiveness of this rationale in the University of Toronto context. Both make reference to the importance of interdisciplinary approaches activating this popular discourse in a facilitative capacity for the uptake of knowledge economy principles:

_In Medicine:_ Changes in the environment demand new relationships and configurations in the way research is conducted, training and teaching programs are carried out, and health care services are delivered. The ability to deliver high quality patient care and
conduct “high impact” research is increasingly dependent on the ability of the Department to develop stronger collaborations involving diverse, multi- and interdisciplinary teams. The Department can no longer afford the internal competitiveness and the lack of inter- and intra-divisional collaboration that have limited our capabilities and created missed opportunities. Today and in the future, to be competitive on a national and international scale, will require the marshalling of the Department of Medicine’s collective strengths to bring together the intellectual and technical expertise from a variety of disciplines that would not be possible from one institution. (Department of Medicine, 2005, p. 12)

*In Engineering:* During the next six years, the focus for teaching and research will be in four strategic directions. These are:

1. **Bioengineering** (biomedical, biomaterials, bioinformatics, biosensors, bioremediation, tissue engineering, etc.).
2. **Nanotechnology** (nano-materials, nano-electronics/photonics/magnetics, nanobiotechnology, etc.).
3. **Information and Communications Technology** (new computer technologies, information engineering, image processing, mechatronics, computer modelling, smart systems, etc.)
4. **Energy and Sustainable Development** (energy sources, sustainable systems, clean water and air, clean production, etc.).

We will: allocate Faculty resources to these four strategic directions; increase interdisciplinary research and teaching; where feasible, establish undergraduate options across the Faculty and expand inter-Faculty collaboration.

[We will also] [a]im for a more flexible intellectual property (IP) policy, to be adopted by the University, to better meet our needs for industrial collaboration. (Venetsanopoulos, 2004, p. 3)

In both excerpts, the emphasis on demonstrating relevance through collaborative knowledge-making activities is evident. Also evident is the concept of researching areas of strategic
importance. This approach to knowledge-making evolves hierarchies in knowledge-production that favour, as argued thus far, products that are marketable and that ostensibly provide solutions to socially important problems. Linking social issues with market imperatives is argued to have many advantages. Cures for diseases can be made readily accessible to people that need them. The cost of the development of the cure is taken on by companies that hope to capitalize on the distribution of the cure. This symbiotic relationship between science making and the industry sector is not new. In fact, during my interviews, the topic came up in the context of discussing interdisciplinarity. One participant quoted the discovery of insulin (which took place close to a century ago) as an exemplar of ‘making a difference’ through interdisciplinarity. In my broader archive, the discovery of insulin is used regularly by UofT and historians to speak about the University’s capacity to make discoveries (its ‘excellence’) but also its capacity to improve the lives of people through these discoveries (i.e. innovate to make a difference). These various accounts of the discovery of insulin and the way this discovery is remembered and celebrated is consistent with rationales embedded in the popular form of interdisciplinarity as well as with features of the EBM currently thought of as markers of success in the knowledge economy. Thus, before specifically analyzing the current interdisciplinary policy arrangements at UofT, I will expose (through a short genealogy) how this institutional discourse of making-a-difference relates to demonstrating relevance through interdisciplinary collaborative knowledge-making.

7.2 An brief genealogy of the discourse of ‘making a difference’

As the story of insulin goes, UofT was established in 1827. The medical school was built in 1903 and the Toronto General Hospital was built in 1912. The addition of the hospital and the medical school made Toronto’s medical laboratory facilities at the time among the best in North America, as documented by the Flexner report (1910). In 1922, the discovery of insulin, Friedland argues, and the subsequent establishment of the School of Graduate Studies, were “the turning point in Toronto’s becoming the leading university in Canada” (2002, p. 285).

Put discursively, the contingencies necessary for UofT to emerge as the research-intensive university that it is today, were a) a medical innovation with widespread positive social impact and b) a concentration of resources and organizational infrastructure to advanced research and training of researchers.
In re-telling the story of how insulin was discovered I have drawn from multiple sources including academic writing, institutional websites, and my interviews. I did this for two reasons, the first was to problematize how the University of Toronto ‘remembers’ the discovery by looking at how other institutions, and how knowledge-makers describe the discovery. The second reason was to deconstruct how the discourse of ‘making a difference’ or demonstrating ‘relevance’ and the discourse of ‘expertise’ are related. Arguably, both of these discourses currently contribute to the popularity of instrumental forms of interdisciplinarity in medicine and in engineering.

The next section reconstructs the story of the discovery of insulin from my analysis of multiple sources. In an effort not to interrupt the flow of the narrative, the discursive analysis of this story will follow the retelling.

7.2.1.1 Preamble

Before there was thinking about how to organize and govern research, an important discovery was made; insulin was created in a form that could be used to treat patients suffering from a devastating disease, diabetes. The discovery is sometimes attributed to Macleod and Banting and at other times to Banting and Best --and still at other times to Macleod, Banting, Best and Collip. Here is one story of how this important innovation came about:

7.2.1.2 The narrative: A reconstruction from multiple sources

In 1923, Macleod and Banting received the Nobel Prize in physiology for the discovery of insulin. Writing in 1967, Macdermot notes:

It may be safely said that before the discovery of insulin in 1921 medical research as we think of it now was practically non-existent in Canada. Resources in equipment, technical assistance, and money, were meager in the extreme…. One striking aspect of the discovery of insulin lay in its immediate influence in stimulating clinical, and biochemical investigations on a wide scale. All discoveries open up new fields, but seldom has a single piece of research led to a greater volume of investigation of such a varied nature (1967, p. 167 and 173).
The discovery of insulin reportedly drew much financing for research to the University of Toronto for the creation of laboratories and the support of researchers. Some of the funding came from private donors but also from sources such as the Rockefeller Foundation. The promise that new scientific discoveries offered for securing a ‘cure’ for medical but also many social conditions such as poverty attracted attention from private foundations. Whole new disciplines were created to sustain research directions encouraged by such associations (Brown, 1979; Kay, 1993).

Friedland argues that while the discovery of insulin was a breakthrough for the treatment of diabetes and a huge boost to the reputation of the University of Toronto, it may have actually held back scientific research at UofT, because it diverted attention from other forms of scientific research, while concentrating huge investments in research funding in the hands of Banting, who “reportedly was not a good scientist” (Friedland, 2002, p. 289-291). Notwithstanding this observation, the discovery of insulin is still commemorated in a variety of ways at the University of Toronto as part of documenting the University’s leadership in scientific research and the impact of this research ("About U of T Research: Nobel Laureates," 2008; Cantin, 2008a, 2008b). It is also often used as an example of successful collaborative research. Three reasons are cited: the project focused expertise on a problem that affected many people; teamwork sped up the process of discovery; and partnerships with industry facilitated the ‘translation’ of the discovery into a useful and accessible outcome. In the words of one participant in my study, “diabetes had mystified humanity for thousands of years” and “when Banting and Best [made the discovery]…there were 10 or 12 other groups that were really hot on it as well.” To find a treatment for a disease that has broad incapacitating effects on those inflicted is perceived as one of the ‘noblest’ contributions to humankind. To have this innovation credited to researchers working at the University of Toronto, when it could have been credited to a number of other research groups around the world, signals why the discovery is constructed as a turning point in the history of the University.

Glossed over in current storylines about the importance associated with the discovery of insulin, is the considerable controversy which occurred over the years as to who should have received credit for the discovery and be awarded the Nobel Prize. There were a number of individuals involved in the work surrounding the discovery, but only MacLeod and Banting were nominated for the award. Bliss (2000) argues that the best choice was made for awarding the Nobel Prize
given the rules at time. The rules of the time indicated that unless you had been nominated you could not be considered for the award. In the case of Macleod and Banting’s nomination, the discovery was published in 1922 and in 1923 they were nominated and received the prestigious award. It was very unusual for someone to receive the Nobel Prize in physiology or medicine the same year they had been nominated and one view has it that had the Committee taken more time to deliberate the merits of the nomination, Collip and Best might also have received more timely nominations and included in the award. As it stands, Collip and Best were nominated for their scientific work in 1928 and 1950, respectively.

Jan Lindsten describes how the nomination of Macleod and Banting was rationalized by one of the key nominators, August Krogh, also a Nobel Laureate in physiology:

In his nomination, August Krogh summarized his reasons for proposing Banting and Macleod in the following way: "With the information which I personally have obtained in Toronto, and which also, although less clearly so, emerges from the published works, one may conclude that the credit for the idea behind the work which led to the discovery, undoubtedly goes to Banting, who is a young and apparently very talented man. However, he would definitely not have been able to carry out the investigations, which from the start and during all stages, have been supervised by Professor Macleod" (Lindsten, 2001, par 6).

The need to attribute ‘ownership’ to ideas and innovations is still an important feature of contemporary knowledge-making activity, as it is directly linked to crediting individuals for their efforts in demonstrating ‘relevance’. Not surprisingly, collaborative activity, such as that currently promoted through the popular discourse of interdisciplinarity, complicates this effort.

Bliss argues that on their own, Banting and Best would probably not have accomplished the discovery of insulin. To make this point, he describes in great detail the many individuals involved in the ultimate discovery. Like Krogh, Bliss argues that it was J.J. R. Macleod who in fact directed the research program, which expanded and brought to completion the project that was initiated by Banting with the help of Best. According to Bliss, as director of the research program, Macleod played a significant role in bringing the right people together at the right time. As I will argue later, attributing significant credit to the lead researcher for ‘managing’ the collaborative research process is still practiced in contexts where the popular discourse of
interdisciplinarity dominates. This has implications for interdisciplinary knowledge-makers who make careers out of participating in large collaborative research projects.

Best’s involvement with the project was part of a summer work placement arranged by Macleod. He was one of two students chosen to assist Banting with the experiments over the course of the summer. The other student was E. Clarke Noble, who was described by James Wright in a recent CMAJ article as the “almost famous” contributor to the discovery of insulin (Wright, 2002). Best and Noble tossed a coin to see who would begin his placement first. Best won the coin toss, and in that fateful moment changed the course of his and Noble’s careers. As Wright describes:

Noble performed important early studies helping to characterize insulin's action, and he co-authored many of the original papers describing insulin…. Noble later played a small but critical role in the most important Canadian contribution to cancer chemotherapy research: the discovery of vinca alkaloids by his brother Robert Laing Noble. Although one might expect that a physician involved in two of Canada's most important medical discoveries during the 20th century must be famous, such was not Clark Noble's fate. He died without so much as an obituary in CMAJ (2002, p. 1391).

Thus, while playing a role in the discovery, Noble was made ‘invisible’ because he was distanced from the activity. He was not in the lab assisting Banting, even though he continued to work with Macleod on related work. Best, on the other hand, went on to have a very visible and internationally acclaimed career, even if he was not awarded the Nobel Prize for his role in the discovery of insulin. Banting apparently was “offended by the fact that Best was not included in the nomination” and as a sign of acknowledgement of Best’s contributions to the discovery, he made it publicly known that he shared his prize money with Best (Lindsten, 2001).

Also part of the discovery was James Betrand Collip, who, according to Bliss, made the single most important technical achievement in the whole project when he produced insulin in a form which permitted its clinical use (1993). However, his technical expertise was not credited with the Nobel Prize. Wright, drawing on Noble’s memoirs, provides insight as to why that might have been. Following the promising results of the early experiments conducted by Banting and Best, Macleod invited Collip to “join the team”:
Collip was able to greatly purify the extracts, which permitted the first successful clinical application on Jan. 23–24, 1922. When Banting demanded that Collip share his methods, Collip refused, igniting Banting's famous temper…. Shortly after this incident, Banting curtailed most of his laboratory research and focused on treating diabetic patients. Collip returned to Alberta, and Best was put in charge of insulin production in Toronto (Wright, 2002, pp. 1391-1392).

Thus Collip, while invited to be part of the team, was not in fact a ‘team player’ because he did not want to ‘share’ key information with Banting. Surprisingly, this did not hold up the project by much. In fact arguably what makes the discovery of insulin so significant for current institutional storytelling is that it was put into mass production almost immediately and began extending the lives of people worldwide who, as the story goes, previously had no other recourse from a disease, diabetes mellitus, that had a very poor prognosis (blindness and death).

The following paragraph in the University of Toronto biographical page of Charles Best describes the speed with which the discovery, refinement and production phases of insulin took place:

The experiments began on 17 May [1921]. Their initial results were discouraging and were conducted in hot, cramped, and difficult conditions. The first sign of success occurred on 30 July, after an injection of pancreatic extract resulted in the lowering of blood sugar in Dog 410. Subsequent injections into Dogs 406 and 408 had similar effects…. In December 1921, Best, along with Banting, Macleod, and J. B. Collip traveled to New Haven to present the results at the annual meeting of the American Physiological Society. Many prominent scientists and doctors, including two senior diabetes specialists, Dr. E.P. Joslin and Dr. F.M. Allen, and G.H.A. Clowes, director of research for Eli Lilly and Company, were in attendance and the Toronto team fielded many questions about their findings.

Best then began to develop a method for producing a potent, pure extract that could be safely administered to humans. On 11 January 1922, Best's pancreatic extract was injected into Leonard Thompson, a fourteen-year old diabetic at Toronto General Hospital. The extract lowered blood sugar but had little clinical effect. On 23 January, however, a purified extract produced by Collip proved successful. The production phase
of the insulin project had begun, with the cooperation of the Connaught Anti-toxin Laboratories.

In February 1922, Collip proved unable to sustain the purity and potency of the extract he had made in January. The resulting insulin famine pressured Best and the insulin team to refine their extraction methodology. In May, a stable method was established and the team enlisted the Eli Lilly Pharmaceutical Company to collaborate in large-scale production and Best, at only 23 years of age and having just completed his M.A., was put in charge of the production of insulin for Canada. He was also serving as a liaison between the Research Laboratories of the Eli Lilly Company in Indianapolis and the Connaught Laboratories in Toronto. In the summer of 1922, large-scale clinical trials of insulin began at the Toronto General Hospital and the Christie Street Hospital ("Charles Herbert Best," par. 2-4).

In the excerpt above, there is no discussion of the falling out between Collip and Banting. This is an interesting omission because it is consistent with contemporary processes of emphasizing collaboration and of keeping track of outcomes only. How the research team got along is not important. What is important is what the research team did. For example, the opening paragraph makes it known to the reader that the initial experiments were conducted in “hot, cramped and difficult conditions.” The rhetorical effect is to cast the scientists as diligently working for the larger ‘good’ in substandard conditions. The reader is cleverly led to imagine ‘what wonderful discoveries scientists could make if they were better resourced’, allowing the organization to lobby for greater investment in research. Discussing the Collip and Banting falling out would not fit with the altruistic image painted by this account of ‘collaboration’. Also important in this account is the portrayal of the synergistic relationship between industry and the university that made possible the mass production of insulin in such a short time. Dissemination of research results to peers at the American Physiological society provided the necessary exposure to the team’s work that resulted in the fruitful partnership with Eli Lilly.

A third account offers insight to another dimension of synergistic partnerships and the role of networking. Knowledge-making in this story can be read as an activity that makes some researchers very visible and others not so visible. As analyzed in the section that follows, the
discourse of expertise sets up a hierarchy of knowledge-making and of knowledge-makers with material implications.

Jan Lindsten describes how August Krogh (whose testimony, as I mentioned earlier, was key in the nomination of Banting and Macleod for the Nobel prize) came to know of the discovery of insulin and his role in the mass production and distribution of the compound:

August Krogh was invited to the U.S.A. in 1922. His wife Marie, who, probably in 1921, had been found to have maturity onset diabetes, joined him on the trip. At a private dinner, Marie Krogh was told by the renowned American diabetologist Eliot P. Joslin that insulin had just been discovered and purified in Toronto. August and Marie Krogh therefore extended their journey and spent November 23-25 in Toronto as John Macleod’s guests. During his stay in Toronto, Krogh obtained a license, which allowed him to use the protocol for insulin purification developed there. Production was started immediately upon his return to Copenhagen on December 12. The first patient was treated as early as March 13, 1923. Together with the Danish physician H. C. Hagedorn, Krogh then founded the Nordic Insulin Laboratory and the Novo Nordisk Fund (formally approved by the authorities in 1927). This became the starting point of a very successful Danish pharmaceutical company and a research fund, which today constitute the company Novo Nordisk and the Novo Nordisk Fund, respectively. However, soon thereafter, Krogh left the business so he could concentrate on his scientific work. Marie Krogh’s diabetes was successfully treated with insulin, and when she died of breast cancer in 1943 none of their four children were aware that she had, in fact, also suffered from diabetes (Lindsten, 2001, par 2-3).

The following statement offered by one of the members of the scientific Nobel Committee shows how Krogh’s inside knowledge of Macleod’s research lab may have swayed the decision:

Dr. Banting, who undoubtedly was the first to have the idea and who has carried out the investigations, should be the one who in the first place is awarded the prize. On the other hand, it is difficult to evaluate Macleod’s contribution. It is not apparent from the literature. Macleod, who is the head of the department in Toronto, has previously carried out investigations on blood sugar. Banting came to Macleod with his idea and purified insulin under the direction of Macleod. I have been told that it is very likely that the
discovery would never have been made if Macleod had not guided him, at least not as early as it turned out. It has even been declared that Banting planned experiments that would not have been successful unless corrected by Macleod. On the basis of what has been said I am most inclined that Banting and Macleod jointly receive the Nobel Prize. (Lindsten, 2001)

While the ‘inside’ knowledge in the above statement is not attributed to Krogh directly, the rationale for nominating both Banting and Macleod is almost identical to the excerpt from Krogh’s nomination letter I quoted from earlier. Krogh would not have had this type of inside knowledge of Macleod’s laboratory if he were not invested in finding a cure for his wife and had not been a guest in Macleod’s house. We may also speculate how obtaining a license for producing insulin factored in his decision to include Macleod in his nomination. Krogh’s interest in insulin was spurred by personal experience with the disease. His efforts to see the compound in production ultimately spared his wife the debilitating effects of diabetes. In this context, pursuit of ‘relevance’ holds personal meaning for the scientist and his family. It is not an abstract ideal. As this analysis shows, when writers embody through personal experience the discourse of ‘relevance,’ it is difficult to be critical of partnerships between industry and university.

Close to a hundred years later in an interesting parallel, one of my participants used the example of the discovery of insulin as a way to rationalize the merit in university-industry relationships. When I asked his/her opinion as to whether the university should be engaging in closer partnerships with industry, s/he answered:

My [spouse] is an insulin dependent diabetic. S/he has been since s/he was eight years old…. There’s just no way I would come out and say that research commercialization is wrong. I don’t think it is wrong. If it were wrong then we’d have to say that insulin is a bad thing, because [while] Banting and Best made the scientific discovery, someone had to take it to the marketplace.

Universities have a longstanding history of attracting endowments from individuals who have been positively ‘touched’ by the research activities of the university. Arguably academic health centres or teaching hospitals are particularly adept at using ‘real stories’ to raise funds for research or hospital infrastructure. The same participant quoted above spoke about how the discourse of ‘relevance’ impacted the way s/he approached his/her work at the UofT:
I think that too often we are asked to write…about stories that have relevance and I always wonder, relevance to what? When I first came into this job [at UofT], my own perception was… [that] all they [the University] wanted to talk about were cures-- a cure for cancer, a cure for Alzheimer’s, Parkinson’s, diabetes, AIDS. Or the things that would turn people on would be gadgets that were developed or cool products like Gatorade or cell phones. Or this guy came up with this technology that led to DVDs, and that’s what the public would be interested in, or dinosaur bone discoveries or star discoveries or stuff like that that, people would get jazzed about.

In this critique, relevance is directly linked to outcomes that can be quantified (a cure that saves thousands, a gadget that sells in the millions, etc.). Corporate profit is equated with social profit through a discourse that does not problematize the process by which these outcomes come to be or the effects of these partnerships. Applied research becomes evidence of the university’s social mission. It is a form of accounting for public expenditure and for the almost monopoly universities have over the “ownership and transmission of knowledge” (Finnegan, 2007)

Contrast the previous comment made by the participant who rationalized that commercialization is a good thing because people’s lives are made better in the process with the following excerpt from my interview with an engineer engaged in developing the science for ‘hot’ telecommunications gadgets. This participant had expressed a philosophy of trying to “make a difference” socially with his/her work early on in the interview. When the discussion turned to the practical aspects of conducting research, s/he noted that throughout his/her career, s/he had developed close partnerships with industry partners. When I asked whether his/her personal philosophy of wanting to make a difference ever conflicted with industry priorities with regard to generating profit, s/he commented:

Well, you see, from the point of view of engineering, what drives us is to make things; [our] mission from the point of engineering is clear. We have to make things more efficient, to make the process more efficient, et cetera…. Yes, there’s too much technology and the impact that it has on the earth and all those things -- but when you are in engineering…there’s no conflict...because you want to make the computers faster, you want to make your processes more efficient. (Interviewer: But here’s the counter-argument, I’ll be devil’s advocate now, okay? So in the process of making a product more efficient, you make something else obsolete and in making products obsolete we have
whole junkyards of computers that are pretty much functional but we’ve just evolved them too fast and replaced them because in our consumer driven society everybody has to have the latest. So does that put you in a personal tension? Wireless technology is another example. Cell phones, there’s the whole health issue related to evolving the technology so fast that we can’t do the proper trials to make sure that cell phones do not contribute to brain tumours.) Well, these are things that I haven’t thought of and I haven’t concerned myself with; you know, maybe I should; maybe as a community we need to broaden engineering to take into consideration these other things, the impacts of what we’ve developed on society. But I mean personally, I haven’t been doing that.

This participant argues that engineers, by the very nature of their work, make a difference or contribute to society by making things work better. This perception can be linked to ‘salvation’ narratives of progress through industrialization and scientific discovery (Haraway, 1989; Haraway, 1997; Noble, 1977). The response I received from this participant is not unique. While this participant appreciates that in Western societies there seems to be too much reliance on technology, there is a lack of consideration of how his/her work and how relationships with industry contribute to over-development, iatrogenesis or other negative effects. Linking efficiency with environmental issues was also a novel consideration for this participant. This example illustrates how disciplinary delimitations impact knowledge-making. Environmental engineers worry about the environment. That is their ‘job,’ after all. At the end of the interview, the participant said that s/he had learned a great deal from trying to answer my questions and that s/he had a different appreciation of how his/her work related to broader issues. S/he also noted that s/he did not have educational exposure to social science or humanities courses in his/her training or through his/her collaborations, for while his/her work was interdisciplinary, s/he only worked within a very narrow range of natural science domains. This narrow scope is a testament of the dividing practices of an educational system which favours depth over breadth.

7.2.1.3 The discourses

In the re-telling of the discovery of insulin, I chose to foreground how two related but somewhat contradictory discourses operate through collaborative knowledge-making. As I have identified it, the first is the discourse of ‘relevance’. The discourse of ‘relevance’ stands as a signifier for ‘purpose’ and ‘calculated intent’ in knowledge-making. Within this discourse, knowledge-
making is ideologically presented as the pursuit of knowledge for the purpose of ‘making a difference’. Ideologically, it operates as an ethical discourse, one that aligns knowledge with responsibility and renders judgment on those who fail to ‘account’ for how their work contributes to society. The discovery of insulin is a historical event with material effects for the scientists, the University and society. Knowledge of insulin existed years before the ‘discovery’. The knowledges that led to the discovery of a clinically usable form of insulin are in fact obfuscated by the discourse of ‘relevance’, which stresses the outcome over the process of discovery.

The importance of winning the Nobel prize and for making sure the ‘right’ person or persons were made ‘winners’ is linked to a second discourse, that of the ‘expert’. The ‘expert’ is in a position of power. The researcher and the organization that employs the ‘expert’ benefit also from this power (realized through scientific discoveries). As the reputation of the researcher grows, so does the ability of the researcher, but also the organization that employs the researcher to leverage research funding, lab space and equipment and to attract students. The importance of the supervisor in ‘guiding’ the research and keeping the scientific inquiry on the ‘right track’ are central to the way the storyline of the discovery of insulin unfolded and in the way it is re-told. The discourse of ‘expertise’ sustains merit driven organizational structures that reward individuals. This may put the discourse of ‘expertise’ in tension with the discourse of ‘relevance’ and in the process collaborative activities can be compromised.

While in this example, the conflict between Banting and Collip did not reportedly compromise the outcome, it does make visible the tension knowledge-makers must negotiate on a daily basis when asked to collaborate in an environment that rewards individual achievements. This was an overarching theme in the life experiences of my participants (as the next chapters will illustrate). The organization must also negotiate this tension. Using the ‘achievements’ of experts to attract investment can have unintended consequences. Money was concentrated in the hands of Banting following the discovery of insulin, and some argue this concentration of funds held back research in other fields (Friedland, 2002). What happens when the universities strive to attract ‘superstars’ and leverage their success for organizational growth? And what effect does this have on knowledge-making in the fields that do not have superstars?
While these questions were not directly addressed in the context of my interviews, the implications of striving for technological innovations were considered. For example, one non-faculty administrator shared a discussion s/he had with a museum curator as a way to relay his/her personal concern that universities often place an over-emphasis on ‘cures’ and ‘gadgets’ when self-promoting, and that this inadvertently disadvantages non-technical fields:

And I put this question to her. I said, “how do you make your case for funding when nothing that you do has to do with any of those things I’ve just listed? There’s no cures, there’s no gadgets, nothing.” She said, “think of it this way. What if in the world, in our society, there was no art whatsoever, no film, theatre, music, TV, radio, paintings, anything, and it was just about productivity and coming up with discoveries?” She said, “that would be a nightmarish kind of world, wouldn’t it?” I said, “yeah.” She said, “well, that’s the point I make.”

The participant went on to reflect on how scientific inquiry benefits from exposure to subjects such as English, history and political science, allowing scientists to make interesting connections and to innovate. S/he concluded that the current push towards interdisciplinary research allows the social sciences and the humanities to “thrive together” with the sciences. The assumption is that collaborative research within a broad interdisciplinary base could provide the corrective for an over-emphasis on “cures” and “gadgets.” I will argue below that this assumption is in fact embedded in that way that the discourse of interdisciplinarity is currently operationalized at UofT.

In the broader archive of texts analyzed is a recent article in which a knowledge-maker identifies some of the material effects of not meeting career expectations. Specifically, Keijo Räsänen (2008) addresses the feeling of being outside the “loop” in terms of being able to decide what should matter and what should be foregrounded as success in academic work. He begins by articulating his vision of what academic work should look like and then juxtaposes this with growing frustrations currently experienced by knowledge-makers:

The university can be a site for meaningful work. Academic work can be autonomous, inherently rewarding, and socially significant. Yet many academics seem to share the experience that they are losing control over their work. They complain that their work agenda becomes increasingly fragmented and the purpose of the various activities gets
They are concerned for the ever-changing performance indicators and standards of “excellence” imposed on them by university administrators and “manager” (Rasanen, 2008, pp. 1-2).

The author proceeds to position his own experience within the changing social relations of academic work he has observed:

What I--an ordinary academic--consider important and valuable in academic work is considered irrelevant. Especially those who are only “mediocre” according to the indicators should keep silent—whatever they might think about the indicators and other forms of managerial control. (Rasanen, 2008, pp. 1-2).

While Räsänen is not specifically speaking about collaborative knowledge-making, her account exposes her frustration with the “accounting logic” that has permeated university governance, which makes university managers strive to measure “socially significant” contributions and erodes the capacity of academics to influence what those markers of excellence should be. And even though “accounting logic” affects all knowledge-making, it poses specific challenges for interdisciplinarians especially in contexts where certain forms of interdisciplinarity are valued more than others.

This section exploring and analyzing the discovery of insulin at the University of Toronto has exposed the operation of some of the active discourses related to contemporary knowledge-making (expertise, relevance/making a difference, accountability and collaboration). The next section moves on to focus on the policy on interdisciplinarity and some of the structural arrangements at UofT which encourage and support interdisciplinary research. In the process, I will also highlight ways in which the policy of interdisciplinarity at UofT and other arrangements have reproduced what I have identified as the popular discourse of interdisciplinarity -- that is the pooling of expert knowledge to produce innovative solutions and products to address complex problems of strategic importance.
7.3 Interdisciplinarity at UofT

7.3.1.1 Current Strategy

The University of Toronto’s current academic five year plan is officially articulated in a white paper entitled *Stepping Up: 2004-2010*. Within it, the following goal specifically makes reference to supporting interdisciplinarity:

We will foster and support research and teaching that falls outside our usual academic structures and practices when it offers promises of important discovery. This includes interdisciplinary research and teaching that involves carefully thought-out strategic risk-taking and innovation (University of Toronto Office of the Vice President and Provost, 2004b, p. 12).

To provide the rationale for this goal and to articulate the importance of interdisciplinarity within the University’s operations, a separate companion paper was included with *Stepping Up* entitled *Enabling interdisciplinary teaching and research* (University of Toronto Office of the Vice President and Provost, 2004a). Within this document, UofT’s commitment to fostering interdisciplinary teaching and research is articulated. In the process, the rationale for delimiting what will be currently encapsulated and legitimated under the term ‘interdisciplinary’ is constructed through a variety of regulatory processes that organize social relations around the term ‘interdisciplinarity’. The document starts by affirming the primacy of the disciplines:

> From their beginnings, universities have constructed their curricula on disciplinary grounds and have conducted their scholarship in relation to disciplinary standards regarding method, theory, and content…. Disciplines have become entrenched by more than the territory of knowledge which they claim. They have become powerful administrative structures, through which positions, money, and accountability flow (University of Toronto Office of the Vice President and Provost, 2004a, p. 3).

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14 The University has also published a strategic directions document entitled *Towards 2030: A third century of excellence at the University of Toronto* (2008). Within this document, interdisciplinary programming is recognized as having an important role to play in the way the University expands across three campuses to meet the needs of a growing student body.
The first paragraph sets the tone for the rest of the document. The ‘disciplines’ are important because through them power in the form of money, influence and legitimacy flow. It is for this reason that the institution will continue to invest authority in ‘disciplines’. Disciplines provide the platform for further inquiry through their methodological rigour and ‘bodies of theoretical understanding’:

Method and theory, taken together, constitute a way of undertaking to understand the world…. *Without disciplinary training, many argue, interdisciplinary study proves impossible* (University of Toronto Office of the Vice President and Provost, 2004a, p. 3 my emphasis).

This is an important delimitation. It constructs interdisciplinary research and teaching as a ‘dependent’ process, linked directly to the disciplines. In the process, it devalues interdisciplinary approaches that critique disciplinary authoritarianism, or which invest considerable energy in developing and engaging in a scholarly process that transcends disciplinary boundaries. It also does not take into consideration the approaches of students trained in interdisciplinary fields such as education, women’s studies, and environmental studies. For example, May Romero’s exploration of the evolution of women’s studies within the contours of the disciplinary structure of the modern university draws attention to the way the disciplines engage in boundary work to demarcate division of resources and lay claim to students. In contrast, women’s studies, philosophically grounded in breaking down the authority invested in disciplines through critical interdisciplinary approaches, finds itself hard pressed to compete with established disciplines for resources and space. As a result, most women’s studies programs are multi-disciplinary (paying tribute to traditional disciplines rather than interdisciplinarity). As a result the broader political project which women’s studies belongs to is compromised, argues Romero (2000).

Returning to the UofT Report, the links made to accountability directly in the first citation (which articulates that “[disciplines] have become powerful administrative structures, through which positions, money, and accountability flow,”) and indirectly in the second citation (which presents the position that rigour can only be achieved through the application of the theory and method evolved within disciplines,) are important. They evoke a specific regulatory enterprise in association with what scholars call the ‘audit culture’ and which arguably provides the overarching frame for the University’s governance structure (Alexander, 2000; Broadhead &
Howard, 1998; Hare, 2003; Olssen & Peters, 2005; Shaw et al., 2005; Strathern, 2000).

‘Standards’ are embedded in UofT’s *Statement of Institutional Purpose* (University of Toronto Governing Council, 1992), which contains a number of articulated career expectations of faculty primarily in terms of outcomes. These accountability data are useful for the University to demonstrate in tangible ways how it contributes constructively to society in a fiscally accountable manner. The university’s commitment to standards of excellence is thus linked directly to fiscal and social accountability. Applied to the context of interdisciplinarity, accountability may be evoked in developing standards for assessing the ‘excellence’ of such activity, as well as for administrative reasons, ranging from allocation of funding to specific units, promotion of faculty, adjudication of student performance and so on.

After the purpose and scope of disciplines is affirmed, the companion paper to the *Stepping Up* report shifts to a description of the origins of interdisciplinary research and the rationale for its current importance. It links interdisciplinary research directly to the emergence of the professional faculties and the particular approach to problem solving they brought with them. Consistent with the popular discourse of interdisciplinarity, the document states that professional schools ‘draw on different disciplines to address particular questions’ (University of Toronto Office of the Vice President and Provost, 2004a, p. 3). The particularity of the questions is implicitly linked to concerns regarding social accountability. This echoes a currently popular author in the field of health professional education. Writing in the early 1980s, Donald Schö

\[\text{In the varied topography of professional practice, there is a high, hard ground where practitioners can make effective use of research-based theory and technique, and there is a swampy lowland where situations are confusing ‘messes’, incapable of technical solution. The difficulty is that the problems of the high ground, however great their technical interest, are often relatively unimportant to clients or to the larger society, while in the swamp are the problems of greatest human concern. (Schö, 1984, p. 42)}\]

Consistent with the OECD discourse analyzed in the previous chapters, Schö

\[\text{Consistent with the OECD discourse analyzed in the previous chapters, Schö proposes a shift to practice-based education and applied research approaches at a time when professions were under attack for their lack of engagement with social issues. The companion paper being discussed}\]
Similarly explains the growing importance of interdisciplinarity as the desire to answer “difficult questions” and “intransigent problems” which more often than not “seep, flow or leap from one discipline to another.” As disciplinary categories ‘leak,’ new organizational structures are created in order to draw together the expertise necessary to answer these ‘difficult’ and ‘intransigent’ problems. The reader is left with the impression of disciplines over-bursting with expertise, too small or too clearly defined to leave room for the creativity of its modern scholars. Juxtaposed with Schön’s metaphor, however, it can be theorized that the uptake of the popular discourse of interdisciplinarity may have less to do with harnessing creativity and more with an attempt to project a socially responsive image without compromising current dominant forms of knowledge-making.

The UofT companion paper documents how federal research funding both ‘follows’ and ‘fosters’ the growth of interdisciplinarity “through the re-organization of health research to include the interdisciplinary institute of the Canadian Institutes for Health Research, to the Networks of Excellence, to the large interdisciplinary and collaborative programs that have emerged from NSERC and SSHRC over the last years” (University of Toronto Office of the Vice President and Provost, 2004a, p. 4). Interdisciplinary inquiry is constructed as timely, important, and difficult, but also exciting in its promise:

Many scholars find that their own most exciting and creative work, and the most important work in their fields, occurs at the interface between disciplines…. For faculty members seeking to create the research teams to address such questions, a discipline or a department can quickly seem an antiquated administrative barrier, a narrowly disciplinary training, a limitation rather than an enablement. Such scholars seek flexible alignments and re-alignments, alternative administrative practices and appointments (University of Toronto Office of the Vice President and Provost, 2004a, p. 4).

On the other hand, interdisciplinarity, it seems, creates “anxiety” for individuals engaged in traditional disciplinary research because it is seen as diverting financial and human resources from departmentally-based disciplines, “compromising the integrity of depth and rigour of knowledge for a shallow breadth” (University of Toronto Office of the Vice President and Provost, 2004a, p. 4). This is a sentiment recognizable from the literature broadly used when discussing forms of interdisciplinarity that do not start from the assumption that disciplinary
training is a requirement for interdisciplinary research (as discussed in Chapter 3). In articulating this anxiety, there is no acknowledgement of other types of interdisciplinarity in the UofT document such as forms that challenge the epistemic authority of disciplines or transcend disciplinary boundaries altogether through the synthesis or integration of knowledge (e.g. Lattuca, 2001). Rather, just at the point where it seems that interdisciplinarity will be set free from disciplinary binds, the shackles are in fact tightened in a ‘disciplining’ exercise made possible by the techniques of regulation linked to the discourse of “accountability.”

Specifically, the projected excitement and promise of innovation offered by interdisciplinarity as articulated in this UofT paper are moderated by market-oriented processes including risk assessment concerns. The remaining document is dedicated to articulating a number of governance objectives, aligning interdisciplinary research with the pervasive techniques of regulation associated with the audit culture. In terms of funding, for example, it is argued that the University should provide “national and international leadership on highly important interdisciplinary research projects” and that “interdisciplinary ventures will have to find their resources by making their informing ideas and their findings compelling to students and granting agencies” (University of Toronto Office of the Vice President and Provost, 2004a, p. 4). That is, researchers who allow themselves to be constructed through the popular discourse of interdisciplinarity as it is operationalized by the University will have to justify themselves to the various ‘stakeholders’, who literally or metaphorically occupy the position of ‘auditor’. They will have to demonstrate relevance and impact in order to claim successful research outcomes by focusing their work on the strategic priorities determined by government funding sources. Arguably, disciplinarians are not challenged to demonstrate the impact and relevance of their work in quite the same way.

The direct link between outcomes and funding is thus made structurally. As I have emphasized, the association of the discourse of ‘relevance’ with the discourse of ‘accountability’ is not new. Historically it can be traced to the instrumentality of interdisciplinary projects in applied fields. Interdisciplinary researchers and teachers are thus effectively inscribed with the features associated with professional schools, which historically have had a reciprocal relationship with various so called ‘stakeholders’ in the production of new knowledge such as industry, government, foundations, etc. (Haraway, 1997; Kay, 1993; Noble, 1977). What is new is that these types of relationships have now permeated non-professional disciplines making
interdisciplinarity a ‘diagnostic’ feature of the new knowledge-production through the discourse of accountability. As Strathern argues, “accountability makes reference to a formal process of ‘institutional responsibility’, and one of the forms it takes is acknowledging the interests of users” (2004b, p. 551).

7.3.2 Policy on interdisciplinary education and research planning

To foster interdisciplinary education and research at the University of Toronto, an Interdisciplinary Committee was created in 2005. As part of fulfilling their mandate, they developed an overarching policy for the University. On February 1, 2007, the Governing Council of the University of Toronto approved the Policy on Interdisciplinary Education and Research Planning (University of Toronto Governing Council, Feb. 2007). The policy consists of three sections: scope, procedure and accountability. Under the section on scope, the University’s commitment to “fostering and facilitating interdisciplinary teaching, learning and research” is described as “essential” to the University’s academic mission. Delimiting this commitment is a statement taken almost word for word from the strategic planning document described above articulating the University’s fundamental commitment to disciplinary education and research:

> Academic disciplines define epistemologies, theoretical studies and standards for research and education in a well-defined area of inquiry. Disciplines serve as platforms and frameworks for further scholarship and are defined in part by traditional groupings of scholars within academic institutions. The University remains strongly committed to fostering strength and excellence in the disciplines, as strong disciplines are the basis for strong interdisciplinary work (University of Toronto Governing Council, Feb. 2007, par. 2).

The section on procedures describes how the University will “foster and promote interdisciplinary education and research through guidelines and practices, organizational structures, and budgetary and financial frameworks,” delegating the responsibility for this to the Office of the Vice-President and Provost (University of Toronto Governing Council, Feb. 2007, par. 3 and 4). Finally, the section on accountability makes it clear that interdisciplinary education and research will be formally assessed through the University’s various accountability processes.
Consistent both with the spirit of the strategic planning document and the procedures outlined in the *Policy on Interdisciplinary Education and Research Planning*, two working groups were formed in January 2007. The first was given the mandate to consider the administration and governance of extra-departmental units (EDUs) and the second to “examine barriers to interdisciplinarity” as well as “to provide recommendations and best practices to foster interdisciplinary research and teaching” (University of Toronto Office of the Vice President and Provost, September 2007, p. 1). The reports produced by both working groups will be considered here.

### 7.3.3 Administration of extra-departmental units (EDUs)

The Governance and Administration Working group was comprised of seven members (with no student representation). The Group’s terms of reference were to identify best practices for administration and governance of extra-departmental units. Within the report, EDUs are defined as units “organized around emerging research and teaching foci that span disciplines” (University of Toronto Office of the Vice President and Provost, Sept. 2007, p. 3). The current EDUs are categorized into four distinct categories linked to their administrative structures and internal governance arrangements as well as the type of interdisciplinary activity they facilitate:

1. An EDU:A has a well-established and defined area of scholarship as a focus. The unit has attained a critical mass of interdisciplinary scholarship at the University that allows for the unit to engage in the appointment of teaching staff, admission of students to a program of graduate or undergraduate study, and engage in interdisciplinary research. EDU:As differ from departments in that departments generally offer a full range of undergraduate and graduate programs and research. It is expected that the total number of EDU:As at any given time will be small.

2. An EDU:B has a defined area of scholarship as a focus and also admits students to interdisciplinary programs and engages in interdisciplinary research. However, teaching staff appointments are made in established departments with teaching staff cross-appointed to the EDU:B.

3. An EDU:C unit does not have a program to which students are admitted.

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15 Slaughter and Rhoades have documented the proliferation of EDUs in research-intensive universities, attributing this phenomenon to the growing commercialization of North American campuses (2004).
4. An EDU:D represents a group of scholars who have come together for the purpose of pursuing specific research objectives or offering a set of courses in an area of academic interest not offered under departmental, EDU:A and EDU:B course offerings. It may be multidisciplinary or it may arise within a single discipline or department, EDU:A or EDU:B (University of Toronto Office of the Vice President and Provost, 2007, p. 2)

The establishment of EDU:A and B must be approved by Governing Council, while the creation of EDU:C is delegated to Faculty Councils, and EDU:D to the relevant academic unit.

Reviewing the above classifications, the role EDUs can play in sustaining and supporting interdisciplinary activity with the University is very evident. Also evident is the increasing interdisciplinary activity within UofT. According to 2006 figures, since 1984 the number of catalogued EDUs has grown from 42 to over 175. There is variability in the mission, size and configuration of these units. Some, for example, span several academic divisions and others are located within a department. Some are in their early years of formation and some are well-established with substantive research and teaching activities and international stature. In exploring ways to foster interdisciplinarity through administrative structures and governance arrangements, the working group made the following statement:

Although various models and structures and best practices are suggested,…the Working Group stresses that there is a need to recognize interdisciplinary research and education will continue to occur in a variety of formal and informal ways. The Working Group concludes that we cannot and should not regulate all EDUs under the specified framework. The potential variety of approaches makes it particularly important to communicate and share best practices for those initiatives that are formally constituted (University of Toronto Office of the Vice President and Provost, Sept. 2007, p. 1).

The recommendations that followed were directly linked to supporting flexible governance arrangements to allow for ‘creativity’ and facilitate new initiatives that ‘cannot easily flourish’ under the constraints of traditional departmental organization structures. Permeating the recommendations is an expressed desire to increase and improve communication between directors of EDUs to “share information” and explore opportunities for “collaboration.” Priorities are encouraged which are in line with the features of the successful EGM university outlined at the outset of this chapter. Establishing best practices with regard to the governance of
EDUs is intended as a way to “maximize the potential for collaboration and integration of colleagues from diverse backgrounds and disciplines” (University of Toronto Office of the Vice President and Provost, Sept. 2007, p. 3). Making ‘transparent’ and visible governance and administrative links to existing structures was also deemed important by the Working Group, so that interdisciplinary research does not take place in isolation. Finally, specifications regarding accountability requirements were also made, requiring EDUs to engage in research and academic programming planning, financial resources and budget planning and human resource planning. They must also participate in report and review writing, performance measures reviews, communications and strategic plans (University of Toronto Office of the Vice President and Provost, Sept. 2007, p. 4).

It is of interest that, despite the earlier comment about maintaining flexibility about how EDUs were set up in terms of administrative and governance structures, the following subject-positions were listed as essential prerequisites to ensure “effective functioning” of EDUs such that institutional expectations regarding oversight and accountability are met:

1. Lead academic administrator
2. Director
3. Financial and/or administrative officer
4. Members, Executive Committee
5. Members, Advisory and/or governing Committees (University of Toronto Office of the Vice President and Provost, Sept. 2007, p. 4).

The Report goes on to describe what individuals fulfilling these roles would do to contribute to the success of the EDU. In one instance, the role of the Director, the Working Group noted some of the attributes a suitable candidate would have, such as “diplomatic and negotiation skills” to “formalize joint support, shared personnel, and shared funding, with the awareness of differing priorities of affiliated units” (University of Toronto Office of the Vice President and Provost, Sept. 2007, p. 5).

7.3.4 Fostering Interdisciplinary Research and Teaching

The Fostering Interdisciplinarity Working Group was comprised of eight members, including a PhD student, and had representation from all three campuses. Its terms of reference were to identify ‘barriers’ to interdisciplinarity at UofT and identify mechanisms to overcome these
barriers. The group met on three occasions and “reviewed a wide range of documents related to best practices for fostering interdisciplinarity both from the University of Toronto and from institutions across North America.” As part of this review, they also scanned the academic literature on interdisciplinarity. The tone of the document is upbeat and positive. The Working Group assessed that within the University there already exist significant numbers of successful examples of interdisciplinary research and teaching and offered their recommendations to ‘help bolster’ the continued growth of these programs. The overarching recommendations made by the Group include elements of consolidating existing interdisciplinary activity, developing a system for facilitating, capturing and profiling new interdisciplinary activity, and finally, rewarding interdisciplinary activity by:

1. Developing a communication strategy to disseminate information related to interdisciplinary teaching and research to faculty, students and staff, as well as encouraging the reporting of interdisciplinary activity and collaborative work in annual reports from research centres, institutes and programs;
2. Reviewing policies and procedures on a regular basis to ensure that faculty engaged in interdisciplinary activity are not adversely affected, particularly when it comes to tenure, promotion and annual performance reviews;
3. Developing faculty development programs to assist faculty in the presentation of their activity in formal review processes as well as developing expertise in academic administrators in reviewing and evaluating interdisciplinary activity;
4. Examining ways to encourage and facilitate interdisciplinary programs and teaching at the graduate level, particularly in enabling flexibility in course options/substitutions as well as counseling students who wish to take courses across different graduate programs;
5. Encouraging academic units undertaking curriculum review to include, where appropriate, consideration of interdisciplinarity in the programs offered;
6. Ensuring, through the Vice Provost Academic, that discussions of best-practices are ongoing with faculty and are incorporated as points of discussion in exit interviews of faculty so that feedback from these consultations informs ongoing development of policies and guidelines (University of Toronto Office of the Vice President and Provost, September 2007, p. 2).
The communication strategy proposed is consistent with technologies of governmentality (Foucault, 1976, 2008). They reinforce the institution’s preferred approach by “spreading the word,” and “raising the profile” of interdisciplinary research and interdisciplinary researchers at the University. And this, in turn, the Working Group argues, will “cement” the University’s “place as a leader in Canada of interdisciplinary research and teaching” (University of Toronto Office of the Vice President and Provost, September 2007, p. 3). The Working Group also acknowledges within the Report the role evaluation plays in helping “cement” a particular form of knowledge-making. Throughout the Report, there is expressed a genuine commitment in considering ways of evaluating the rigour of interdisciplinary research without imposing the standards of traditional disciplines on work that is developed outside disciplinary frames. For example, in reaction to reported difficulties in publishing interdisciplinary work in leading journals, or in evaluating the performance of interdisciplinary researchers located within traditional disciplinary departments, the Working Group proposes such solutions as ensuring promotion and evaluation committees are diverse in their composition, as well as accepting that publications might not be the primary means of peer review for interdisciplinary knowledge-makers. Towards the end of the Report, interdisciplinarity is explicitly linked to innovation in a way that centres graduate studies in the University’s overarching strategy for fostering creative forms of collaborative knowledge-making:

Graduate students will act as society’s catalysts of innovation and leadership, so one of the most important places to foster interdisciplinarity will be in supporting their interdisciplinary scholarship and research (University of Toronto Office of the Vice President and Provost, September 2007, p. 10).

In this way, the rationale for investing in the training of graduate students can be linked directly to institutional strategies for promoting collaborative forms of knowledge-making that foster applied research for commercial appeal. The statement is very closely aligned to the human capital arguments embedded in OECD, federal and provincial government reports analyzed in previous chapter. Collaborative programs at the University of Toronto are presented as currently a strong selling feature for the University. In the words of one non-faculty administrator:
There’s no question in my mind and the School of Graduate Studies (SGS) will tell you the same thing: students come to the University of Toronto because of the number of choices that they have in collaborative programs.

As of 2010, the University of Toronto lists over 106 graduate programs and 39 collaborative (interdisciplinary) programs ("School of Graduate Studies: Units and Programs," 2010). According to the School of Graduate Studies, the collaborative programs “explore a novel interdisciplinary area or a special development in a particular discipline, to complement their degree studies” ("School of Graduate Studies Collaborative Programs," 2010). However, there is added administration involved in pursing collaborative programs. Students must be admitted and enrolled in one of the collaborative units (home departments or disciplines), before they can participate in a collaborative program. Students must also apply to both department and collaborative program and be admitted to both in order to be able to pursue studies in the collaborative program ("School of Graduate Studies Collaborative Programs," 2010). In fact, according to a senior faculty administrator, the collaborative programs do keep growing, but they are not attracting as high a proportion of all students as popular perception would have it. In the words of the participant,

I mean, yes, that’s true, they keep growing, but we have about 600 students in our collaborative programmes out of 13,000 graduate students. So if they’re so great, why aren’t they doing them?

Another participant, currently not at UofT, shared his/her own experience with seeking out an interdisciplinary program of studies for pursing a doctorate that combined science and feminist training:

As a student with undergraduate training in biology, graduate training in molecular genetics and a Masters in Environmental Studies…which was a feminist science studies project, I couldn’t apply to a single program at UofT. I was not qualified to apply to any of their graduate programs outside of science. I could have applied to a PhD in Biology, which was not my plan but there was no single program that I could actually apply to. I might have been able to apply to OISE to do a project. I was thinking about starting a PhD in 2001 or 2002. There was nothing here for me. It’s a very interesting situation to find yourself in, where your work is very interdisciplinary and your goal is
interdisciplinarity but you’re faced with an institution that has incredibly strong disciplinary boundaries. I would have had to have an undergraduate degree in Philosophy or an undergraduate degree in Anthropology or an undergraduate degree in a very specific field if I wanted to even go out and do a project in women’s studies. So I didn’t apply.

The materiality of developing administrative processes and policies that favour certain forms of interdisciplinarity over others is evident in the above testimonial. Clearly, throughout UofT’s history, interdisciplinarity is supported as long as it does not interfere with disciplinary studies. As might be expected, linked to the way the discourse of expertise is used to rationalize collaborative forms of knowledge-making, some forms of interdisciplinarity, mostly instrumental forms, are better supported and facilitated than others, such as conceptual or critical forms of interdisciplinarity. However, other participants in my study made references to the many ways that their epistemic fields are becoming more interdisciplinary in their mainstream configurations. Thus, further research is required to explore how the popular discourse of interdisciplinarity is affecting disciplinary settings.

Returning to the topic of collaborative programs, their attractiveness for faculty and students is that learning and research can be pursued in an environment that is somewhat ‘unencumbered’ by “encumbrances’ on academic activity in departments, such as observing traditions about what areas of research are worthy to pursue and dominant methodologies and approaches to teaching and research. Collaborative programs are heralded as cutting edge fields and hubs of innovation. They purportedly offer breadth and scope for students wishing to pursue an interdisciplinary course of studies to ‘complement’ their degree. But the existence of so many collaborative programs is a fairly recent phenomenon, facilitated by changes in funding structures that provided an influx of resources to start the programs about 10 years ago and the sustainability of these ‘ventures’ may be questioned. One non-faculty administrator working in a collaborative program noted:

SGS glows about how many collaborative programmes that they have, yet they do nothing structurally or within SGS to support the continuation of those collaborative programs, so it’s left to the departments and the faculties to make it happen.
Here the participant finds the valuing of the programs in material terms lacking with consequences for sustainability. The School of Graduate Studies is perceived as not responding to the continuing funding needs of the collaborative programs. In contrast, an administrator working at the Provostial level was not so concerned. S/he commented that the University has sufficiently evolved to encourage interdisciplinarity through “accommodations in the budget models.” These changes, the participant felt, had contributed to “greater inter-divisional teaching.” The problems s/he noted were in “overcoming administrative roadblocks” to better promote interdisciplinary research. In his/her words:

So, when you really start to look at the collaborative programs, you see that they’re performing an important function but many of them are marginally viable. Well, the thing about collaborative programmes is that they are relatively easy to start and they’re relatively easy to close. And each year we see a couple coming and a couple going.

The coming and going of collaborative programs is also consistent with instrumental forms of interdisciplinarity promoted by the popular discourse. Just as expertise is brought together for the duration required to solve a pressing problem and then dismantled, so do collaborative programs ‘come and go’, as training in specific fields outside of the training offered by traditional disciplines is dictated by social need. Thus programs are not static and basic building blocks are meant to be used in the same way that modular furniture is built. Depending on the context and the need, modular parts are brought together. The issue of sustainability is theoretically interesting in the way that it is used in this context. Collaborative programs that cannot demonstrate sustainability through student enrollment, sponsorship from community or industry partners, or funding from special targeted programs from the Tri-Council, are thought to be ‘unsustainable’ because their current configuration is no longer ‘relevant’. The discourse of interdisciplinarity in its popular form encourages configurations that draw in partners from different sectors. Most recently, at UofT and at other research intensive universities (as shown in Chapter 1), new institutional partnerships are erected for the express purpose of capitalizing on the potential afforded by cross sector collaborations and then moves on. The next section will explore this phenomenon with the example of the creation of MaRS, an independent organization in cooperation with the University of Toronto providing support and facilitation for linking up scientific innovation with the financial sector. MaRS appeared in my broader archive as an object made possible by the popular discourse of interdisciplinarity. As I will show, analyzing the
creation of MaRS and exploring the rationales that made it possible provides insight to the changing governance relations in higher education and evidence of the materiality of discourse at the institutional level.

7.3.5 Distributed models of knowledge-production: Innovations in governance and the emergence of MaRS (Medicine and Related Sciences)

Comparable to the story of how insulin was discovered, I theorized that there would be particular ways in which the creation of MaRS would be remembered. I encountered two versions in the context of this research. The first can be considered the official story since it is the one projected on the MaRS website and UofT news sources. It starts this way:

MaRS began with a question: “Is there a better way to capture the commercial potential of Toronto's $1 billion in annual science and technology research spending?” The answer was a resounding “Yes!” A charitable organization could be created to better connect the worlds of science, business and government. A public-private partnership with a mission to remove the barriers between silos. Nurture a culture of innovation. And help create global enterprises that would contribute to Canada’s economic and social development. Visionary individuals and organizations took the lead. They raised capital, secured a strategically-located heritage building and began to develop the MaRS organization ("How did MaRS get started?", 2010).

Writing for the UofT Varsity, Smookler describes MaRS as a convergence innovation centre…. A not-for-profit corporation including the Toronto Medical Discovery Tower -- a 15-floor building full of labs housing University of Toronto professors, start-up companies that MaRS provides with business resources, and investment groups that fund the development of basic research discoveries into products (Smookler, 2006).

According to its website, “MaRS is where science, technology and social entrepreneurs get the help they need. Where all kinds of people meet to spark new ideas. And where a global reputation for innovation is being earned, one success story at a time” ("About MaRS," 2009). Its goal is to “build great companies. And a vibrant and diverse Canadian economy.”
This account projects the creation of MaRS as a combination of strategic planning and circumstance. Its development is remembered as a ‘coming together’ of individuals and organizations with a shared purpose and goal, namely to “contribute to Canada’s economic and social development”. Furthermore, the creation of MaRS is clearly aligned to neo-liberal mandates of capitalizing on knowledge-production that produces marketable innovations.

To this effect, “MaRS works with entrepreneurs in a range of sectors, including: advanced materials and engineering, Cleantech, information and communication technology, life sciences and healthcare, social innovation” ("Working With MaRS," 2009). The social innovation group (SIG), an interesting addition to this cluster of innovation ‘stakeholders’, harnesses the existing discourse of working across sectors to innovate and ‘make-a-difference’ in partnership with MaRS, the Vancouver-based Planned Lifetime Advocacy Network, the J.W McConnell Family Foundation in Montreal and the University of Waterloo. The organization works on advancing new approaches to addressing “persistent social and environmental issues.” SIG has a specific focus on social entrepreneurship and has been involved in the following initiatives: the National Family Care Giving Initiative, the National Mental Health Care Commission, the Ontario Provincial Poverty Reduction Strategy, a review of environmental sustainability education in Canada, the development of a workshop series to support organizations through stages of social innovation, the creation of the Registered Disability Savings Plan and advancing social finance in Canada through the Causeway Project (Social Innovation Generation, 2010). This addition to the MaRS organization expands the concept of innovation as promoted through the popular discourse of interdisciplinarity to include domains and sectors not traditionally associated with marketable innovations.

Basically, as the MaRs website describes it, the organization matches qualified entrepreneurs with its in-house advisors (individuals who have been successful entrepreneurs) and provides them with access to services such as market ‘intelligence’, practical learning programs, business planning, financing and funding strategy, legal and intellectual property advice, human resources, and connections to strategic partners. The cost of these services is absorbed through a combination of private and public funding. Arguably, MaRS represents a Foucauldian technology of facilitation, operating to enhance collaborative knowledge-making of the popular kind, a topic which will be further discussed in the next chapter.
The second version of how MaRS was created was told to me by a faculty administrator at UofT. In the context of describing changes in the way knowledge-production is governed, I asked this participant if she thought MaRS was deliberately created as an independent organization in order to facilitate the University in fulfilling its mandate of ‘making-a-difference’ through marketable innovations. (Such a strategy would provide commercialization services to the academic sector at arm’s length and avoid critique that the mission of the University was being compromised.) In answering this question, the participant spoke about the contingencies, rationales and actions that brought MaRS from an idea to fruition:

I think there’s all of that involved. Probably less that we’re selling out although the selling out argument is alive and well and living within the University…. Relevance is important for a university. It always has been and always will be. Relevance gets translated differently at different points in time and commercial application makes perfectly good sense when we can do economic, social and culture good by it. But the fundamental mission of a university has been, [is], and always should be, to provide a safe environment for intellectual inquiry in its broadest sense.

The above statement suggests that the development of MaRS was not unanimously supported (unlike the official story which does not reference critical perspectives on how MaRS could inadvertently compromise the activities of knowledge-makers). My participant went on to describe how she remembers MaRS coming about:

The MaRS story, again serendipity, opportunity, planning, and strategy. The MaRS site could well have been a condominium development. The University Health Network (UHN) was decommissioning the site and was going to sell the site as part of its overall organization development plan. A number of key business people around the community came together and said, “this is one of the most important sites in Toronto in terms of the future of the research enterprise in Toronto, particularly the biomedical research enterprise, which is one of the largest in North America, so we need to save the site”. So they put a bunch of money together, all in all, 12 million dollars, of which five was University of Toronto money. (Interviewer: In kind or cash?) Cash, to protect the site. And then went to government to look for government resources to develop the site. Land
acquisition people always have these code names and stuff so that nobody knows what they’re doing. The code name on the file was MaRS.

From the outset of this participant’s narrative, it could be seen that, that similar to the insulin story, a number of contingencies were in place that allowed the rationale for creating an organization such as MaRS to take hold. The first was the governance relationship between UofT and the academic health science centres (teaching hospitals) where the bulk of the clinical training of medical students and training takes place. The relationship between medical schools and teaching hospitals in North America varies from context to context and is dependent on culture, economic arrangements and politics. As Ferris, Singer and Naylor (2004) describe:

Both Toronto and Harvard…are characterized by medical schools embedded in the host university administratively, independently governed hospitals party to a university/hospital affiliation agreement, and highly autonomous practice plans involving groups of clinical faculty who are more dependent on the clinical resources of their base hospital than on any salary support from the medical school or university (p. 25).

Thus, the University Health HN, an amalgamated organization that brings together three teaching hospitals (Toronto Western Hospital, Toronto General Hospital and Princess Margaret Hospital), owned property which it could have sold off for profit, independent from the University. Also important for the way this story unfolds is that fact that the bulk of the biomedical research conducted by UofT is supported and operationalized through the various teaching hospitals. This made the investment of University funds for the acquisition of property close to these academic health science centres not only logical but potentially profitable for the University. Finally, the discourse of popular interdisciplinarity provided the rationale of the pooling of resources and the bringing together of different sectors to capitalize on the marketization of biomedical innovations. It is also theoretically interesting to note that according to the recollection of this participant, it was “a number of key business people” that thought to approach the university and the government to partner in the development of MaRS. This provides evidence of the local effect of the phenomenon I discussed earlier in this chapter of firms working to establish stable and sustainable access to the human resources and knowledge boundaries of the internal labour markets of the universities (Lam, 2007, pp. 993-994). Returning to the participant’s account, just
as in the insulin story, a trip to a scientific conference held in the US precipitated the alliance between industry, researchers and government in the MaRS project:

As it looked like they would reach an agreement with UHN on the land, they quickly put together a development plan which essentially is built around this notion of a convergence centre where science, business, and entrepreneurs would meet. The convergence centre notion was based very much on Kendall Square in Cambridge, which is the MIT convergence centre. A little bit on other facilities in the United States but there had been a meeting at MIT where a number of the key players had been to Boston and they’d seen Kendall Square and said, yeah, that’s what we want to do.

The participant went on to describe how the government was approached for support. In the context of government strategies to enhance inter-sector collaborations between the education and economic sector, according to this participant, the MaRS proposal was different in that it was a concept “with money already on the table from the private sector”. As s/he describes it:

First of all, this was a scary proposition for government because its scope and scale was different than anything envisaged before in the province. It was seen to be relatively risky but one of the policy arguments that [turned out to be] persuasive was, “this is a provincial asset that could be a flagship”. The [government] will now say everybody thought it was going to be a flagship from the start.

The government decided to support the initiative in early 2002. “And some bright person said,” the participant recalls, “well we have this thing called MaRS, so is there a meaning for MaRS?” and they came up with “Medical and Related Sciences, which everyone thought “spoke precisely to what the original intention was”. In the first few years, the focus was on how to develop a working business model and to secure the funds necessary to construct the facilities needed:

As…construction of Phase one proceeded…there were two or three things that MaRS had to worry about as it developed. One was to meet space requirements of UHN and Sick Kids in particular, and so the research tower that’s on Elizabeth Street was designed to meet that. The second thing was to build facilities that could promote business development. So the wet lab space addressed that. Nine million dollars came from a prior government initiative to develop incubated space for biotechnology for two
companies, so that went in to match the 12 million, to match the other government money that was already in there. The third thing was to build attractive space for professional service companies like legal service companies, and to build space for tech transfer offices of UofT because U of T was an investor.

As the above interview excerpt shows, establishing partnerships and leveraging funds across sectors involves meeting and balancing stakeholder interests. The vision to create an organization that could “galvanize the intellectual property across research institutions for commercialization purposes” needed a flexible organization structure that would consolidate these interests. This came in the form of an additional umbrella organization to which MaRS belongs, called MaRS Innovation. As the participant described:

One of the reasons MaRS was supported and built was because it’s one of the largest concentrations of research in North America anywhere. So, to capitalize on that you need to galvanize the IP across those research institutions for commercialization purposes. And the galvanization has happened in the last few months with an agreement among the 10 affiliated research hospitals, U of T, Ryerson, Ontario College of Art and Design, the Ontario Institute for Cancer Research, and Bio Discovery Toronto, to form a new corporation, not-for-profit corporation, called MaRS Innovation, which will provide umbrella commercialization services for all of the member institutions. MaRS is a member of this too. MaRS will be providing administrative support and services. So we now have an organization structure emerging that will actually be a single consolidated, coordinated commercialization hub for research IP that comes out of the downtown Toronto research institutions. It will work with the institutions in the development and commercialization of intellectual property (IP). It’s the missing piece to MaRS that makes MaRS a true convergence centre.

When I asked how much control the University of Toronto had over the research activity taking place within MaRS, the participant noted:

Well, actually, U of T doesn’t have research labs in MaRS. UHN and Sick Kids do [with] cross-appointed faculty…. MaRS has control over the incubated space and there are some MaRS professors who have incubator space in there…. MaRS is a service agency in many respects. MaRS drives a number of things but it doesn’t drive it through
researchers and it doesn’t drive it through faculty members… So what does that do in terms of academic freedom and the role of the researchers and cross appointments? It probably does nothing in that it’s dealing with the outcome of research, not the execution of research. The execution of research carries with it all of those questions about academic freedom, encumbrances, and all of the various issues. Cross appointments are complicated but not if you deconstruct the nature of the cross appointments. And then how you weigh conflicting interests. There are a lot of researchers in the hospitals who are hired by, and paid by, those institutions, and they have status cross appointments with the university. So in a sense their primary allegiance is to their paycheque, in blunt terms.

This final comment made in the context of describing the emergence of MaRS brings to the forefront a particular material implication of the popular discourse of interdisciplinarity, namely the establishment of decentralized models of governance of knowledge-production. The notion of clinical faculty having status-only cross appointments to the University is used by the participant to distance the knowledge-making activity taking place within the teaching hospitals from “questions of academic freedom, encumbrances and other issues” associated with working within a university. The issue of academic capitalism and how it may compromise the academic mission is not dealt with philosophically; rather, administrative processes and arrangements are made to distance the danger (“commercialization”) from the production process. Cross appointments, according to the participant and decentralized models of governance such as MaRS are assumed to protect the academic freedom of faculty engaged in work that produces marketable innovations.

The notion that status only clinical faculty are distinct from other faculty appointed to the University became a policy issue related to academic freedom around the same time that MaRS was being built. Drawing on the notion of ‘self-determination,’ a new policy framework related to clinical faculty appointments was created, at the request of the Faculty of Medicine and with the support of clinical faculty, that essentially distinguishes clinical faculty from other members of the University and compromises university oversight and protection when it comes to issues related to academic freedom in the clinical setting (Martimianakis, 2008a, pp. 10-11). But I have argued elsewhere that creating a policy framework for physician academics who have status only appointments sets them apart from other faculty because of their unique employment conditions
(they are employed by teaching hospitals which operate as separate organizational entities with their own missions and are in partnership with the University to provide medical training). This can compromise their academic freedom with implications for the way they approach their teaching of medical students and residents (Martimianakis, 2008b). Specifically, the policy includes a clause that states that the mission of the hospital trumps the protection of academic freedom when and if these two are in conflict. The policy also makes explicit that faculty are obliged to fulfill the mission of the hospital they work for first, or in the words of the participant quoted above, “their primary allegiance is to their paycheque”. This new policy has potential negative implications for medical education, as the bulk of clinical teaching happens at affiliated teaching hospitals as part of caring for patients. The policy also obscures the fact that the bulk of biomedical research for which the university receives credit is conducted in a context where academic freedom is not protected in the same way or to the same degree as it is for the rest of the university community (Martimianakis, 2008a, pp. 10-11).

The official and unofficial stories of how MaRS came about all speak to a convergence of opportunities and rationales. Facilitating knowledge translation and commercialization of knowledge products was perceived as an opportunity to demonstrate relevance and to make a difference. The need to bring together expertise from different sectors provides evidence of the materiality of discourse when instrumental forms of interdisciplinarity are put to work. A full city block of new buildings dedicated to seeing popular interdisciplinarity succeed is testimonial to the pervasiveness of this discourse. Also evident in both versions is the idea that universities (and especially affiliated teaching hospitals) account for a large portion of the marketable knowledge-production.

MaRS and similar interdisciplinary clusters that bridge education, government and business sectors are being established across North America. They are used as examples provoking concern about the growing commercialism of university campuses by scholars critical of the corporatization of academic work. Universities and government speak about these organizational clusters in positive terms, emphasizing how collaboration across sectors can and should work. As can be seen in its description, MaRS embodies the discourse of instrumental interdisciplinarity. The organization strives to ‘make-a-difference’ through innovation by harnessing diverse expertise across different sectors through facilitated collaboration. In a recent volume, with the aim of making sense of how societal and institutional changes are impacting the sociology of
higher education field, Clark, drawing on Evans, makes the following comment on the importance of MaRS:

A good example of adaptive research operating at the cutting edge of university change comes from Canada. In a collection of papers given at a 2002 conference on “the changing role of higher education.” John R. Evans reported on “the academic-commercial interface in a knowledge-driven economy,” as seen specifically in “a view from MaRS” – an example of “clusters” at various stages of development across Canada, six of which have major emphasis on bio-technology. Details are reported particularly for the promising MaRS clusters (Medical and Related Sciences Discovery District) in Toronto, seen as “a great site to promote the cluster convergence of critical elements” and exemplifying the agglomeration effects or critical mass of having a large number of scientists, investors, and firms all in a single location. Among the practitioners at this Canadian cutting edge, commercialization is a highly positive term, with its financing and nurturing at the centre of attention. This attitude toward university-commer...
9. Yet, despite Clark’s belief that Canadian universities are more accepting of commercialism (than for example, American critics), the creation of MaRS did stir up critique, especially from academics who are wary of associating their work too closely with the corporate sector. Student groups also voiced concern. The following incident was reported in the UofT Varsity paper:

As the newest corporate edifice on the block, MaRS has also drawn flak from at least one student peace group: People Against the Militarization of Life, who recently pranked U of T President David Naylor [Varsity Feb 16 2006] citing the university's involvement with MaRS and MaRS's association with Battelle Memorial Institute, a corporation with ties to the U.S. military. When asked why Battelle has an office at MaRS, Ilse Treurnicht, CEO of MaRS and Naylor's wife, appeared somewhat frustrated. "Battelle has one small office here in a 700,000 square foot complex. So having that as a focus is unfortunate and out of proportion," she said. "Battelle has had a number of important breakthroughs in the area of medical research. Military research is not what we do, or would want to do. Haven't done it, do not do it, have no interest in it. (Smookler, 2006)

Later the relationship with Battelle was reported to have fallen through. However, the example draws attention to another phenomenon related to the popular discourse of interdisciplinarity. Collaborations among researchers and organizational arrangements that connect different sectors bring not only specific individuals closer together, but the affiliates and partners of these also. Without incorporating a specific focus on exploring philosophies, starting points, differences in ontologies and epistemologies, power relations can thwart collaborations and influence the final product both in terms of its design and its application. And perhaps most importantly, with decentralized models for governing, supporting and overseeing knowledge-production and its commercialization such as MaRS being popularized, there is a danger of losing longstanding and hard fought protections for intellectual inquiry. These are currently only provided by the University, to members of its community that chose to work directly within its aegis. This has immediate and important implications for the careers of interdisciplinarians working in clinical settings. The popularization of instrumental forms of interdisciplinarity also creates new subject-positions (and career paths) in the domain of knowledge-production, a topic which the final chapters will explore.
7.4 Conclusion

This chapter explored how the University of Toronto takes up and circulates the popular discourse of interdisciplinarity. Here UofT is shown to have, in the context of establishing itself as a research-intensive university of international stature, supported and facilitated the uptake of interdisciplinarity through a variety of policy arrangements. The material effects of operationalizing the popularized or instrumental form of interdisciplinarity have been briefly sketched out in this chapter as a way to foreground how the discourse and its material effects are experienced at the level of individual interactions. This chapter thus completes the contextual framing for discussing and analyzing the experiences of knowledge-makers that work in environments where the popular discourse of interdisciplinarity dominates. I have argued that contemporary socio-economic priorities construct expectations of higher learning in very specific ways. This chapter has shown how UofT has responded to these evolving priorities by restructuring and developing practices that allow it to better demonstrate success but also to compete successfully for resources and funding. A deconstruction of the way UofT portrays itself as a research-intensive university and an overview of how it governs interdisciplinary knowledge-production, reveals that in many respects, UofT has adopted the popular discourse of interdisciplinarity. However, while it supports interdisciplinary research in general and affirms all the different forms it can take, in its policies and practices, it also very carefully safeguards disciplinary research. The overview of how MaRS was created was used to show how the uptake of the popular discourse of interdisciplinarity can also have implications more broadly for how knowledge is produced, governed, supported and safeguarded. The institutional identity UofT projects in some respects is contradicted by its evolving strategies and practices in relation to interdisciplinarity. Exploring how institutions project their identity offers insight as to their expressed overarching priorities, hopes and aspirations. The same can be theorized of individual faculty members, which is the topic to which I now turn.
Chapter 8
The world of the interdisciplined subject

8 Introduction

To this point I have shown how UofT strives to demonstrate success by constructing an identity of a research-intensive university that works collaboratively with other sectors to provide solutions to pressing social problems. In this chapter, I will show that the socio-economic relations that operate on UofT’s institutional identity also impact the way faculty approach their knowledge-making activities and rationalize their work. To glimpse the micro-processes linked to the popular discourse of interdisciplinarity, I asked my participants to articulate their rationales for engaging in collaborative knowledge-making. I was also interested in how these rationales are related to their ‘ethics’ in the Foucauldian sense, that is, their broader philosophical position on how to lead their lives and pursue their career aspirations. (In Chapter 4, I explored how participant rationales are similar or different to the popular discourse of interdisciplinarity.) Participants spoke about interdisciplinarity as a modality for problem solving and a way to achieve conceptual breadth or incorporate diverse perspectives on a topic. Participants perceived interdisciplinarity as a way to create knowledge across disciplines, to research between or outside disciplinary boundaries, to work in different academic and/or professional contexts and to innovate in order to make a difference. Finally, participants also rationalized interdisciplinarity as a form of reflexivity or a modality for activism. In other words, while there was evidence of uptake of the popular discourse of interdisciplinarity, this discourse did not preclude alternative story lines. In this chapter I will show how participant rationales are linked to specific every day practices associated with interdisciplinary knowledge-making.

As outlined in Chapter 2, I have conceptualized interviews as a site for discursive struggle offering the opportunity to observe how individuals negotiate their subjectivity, including their ‘resistance’ and ‘agency’ in the context of a specific subject-position. To conceptualize how relationships of power are experienced more generally by subjects in the context of collaborative

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16 While I maintain that these relationships are co-constituting, for the purpose of drawing out the effects of discourse in this chapter I will focus primarily on how the socio-economic priorities and conditions related to popular interdisciplinarity (as outlined in previous chapters) impact the way participants organize and experience their work and less on how participant rationales and activities modify this discourse. The latter is the topic of Chapter 10.
interdisciplinary knowledge-making, I have also drawn from the work of Valerie Walkerdine (2006), specifically employing the concept of border crossing to highlight manifestations of internal struggles of interdisciplined subjects engaged in projecting or resisting expectations associated with contemporary academic activity. I also drew from the work of Davies and Bansel (2005) to theorize about participants evoking notions of ‘lack of time’ as a way to express either dissatisfaction with their current work requirements or an awareness of work intensification.

Both the work of Walkerdine and Davies and Bansel speak to the effects of globalization and neo-liberal politics on academic life. Walkerdine (2006) describes the construction of neoliberal subjects as “self contained, with a transportable self that must be produced through the developmental processes of personality and rationality”…which entails that the self “must be coherent yet mutable, fixed yet multiple and flexible” (p. 10). While her work does not specifically study subjectivity in the academic context, her concept of border crossing captures the effects of trying to fulfill expectations associated with neo-liberal subject positions on people who resist the embodiment of multiplicity and flexibility. As multiplicity and flexibility are closely inter-related to interdisciplinarity I posited that her concept of border crossing also holds relevance for capturing the experiences of interdisciplined subjects.

Davies and Bansel (2005), on the other hand, have studied the impact of neo-liberal policies on academic subjects including practices of work intensification. They argue that in the context of Australia, the institutional links between sustainability and productivity are such that academics are hard pressed to fulfill expectations of productivity and excellence. Despite the challenges with fulfilling this mandate, their participants did not experience their working circumstances as visibly oppressive. The concept of time, as deconstructed by Davies and Bansel for its discursive relationship to neoliberal management approaches, aptly demonstrates the counter-productivity encouraged by academics voluntarily striving to find ‘more time’ to fulfill the expectations of work, even if these expectations are perceived to affect their professional or personal lives negatively. The authors explain how the embracing of work intensification which affects the capacity of academics to attend to rigour and quality, may be linked to popularized rationales for the growing importance of the role of universities in the knowledge-economy. In a later paper, this link is picked up by Davies, Gottsche and Bansel (2006) who argue that “academics have been hard pressed to generate a collective position of resistance” to university reforms “as neo-liberal managerialism has come to be understood as a set of practices that is necessary for
individual, institutional, and national and economic survival” (p. 305). Their work thus links the political docility of academics to an internalization of discourses of individuality and freedom linked to moral imperatives. These links also appeared strongly in my archive.

As I have been arguing thus far, there is a strong link between the popular discourse of interdisciplinarity and the broader discursive formation of globalization and the knowledge economy. Thus, in using Walkerdine and Davies and Bansel’s work to frame the next two chapters, I am also foregrounding the effects of the popular discourse of interdisciplinarity. As experienced by knowledge-makers at UofT, these are part of a more systemic and pervasive issue, namely the corporatization of higher education (Etzkowitz, 2003; Slaughter & Leslie, 1997). In this chapter I will link the popular discourse of interdisciplinarity, as experienced by knowledge-makers at the UofT, to everyday practices that accommodate or are consistent with neo-liberal rationales for knowledge-making.

To provide some context for this level of analysis, I first revisit the emergence of the popular discourse of interdisciplinarity at UofT. The remainder of the chapter turns to an exploration of participant experiences. While the activities and lived experience of individuals are explored in this chapter, the findings can be read as local narratives of the ‘interdisciplined subject’ at UofT. In other words, the combined experiences of my participants highlight the various subject-positions made possible by the discourse of interdisciplinarity. As I will show, exploring participant experiences in this way establishes the scope and limits of the popular discourse of interdisciplinarity and reveals the many different ways that it relates to other discourses (such as ‘accountability’, ‘expertise’, ‘social responsibility’) currently used to govern the operations of the university. My goal is not to suggest that structure and rationale delimit agency and practice, but rather to show that the relationship between discourse, governance and subjectivity is co-constituting, mutually reinforcing and always in flux.
8.1 The emergence of ‘interdisciplinarity’ at the University of Toronto

8.1.1 The university remembers

As discussed in the preceding chapters, the literature more broadly and Friedland (2002), in his history of the University of Toronto, identify a concerted approach to interdisciplinary teaching and research. Beginning in the 1960s interdisciplinarity was clearly evident in the 1970s, according to Freidland. This observation is important for a number of reasons. First, it links experiences at the University of Toronto to a more widespread phenomenon, since similar observations have been made by a number of other authors writing in different contexts (Klein, 1990; Lattuca, 2001). Furthermore, Friedland’s articulated goal for his work was to mark “major turning points” in the University’s history (2002, p. x). He describes the work as an “exploration of ideas.” This makes his selection of representative events all the more interesting from a discursive perspective, as his delimitations have pointed to discontinuities in dominant approaches to knowledge-making (2002, p. xi).

Specifically, Friedland subsumed descriptions of how the University evolved structurally to accommodate more interaction between departments and encourage cross disciplinary research in a separate chapter entitled “Multidisciplinary Endeavour” (2002, p. 479-498). This chapter describes the structural shift in knowledge-production that resulted from the change in rationale (discursive break/discontinuity) regarding the role of the university in society that took place in the post WWII years (see Chapter 5). Within the same chapter Freidland also describes how and why more power was concentrated in the school of graduate studies during the 1960s, consistent

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17 There are three institutional histories written about the University of Toronto. The first was published in 1906 (Alexander, Macallum, Langton & University of Toronto.), the second in 1927 (Wallace) and the third in 2002 (Friedland) to commemorate the 175th anniversary of the granting of a charter to King’s College, the predecessor to the University of Toronto. I have have drawn primarily from Friedland’s history for several reasons. First it was commissioned by the University of Toronto and thus it can stand as the ‘official’ history. Second, it covers the longest period (1827-1997) and it is the only history that captures the historical period I am interested in: 1960-2008. Third, it was written during a period when the University was engaged in celebrating its successes and the book carefully chooses representations of this success; it thus also provides insight as to what is considered important to project as successes towards the end of the 20th century. Finally, Friedland has consulted and drawn from the earlier histories. Friedland employs a chronological approach in his writing, reconstructing major University events through the perspectives of ‘key players,’ such as past presidents, academic administrators, successful faculty, etc. This makes it primarily a white male history, and perhaps in an effort to counter this dominant perspective, at times, Friedland makes note of gender and racial discrimination in admission policies and hiring practices and major milestones in creating a more diverse and representative faculty and student body.
with more research-intensive endeavours documented in other locations such as U.S. universities (Geiger, 2004). As Friedland describes it,

The 1960s would see the creation of numerous multidisciplinary centres and institutes, especially in the humanities and social sciences [at UofT]. They were a means of integrating knowledge among the established disciplines. Such an approach was designed to assist in the understanding of the past and in the shedding of light on specific societal problems. The barriers between disciplines were slowly coming down, but owing to jealousy on the part of the traditional academic departments, their removal took place in the graduate school (Friedland, 2002, p. 479).

According to Friedland, during the 1960s, a number of Institutes were created strictly as graduate departments, such as the Centre for Medieval Studies and the Centre for Linguistics. Their establishment was also consistent with emerging rationales for collaborative research production. However, this move also aimed to safeguard disciplinary training. All undergraduate training continued to be disciplinary based. To engage in interdisciplinary training, students had to first complete disciplinary training (a stipulation that persists to this day at UofT as discussed in an example in the previous chapter). In the 1960s, the University of Toronto Press also expanded the scope of its operations, especially with respect to “large multidisciplinary editorial boards.” Friedland observes:

The Centres, the institutes and the Press were both significant forces in the promotion of scholarship in the University and the enhancement of its growing international reputation…. [T]he centres and institutes gave focus for multidisciplinary scholarship, and the Press provided a vehicle for its dissemination (Friedland, 2002, p. 479).

Yet, while multidisciplinary projects and activity proliferated during this period, international reputations of universities “continued to be based upon the important work done by the traditional university departments” (Friedland, 2002, p. 479).

Arguably, Friedland’s choice to dedicate a whole chapter to multidisciplinarity speaks to the degree to which collaborative modalities for pursuing knowledge-production were taken up within UofT during the time he was writing, and the importance this approach to knowledge-making holds currently both within the institution and the system within which it operates. It is
hard to miss the reproduction of the contemporary popular discourse of interdisciplinarity in his statements such as: “multidisciplinary centres and institutes are a means for integrating knowledge amongst established disciplines…to shed light on specific societal problems” (p. 479).

The next section explores the emergence of the popular discourse of interdisciplinarity from the perspective of participant experiences.

8.1.2 Knowledge-makers remember

The participants interviewed for this research ranged in age from their late twenties to early sixties. All participants had worked, taught or researched at UofT and many had also studied at the University. A couple of participants currently had more circumscribed relationships with the UofT than in the past, as they currently worked at other universities. But all participants spoke of currently engaging in collaborative, interdisciplinary knowledge-making activities (academic and non-academic). Participants were asked to describe their educational backgrounds, their career paths and the circumstances that brought them to UofT or into an association with UofT. All participants were also asked to describe when they began thinking about interdisciplinarity and when they remember the term and concept gaining popularity.

Virtually all of the participants (except for the two youngest) were originally trained in disciplines. Some had backgrounds in more than one discipline, but no one recalls the term ‘interdisciplinary’ being used at the university they trained at to describe courses they took during the period between the 1960s and 1980s. Most participants remember the term interdisciplinarity emerging more broadly in academia and at the University of Toronto specifically, sometime in the 1990s. One faculty administrator reflected on how the emergence of interdisciplinarity as a focus also coincided with a shift in the way the administrator’s field was conceptualized:

Even my training [during the mid and late 1980s] didn’t reach across disciplines, not at all. No, it was pure exercise physiology, laboratory type [research] that is applied, yes, but laboratory type. It didn’t involve any of the other disciplines. Actually nowadays our discipline, kinesiology, is extremely interdisciplinary and it should be because it does reach across different disciplines, but in that era everybody was doing research and work
in their own little world. Although the departments were made up of different kinds of people, not only researchers, there was not much collaboration between them at that point. But the discipline was also very new at that point. It was the era [1990s] of changing from traditional physical education to what is today kinesiology.

In comparing the historical account offered by Friedland with the accounts of my participants, it became clear that a distinction would need to be made between what is retrospectively labeled interdisciplinarity and what is actually rationalized and experienced as interdisciplinary in the context of lived experience. Another point to be made is that changes in socio-economic priorities and structural changes within the University might not be immediately associated with changes in everyday practices as experienced by faculty and students. Several participants noted in the context of this research that they do not follow changes in policies or read university reports or press releases. Of these individuals, some even argued that reports are generated for outside ‘stakeholders’ and do not really affect anything that they do. Such beliefs make it difficult for them to link small changes in everyday practices to broader socio-economic phenomena, although many such links were made spontaneously.

The next sections detail some of the ways knowledge-makers at UofT are affected by the institution’s uptake of the popular discourse of interdisciplinarity. In my analysis of participant experiences, I looked at how popular interdisciplinarity materialized in their everyday experiences. Some of the material effects were articulated directly by the participants and linked to aspects of the interdisciplinary process with which they were most familiar. Other material effects can be extrapolated from their statements and discussion of the discursive statements I have identified as components of the popular version of interdisciplinarity (i.e. collaborate, diversify, innovate, integrate).

8.2 Knowledge-makers negotiate the popular discourse of interdisciplinarity

The range of possibilities afforded by diversification was a theme that came up in the context of several of the interviews. As the next sections will show, the types of activities participants described in relation to diversity and the individuals they thought of in the context of these activities differed depending on how participants defined diversity and how they rationalized the role of diversity in knowledge-making more broadly.
8.2.1 Interdisciplinarians diversify their thinking

Participants noted that interdisciplinarity took several forms depending on the context. This had implications for how they thought about diversification and how they approached their interdisciplinary activities. For example, one participant working in occupational therapy noted:

Here at OT, interdisciplinary really means working with a lot of different people, whether they’re the engineers or designers or doctors or nurses or whoever else, and I think here it’s far more general. Computer science is a bit interesting. I think in computer science, interdisciplinary means working with different areas of computer science. The artificial intelligence people work with the sensing. The sensing people work with the knowledge media people. You don’t see a lot of work happening outside computer science in computer science.

Diversification thus could take the form of reaching across disciplines, or even across professions, or reaching across sub-specialties within the same discipline/profession. The possibilities afforded with such a flexible definition are vast within an institution the size of the University of Toronto. As argued in Chapter 3, by classifying interdisciplinarity using a simple typology of degree of interaction with disciplines, all rationales for engaging in interdisciplinary research are represented, except the most radical forms which challenge the authority of disciplines or seek to transcend disciplinary knowledge-making all together. Returning to the excerpt cited above, the perception of this participant is that local cultures are linked to particular contexts that have developed rules about ‘how it’s done’ (meaning collaborative research). This indicates an awareness of different expectations around what interdisciplinarity should accomplish and how these differences can impact career development.

In the interviews there was evidence of cultures around ‘interdisciplinarity’ or ‘diversity’ conceptualized differently within medicine as compared to engineering, but there were also differences within each field. As mentioned in a previous chapter, when I spoke to engineers, they would rarely use the term ‘interdisciplinary’ to describe what they were doing, even if they were working with individuals from other disciplines (i.e. mathematicians or computer scientists). These research collaborations were seen as ‘normal’ everyday activity. The term, however, was used to reference partnerships or collaborations (and the people engaged in these collaborations) that were not within the ‘norm’ i.e. collaborations that spanned Faculties and/or
involved social scientists. Distance in the sense of lack of affinity within a domain seemed to matter when it came to ascribing the descriptor, interdisciplinary. Similarly, when I would ask which colleagues were considered interdisciplinary, participants would reference engineers who had incorporated social science perspectives into their work; and these references were primarily to *environmental* engineers. In contrast, the term ‘interdisciplinary’ was much more prominent in the everyday vernacular of the Faculty in Medicine. In medicine, the most commonly cited groupings were physicians versus non-physicians. Furthermore, the PhD-trained non-physician group working within the Faculty of Medicine is very diverse and includes individuals from a myriad of disciplines. When I asked individuals to identify who was considered ‘interdisciplinary’ within the Faculty of Medicine, I was always referred to non-physicians who worked with scientists and clinicians from a variety of backgrounds, and whose work had received public attention and funding. This can be linked to the way research is organized, supported, and governed within medicine. Specifically, until recently, basic scientists who were not physicians conducted most of the research related to the clinical sciences. However, as one social scientist working within medicine noted, “the decision-making power rests in the hands of physicians.” This poses many challenges to researchers who choose to leave their ‘disciplinary’ homes to work within medicine (a topic I will address later on in this chapter).

The term “diversity” was also used to describe the learning possibilities offered at a large university such as UofT. One administrator spoke about diversity in terms of programming to note that there are currently “169 graduate programs many of which take place in Extra Departmental Units” (EDUs) and “they are diverse graduate programs because we have 169 of them and they’re all coming from some different set of thinking.” When I asked this participant, an administrator in the School of Graduate Studies, about his/her goal regarding diversity s/he answered:

> I’m not sure if I see my goal as one of nurturing diversity. I don’t see diversity as good, in and of itself. Sometimes I think it exists because of the human tendency to fission. Human societies are capable of fusion and fission. Human societies come together. Human societies break apart. But humans being humans, they’re better at breaking apart than they are at coming together. So I think, as an administrator at a complex institution that already has a diversity of units, if I’m going to put my energies into something, it’s bringing people together.
In other words, in contexts where diversity was used to describe programming or breadth of research expertise, everyday activities of knowledge-makers included efforts to “bring people together.” Bringing people together was in fact a major activity described by many of my participants, especially those who had an administrative role within the University.

A participant with an interdisciplinary background in the social sciences offered the following eloquent expression of diversity:

I’m more interested in multiplicity and the finites that you can delve across. I think it’s the infinities and discovering those infinities that has created something new. Conversations to me are pretty magical things. A real conversation is something new happening that has never happened before. The idea about the conversation is that two people or more than one person get involved in creating something new and a conversation is something that never happened before and it’s ephemeral. I think interdisciplinarity is something that can be actually quite ephemeral and may not actually be about building a new institution or actually about innovating or producing something new. But there’s something in the conversation between multiples that creates maybe new lines of flight, new directions, new inspirations, new energy or new possibilities. [A conversation] that didn’t have to have a kind of material [objective] which is about the output, about products, about innovation. In other words, [a conversation] that did not have a production line sensibility to it.

This participant equated diversity with a multiplicity of perspectives, seen as productive potential inherent in interdisciplinary research. His/her reference to “new lines of flight” brings to mind Deleuzian notions of the productivity of desire (Deleuze & Guttari, 2005). Also notable in the above statement is the idea that innovation can be conceptual. This idea is very different from the idea of innovation as outcome, which is the popularized version. Following this rationale made this participant tolerant of working through epistemological differences while other participants did not see ‘value-added’ in working through conceptual issues.

The productive potential of conceptual diversification was also described by an administrator in the context of speaking about the advantages and disadvantages of working within an institution the size of UofT. S/he noted,
The only barrier is your own personal time and how much time you have to devote to it. That’s it. And in an institution of this size, just the volume of work that you have and how you manage your time... that’s it, really. There are no other barriers, in terms of resources or being able to do it or in meeting collaborators.

Consistent with Davies and Bansel’s (2005) findings, the above participant’s conceptualization of ‘time management’ makes it the responsibility of the individual knowledge-maker to keep up with expectations related to innovating and applying knowledge to relevant problems. The participant acknowledged that this created a ‘burden’ on his/her time in the process of trying to manage all the expectations. However, the endless possibilities afforded by UofT’s size, in terms of programming, potential collaborators and resources were constructed as a huge advantage in the current knowledge-making environment. Other participants went about describing the connection of diversity to knowledge-making in less philosophical language, but nevertheless articulating a Deuleuzian relationship between diversity and interdisciplinarity. For example, a participant working in the field of biomedical communications jumped directly from a reference to diversity as culture to a definition of diversity as a form of interdisciplinary research:

Diversity? I guess I always think of diversity as a word that is applicable to culture. Are you a diverse researcher? You can do interdisciplinary research.

Similarly, a participant working in the field of occupational therapy defined diversity as

having different points of view, different perspectives, different backgrounds, different experiences from their backgrounds that they’re bringing to the table. Like I said, in my lab meetings --we do bi-weekly lab meetings, or bi-monthly lab meetings -- at the table I have my engineering students, my computer science students, my OT students, all at the same table bringing different points of view. So it’s very interesting to see some of the conversations that happen.

Individuals who thus believed in the productive capacity of diversification would actively pursue collaborations and take on partnership within and outside the contours of their specific locations. The idea of ‘different backgrounds’ referred not only to disciplinary backgrounds, but also occupational backgrounds and beyond. This flexibility in ascribing the term interdisciplinary to multiple occupations is prevalent in health fields where collaboration is strongly promoted and
linked to professionalism, communication skills, the capacity to work in flexible work arrangements and so on, as noted previously. It was contingent with a greater tolerance of differences.

A similar flexibility to that found in medicine in extending notions of interdisciplinarity to include different occupational groupings was also evident in engineering. However this ‘flexibility’ manifested differently than in medicine. In engineering, actively seeking to partner up with industry was experienced as commonsensical: “that’s the way we work.” Further though, even in this reductionist field, as mentioned previously, I detected a widening of the disciplinary spectrum of collaborators who are thought to potentially enhance the capacity of the engineer to ‘think outside the box’ or ‘create better solutions for complex problems’. Individuals who engage in collaborations with social scientists, for example, are attributed the title ‘interdisciplinary’ by colleagues, whether they think of themselves that way or not. I contacted such individuals whom my interview participants had identified as being interdisciplinary to invite them to take part in my research study. All noted in the context of our interview that they would not have used the word interdisciplinary to describe themselves academically. In other words, projecting a core identity can be troubled in a Foucauldian sense by activity that is de-centered, diverse, and constantly changing. This is an important material implication related to the process of subjectification. Given the historical marginalization and even stigma associated with undertaking interdisciplinary research (evident in the debates about definitions of interdisciplinarity explored in Chapter 3), being labeled interdisciplinary has implications for how one’s research activities are perceived and ultimately valued. In spite of this reality, having to learn to navigate environments where interdisciplinarity means different things to different people was the norm for many of my participants. Furthermore, tension is created for individuals when interdisciplinarity and collaboration is highly valued by external funders, while the university’s reward structures privilege individual excellence and recognition in a discipline.

8.2.2 Interdisciplinarians integrate to innovate

As I have suggested participants who used the term ‘diversify’ in the context of collaborative knowledge-making evoked the value of integrating new perspectives into their work in order to produce something that is innovative. For example, the participant working in occupational therapy quoted above who affirmed the importance of diversity in knowledge-making, spoke positively about the process of integrating new perspectives into research:
So in terms of integration, I guess the main thing is integrating the different points of view in terms of the work that we’re doing. Everything is always on the table when we talk about the different projects coming out--what other research has to be done, or the approach we’re going to take, or whatever else. (Interviewer: So you make a point of trying to integrate all these perspectives?) Yeah, as much as we can. Obviously sometimes it’s not always feasible to do it.

Here the participant describes how an interdisciplinary research group approaches integration. His/her goal is to ensure that everyone’s perspectives are integrated into the work. “Everything is always on the table” connotes that negotiation of interests and differences are built into the research process. Consistent with the popular rationale for engaging in interdisciplinary research, the research conducted by this participant and collaborators was described as “cutting edge” and “innovative.” So “putting everything on the table” is a reaffirmation of the popular discourse -- that is, a claim that the pathway to innovation is “diversification”--an opening up of one’s perspective to other ways of thinking or even knowing.

The same participant also articulated a commitment to ensure that all members of the “team” were appropriately rewarded for their input so that through their participation, they could take credit for some portion of the work to further their personal careers. To accomplish all this, ‘time’ is needed to “understand each other’s perspectives,” to “think about the different projects” that will come out of the research and to consider what additional research might be required to ensure everyone’s perspective is ‘leveraged’. Finally, additional effort is required to ensure that everyone is appropriately rewarded in the context of engaging in this work. This additional effort is required because it is not always possible to synthesize and “integrate” everyone’s perspective into one publication. However, incorporating everyone’s thinking in the research, and ensuring everyone is rewarded in some way for their effort is not the same as working through conceptual differences. And this is the point which distinguishes the instrumental form of interdisciplinarity (which the popular discourse promotes) from critical and conceptual forms of interdisciplinarity (as described in Chapter 3).

18 This issue of ensuring that individuals could be appropriately rewarded for collaborative work was a point of discussion for several of my participants and I will come back to this in the next chapter.
In a similar vein, a participant who spoke about diversity as interdisciplinary research in the context of biomedical communication research also noted:

I’m always, as I’m introduced to new things, finding ways of integrating them into what it is I’m doing or what it is I know and it always sort of changes the form of things. (Interviewer: And the inspiration could come from a variety of fields?) Oh yes. (Interviewer: What kind of literatures do you draw from?) I draw from literature in computer science, educational psychology, medicine, just general education, as well as, specifically the areas that relate to --I don’t want to say design--but papers relating to information visualization and the science of information design.

In this person’s work, integration was also associated with incorporating “diverse perspectives” but this was not necessarily a collaborative process with others. Identification with the term interdisciplinary was more an acknowledgement that this individual worked in an interdisciplinary setting and of a personal approach to research, rather than a collaborative knowledge-making process. The participant went on to make the point that technological innovations in data-basing resources made interdisciplinary scans of multiple literatures “easy.” However, in order to integrate the new information into his/her work, there was a time commitment associated with learning the “jargon” of each discipline and familiarizing oneself with how to understand the different “scientific processes” that these diverse literatures were using.

When I asked how s/he frames work drawn from so many different perspectives, the participant noted that s/he generally employs educational theory, and is aware that this preference “biases” the literature searches s/he conducts. S/he went on to describe the “bias” as resulting from the application of the educational “filter” during literature searches. S/he felt this filter draws him/her to particular types of papers, most closely aligned to the educational theory s/he employs. Maintaining a frame of reference for analyzing and incorporating diverse perspectives into one’s work was seen as very important for this participant, yet s/he did not publish in educational journals. Was the framing approach described by the above participant a centring of sorts? Working in a department which was interdisciplinary and conducting interdisciplinary work can be experienced as professionally de-centring in terms of identity. But using consistent ways to frame forays into different disciplinary arrays of knowledge, may help counter this de-
centring effect and allow the researcher to project some consistency across his/her research. There was no sense given to me in the context of this interview that this participant’s forays into other disciplines were in any way problematic conceptually to him/her. However, s/he did emphasize that interdisciplinary integration was a time-consuming process and that it required a facility with search engines and a capacity to sift through different literatures to extract useful information.

8.2.3 Interdisciplinarians ‘leverage’ technology to diversify

The above example makes reference to technological advancements that accommodate interdisciplinary knowledge-making approaches. Search engines have been designed to look across disciplinary fields and pool together ‘relevant’ literature on a topic. In theory, this type of pooling together of resources is unproblematic. However, articles that have little or no relation to the topic under search are also included, because somewhere within the paper, one of the exact search terms was used. For example, a researcher might be doing an internet search on the topic of identity using the keyword “identity” and asking the search engine to look for the term anywhere in the paper. This will bring up papers that might include the term “identity” somewhere in the paper; even if the topic of the paper is not about identity. Libraries offer professional development courses on how to use such search engines effectively. Presumably, once researchers become skilled at using these engines, they might experience an increased capacity to evolve interdisciplinary research, which may explain why participants noted that their collaborative activities have been enhanced by the internet. Paradoxically, they may no longer leave their offices to conduct a ‘search of the literature’ or to access articles. Most journals offer electronic versions of their publications and universities pay subscriptions to many journals that allow faculty and staff members of the university to access these articles for free if they are working from within the university’s physical or virtual environment. Articles are easier to access than books, which can have implications for the depth of the reviews of literatures. This also possibly disadvantages social science and humanities researchers who value the book format for interpreting results.

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19 Recently, I published an article in a clinical education journal which drew from the sociology of the professions literature to discuss a phenomenon specific to clinical settings. During the revision phase, the journal’s copy editors sent back my manuscript asking me to complete the citation and to list page numbers for all the books I had cited, thinking that they were articles. I had to write back explicitly stating that these were books I was citing-- whole books and not portions of a book-- and thus, would not require page numbers.
Participants also described an increased capacity to link up and work with colleagues at other locations when they used new telephone and video-conferencing technologies. Research meetings with different stakeholder groups were described as being easier to organize. Also facilitating communication between collaborators in large research projects is software that allows calendar access allowing administrators to probe calendars for availability without having to wait for a reply from an individual. This software is primarily in operation in intra-networked settings connecting together members of the same hospital or departmental unit. Of course individuals can opt out of having their calendar probed with a variety of security options built into the software. However, many chose not to opt out because they see merit in expediting the process and not having to respond to several emails until a suitable meeting time can be found. Others spoke of the speed at which a manuscript can be composed and bibliographies generated through internet based search engines but also data-basing software such as Endnotes and Reference Manager. These technologies allow one to generate a bibliography in different formats easily without having to retype a manuscript. Saving time to revise or reformat findings for different journal requirements likely facilitates co-writing between colleagues from different disciplines. But while the above technologies were cited as facilitating collaborations and integration of diverse perspectives into the research process, they did not necessarily help researchers navigate epistemological and ontological differences. This task was left up to individuals to negotiate, as the next section illustrates.

8.2.4 Interdisciplinarians negotiate epistemological and ontological differences

The notion of working across different epistemologies or ontologies was raised in the context of my interviews with most participants insisting they did not attempt to work through such differences. This is consistent with the popular discourse of interdisciplinarity, as exemplified in the following interview excerpt:

When I talk with colleagues who are qualitative researchers, I have a hard time to see how their perspective would fit into my research and what kind of questions their approach could answer for me. So with behavioural scientists, the collaboration is easier [for me]. The same with motor control people. [Collaboration] is easier because we are all quantitative. So there is at least a methodological understanding. Qualitative collaborations I still haven’t had time to even fit it into my research. I don’t know yet how to make [the qualitative results] fit into my research. I have a hard time
understanding and interpreting the results. I have a hard time understanding and interpreting the role and the hypothesis behind it.

One again, “lack of time” is evoked in the context of describing ‘barriers’ to engaging in conceptual forms of collaborative interdisciplinary research. The above participant, having listed several reasons why exploring ways to incorporate qualitative research approaches into his/her work are difficult, went on to say that in the context of engaging in collaborative knowledge-making that includes qualitative research, his/her strategy is to allow other collaborators the space they need to evolve their research, and publish these results separately (a strategy other participants also described as practicing). This particular participant explained that allowing her collaborators working in different epistemological domains to “get what they need out of the collaboration” was not problematic for her: s/he merely does not use their research in his/her publications because s/he does not understand it. This inability to “understand” what the qualitative researchers are doing was not problematic for this participant-- s/he really does not “need” to bridge these differences because in a practical sense his/her work is evolving very successfully without incorporating qualitative perspectives in his/her manuscripts.

In contrast, from a non-mainstream position of interdisciplinarity, another knowledge-maker who was conducting an ethnography of scientists engaged in interdisciplinary collaborations described how s/he observed in the context of the research the “frustration” of researchers “not getting it”-- of suspecting that there was “something there” that could really push their work to a new level, and yet lacking the insights to be able to use different ways of knowing. In the following quote, s/he articulates what this frustration felt like in the context of an interdisciplinary symposium. At the meeting, a group of mathematicians familiar with working together were inspired to come up with new conjectures based on what they were hearing in the context of the symposium from scientists in other domains. In this account they followed through with their curiosities and tried to bridge the conceptual distance between different disciplines. But in the end, the mathematicians could not follow the “science” of their colleagues from other disciplines. In the words of my participant,

[t]he mathematicians are really a group that works over beers in the lunchroom in the evening. You just had five mathematicians sitting over a little piece of paper like this, arguing, getting involved and getting passionate about committing and it was fabulous.
They were coming up with new conjectures and it’s a collective…everyone in the room is on the paper. Then you have a different menu of different models of knowledge coming out. You have a group of mathematicians who were saying; “we need to talk to you guys…. We need you, we need you” and they’re gathering these people up. They are [saying] “Oh my God, how do we learn to talk to you?” In this sense, there was both collaboration within a discipline, within mathematics, and a kind of reaching outward, a kind of saying “who else can we include in this conversation? Can we get them to give us a lecture on what they’re doing? Oh now, give me a talk on this? Okay, you give me a talk now?” So there was this open and very fluid schedule of presentations where they were like “oh, what do we need now? Oh, we need you. Tell us about this. Get out there and do a 20-minute talk on your thing. Oh, oh and now you!” It was like choosing things off a menu to feed the kind of curiosity they were growing. At the end of the day though, the mathematicians were frustrated that there wasn’t enough math [in the presentations from other fields] and the graduate students were particularly frustrated because they didn’t understand [what the presenters were taking about]. The mathematical-based grad students couldn’t understand any of the chemistry and they didn’t understand why they had to sit through it.

In this interdisciplinary meeting, my participant observed how there was much frustration while at the same time key actors were “performing the enthusiasm of innovation and the enthusiasm of interdisciplinarity.” It was interdisciplinarity in action. S/he noted:

They were trying as hard as they could to learn each other’s language. They were putting on a good show and then underneath they were like, “it was hard or I still have no idea what was going on there”; they were really honest about getting stuck in the problem.

Despite the frustrations, s/he concluded, interdisciplinarity won out at this meeting because the scientists felt that “their research problems are larger than them, and what they can work on themselves.” This echoes the popular rationale for interdisciplinary research articulated in government, institutional and funding agency strategic planning reports, which I have labeled collaboration, diversity, integration, innovation.

However, another important element that emerged from the analysis of this participant’s knowledge-making experiences was the performance of “enthusiasm for interdisciplinarity”
despite experiencing frustrations about ‘not getting’ what they thought they needed to ‘get’ in order to push forward the research agenda. The observation that the problems were “larger,” that is, more important than their frustration in their lack of skills or training to understand each other, was theorized as motivating the researchers to continue working through the issues despite the challenges. But the onus of responsibility for working through the issues is placed on the individual again. It is relevant here that in facilitating the capacity of knowledge-makers to engage in interdisciplinary collaborations institutions have routinely adopted life-long learning mandates and other professional development programs. The system provides the training. If the individual does not pursue the training, the blame then rests with the individual for failing to ‘re-train’. The instrumental rationale for engaging in large-scale interdisciplinary collaborations, however, is not challenged in the process.

Returning to the example just cited, it might be argued that this participant’s social science background allowed him/her to observe the materiality of the discourse of interdisciplinarity as a foregrounding of a rationale for collaborative knowledge-production and a back-grounding of the frustrations involved in engaging in this type of collaborative knowledge-making. In the context of my interview, the participant insisted that the frustrations of interdisciplinarity did not take away from the commitment to interdisciplinarity as an ideal. In fact, s/he noted that the mathematicians, chemists and other natural scientists s/he was observing looked to him/her as the social scientist in the hope that s/he might “help” them “think through this” getting stuck in the context of diversifying their perspectives. S/he noted that they truly believed that social science type observations would help get them “to a new place with” with their interdisciplinary research. Why would mathematicians and other scientist turn to the social scientist to ‘guide’ them through the negotiation of disciplinary differences? They not only lacked the training to understand each other, they also did not presumably know about different ways of knowing required to make sense of the social process of working across disciplines (though they knew social scientists do). Given that there are few opportunities to achieve the epistemological humility to learn to bridge these differences, scientists might be forgiven for appearing impatient and citing a “lack of time” preventing them from learning to bridge these differences. But this proclaimed inability to ‘make sense’ of disciplinary or methodological differences observed in

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20 I will pick up the issue of performing expectations associated with interdisciplinarity in the next chapter (in the section on the politics of collaboration).
the last two examples is arguably a side-effect of the way the popular discourse of interdisciplinarity has been implemented as problem solving in medicine and engineering. That is, conceptual forms of interdisciplinarity cannot be appreciated in an educational system which has evolved on dividing practices, as Tripp and Muzzin (2005) have lamented and as I have discussed in Chapter 3. Thus, while conceptual interdisciplinarity might be a stated goal of some knowledge-makers, contemporary knowledge-making environments (including technologies, office spaces, training, expertise, reward systems, in short material conditions and power relations) are structured in such a way as to make the implementation of instrumental forms of interdisciplinarity easier. Occasionally, researchers may be able to bridge epistemological domains either through training or acquired expertise and here social scientists from marginalized interdisciplinary traditions might be particularly valued.

To explore the materiality of interdisciplinary discourse in more detail, the next sections will draw out some of the politics associated with the contemporary knowledge-making as described here. First, I will highlight shifts in the governance of knowledge-production by focusing on everyday practices which are motivated by a desire to facilitate interdisciplinarity. Next, I will trace out the politics of ‘collaboration’ and the politics of ‘making a difference’. In the process, I will problematize the relationship between individual and institutional priorities.

8.3 The governance of interdisciplinarity through facilitation

8.3.1 Facilitating collaboration structurally

The notion of ‘facilitating’ collaborative knowledge-making was a prominent theme in the experiences of participants, particularly those who had an administrative background. The activity was linked to the idea of enabling people to “make a difference,” also a key discursive component of the popular discourse of interdisciplinarity, as I have argued thus far. This was consistent with the increase in collaborative activity in the last 10 years, noticed by participants, which they associated with changes in the way research was funded. For example, one participant described the current climate regarding collaboration this way:

I’ve really heard a lot of positive stories about collaboration. I’ve heard of some frustrations but people are championing that as a cause so they are really embodying the rhetoric of it.
This championing of collaboration was not perceived as forced. For example, when another participant was asked if s/he felt pressured to engage in collaborative research, s/he noted:

People don’t come and say, I think you should do this, because, for one, I think they see we’re already doing it. But if they see some work that they think I can be involved in or expertise they think they I could lend, then we would explore that potential collaboration.

Here the pronoun ‘they’ refers to program heads and department chairs. This participant felt that while collaboration was not forced, it was encouraged, and since collaboration is currently a favoured approach to knowledge-making, academic leaders think about how to bring people together. In this example, departmental chairs and program heads are ‘facilitators’ and they work towards creating opportunities for collaborative knowledge-making by introducing faculty they think might make good alliances for certain projects. It is theoretically interesting that collaborations are not perceived as mandated, but negotiated, as discerned from the phrase, “we would explore that potential collaboration.” This presumes autonomy on the part of faculty as to whether to pursue the collaboration. Another organizing process evident in the above excerpt is the notion that if you are perceived as engaged in collaborative activity, collaborations will come your way. A similar idea was projected by a participant working in the Faculty of Medicine:

So, I think that’s one way to get recognition. You get published in a journal that you otherwise wouldn’t have published in and you add to your publication count. I think another way that you get recognized is that other people from other disciplines want to approach you and work with you. They’ve seen that you’ve done a successful project with a critical care physician, somebody in palliative care, somebody in child health, et cetera, and they say, “oh, we’ve heard that you worked with so-and-so, would you be interested in collaborating with us?” So, I think that is helpful in terms of future collaborations.

The idea that collaborations are ‘visible’ or ‘material’ is worth exploring because it emphasizes how discourse operates through a social nexus. Collaboration as a process is ‘visible’ because it mobilizes people from various locations. The movement is both conceptual and physical. Shifts in thinking, or drawing from different epistemic domains may increase the ‘visibility’ of scholars in their immediate community if they suddenly ‘stand out’ for their work in particular ways. Multi-authored publications in a department where single authored papers are the norm, or a
large grant or a big award for a collaborative research project can bring ‘collaborators’ to the forefront. Shifts of location also make academics stand out. For example, cross-appointments to other departments may alert departmental chairs that their faculty are exploring or engaged in interdisciplinary collaborations, but also that their work is of interest to a wider audience. Requests for sabbaticals to pursue work in another department or institution, or to work in industry, are also forms of physical movement that create perceptions about willingness to engage in collaborative forms of knowledge-making. It is not hard to imagine that those who are perceived to occupy the subject-position of ‘collaborator’, ‘partner’, ‘interdisciplinarian’ or ‘team member’ are more readily involved in the strategic efforts of departmental chairs and program heads to capitalize on current funding arrangements. Conversely, there is the danger that in contexts where interdisciplinary work is not valued, those who are perceived to be collaborative knowledge-makers might find themselves marginalized.

Collaborations are also facilitated structurally in a variety of ways. Fields such as medicine and engineering are perceived to be inherently collaborative. All the faculty of medicine knowledge-makers I interviewed held more than one departmental affiliation. They might be cross-appointed to several other academic locations including other departments, extra-departmental units and research institutes. Cross affiliations are assumed to ‘facilitate’ the work of interdisciplinary knowledge-makers by increasing their network of potential collaborators and also their pool of graduate students. This was particularly important for researchers who held a primary appointment to a clinical department but who were not clinicians. As one participant working in a clinical setting described it,

[cross appointments] offer me the graduate students and they offer me collaborators. In computer science I have a couple of key collaborators I’ve been working with for several years. In biomedical engineering I have collaborators as well, but the main thing they offer me is access to the grad students.

Working to ‘make a difference’ through research, this participant felt that having a primary appointment to a clinical department was essential because it offered him/her access to the population of individuals who could benefit directly from the technology that s/he was evolving.

Access to knowledge users (such as patients in medicine) can also offer the means for verifying empirically the capacity of the technology to work effectively and efficiently. Just as clinical
scientists perform clinical trials to ascertain the benefits and side effects of new medications, so do clinical engineers perform trials on patient populations to ascertain the effectiveness of their technologies in alleviating patient conditions or facilitating their treatment. However, to develop the technology in the first place the researcher working within this clinical setting also requires access to students and their expertise in various science technology fields.

Cross-appointments also serve to boost departmental profiles. One participant who had seven cross-appointments in various departments in the Faculties of Engineering and Medicine, as well as EDUs and hospital research institutes, noted that some of these cross-appointments came to him/her after s/he received a prestigious award. Notice of the award was followed by invitations to come on as faculty member or scientist in other locations. Here the cross-appointments are facilitating departments, EDUs, collaborative programs and research institutes in boosting their productivity counts and their public profiles. This knowledge-maker’s activity and success could thus potentially be quantified through seven different locations, through the facilitative technologies linked to collaboration. The discourse also creates a tolerance of such professional identity multiplying. In a recent article exploring the identity politics of collaborative research teams, the following reflection is made by one of the authors drawing on her personal experiences conducting interdisciplinary research:

A team’s ‘diversity’ is not simply the sum of differing backgrounds, because each individual team member does not translate into a single identity. Our research team provides a multi-layered example of an interdisciplinary group because, like many social scientists engaged in health research, each of us inhabits multiple scholarly communities. This multiplicity of identities means that our combined ‘interdisciplinarity’ is exponential, creating the conditions for both creativity and conflict. Managing this multiplicity has implications for how we experience the team and the nature of the work we produce (Lingard, Schryer, Spafford & Campbell, 2007, p. 506)

The popular discourse of interdisciplinarity thus makes it possible for one individual to wear many professional hats in the process of ‘integration,’ just as it promises to ‘increase the creativity’ of the knowledge-making activity. Wearing ‘multiple hats’ creates a number of material effects for both institutional and individual identities, particularly in relation to reputation building. For example, multiple individual professional affiliations make it possible
for the organization (here the university) to capitalize on the same individual’s productivity simultaneously in a number of different contexts. This allows the individual and the institutions opportunities to demonstrate how they make a difference in multiple contexts and in the ‘real world’.

This ‘cost-sharing’ of expertise is also facilitated by the Internet. Academic knowledge-makers in my study had separate public identities posted on the Internet for each appointment they held. For these postings, while biographical information was repeated, the research and teaching activity of the individual was often specifically tailored to the mission statement of the location. The other affiliated locations of the individual might also be listed on each posting. The Internet has thus increased the ability of researchers to project nuanced and multi-faceted professional identities in much more expedient ways than were previously available, for example, through such media as curriculum vitae or departmental newsletters. Web-based cross-referencing technologies erect informal models of collaboration, which are projected as virtual matrices constantly evolving and with dynamic properties. Multi-dimensional interactions are mapped that can have national and international dimensions, as collaborations both formal and informal are showcased involving students, industry or corporate partnerships, community groups, NGOs, government agencies and other universities for each individual. The projected models of collaboration are dynamic, as matrices morph and reform as information about individual activity is continuously uploaded onto the Internet. As models, their constitutive capacity is formulated through the individuals with which they share ethernet connections. For example, if a faculty member of department A has a cross appointment in department B, and a faculty member in department B has a cross appointment in department C, then it is possible that a faculty member in department A may also find compatibility in department C. One of the participants described how this worked in his/her centre:

[W]e keep our profiles up-to-date, [and] research projects are discussed as part of those profiles. All of the seed grants that were awarded are posted on our website, so…it’s a resource for people who are looking at who is doing research in specific areas. And so that’s a way of facilitating and helping to put people together.

With each individual knowledge-maker connected to this virtual matrix holding multiple affiliations and projecting numerous configurations of collaborations through multi-authored
publications and presentations, the possibilities of reconfiguration become, in theory, endless. In reality, they are subject to the individual faculty member’s work time. In assembling the archives for each participant, such virtual connections made individuals appear closer to each other conceptually because, for example, they were appointed or cross-appointed to the same department or had common collaborators -- or their work was presented in the same newsletter. However, when I explored the content areas of their work, the similarities were not as apparent.

Participants described another important materiality associated with ‘wearing multiple hats’: not being pinned down to a core professional identity. In the context of my interviewing, I asked participants to describe their professional identities in a couple of sentences. One participant wearing multiple hats described the conceptual freedom of having the opportunity to project a different professional identities in different contexts. S/he said:

[I]n single disciplinary settings…I had this desire to be interdisciplinary, to develop that and distinguish myself that way, as someone who spans disciplines. But in this interdisciplinary setting [medicine] or the various interdisciplinary settings that I’m involved in now, I found myself wanting to articulate a more unified identity [linked to my disciplinary training]. [I]n both cases, it seems like I’m engaging in strategies of distinction…because I am trying to distinguish myself within a group and there’s something in that, something central to my identity. [I] kind of boil it down to: enjoying being outside of whatever or partially outside of whatever group I’m in. The other way I distinguish my professional identity relates to the words translation and applied. What I mean is the ability to translate between communities and between discourses… a kind of connection building, not transferring from one to the other but finding connections between ideas, and between contexts (my emphasis).

For this participant, the ability to “change shape and move between” concepts but also settings has become a central feature of his/her professional identity -- an identity which is in constant flux. In the context of the interview, s/he reflected that in collaborative settings s/he feels more inclined to operate from a stricter disciplinary stance and that this is the expectation -- your discipline becomes your centre, the point from which you define your role in your respective collaborative circle. For this participant, the effect was even more nuanced as s/he is trained in more than one discipline (humanities and life sciences), and so when s/he is in a humanities
setting, his/her life science background comes to the fore and s/he describes that s/he is often perceived as the spokesperson for topics related to health care. Conversely, when s/he is in the health setting, his/her humanities expertise becomes his/her projected and recognized identity. This shifting identity was not experienced as problematic. Rather, the participant noted a sense of freedom to be different things to different people, and an opportunity to explore different ways of thinking that were mutually reinforcing. This ability to move from setting to setting unproblematically requires a certain flexibility in thinking but also attitude, and a skill-set that is promoted as much demand in current work environments (Walkerdine, 2006).

Consider also the following excerpt from another participant working within the Faculty of Medicine and cross-appointed to different institutional locations (departmental and EDUs):

No one ever knows where I am because I’m always somewhere else, it seems. I think the reason it works well is because people are happy that I do the thing that I do [bring in lots of money and publish lots of papers]. And there are very few constraints to do anything else. They’re happy because I’m fairly productive so they like the fact that my papers are coming out…. It’s interesting when I think about the way my job is configured here. In [my previous job], I had one employer and that was it…. But it was not as complicated as it is over here. So jobs are configured completely differently and I assume it’s a sort of spreading the risk kind of approach [my emphasis].

What does this participant mean by describing his/her current work arrangements as creating the impression that s/he “was always somewhere else?” Holding multiple locations made it very difficult to maintain a ‘visible presence’ in any one location. In some ways this worked out well for this individual, because his/her multiple employers were less likely to add on to his/her research expectations with administrative responsibilities. S/he rationalized the existence of positions such as his/her own in medicine as an approach to “spread the risk.” This reference is to the pooling of resources to hire ‘experts’. If things did not work out, each department would have lost a fraction of the cost of having hired the ‘expert’ on their own unit. However, if things worked out, each location can reap the full benefits of “productivity” of the ‘expert’ at a fraction of the cost. When I asked if having multiple employers was frustrating in terms of meeting expectations, the participant noted that s/he was doing “okay.” S/he added that “if anybody” wanted “anything” s/he would “send them” his/her “cv,” with the assumption that they could
easily extract what they need from that. Occasionally, each of the departments/units s/he belongs to would have to produce a report for a review or some other accountability exercise, and this might require a bit more effort to showcase his/her productivity. However, even for these types of demands, the participant noted, “the administrative staff” handle most of it (portraying here administrators as facilitators).

8.3.2 Facilitating collaboration conceptually

Participants also noted a variety of ways that collaboration was facilitated conceptually. One participant used the term “disciplinary chauvinism” to denote a conceptual barrier to interdisciplinary research. But it was also used to create a point of reference in order to distinguish individuals who were more naturally inclined to work outside the epistemic parameters of their training. To do this, it was argued, requires the skills inherent in a “facilitator”—an ability to conceptually interweave points of view into a synthesis that holds resonance for all parties involved, without the encumbrance of staying rigidly true to methodological or ontological principles (which carry normalized formats for collection, analysis and dissemination of data).

The characteristics which this participant considers ‘inherent’ in people who are more inclined to work outside the epistemic parameters of their training resonates with what one ‘expert’ on interdisciplinarity has described as qualities emerging from good interdisciplinary training:

…an appreciation for perspectives other than one’s own; an ability to evaluate the testimony of experts; tolerance of ambiguity; increased sensitivity to ethical issues; an ability to synthesize or integrate; enlarged perspectives or horizons; more creative, original or unconventional thinking; increased humility or listening skills; and sensitivity to disciplinary, political, or religious bias (Newell, 1994).

Being unaware of the literature on interdisciplinarity, my participant did not make the connection to ‘best practices’ associated with engaging in interdisciplinary work. However, his/her experiences with interdisciplinary activities which have ‘worked’ or ‘failed’ have led him/her to analyze the failings as examples of ‘inflexible’ personalities as well as lack of skills in developing conceptual consensus. According to this participant, successful collaborations have one or two individuals who will naturally play the role of facilitator because “at some point
somebody has to take the lead” and “put things down and start doing things and get the feedback and check backs.” In other words, “somebody has to complete the work.” The concept of an inherent “lead” in the collaborative process may help rationalize how departments and peers may single out one or two individuals in large interdisciplinary projects and give them major credit for the work. Of course, the “lead” is also valorized institutionally in the mechanistic way that the most credit is awarded consistently to the principal investigator on a grant application. This assumes that taking the lead means that the principal investigator will also assume leadership in the collaborative process and actually do the work.

However, as one participant describes it, the “lead” is often a kind of “manager” rather than the content expert engaged with the data collection and analysis, particularly in the large multi-thousand dollar and multi-institutional grants currently favoured by funding agencies. When I asked this participant to describe what role s/he plays in collaborative research as a principal investigator, s/he answered:

It depends if we are lucky enough to get things well-funded. So [in one funded project], I was involved in the creation. It was my idea to do this thing and then we got it together and submitted it. But [with the grant], we hired a curriculum developer and we hired a project manager. There’s an admin person attached to [the project] part-time and then there’s a research associate attached to it as well…. [T]he thing’s up and running and I’ve got very little interest in developing the content of the [day to day] stuff. I mean, I’m marginally involved in some of it but it’s really them working with the researcher to make sure that the research questions are formulated and we get the ethics [approval]. So it depends; that project is slightly different and I want more distance… But then on other projects, I’m hands on. Smaller projects …I sometimes get more out of because I’m more connected to them personally and emotionally, I guess. You know, when there’s no money and you’re trying to do something; if there’s no money, there needs to be a lot of enthusiasm.

In this participant’s account, the role of the conceptual lead in large collaborative projects sometimes amounts to developing an overarching approach for a project, assembling the team, ensuring that the project secures funding and having the necessary staff to carry out the day-to-day work. For this participant, a large-scale project (which was well funded) presumably boosted
his/her career but was less “hands-on” than his/her other research. Participants who supervised many graduate students and had large “research labs” described feeling similarly distanced from the actual research activity – like the CEOs of a business enterprise. While they provided conceptual framing for the research and ensured that the projects fit into an overarching program of activity, they “managed” the research enterprise. The research manager can also be viewed as a ‘facilitator’ in the knowledge-making economy: ensuring that the funding is brought in, that the right individuals are hired or financially supported (as in the case of graduate students), and that the research work is completed in a timely fashion.

8.3.3 Facilitating interdisciplinary learning

In contrast to senior interdisciplinarians, participants who were students or early in their careers evoked the concept of “facilitator” in the context of describing successful collaborative programs that provide interdisciplinary training. One currently enrolled in a collaborative graduate program offered in the Faculty of Medicine described the sense of independence afforded to pursue research in a creative way:

[The student] is respected from the start as an independent researcher, as an independent person who thinks for themselves and you don’t have to play the role of the student. You are a student, but you are given the resources, and you are foremost a member of a community and your mentors are there who engage and collaborate with you but not necessarily teach you everything.

Here the independence of the student is juxtaposed against the teacher not as master but as collaborator. In this rubric, the teacher as collaborator is a facilitator of learning but not necessarily the source of learning. As the rationale goes collaboration as a process that facilitates learning and independence takes on an additional dimension of freedom, realized in the capacity to explore different ways of doing things that break the cycle of reproducing dominant epistemic modalities. Power relationships between learner and teacher are thus implicitly challenged in a discourse that promotes the ability to offer a productive and dynamic environment conducive for individuals with diverse disciplinary backgrounds to work together productively. The teacher as facilitator is very consistent with models of problem-based learning, which are well-embedded in health professional education.
Equity is not part of the explicit philosophy of the collaborative program referred to above, nor is the concept of creating ‘safe spaces’ for learning. However, students of this program described it as supporting and encouraging them to draw from critical paradigms if they so desired and to work towards making connections between critical theories and scientific theories through active collaborations. Safety, in this context, is conceptualized as opportunity to engage in learning with other students and faculty who have different expertise, without having to justify one’s ontological positioning nor suffer ‘attacks’ on one’s research stemming from “scientific chauvinism.” That is, the teacher is presented as actively facilitating collaborations between students from different disciplinary backgrounds by helping trainees negotiate epistemic differences in a ‘respectful’ way. What makes this different from critical collaborative pedagogies is that there is no explicit acknowledgement that historically certain methods or certain approaches have been marginalized within the health professional community; this is often the starting point of critical approaches. The assumption is not that everyone will have to work outside their epistemic training all the time but rather that they will have to invest the effort to resolve collaborative tensions when epistemic cultures clash. The time afforded to these negotiations was described as integral to the success of the program. Through modeling, participants explained, students are trained to navigate such tensions during training in preparation for work they will be doing upon graduation. They are thus trained to be future facilitators of conceptual forms of interdisciplinarity, having developed expertise in bridging epistemological differences.

8.3.4 Facilitation as discursive technology

Arguably, in Medicine and Engineering, the facilitator, as a subject-position, as well as facilitation as a discursive technology, are becoming intimately connected to knowledge-making. At the administrative level, the historical evolution of the Office of Research Administration to the Office of Research Services at UofT is very much implicated in the authorization of facilitator as a subject-position within the university at large. Its existence and growing professionalization and importance is indicative of the changing research environment, where universities are becoming increasingly dependent on external funding (Dehli, 2010; Polster, 2007). One participant who worked at the University research office and experienced this transformation first hand recalled that when s/he first joined the research office, s/he felt more like an “enforcer” and a “gate-keeper.” S/he operated like “an arm or an extension of the funding
agencies” rather than as a member of the service sector of the university community. His/her position originally involved ensuring that the funding agencies’ rules were “applied and adhered to.” There was no flexibility in blending the needs of the professoriate with the requirements of the granting agencies. This approach to the work went contrary to his/her personal inclinations, but there was little tolerance or room to do things differently. At the mid-1980s, the participant recalled that “the Office” changed by implementing longer staff working hours and working over the weekend in order to assist academics in getting required signatures to meet major grant deadlines. This intensification of work and procedures evolved to advocating on behalf of the academic community for changes in funding procedures. Under the leadership of the then Vice President of Research, the participant reminisced, the role of the Research Office changed from “gate-keeping” to “facilitating.” The participant emphasized that the new research office was no longer there to manage or administer knowledge-production. Employees were now “challenged to think creatively” about providing

the most direct, useful support to the wonderfully creative bright people on faculty and the graduate students and so forth while maintaining appropriate levels of accountability and proper stewardship of public funds and private funds, for that matter.

This new role “fit with” this participant’s “personality” and s/he stayed on and worked for several years in various positions in the Research Office. When asked how s/he would describe her professional identity s/he said:

Well I guess I see myself as a facilitator. My prime role is to facilitate research and generation of new knowledge but I’m also a citizen of the University and I seek to facilitate and contribute to the University’s advancement as an international leader.

Another senior administrator provided a strong rationale for this shift with the statement that “one of the great sea anchors to innovation in scholarship and research these days is the reporting requirements and the onerous character of the reporting requirements.” In other words, if the administration did not ‘facilitate’ reporting activities, and assume some of the burden of these audit exercises, innovation could be stifled.

Often now framed as part of the “management apparatus” of the university, the pervasiveness of the discourse of collaboration has arguably reframed the role of administrative staff from
working “for” the management to being in the service of the academic community. All the administrative staff who participated in this study echoed a similar approach to their work and projected a clearly facilitative professional identity when it came to supporting the needs of the faculty and the students in their day-to-day activities. Here can be seen how the discourse of collaboration modifies processes that are not only linked to collaborative knowledge-making, but have implications for the whole research enterprise of the institution.

The final example of facilitation offered here, that of the emergence of the field of “knowledge translation,” provides another dimension of the materiality of the popular discourse of interdisciplinarity. One of my participants made the following simple distinction between information and knowledge in the context of describing his/her academic identity:

I guess I would say that first of all I am fascinated by research, by knowledge, and in this time and age, I am seeking knowledge while I am drowning in a sea of information. Because I think knowledge is very precious and unfortunately we have too much information, which is not knowledge.

According to this participant, the role of research is to make sense of information. It is to generate the explanatory framework within which information can be transformed into a useful materiality. Drawing on this definition of what constitutes knowledge, this academic supports and reproduces the rationale that his/her work needs to demonstrate relevance in order to be meaningful. As I have argued, demonstrating relevance is evolving into a specific practice for knowledge-makers, especially in fields such as medicine and engineering. While the issue of relevance affects all knowledge-makers, it affects interdisciplinarians in very specific ways. As the mandates of federal funding agencies have shifted to fund large collaborative programs of research which focus on socially strategic priorities such as health and the environment, knowledge-makers must also demonstrate or empirically support the contention that knowledge-users are actually engaging with their research. They must show convincingly how their new knowledge is impacting the social or economic sector to demonstrate the relevance of their work. This new expectation has been accompanied by the emergence of a new field, namely knowledge translation. With financial support from funders such as the Canadian Institute for Health Research (CIHR), knowledge-makers have a new epistemic domain to work within that focuses on developing theories for enhancing the “translation” or “transfer” or “communication” of new
knowledge to users so that they can “make-a-difference” through their practice. The emergence of the knowledge translation field does not automatically mitigate the material effects of historically entrenched attitudes towards social science and humanities research and methodologies. It does, however, create what popular discourse would label an ‘evidence base’ for processes that facilitate the take-up of knowledge in general, especially knowledge that produces innovations (e.g. interdisciplinary knowledge). The new epistemic field thus acts as a ‘facilitating’ technology, purportedly evolving methods, practices and processes that ‘translate’ conceptual findings into applications in a rigorous way.

Despite the effort and activities associated with supporting, enhancing and facilitating interdisciplinary knowledge-making, participants offered a number of examples of how their interdisciplinary activities caused them distress and anxiety, as the next two sections will show.

8.4 The politics of collaborative knowledge-making

In a previous section, I reported a participant describing mathematics collaborators performing the process of collaboration despite the frustrations they felt in the context of the collaboration (because they perceived the problems they were working on as more important than their frustrations). I explored this tension between what is projected as important and what is experienced as problematic in subsequent participant interviews and found another participant who drew a similar analogy with regard to fore-grounding what is rationalized as “good” and backgrounding what is problematic. However, s/he spent more time dwelling on the implications of this tension than in the mathematician example. Here is what the participant said:

[T]he most prevailing culture today is rhetorically a collaborative one and you’re meant to work collaboratively. And people generally do. There are those which you butt up against,[with whom] you have differences of opinion. How you get out of a collaboration without upsetting people can be tricky…. You withdraw and you make up some excuse about why you withdrew. Time commitment is generally the favourite one, needing to spend more time with one’s family type of thing. So that’s how I kind of spin it. And arguably, as I said, what I try and do is work with those people that it makes sense to work with. And I’m still on the fence with some projects, pulling out with people and it’s a slow process. I’ve managed to pull out of one area where I was working. I’m connected in four ways and I’ve managed to pull out in two significant ways. But I’m
still hooked in two other ways. (Interviewer: And why can’t you pull out?) Because it would look too bad. For me, it would look like I was really not playing ball. So I’m having to grin and bear it…. And you know, when you get to the pub on a Friday and I’ve been drinking with my friend, we’ll talk about the back stage stuff. Which I’m trying to stop doing actually because it depresses me too much, the politics that go on.

(Interviewer: Can you give me some examples?) Oh you know, again it’s this issue that’s slightly annoying me about who gets credit in the collaboration. And there’s been problems over data ownership. It’s an authority thing. It’s an assumption.

Arguably the politics of collaboration have troubled this participant’s sense of identity and have impacted the way in which s/he experiences his/her work. Not wanting to appear as someone who does not “play ball,” the participant described going to great lengths to distance him/herself from problematic collaborations without making the interpersonal and political reasons visible. The metaphor in the quote brings to mind Goffman’s theorizing about social life as performance with “front” and “backstage” activities (Goffman, 1958). Maintaining a “front-stage” image of a team player and a collaborator are described by this participant as important in succeeding in a climate that places value on collaboration as a mode of knowledge-production (assuming that knowledge-makers are still evaluated on the basis of individual productivity). The dispute here about who controls the “rights to the dataset,” who will “get credit in the collaboration,” who will be author on a publication, and so on. The politics of collaboration are about the complexity of negotiations that take place in contexts where hierarchies are still operating as organizing principles. Despite these ‘politics’ (power relations), this participant estimated that almost 95 per cent of his/her work was collaborative and s/he attributes this to what she calls “the field”:

I think the field is meant to be a collaborative field. It’s one of the great ironies that the people working in the field are probably some of the most collaborative people I’ve ever worked with. Because there is a tension between collaboration and, you know, building your sort of empire or staking your academic claim and doing that. Yes, I’m collaborative. A lot of my stuff depends on other people coming to me and us working together. And I actually like working with people. And I think there’s a way of sort of sharing out the spoils, if you like. You rotate leadership on things, you know, so on papers there’s a sort of rotation…. You do the same, so it can be a win/win.
The problem for this participant is not that the epistemic field is so much invested in the process of collaboration, but rather that people working in this field “don’t seem to get it” that the “spoils” are to be shared, in this case, with the participant. When I probed about why this may be, s/he linked it to him/her not being a health professional and thus having less power in the relationship. S/he noted that s/he had been recruited because of his/her expertise. This was, arguably, something made possible by the rhetoric of diversifying perspectives. However, not being a health professional then interfered with his/her ability to lay claim to the “spoils” of collaboration. When working with health professionals, this participant identified varying assumptions about who gets to decide what knowledge is important in the context of a given project. These assumptions are not necessarily based on who has the expertise, but rather on “whose field this really is.”

Another participant also used the metaphor of “building an empire” to describe the knowledge-making strategy of pursuing a research program. Working in engineering, s/he described a shift that s/he perceived had taken place. Specifically, about 25 years ago, s/he recalls that it was considered problematic to want to “organize” your research activity and that of your students under the notion of a “research lab,” whereas now it is commonplace, and even expected:

When I started here in this department, if you did what is now so common (individual professors having their own research groups to which they give names, it [was] like you were trying to start a cell of Al Qaeda. They thought you were threatening: “S/he’s going off on his/her own, s/he’s meeting with his/her students, and s/he’s building his/her own empire” (laughing).

Nostalgic about the same period, a third participant, currently in a senior administrative position and also with a background in engineering, described the important role collaborative knowledge-making approaches have had in the way faculty experience their academic activity. S/he said:

There is no doubt that in the days when I was an Assistant Professor I would get a lot less money because there was less money available, but I had fewer constraints and less time wasted also. And once I got the money, I could do whatever I wanted with it. And it was really wonderful, for a creative person, to be able to do what you wanted to do. Increasingly now if you are a professor who wants to be successful at the university and
[considered] an active professor, you have to apply for many grants. You have to find companies to support your proposals. You have to find matching funds. You have to find students who will do the things that the companies want to be done. And you don’t necessarily want them yourself, but you have to justify the money you got and all the rest. So, it’s a little bit of a thankless job [now] and if I look at it from the point of view of my past experience, the beauty of being an academic [back then] was that I didn’t have all those constraints in my life. If I am going to [tie] myself to all those constraints and became a salesman or something, then I might as well go into sales and probably make more money.

In medicine and engineering lab managing (including securing funding) may preclude the opportunity to engage in the actual activity of researching. Thus, collaborations of the popular kind are critiqued as eroding the capacity of knowledge-makers to “be creative” in an unconstrained way (Slaughter & Rhoades, 2004; Strathern, 2000). This freedom is “eroded” by changing work requirements that include much more everyday time commitment to keeping the knowledge economy robust than engaging in conceptual innovation. In this context “facilitation” (or processes that enable researchers to engage in more collaborative knowledge-making activities of the popular kind) takes on the negative connotation of stifling creativity and turning thinkers into managers.

In a similar vein, another participant has avoided large collaborative grants altogether because, in his words, they “steep” him “in administration.” Yet, despite the “overhead” associated with engaging in collaborative research, judging from my participants’ comments interdisciplinary research still holds appeal. It is described as having the capacity to boost careers through large-scale research projects that attract funding and yield multiple presentations and peer reviewed publications (the classic markers of academic success). But these successes are not always experienced as positive accomplishments by knowledge-makers senior enough to have experienced the shift in their work requirements. Davies and Bansel suggest that the shift identified here is spreading across academic contexts, which in turn suggests restructuring and adjusting to the evolving expectations of staying competitive in the knowledge-economy (2005).

I have been arguing to this point that instrumental interdisciplinarity has its downside at the interpersonal and personal level in empire-building and managerial aspects. Conceptual
interdisciplinarity while attractive, also has its downsides in being time-consuming. In addition, several participants expressed the opinion that conceptual integration is not only difficult to achieve but also risky and problematic for an academic career. Consider for example the following example offered by a knowledge-maker working in medicine. S/he commented:

If I’m writing a grant proposal, I can’t be integrating everyone’s different points of view or different interests or experience. That’s never going to fly at the review level because they’re going to think we’re all over the place, which we tend to be a lot of times because that’s what we have to do to get the project done.

This comment is consistent with epistemic critiques of interdisciplinarity described in the opening chapters of this thesis. In this example, the participant had originally expressed a commitment to integrating everyone’s perspectives in the context of his/her collaborative work. However, this commitment is not easy to fulfill. The participant learned that while funding agencies promote integration in their calls, they do not necessarily validate integration when reviewing proposals. This is indicated in the participant’s comment, “they’re going to think we’re all over the place.” Even though, according to the experiences of this participant, innovative work may indeed occur when researchers try to “go all over the place,” this is not the type of research process that funding agencies favour. Another participant, working in engineering, learned through personal experience that projects labeled interdisciplinary might be projected to be interdisciplinary to fit the mandate of the funding agencies, but in practice brought together experts who were not that far from each other conceptually.

Alternatively, securing funding from different sources on a variety of different topics and projects might earn the label interdisciplinary, but because of the breadth and scope of their research, they are more managerial than conceptually interdisciplinary:

I can see some people being thought of as being interdisciplinary but if there is a person that is covering too many bases, you know it’s because the more bases you cover, the more areas you cover, the more possible sources of funding. Maybe you want to take a little bit more managerial role, you know managing things.
This same participant also spoke about the politics of having one’s research financed through industry. Drawing a distinction between the ‘skill set’ required to procure funding from a government agency and industry, s/he noted:

If you want to make a case to industry to get some funding, it’s very different than writing a proposal. Because … there’s all these mechanics of proposal writing that become important. Whereas when you talk to industry, they don’t care about all those things. They talk to them for a while and they feel that you have really good ideas. I mean, what I found is, there’s no standard: “Okay, now you come in with your application and fill in these forms,” you know -- it’s a lot more informal. The moment they feel comfortable and they can see that your knowledge is useful, they appreciate your knowledge then it all becomes easier.

However, while procuring funding from industry might be easier to finance his/her research, industry money carries less prestige in the academic community than for example Natural Science and Engineering Research Council (NSERC) grants. Thus, if a researcher turned too much to industry partnerships for financing, and did not secure government funding over several years, NSERC might close the door on the researchers\(^\text{21}\).

Interdisciplinary collaborative knowledge-making affords individuals the ability to affiliate with a variety of settings and benefit materially from these associations. Several participants described these benefits and I have reported them in the previous section. However, one participant acknowledged some material drawbacks with regard to working within a ‘facilitated’ research environment but not having a strong presence in any one of the institutional locations s/he works at. As s/he put it,

I’m noticing that being on the margins and not having administrative influence in the organizations where I work is beginning to frustrate me slightly because you’re not very visible. You have a very low internal face. People don’t know what you do, generally.

\(^{21}\) NSERC’s mandate is to fund individuals who can show they are consistently fundable (i.e. their expertise and productivity is valued and appreciated in peer reviewed competitions as evidenced from a string of successful NSERC awards), as do other federal granting agencies. There are also mixes of industry-granting council-competitions which contain elements of the “negotiations” with industry referred to above.
They see you occasionally pop in. But it means that you can’t do things and be more in control of your fate in these organizations because other people are doing that for you. And I have concerns about their abilities to do this stuff administratively. But what I’ve got in place of that, I guess, is an authority in the field and a high profile outside of the organization, which is good. But it still doesn’t give you the internal administrative kind of influence (my emphasis).

That is, having time to focus on research had come at a price: namely, not having significant input in decision-making within his/her institution. Without a strong presence in any one of the locations s/he is appointed to, this participant suspected s/he was, for example, passed up for faculty-administrative positions, which reduces his/her influence on short term and long term departmental decision-making… This participant’s experience thus takes on a disturbing dimension. While multiple appointments facilitated his/her ability to produce knowledge, s/he perceives his/herself as lacking the ability to define or shape the mandate of the organization. This comment also raises the question, how is the productivity of faculty who take on administrative positions affected? Do they have the chance or time to invest in the collaborative effort required to pursue interdisciplinary funding and research?

Looking through my archive, I found other examples of the above participant’s description of feeling somewhat outside of the decision-making process. It was also present in a prior study I conducted investigating PhD-credentialed researchers working within the Department of Psychiatry, University of Toronto (Martimianakis, Hodges & Wasylenki, 2009). Specifically, my colleagues and I explored the social dimensions of the science and clinical teaching interface in a large department of psychiatry, in order to understand the opportunities and barriers that might be associated with collaborative teaching approaches. Our findings showed that [p]articipants frequently made reference to a concept of “relevance” in constructing arguments about what should be taught and by whom. This appeared to function as a form of social negotiation of boundaries. Specifically, in several conversations it was argued that when a basic science becomes “clinically relevant,” it then ceases to be basic science. Through such interactions, a boundary was created around the clinical setting, limiting the participation of scientists in clinical teaching to their ability to render their research relevant to clinical practice. It also explicitly made the scientists responsible for
translating the science they generate into clinically-relevant knowledge or applications (Martimianakis et al., 2009, p. 244).

Our study concluded that complicating relationships between scientists and clinicians were prevalent perceptions amongst clinical faculty with regard to which disciplines were perceived to be more “relevant” to psychiatric practice than others. That is, the politics of relevance were particularly difficult for the social scientists appointed to the Department of Psychiatry to navigate. As we put it,

[our ongoing research has revealed that there are problematic attitudes among our faculty toward social science research, which arise from unfamiliarity with social science research methodologies and epistemologies (Martimianakis et al., 2009, p. 246).

We had speculated that the boundary-work taking place in the context of everyday practices within this clinical academic department had amplified in recent years with the diversification of the faculty in terms of research expertise. As a follow-up to this study, I later explored how the rationale for hiring more scientists from a breadth of disciplinary backgrounds, including the social sciences and the humanities, relates to the discourse of ‘interdisciplinarity’. The diversification of its faculty base, I would argue, has allowed the Department to tackle not only specific problems related to management of psychiatric conditions, but also to devote study to the determinants of psychiatric health, and the socio-economic dimensions for reaching and providing care to those who need it. This in-house diversification, structurally, made interdisciplinary research more likely, and in some respects easier to manage. The diversity in terms of expertise, training and research possibilities is materially represented in the way the Department is organized:

Each faculty member has an academic home in one of the Department’s 14 academic divisions or programs, each of which oversees the research activities of its faculty. Ten of these are clinically based programs (mood and anxiety; schizophrenia; psychiatry, health and disease; child and adolescent psychiatry; addiction psychiatry; law and mental health; geriatric psychiatry; general psychiatry; psychotherapy; women’s mental health) and four are specialized programs that cut across clinical domains (culture community and heath; health systems; education; and neuroscience). This matrix of clinical, education, basic science and public health foci dovetails nicely with the four major strategic initiatives of
the Canadian Institutes of Health Research (CIHR) – clinical research, global health, regenerative and nanomedicine focusing on genetic and rehabilitation sciences, and lifelong health focusing on cultural and environmental determinants of health over the lifespan (Department of Psychiatry, 2008, p. 12).

As the above excerpt from the Department’s annual report notes, its organizational structure facilitates the advancement of a research agenda, which is closely aligned to the strategic priorities of CIHR. I am not suggesting that this alignment has been contrived specifically in order to take advantage of funding opportunities. In fact, the organization of the Department has undergone very little change in the past 10 years. However, the diversity of its programming, and its sheer size in terms of faculty (over 700, one third of whom are PhD trained), has allowed the Department to capitalize on funding mandates that require partnerships that cross disciplinary domains. The following paragraphs articulate the strengths of the Department in terms of research output.

Currently, there are 17 Endowed Chairs and two Endowed Professorships in the Department. …. This past academic year the department attracted over $45 million in research funding, the majority of which is peer reviewed. This represents close to a 5% increase from last year…. In the academic year 2007-2008, members of the Department published close to 500 peer reviewed papers, over 50 book chapters and 13 books (Department of Psychiatry, 2008, pp. 12-13).

Despite the above research success (with a significant portion deriving from the activities of social scientists appointed to the Department), the politics of relevance intervene. Specifically, not all the knowledge produced within the Department translates into practice because of prevalent attitudes amongst clinical faculty as to what constitutes relevant knowledge to clinical practice. In the words of one participant interviewed in the context of a study examining attitudes and perceptions of social science research amongst educational leaders, while pharmacology and genetics are considered “critical” for operating a functional training program in psychiatry, hiring experts from social science fields is a “luxury” available only to larger departments which can finance this diversity as a way to “enrich the environment” (Martimianakis, Dewa & Hodges, 2008).
Thus, work contexts that diversify in order to innovate and respond to current socio-economic priorities, do not necessarily change existing power relations to suit the interdisciplinary shift. As the above example illustrates, not all knowledge is considered ‘relevant’ to practice and spending the time to work through ontological and epistemological differences is considered a ‘luxury’. The implication for social scientists working in such settings is that while recruited for their perspectives, they are left with the responsibility to figure out how to make their work ‘relevant’ in order to advance their careers. This is not always an easy task, and is a unique challenge associated with the way the discourse of interdisciplinarity has shaped contemporary collaborative knowledge-making. As examples in this chapter suggest, as interdisciplinarians embody flexibility in the context of their work (multiple work settings, different collaborators for different projects, etc.), the ability to challenge their institution becomes diffused. They operate as single professional entities, often on the margins of fields, with their professional identity constantly in flux, and little opportunity to develop a collective consciousness with their colleagues beyond a commitment to work collaboratively and respectfully.

This section has outlined several dimensions of the politics of collaborative knowledge-making which I have argued relate to the popular discourse of interdisciplinarity and the knowledge economy more broadly. I have theorized these power relations to be problematic and to hold several negative implications for the careers of my participants. Why then, despite these negative implications, did my participants continue to pursue interdisciplinary collaborations? In analyzing the responses to this question it became clear that the discourse of interdisciplinarity, as popularized, may be capitalizing on the researchers’ compliance with the mantra or desire to “make-a-difference.”

8.5 The politics of ‘making a difference’

Theorists see collaboration in the context of knowledge economy discourse as a form of capital (David & Foray, 2001; Olssen & Peters, 2005; Peters, 2003). Also, in the words of one participant, collaboration is “a style of being and working” that “resonates and does get taken up.” Why does it resonate with researchers? The comments of my participants echo the popular discourse that collaboration as a process is closely linked to areas of research that are considered very ‘valuable’ to society as a whole such as health care and the environment.
Participants touched on two dimensions of collaboration to which they ascribed a value: collaboration as a product and collaboration as a process. These dimensions were not mutually exclusive and not all participants spoke about them as separate and distinct aspects of collaboration. Collaboration as a product vs. process is worth exploring here in order to make visible the constitutive social relations linked to this discourse. Collaboration as a product relates directly to the commercialization ethos of the University. The following quote from a faculty member working in engineering describes interdisciplinary research as an opportunity to evolve applications of research that would otherwise be only conceptual. In his/her words:

> In image processing we have often had wonderful algorithms; we still have, and we were looking for important applications. So often we took image processing and we went to the area in which it was applied [medicine] and we found some interesting problems there and we tried to apply the [algorithms] to these problems through sharing the expertise of the experts in this area.

The researcher also discussed being marginalized because of interdisciplinarity that does not produce “outcomes,” though the tone of his/her interview, as shown above, was generally positive. While collaborative activity was not rewarded as a process in the academy, personal and social rewards that stemmed from collaborations were acknowledged. Several participants, in fact, resisted my attempts to rationalize collaboration in traditional academic terms as linked to a merit driven reward system tightly delineated within the contours of the academy. It wasn’t the focus on an outcome that was being resisted but rather what was perceived as an artificial separation of the process from the outcome in the way I was asking the questions. As one participant said,

> I think it’s both [outcome and process]. I think it is the outcome because…that’s what the whole point of it is…. But it is recognized that you really can’t get to that point unless you do have good working relationships and collaborations going on. And so I think they go hand in hand.

Participants also acknowledged the incompatibility of the social nature of collaboration and the individual nature of the academic reward systems, and articulated the benefits derived from collaboration in collective terms. Specifically, participants spoke of rewards that were implicitly defined as social rewards.
Complicating my analysis was the fact that the discourse of collaboration might be activated in my interviews through a discourse of social accountability, as in this comment:

I’m thinking in particular of a colleague of mine who has been collaborating with a number of people on different things [such as]…the Metro Police in developing a system for reconstructing facial features of unnamed, unidentified deceased people. And he’s invested a lot of time and energy in developing these great collaborative relationships but because it hasn’t resulted in any publications, I doubt that it will be recognized on his PTR. But I think what he’s accomplished over the last year or two is really tremendous.

Because of a rewards system that values individual accomplishments, collaborations are witnessed and seen but they are not necessarily ‘counted’. The institutional rewards system, now decades old, thus conflicts with a discourse that often equates academic outcomes with social outcomes. Arguably the problem is an over-reliance on numbers of publications and numbers of citations as measures of relevance. The “accomplishments” referred to in the above passage also evoke a positive emotional response in people committed to merging their academic activity with community service or other forms of social contribution.

Academic activity touches both knowledge producer and knowledge user at an emotional level and emotion here is governed specifically through a discursive shift in the types of research activity that are promoted as valuable. In the case cited above, the emotional satisfaction of participating in helping people reunite with their deceased loved ones is meaningful not only for the recipients of this knowledge but also for the producers as well as the bystanders such as other colleagues. The research materially helps resolve ‘real’ problems. While such activity may not be rewarded in the academy explicitly if it is not translated into an academic publication, it can carry intrinsic rewards that are reinforced socially. If as Gibbons (1994) suggests, the knowledge-production system is increasingly becoming diffused and decentralized as more and more sites outside higher education institutions develop the competencies to engage in knowledge-making activities, the expectation should be that rewards too will be generated through a decentralized model. In other words, as this discourse suggests, academic work conducted within the university need not be limited to rewards offered by the university or the academy.
A participant trained in the social sciences noted that the altruistic goal of “making-a-difference” through academic work was causing frustration to the science students s/he has been studying. This intrigued her enough to study the phenomenon further. In his/her words,

What I’m really interested in is this notion of “I want to make a difference” and the impulse thinking about that. The students that I have been interviewing struggle with this. They are either in the basic biological sciences or they are somehow in the applied sciences and technology. They struggle with that need to be [altruistic]; “I want to know if I’m making a difference.” “I’m getting frustrated if I’m not going to make a difference.” I’m very curious about that impulse to do good.

The participant went on to reflect that in the context of interdisciplinary work that purports to “make a difference” through collaboration of experts working across disciplines (the discourse I have labeled collaboration, diversity, integration, innovation), a particular identity of knowledge-maker is valorized:

[W]hat does it mean to be good and to give back inside of the sciences? What…model of ethic is that? What is the impulse to do good in society just so that you can see what then gets decided as the big questions? Because at different times, those big questions change. Right now the politically correct questions are to work on cancer -- that’s a big important question; climate change is a big important question. But just to know that is a moving social political formation [that constructs] academic identity as someone who can do good and make a difference…. All of that gets packaged up into innovation. So then look--you’re doing good by doing science.

The rhetoric is considered problematic for this social scientist because the types of questions that are currently considered meaningful do not have easy answers. And when knowledge-makers feel the need to “measure up” to this discourse, arguably they often feel frustrated. The social scientist went on to speculate that students and faculty in the natural sciences might be more “vulnerable” than those in the applied sciences, because progress in their fields is slow and often it is very difficult to project the relevance of their work. S/he thus drew on a classic argument from the basic-versus-applied debate to make the case that it can be problematic to try to make basic scientists operate under criteria that have evolved out of applied forms of research.
Drawing from my archive, I found other evidence of a disconnect between expectations for ‘relevant’ research. For example, in an article in the *Toronto Star* entitled, “Right idea, wrong illness: Red tape traps scientist,” the material implications of the requirements to make-a-difference is made in a profound way in the following excerpt:

Biochemist David Andrews and his small team of researchers were screening for molecules that would potentially be useful in developing a drug to treat cancer when they made an exciting discovery. “We got some very, very interesting compounds out of the screen,” said Andrews, a professor of biochemistry and biomedical sciences at McMaster University. “Unfortunately, they are completely useless for cancer work, but they might be very, very useful if you’re having a stroke. So what do I have to do? I have to lay off all the people, shut down the project, wait until Fall, apply for money to do heart and stroke research – because I’m paid to do cancer research - and then about this time next year, I might have funding and we could start the project again.” (J. Smith, 2009, p. A21)

The above narrative paints a vivid picture of a collaborative venture that provides an outcome (worthy in its own right) that is not the one the scientist’s funders are looking for. Innovation cannot be pursued in this case. The researcher and the research team as well as the individuals who have supported or facilitated their activity are directly affected. Indirectly affected are the units within which these individuals work and the patients who potentially could benefit from their findings related to stroke. The collaboration, as the author describes, would have to be dismantled only to be re-erected in a completely different configuration in order to pursue a line of research that stems from the same idea and led by the same investigator but that will appeal to a different funding agency. This is perceived as an administrative issue which “traps” the knowledge producer in unnecessary “red-tape” and stifles the creative energy of individuals involved in the project. Here, the actual process of collaboration is not projected as problematic; rather, it is the ‘governance’ of the knowledge-production work that is represented as interfering or acting as a ‘barrier’ to a successful outcome. Joanna Smith, the author of this article, went on to probe how Andrews makes sense of this bind. She writes:

Andrews says the situation points to a trend in research financing that sees money targeted to specific results instead of to basic curiosity–driven work that can lead to accidental discoveries and the fundamental knowledge of tomorrow.
Andrews thus draws from competing discourses (basic science and applied science) to make sense of his knowledge-making activities. The article goes on to report that while CIHR allocates in total more money to open competition awards than it does to strategic initiatives, overall, funding in strategic priorities is increasing more rapidly:

In fiscal 1999/2000, the CIHR issued 4229 grants and awards worth $252 million in the open competition and 602 grants and awards worth 24 million for strategic initiatives. In fiscal 2007/08, the CIHR gave 6067 grants and awards worth $510 million in the open competition and 2,408 grants and awards worth $229 million for strategic priorities. That means a 300 per cent increase in grants and awards and an 854 per cent increase in money for strategic initiatives compared to a 43 per cent increase in grants and awards and a 103 per cent increase in money for the open competition (J. Smith, 2009, p. A21).

Competition between different discourses related to knowledge-making (in this case rationales for pursuing basic science versus rationales for pursuing applied targeted science) create unique challenges for researchers caught in the crossroads. Thus, as current funding approaches are orienting to favour applied research, scientists who pursue basic science currently experience negative material effects of these changing arrangements. Also implicated are those individuals such as Andrews who attempt to bridge the basic and the applied in their everyday work. The above case illustrates that that conceptual work is very much affected by institutional processes. The case also helps problematize the discourse of ‘making-a-difference’ by drawing attention to the politics of relevance. In the case of Andrews’ research, a potential finding that could improve the care of patients with stroke is delayed because the funds provided to the research were earmarked for a different type of outcome. This scientist and his research team are held back from ‘making-a-difference’ because they ‘guessed’ wrong what the potential implication of their basic science research would be. This is a unique material effect that is related directly to the current governance structure of knowledge-production.

22 This example also provides evidence of a form of resistance to the popular discourse of interdisciplinarity and will be further analyzed in the next chapter.
8.6 Conclusion

In this chapter I have described the different ways that knowledge-makers who engage in interdisciplinary research acknowledge the ‘need’ to diversify and approach diversification in their research. The most often cited rationale for engaging in such research by participants working either in medicine or in engineering was to innovate. Diversifying took several different forms and was enabled by a number of new and evolving technologies. Several examples were cited that show different everyday practices linked to diversifying perspectives (sifting through literature from a number of different disciplines, engaging in research meetings to communicate differences in approaches and perspectives, negotiating different approaches to the dissemination of research findings to ensure that all members were ‘rewarded’ in their respective communities for engaging in the research, and working through frustrations about colleagues not ‘getting it’).

Institutional practices have also evolved a culture of facilitation that serves to reinforce collaborative forms of knowledge-making which was documented here. But, while supports and rationales are in place to encourage and motivate individuals to engage in interdisciplinary research, everyday experiences of participants exposed power relations linked to historically entrenched attitudes regarding what counts as relevant knowledge as well as reward systems that continue to value individual performance over team achievement. This, I have theorized, has affected the way interdisciplinarians approach collaborative knowledge-making. It also exposed another interesting phenomenon. The researchers continued to speak favourably about collaboration despite the challenges including lack of material rewards for engaging in collaborations that did not produce measurable outcomes such as publications or presentations, because they claim they are rewarded intrinsically by knowing they had made a difference with their work, despite the difficulties of actually determining this. These findings are similar to those of Davies and Bansel (2005) and connect the popular discourse of interdisciplinarity to a broader regime of practices associated with contemporary neoliberal rationales for economic development (Foucault, 2008).

The next chapter completes my exploration of how governance, discourse and subjectivity interrelate by looking at specific examples of how the popular discourse of interdisciplinarity is challenged, resisted or modified through everyday practices of knowledge-makers.
Chapter 9
Challenging, resisting or modifying the popular discourse

9 Introduction

Multiple rationales for interdisciplinarity are currently activated within and outside of UofT, as I have emphasized. These variations of and deviations from the popular storyline theoretically serve to support, challenge, modify or resist the popular discourse of interdisciplinarity. As described in Chapter 2, in analyzing the experiences of my participants, I looked for evidence of strategic deployment of the popular discourse. Specifically, I looked for examples of rationalizations for knowledge-making which included prescriptions about how knowledge-makers should pursue their work (‘ethics’) and how these prescriptions related to broader socio-political considerations. I also looked for examples of ‘resistance’ or attempts to modify the popular discourse of interdisciplinarity (‘agency’).

The goal of this chapter is to describe how knowledge-makers rationalize and bring about formal or informal challenges to the popular discourse of interdisciplinarity. In the process, I hope to show what resistance within a discursive structure looks like by drawing on the experiences of the participants as well as interdisciplinarians who have published about their experiences with collaborative knowledge-making. This chapter thus continues my discussion on the relationships among discourse, governance and subjectivity.

9.1 Methodological challenges: I could not ‘hear’ resistance

Numerous examples of different rationales for pursuing interdisciplinary research have been presented, beginning with my review of epistemic positions. Fundamentally, articulations of different rationales for, and theories of interdisciplinarity other than that which I have identified as the popular discourse (especially those which fall under conceptual or radical forms of interdisciplinarity), can be theorized as evidence of formalized or overt resistance or challenge to the discourse. However, having analyzed the epistemic positions of those who study interdisciplinarity before exploring participant experiences, made it initially difficult for me to see moments of resistance or strategic deployment of discourse. In my interviews, positive sentiments were expressed by all of my participants describing their interdisciplinary collaborations, even those that had not ‘worked’. Instead, I had been expecting to “hear”
participants voice a critique of the popular discourse or even to provide examples of explicitly
challenging the “academic capitalism” link which so strongly emerged in my analysis of policy
texts. Rather, I heard from individuals who took the challenges and politics of collaboration and
interdisciplinarity in stride and projected mostly feelings of accomplishment and satisfaction
when thinking of their careers and how they had evolved over time. Part of this can be explained
by the fact that I was interviewing individuals who were in secure and productive careers in
‘rich’ disciplines, they are i.e. in material terms, mainstream members of society as well as the
academy. I have also theorized in the last chapter that collaborative knowledge-makers, as do
many workers, build into their work intrinsic rewards rationalized with personal versions of what
it means to “make-a-difference.” In so doing, the interdisicplinarians could find meaning in their
work even if their employer or community of peers had not acknowledged these successes or
activities as meaningful with material rewards. This realization led me to look for evidence of
’strategic deployment’ of the popular discourse in participant experiences as a marker for both
articulations of personal rationales (ethics) and attempts to negotiate conditions that allowed
them to act on these rationales (agency). I theorized that the phenomenon of making meaning for
one’s actions that are based on intrinsic priorities constitutes a form of resistance—specifically,
not allowing a competing system of thinking or organizational priorities to compromise one’s
personal ethics and convictions.

When this connection was made, it became much easier to find examples of how the popular
discourse is challenged or modified through everyday practices. Specifically, I began looking
across my archive for examples of moments during which negotiations of power took place, and
found examples of the way the popular discourse was being challenged, modified or resisted
through everyday activities that otherwise seemed routine. These examples were raised in the
context of discussions regarding negotiating ‘barriers’ to engaging in collaborative knowledge-
making. Similar examples of negotiating ‘barriers’ to collaborative interdisciplinary knowledge-
making also existed throughout my archive of texts in publications or popular press articles. Two
of these which I will analyze here were authored by interdisciplinary groups working at UofT.
The following sections document my findings from both the analysis of texts and participant
experiences.
9.2 Negotiating subjectivity

9.2.1 Negotiating incommensurability of research goals

While there might be agreement on the perceived problem and even agreement on the approach to take, interdisciplinary research collaborations can stumble at various points. At such junctures the power struggles between disciplines are made visible. For example, incommensurability of research goals among researchers held significant implications for knowledge-makers and signified disciplinary challenges to interdisciplinarity. In such situations drawing on disciplinary knowledge-making to negotiate the conditions of interdisciplinary knowledge-making was a form of resistance which was prevalent both in my participant experiences as well as my broader archive of texts. (Drawing on non-popular interdisciplinary discourse is another possibility).

While participants may not explicitly have identified they were resisting interdisciplinarity, their actions can be interpreted to reproduce the dominance of disciplinary knowledge-making when the integrity of their work, their careers or other materials rewards were at stake. The following example shared by one participant who is a biomedical engineer appointed to a clinical department and cross-appointed to another science department is illustrative of this type of power negotiation.

The expressed goal of this participant’s research was “to create ‘smart’ (i.e. adaptive) assistive technology to alleviate conditions of disability.” Hence he worked in a clinical department. The end user of this research is the disabled patient who through this technology is enabled to manage his/her disability better and achieve higher forms of independence. In the participant’s account, s/he provides an example of a type of ‘barrier’ in evolving interdisciplinary work that s/he explicitly recalls having to negotiate and resolve:

   My…science [collaborator] wants to work on the theoretical model that we integrate with [the technology that we are evolving]; that’s what he wants to publish on, whereas I want to publish on the system as a whole and the clinical results and the importance of it for the user. So sometimes we butt heads when it comes to that. The way that I interpret the data may say one thing about the clinical significance. For example, that the technology did not work for this one particular client, and this is an important finding [for my field]. But then that makes his models look bad from a…science standpoint because I’m saying that essentially the models that he came up with are not working, and that’s a death wish
The disabled patient is argued to be a major stakeholder and assumed beneficiary of this participant’s research. In this account, the researchers too are poised to gain from a successful collaboration; they will gain by publishing and increasing their stature as experts in their respective scientific fields. The collaborators agree that the results regarding the interface between the user and the technology can be analyzed and disseminated from a variety of angles and have agreed to pursue dissemination to both clinical and science audiences. We can also infer from the excerpt that an important clinical finding disseminated in a clinical journal will have more immediate implications for disabled patients than a paper written for the science community. A potential successful outcome for the patients should make for a successful collaboration. There is no suggestion that there is disagreement between the collaborators on this point.

The point of tension in the above case results from the different standards of legitimacy and rigour evolved in their respective epistemic cultures. Specifically, what is ‘good’ science in one domain is irrelevant in the other. If the researchers had internalized the popular discourse of making a difference and if the ultimate goal of their collaboration were to solely improve the conditions of patients with disabilities, the solution would be to publish or disseminate the results in the most expedient way to reach the end user and both researchers would be rewarded for a successful outcome. But in this example, importing the standards and rigour of one academic field into the other has proven to be problematic for the academic knowledge-makers, as it could potentially compromise the status of one as ‘expert’ in his/her respective field. This tension arising out of trying to fulfill the interdisciplinary mandate while working within a disciplinary base came up regularly in my interviews. Similar examples can also be found in the literature that resemble the experiences of our two collaborators. These tensions are attributed to methodological differences, relationships of power, perceptions of what constitutes relevant knowledge and so on (e.g. Lingard, 2007; Robertson, Martin & Singer 2003). Especially problematic is the perceived incommensurability of applied and theoretical approaches. Both researchers want to make an impact in their respective disciplines and so in the end, the solution agreed upon was that the data must be analyzed and disseminated in such a way as to meet the requirements of rigour in both disciplines. The participant went on to emphasize that the two
researchers found a way to resolve their impasse through discussion. Ultimately, both papers were written and both scholars were able to make their mark in their respective domains. But a successful outcome for the end user does not always neatly translate into a successful outcome for the researchers. Interdisciplinarity in this case is closely aligned to the popular form I have been discussing throughout this thesis, namely the merging of different expertise applied to a common problem in order to make-a-difference. When the problem is solved, the collaboration will be dismantled, and the experts will return to their respective academic cultures. However, my analysis suggests that while the work takes place at the interface of their respective disciplines, their research is still managed under disciplinary rules, even when the popular rhetoric suggests otherwise. That is, diversification has allowed these collaborators to innovate. However, by choosing to split up their findings in ways that meet the markers of success for their respective academic domains, the innovation is not being integrated into practice. Arguably, in this case, innovation as a product is being thwarted by the actions of the participants who foreground the importance of disciplinarity over interdisciplinarity. The ‘butting heads’ the participant describes is also likely indicative of entrenchment within their respective disciplinary identities possibly necessitated by structures such as rewards systems, the prestige of journals that publish findings, and so on. Despite the perceived “barrier” in pursuing the collaboration -- the potential delay in the impact of the findings reaching the end user, the work has evolved and the participant described feeling a sense of accomplishment in resolving differences with his/her colleague and being able to continue ‘making-a-difference’ with his/her research.

The next example is of a failed collaboration. This time the “barrier” is perceived to be incompatibility of ‘personalities’. In the words of the participant:

We had an eminent scholar who is in movie-making but who lacks a lot of knowledge in engineering and he wanted to collaborate with a multimedia engineer who knew nothing about movie-making. And this collaboration did not work well because we had two prima donnas; each one considered the other one somehow more like an appendix of his work …. [W]e essentially had two sopranos who were singing their own songs and we didn’t have a melody. And when this collaboration broke down at some point, one of the two prima donnas, the artist, found a young engineer, who was not a prima donna yet. That collaboration is going well because…the young engineer is there to help the other guy
solve his problem and not to make a statement for himself. So I think it was more personality than discipline-based issue.

In this case, the original collaborators are presented as “prima donnas,” very successful researchers in their respective domains. We are unclear why they enter the collaboration, but we know that each holds a condescending attitude towards the role of the other, the term “appendix” suggesting assessing the other as supplementary or secondary to the primary goal. They never “harmonize” and eventually decide to disengage from the project and the collaboration fails. The participant recounting this example does not offer many details about this project. Unlike in the previous example, we cannot infer who the ‘stakeholders’ are. Researchers also do not have a ‘disabled patient’ or other serious problem or condition in the background to evoke emotional commitment to resolving points of disagreement. In this second example, the purpose of collaboration in comparison to the first example at first reading almost sounds frivolous. But when disciplinary power is taken into consideration, there may be more than an issue of incompatible personalities at work. Arguably, academics do not become ‘prima donnas’ in their disciplinary fields unless they are valorized as having a strong command over the rules of their epistemic fields (Bourdieu, 1988; Bourdieu & Wacquant, 1992; Knorr-Cetina, 1999). That is, their professional identities and status in their respective epistemic communities is closely linked to their ability to produce work that is perceived as legitimate, rigorous and of high quality by their peers. Thus, each ‘prima donna’ views the other as an ‘appendix’ to their research enterprise because viewing them in any other way could jeopardize their standing in their respective fields, through a loss of symbolic capital (i.e. status in the community of peers).

Working together poses the challenge of working outside the normalized rules of engagement in their respective fields, the same rules which they have served to consolidate through their knowledge-making activities, hence their ‘prima donna’ status. In this case, compromising on disagreements of rigour would be very difficult.

What are we to make of the young engineer willing to help the ‘prima donna’ solve his problem? Reportedly, the younger engineer, who has yet to arrive to the status of a ‘prima donna,’ does not mind acting like an ‘appendix’ in the collaboration. The young engineer’s career will benefit from an increase in number of publications, while the senior scientist’s sense of control over what constitutes legitimate science will not be threatened. Thus, underlying the success of this collaboration is the subject-position of facilitator. Here the facilitator is the junior engineer. The
collaboration seems to work because everyone knows their place in the hierarchy of knowledge producers. The challenge to the popular discourse of interdisciplinarity is not explicit. It is an implicit reframing of the role of expertise in the collaborative problem solving exercise using traditional disciplinary rationales.

A third challenge to current ‘authorized’ approaches to interdisciplinary research triggered by incommensurability of research goals was located in my archive in academic literature analyzing ‘barriers’ to evolving interdisciplinary research. Namely, in the article entitled “Negotiating the politics of identity in an interdisciplinary team,” a group of four social scientists engaged in a “collaborative research program for over five years” employ “sociological theories of power and knowledge” to explore their own personal experiences “of identity, conflict, team socialization, and knowledge-production.” They conclude the article with ‘lessons learned’ in the declared hope that other interdisciplinary research teams are better able to realize “the rich potential of their collaborative work” (Lingard et al., 2007, p. 501)

This example is more complex than the other two in that it simultaneously reproduces the discourse of interdisciplinarity by leaving unproblematized the ‘usefulness’ of team approaches to knowledge-making, while resisting what I have called the popular form of collaborative knowledge-making. The following excerpts show how the tension around goals was rhetorically positioned in the paper in a way that allowed the authors to appeal to conceptual forms of interdisciplinarity (as opposed to the popular one) as necessary and quite suited to the overarching goals of increasing productivity and making an impact through collaborative knowledge-making. First, the article examines issues of power and identity, but it is published in a qualitative methods journal, suggesting consideration of social relations should be part of the epistemology of knowledge-making. Extending or evolving methodology offers an opportunity to challenge the discourse of interdisciplinarity at the level of process, where it is most entrenched. But the authors are not making this challenge from a position of ‘newcomers’ or ‘outsiders’ trying to ‘fit in’. Rather they claim they are working from a position of success, as “established investigators” and they are clear about this in the paper. They note:

Following such premises for effective collaboration, we have enjoyed a collegial, productive research team, externally represented by multiple peer reviewed research papers. But internally, and carefully elided in many of our published reports, our team has
navigated critical tensions arising from our multiple identities and their evolving impact on research design, analysis, and reporting (Lingard et al., 2007, p. 502).

The phrase “carefully elided” triggers us to consider how the authors used the prevailing discourse of interdisciplinarity strategically to evolve a ‘strong research program’ over a length of time that was ‘positively productive’, attested to by their “multiple peer reviewed research papers.” This framing sets up the problems and tensions of group identity which are articulated in the latter end of the excerpt as areas that the scholars are “choosing” to now explore because they may offer insight into a broader social phenomenon. Immediately following the above excerpt is the following statement:

The issue of team member identity has received little critical attention in the qualitative methodology literature, its treatment largely confined to descriptions of differing backgrounds and personalities in research teams (Lingard et al., 2007, p. 502).

The reader then essentially is told that ‘this is not about us and how we get along with each other, this is about something bigger; it’s about what we are trying to achieve as a community’. The effect of this statement is to open a negotiation with a community of peers, which ends in a rationalization of the importance of looking at identity politics as part of team research dynamics. This abstraction of experiential information into the realm of theory reinforces categories of power such as ‘expert’ and ‘knowledge-maker’(D. E. Smith, 1990). It also mobilizes a broader challenge to discursive practices. It employs collective agency to challenge systems of power. The challenge is not only made by a group of four scholars, it is also made by the reviewers who sanctioned the article to be published and the readership of the journal who will potentially engage with the text. Contemporary methods are thus used to challenge contemporary ways of knowledge-production. As Lingard and colleagues write:

We intend this article to be multi-vocal, to evoke rather than elide the complexity of our team dynamic. Towards this end our article is organized around personal narratives from team members that we produced individually and discussed as a group over a period of six months…. Around these narratives, we began to weave relevant theories and accrue additional examples as we elaborated our understanding of our negotiations, not only with one another as particularly positioned individuals but also with ideological and organizational forces structuring our scholarly work (Lingard et al., 2007, p. 503)
Employing an auto-ethnographic approach and working from a constructivist paradigm, the authors abstract their experiences and infer from them as they would from study participants in one of their studies. They then proceed to develop theories about these experiences and distil elements that can be generalized to other contexts. In their words:

> If teams can explicitly grapple with conflicting structural demands, such as differing degrees of research emphasis across faculties, the team can not only accommodate these structural factors, but also challenge them (2007, p. 515).

The theory is used to legitimize the critique. Unproblematic, the authors argue, team approaches to collaborative research reproduce processes that are evolved through disciplinary structures. What the authors propose is embedding critical reflection in collaborative research methodologies. The resistance is embedded in a reaffirmation of current approaches to collaborative knowledge-making with the proviso that researchers keep in mind that

> [c]onstructing knowledge as a group means that we tell different stories from those we would otherwise, so we must be conscious of this and reflect on why we tell the stories we do (Lingard et al., 2007, p. 516)

The authors thus employ conventional meaning-making devices (reviewing literature, positioning research, explicating methodology) and technologies (theory making and peer review publication) to make at least partially visible how knowledge is constructed and the implications team approaches have in the way academics make meaning and negotiate their identities and positions in society. According to this narrative, interdisciplinary research is not only about bringing together experts from various fields to solve a complex problem. Their analysis of interdisciplinarity is about how we create meaning and how knowledge shapes the way we experience the world and our social activity. This challenges directly the discourse of interdisciplinarity in its most prevalent form. These examples here have all been about research goals while the next section describes power relations and negotiations around the “valuing” of interdisciplinary work.

### 9.2.2 Negotiating the ‘devaluing’ of interdisciplinarians

In this fourth example of what I am calling resistance to popular interdisciplinarity, another form of power negotiations can be observed as interdisciplinarians react to prevalent assumptions that
interdisciplinary research is not ‘rigorous’. In the process, they advocate for what can be considered a modification of the popular discourse, as I have identified it. Authors engaged in a large scale collaboration on genomics policy involving scholars from philosophy, law, management, medicine, public health sciences, social sciences, and molecular biology argue in an article entitled “Interdisciplinary research: putting the methods under the microscope,” that interdisciplinarity can be made rigorously accountable and productive if methods of collaboration are made more transparent. As they argue,

[b]ecause the process of collaboration itself determines the premises of a research project (namely how a phenomenon is conceived of and the ways it is to be apprehended), not reporting on the methods of collaboration make it difficult for others to assess the validity, reliability, trustworthiness of data collection and inferences, and to build on the methods of earlier groups (Robertson, Martin & Singer, 2003, p. 3).

Staying within a positivist paradigm, the authors call for expanding methodological approaches to collaborative research to include a focus on process. The focus on process is meant to testify about how competing discourses can be co-constituting. The discourse of accountability is evoked to incorporate considerations of process. What makes this example different from the previous is the rationale and motivation for engaging in the negotiation of process. That is, the focus on the process is not intended to make visible the politics of science-making – that knowledge is constructed through interaction and that different starting points will evolve different constructions. Rather, the focus is on creating “rigorous methodology”. As the authors write:

Of course the nature of collaboration will differ according to the research question, and the other premises of a given project. Our example merely illustrates an attempt to make interdisciplinary methods explicit. Explicitness allows others to replicate the work, and make different design choices, and learn from the evaluation of the process (Robertson et al., 2003, p. 4).

Interdisciplinarity in this narrative provides an opportunity to evolve new epistemology, but the ontology of ‘rigour’ is not challenged. Nature and phenomenon are to be explained, theories are to be generated and replicated, and processes ultimately controlled. How will this be achieved?
By mobilizing traditional mechanisms of entrenching the authority of expertise in the academy, the authors argue,

[t]he actual work of interdisciplinary groups of researchers on specific projects should be observed and analysed. If this were routinely done, we would have a system for continuously improving interdisciplinary methods. Funding agencies, academic institutions and journals could promote this by requesting that interdisciplinary teams document and reflect on their collaborations, as part of their documentation of methods and in the discussion sections of papers, respectively (Robertson et al., 2003, p. 5).

The focus on “replication” moderates the degree to which popular interdisciplinarity will bend to resistance from competing paradigms. Unlike the Lingard et al. example, these authors are not interested in discussing how the research team experiences collaboration in their projected motivation for modifying the way collaborative knowledge-making takes place in their context. Consideration of team experiences might have been an ongoing consideration of the collaborators as they worked on the research. However, the text insists that the topic of team relationships was secondary to establishing a rigorous process for interdisciplinary research. The resistance engaged in by these authors, then, is not to the totalizing effects of entrenched disciplinary approaches to knowledge-making. Here the resistance is to perceptions within the academy that interdisciplinary research is not ‘rigorous.’ In the process, instrumentalism is valorized and reaffirmed through conventional meaning making technologies.

Along the same lines, I found a number of examples of how participants resisted activities, processes or interactions that challenged or did not fulfill their personal ‘ethic’ about how to engage in interdisciplinarity. These are presented in the next section.

9.2.3 Interdisciplinarians and facilitators negotiating ‘space’, ‘rewards’ and ‘recognition’

Participants talked about negotiating through everyday practices better working conditions or rewards, or in general, generating more space for engaging in interdisciplinary collaborations. As described in the previous chapter, they were keenly aware of different expectations associated with collaborative work in different settings. This awareness of how expectations were culturally constructed was presumably facilitated by the fact that almost everyone who I interviewed held more than one appointment or had worked in more than one academic environment. As already
described, this shifting from setting to setting presented challenges to the participants, but also afforded specific agency in the form of opportunities for advancement. This freedom, as I have labeled it, might allow them to strategically use the prevailing discourse to ‘avoid’ work that was not ‘research’ (if their personal priorities were to conduct research, and not to teach or engage in administration) or to pursue projects that were most appealing, personally rewarding or overall could contribute to their career success. They might also experience an increased capacity to choose those with whom to collaborate which was afforded by their multiple affiliations. They also talked about having the choice to turn down invitations to participate in projects even if a powerful peer made the suggestion for the collaboration. They claimed they could also choose to withdraw from projects that proved to be too problematic. This allowed them to engage in collaborative activities which suited their personal ethics around what it is to be interdisciplinary.

An example of agency can be seen in the following participant interview excerpt in which a faculty administrator (not currently working at UofT) describes the changes s/he and colleagues advocated for and successfully negotiated in their formal work requirements. Their successful negotiations allowed them to more effectively pursue their knowledge-making activities, including taking on larger scale interdisciplinary projects, without suffering the consequences of trying to fulfill the mandates of contemporary knowledge-making. As s/he put it:

“When [X university] became a comprehensive university, we were able to negotiate a better workload. We facilitated researchers to reduce [their] teaching [loads] in order to succeed in their research. People ask me how did you do it at [X university]? Because [X university’s] kinesiology history is a very successful history and I was part of the redesign. I was part of all the negotiations and I’m proud to say that we are one of the top universities right now in research and teaching in that field. So people ask me, how did you do that? And the answer is: we were willing to reduce workload to facilitate researchers, and encourage innovation in research and participation in research. The day has only so many hours and our energy is also limited. We are not wonder people.

Thus, by reproducing aspects of the popular discourse, the above knowledge-makers were able to strategically modify the rationales of diversification at their institution to delimit notions that knowledge-makers can engage in a multitude of activities effortlessly. With this political action,
they successfully advocated for a re-thinking of the standard model of a tenure track appointments.

Another example of agency and resistance can be found in a case described in Chapter 8. Specifically, in describing the politics of relevance, I mentioned the experiences of the basic scientist whose research unexpectedly yielded findings that were not in alignment with the strategic priorities of his funders. This example also provides evidence of a form of resistance to the popular discourse of interdisciplinarity. The academic chose to make his experiences public by agreeing to be interviewed for a newspaper article. In the process, he used his personal experiences as a knowledge-maker to bring awareness to the public about the potential stifling of innovation that occurs when research-funding opportunities become targeted to specific strategic priorities. As a result, contemporary forms of collaborative knowledge-making may be troubled, in that those who read about this scientist’s experience will have the opportunity to question the popular discourse (such as claims that targeted funding of large-scale collaborative interdisciplinary programs of research will yield better solutions to complex problems, such as cures for diseases, at a faster rate).

In the context of facilitating interdisciplinary work, administrators spoke about using internal funding arrangements to counter pervasive attitudes towards the ‘softer’ sciences or the arts and the humanities. One faculty administrator (also not currently at UofT) spoke extensively about the problems faced by some faculty in the arts and the humanities at his/her current institution who do not produce academic papers or books as part of their scholarly output. (Performing arts departments have not fully complied with requests to develop performance indicators of success and face negative attitudes of the relevance of their work amidst basic or applied scientists.) Not having performance indicators, the administrator-facilitator feared might only perpetuate impressions in the minds of basic and applied scientists that artistic forms of knowledge-making are not relevant in scientific inquiry. In his/her words:

Well, I guess [scientists] feel that faculty in the virtual and performing arts, etcetera, are not…considered equal partners with engineering, which of course is carrying the big dollars in research. There is this dichotomy. I am trying to break these barriers by creating interdisciplinary grants, and creating groups of people that work together even though they come from different disciplines. We have been successful in some of that.
Using his/her current power as a high level administrator, this participant describes creating ‘interdisciplinary grants’ to encourage faculty from across the university to apply for funding for projects that are interdisciplinary and that bridge the arts and the sciences. In the process, faculty members in sciences would have the opportunity to see the ‘benefit added’ of working with faculty from the arts (and in the process, the relevance of their activities). Faculty in the arts, for their part, would engage in traditional academic forms of knowledge-making that were more readily recognizable as legitimate outcomes. In the above example, the facilitator promotes a strong articulation of the merits of engaging in contemporary forms of knowledge-making and possibly not for the purpose of generating marketable innovations only. Also embedded in this administrator’s rationale is an explicit strategic use of the discourse of interdisciplinarity to counter the perceptions of a “two tiered faculty” that s/he perceives were created by groupings of faculty who “bring in” the funding in his/her institution, such as the engineers who “produce scholarship” versus those who do not. While the popular discourse is being reproduced through his/her administrative practices, the rationale is being modified in the process and an appeal is made to flatten damaging hierarchies created by the politics of ‘relevance’ within this academic setting.

Despite the evidence for promotion of interdisciplinary research, participants reported many problems associated with obtaining funding and then conducting interdisciplinary research. For example, one participant described encountering difficulties early on in his/her career in obtaining funding, because there was no clear “home” for the type of research s/he was evolving. S/he has applied to all three Canadian funding councils -- NSERC, SSHRC and CIHR-- and has been rejected by all three at different points in his/her career, but has also been funded by all three at other times. In trying to make sense of these experiences, s/he noted the following:

Well, all the agencies claim that they support interdisciplinary research but they don’t do it. They talk a good game but nothing is done. Even today, if you submit an interdisciplinary project, chances are it will not be funded…because, the project will [be perceived] not to have much ‘depth’. It will have breadth but not ‘depth.’ So it is very easy to find flaws in an interdisciplinary project, much easier than having a lab based, straightforward project.
Here the participant is describing the perception which is classically reproduced in epistemic critiques of interdisciplinarity, namely, that research that purports to explore a phenomenon from a broad perspective will lack ‘depth’. The participant protests that funding agencies *say* they promote interdisciplinarity, while favouring ‘deep’ or specialized research. This s/he has gleaned from the reviewer comments s/he has received in the course of her career. The stance of the funding agencies can be seen to be a type of structural gate-keeper for the popularized discourse of interdisciplinarity. However, according to this participant, SSHRC has over time shown “improvement” in their funding of interdisciplinary proposals. Contributing to this participant’s awareness of the “politics” of the funding Councils are two types of proactive activities: agreeing to becoming a reviewer for all three funding councils and participating on two CIHR committees. Through these activities, s/he has gained experience dealing with the “politics” of each council and a “feel” for their cultures. As s/he describes it,

I’ve been reviewing for all the Councils but I have been involved with two committees of CIHR. So I have sat around the table. So funding is limited and at least from what I have seen sitting around the table and being on the committee, you receive as a committee by far more good applications than the number you can fund. So you know that you cannot fund [all good] research proposals…. So it comes down to a completely random selection because when many are good and you know you cannot fund all the good ones, then it’s also random selection. So there is randomness in the process of grant selection. And there is also a lot of politics because everybody wants their university and their institution to get more [grants], of course. But there’s also a sincere difficulty in choosing who (when you know that there are many that are good ones). So interdisciplinarity becomes the bottom of this race because [compared to disciplinary proposals], they seem less convincing…. There [may be] nobody around the table who…does interdisciplinary [research] either, so there is a big difficulty to even appreciate that kind of research.

Having realized these prevalent attitudes regarding interdisciplinary research, this participant actively promotes the merits of interdisciplinary research proposals whenever the opportunity has been afforded him/her as a reviewer. This participant can be seen to explicitly use a routine academic activity, peer reviewing, strategically, first to learn how the funding councils work to become more successful at procuring funding for his/her own research, but also to contribute to a
cultural change by countering the resistance of disciplinarians and embracing the merits of interdisciplinary research. According to this participant, now keenly aware of the politics, funding councils need to stop reproducing “rhetoric” without engaging in meaningful structural changes in their administrative processes:

I mean they either have to include interdisciplinary researchers in their peer review committees, or they have to stop faulty advertising that they support interdisciplinary research. Especially CIHR and NSERC --I think they have no intention for [supporting] interdisciplinary research, at least what I’ve seen until now.

This participant experienced the material effects of disciplinary and popular interdisciplinary discourses. In the process, s/he became aware of the politics and began a process of reflection that has allowed him/her to make more informed choices about where to apply for funding, who to collaborate with, and how much time to spend ‘educating’ people on the merits of interdisciplinary research.

9.3 Conclusion

This chapter completed my exploration of the process of subjectification. I explored specific examples of personal negotiations of points of tension, perceived ‘barriers’ to knowledge-making and power relations as experienced by participants engaged in collaborative interdisciplinarity. By identifying the different ways individuals challenge and modify popular discourse to fulfill their own personal rationales of ‘making-a-difference,’ the ways in which discourse, governance and subjectivity are co-constituting were indicated. I concluded that interdisciplinarity in its popular form is a facilitating discourse. It allows knowledge-makers to strategically use collaborations, partnerships and administrative processes to promote new (or old) ways of knowing and of doing. I also concluded that as any discourse, it allows for partial uptake. This flexibility makes it appealing and productive on an individual scale and facilitates enough activity across different domains to ensure its reproducibility. The next chapter will conclude this thesis with a summary of the key findings and a discussion of the implications of this research.
Chapter 10
Implications and reflections

10 Introduction

There is no doubt that in the days when I was an Assistant Professor I would get a lot less money because there was less money available, but I had fewer constraints and less time wasted also. And once I got the money, I could do whatever I wanted with it. And it was really wonderful, for a creative person, to be able to do what you wanted to do. Increasingly now if you are a professor who wants to be successful at the university and [considered] an active professor, you have to apply for many grants. You have to find companies to support your proposals. You have to find matching funds. You have to find students who will do the things that the companies want to be done. And you don’t necessarily want them yourself, but you have to justify the money you got and all the rest. So, it’s a little bit of a thankless job [now] and if I look at it from the point of view of my past experience, the beauty of being an academic [back then] was that I didn’t have all those constraints in my life. If I am going to [tie] myself to all those constraints and became a salesman or something, then I might as well go into sales and probably make more money.

This participant, quoted previously on page 262, clearly describes an awareness of a changed topography for academic work, one that assumes that education is related to market imperatives. His/her comment captures in a very succinct way the phenomenon I have been studying– that is the shift in rationales from making knowledge for the sake of knowing to producing knowledge for the sake of social and economic prosperity.

As I have argued throughout this thesis, studying institutions and knowledge-makers who construct their identities through articulations of ‘collaboration’ and ‘interdisciplinarity’ is an entry point to studying the larger phenomenon of globalization and the knowledge-economy, its proponents and critics. In other words, the university can be seen as only one of many ‘stakeholders’ engaged in knowledge-making. In many ways, collaborative approaches that extend the activity of knowledge-making outside the contours of academic centres challenge the status, role and perhaps the legitimacy of the university.
The situated archaeological and genealogical inquiry which I undertook for this research allowed me to make visible the social relations of collaborative knowledge-making as well as to articulate possibilities for strategically using the discourse to effect change. The results from this project contribute to the literature on subject formation and agency and address a gap in the sociology of the professions and the literature on academic capitalism and knowledge-production.

This final chapter consists of three sections. The first section will provide an overview of the topics discussed and a summary of the key findings of this research. The second section will discuss the theoretical contributions of this work. Finally, I will end with my personal reflections on the topic, including my experiences conducting this research, the implications the findings have for the way I understand and perceive my role at the University and my thoughts about future investigations.

10.1 Summary of Results

In this study, I used a Foucauldian approach to explore the social relations that maintain the visibility of certain forms of knowledge-production while obscuring others. I have looked at interdisciplinarity as a discursive ‘event,’ tracing in very broad strokes its emergence and its conditions of possibility. This was followed by an analysis of the ‘interdisciplined subject’ in the context of the University of Toronto. At the level of subjectivity, I posited that gender, race, class and other intersections of subject-positions find articulation through negotiations of power about ontological and epistemological issues. It is at the intersection of these negotiations, I have argued, that one can glean not only how a particular discourse operates, but also how it is experienced.

In the opening chapters, I outlined my problem space and how theoretical considerations impacted methodological decisions. The epistemic discourse on interdisciplinarity was explored through an analysis of my archive of academic literature on the topic of interdisciplinarity, revealing hierarchical relationships regarding what counts as knowledge. Chapter four continued the exploration of my archive (including texts and lived experiences) to demonstrate how I came to identify the discourse of interdisciplinarity and the statements that make it up in its most ‘popular’ form. I argued that subjugated discourses of interdisciplinarity exist alongside the popular story line. I also described the emergence of interdisciplinarity at UofT and introduced the symbols of interdisciplinarity embodied by my study participants. These definitions/symbols
of interdisciplinarity were organized into a typology of sorts to show how discursive symbols of interdisciplinarity can be loosely associated with theoretical choices. Finally, these concepts and discourses were linked to the broader socio-political context by identifying globalization and neo-liberal economics as the discursive formation of the popular form of interdisciplinarity.

The beginning of the section on governance explored the discourse of interdisciplinarity in the context of governing knowledge-production showing how the role of the university and its function in a broader system of knowledge-production has changed historically. Discontinuities in the dominant linguistic and material symbols linked to knowledge-production were documented and significant moments in the socio-economic history of Canada related to the system of higher education were identified. The emergence of interdisciplinarity in its contemporary popular form was located in the 1960s. The popular discourse of interdisciplinarity was then shown as circulating and reproducing hegemonic processes starting with an exploration of how OECD policy relates to the role of knowledge-production in nation-building. My analysis of OECD’s take on the contributions that can be made through collaborative knowledge-production approaches (interdisciplinary approaches) documented how these positions appear regularly in key documents produced by government organizations supporting or guiding higher education practices in Canada both at the federal and provincial level.

The final section of the thesis returned to the profile of a research-intensive university in the global economy, first described in the introductory chapter detailing what is currently expected of a research-intensive university and the processes by which universities must ‘account’ for their activity. A short genealogy of the discovery of insulin was presented to show how the popular discourse of interdisciplinarity is linked to discourses of ‘expertise’, ‘accountability’ and ‘making a difference’. UofT’s policy on interdisciplinarity, the current institutional arrangements linked to collaborative knowledge-making and their limitations and their possibilities were then described. A short case study featuring the creation of MaRS and its role in enhancing and facilitating the ability of knowledge-makers to fulfill the popularized mandate for collaborative knowledge-making was presented as an illustration of how discourse impacts organizational restructuring.

Central to my exploration is the assumption that popular and pervasive discourses are mutable and that change can be most readily perceived at the level of individual interaction and in the
performance of everyday activities. The focus on UofT’s institutional identity together with the individual experiences of knowledge-makers there demonstrated how discourse operates through structure and interaction and the material effects of these relationships.

In my overview of the world of the ‘interdisciplined’ subject, discussion shifted to the impact that changing rationales have had on the way knowledge-makers approach their work and identities. One chapter focused primarily on the many different ways individuals projected their identities as interdisciplinary or are recognized as being interdisciplinary, including in direct opposition to the popularized version. Also shown was how participant rationales can converge but also diverge with any number of different theories for engaging in interdisciplinarity. I argued that collaboration operates as a process of facilitation within the popular discourse of interdisciplinarity. Individuals occupying the subject-position of facilitator create bridges between producers and users of knowledge, between resources and knowledge-makers and between disciplines. I concluded that collaborative forms of knowledge-making are currently implicated in management approaches that capitalize on the value individuals place on ‘making a difference’ in medicine and engineering. This affects the way researchers conduct their work and communicate their findings. It also affects the way research-intensive universities account for their activities to ‘stakeholders’.

Discussion of the various ways that the popular discourse of interdisciplinarity is challenged, resisted or modified shifted focus back to the theoretical considerations introduced earlier and the tensions exposed in my analysis of the epistemic discourse. I argued that the relationships among rationales, organizational practices and subjectivity are dynamic, constantly shifting and mutually constitutive.

10.2 Theoretical contributions

10.2.1 A method for conducting a situated archaeological and genealogical inquiry

Entering exploration at the level of a discursive concept provided the opportunity to simultaneously explore rationales and their social relations at the systems, institutional and individual levels. It was also very challenging. I have only been able to draw into this analysis a fraction of my total archive.
There are a number of unique elements of my approach to studying discourse, governance and subjectivity. For example, I intentionally entered this exploration at the level of a discursive concept which allowed me to simultaneously explore rationales and their social relations at three levels: the system, the institution and the individual. To do this, I combined a Foucauldian discourse analysis approach with a modified lived experience approach.

In the process I was able to explore the strategic deployment of discourse, as well as its materiality as experienced by knowledge-makers caught up in the popular discourse of interdisciplinarity. As the systems level, I showed how everyday administrative practices, such as those engaged in by the OECD in the context of collecting statistics and developing recommendations for improving socio-economic productivity of its members, contribute to the circulation of neo-liberal discourse and influence collaborative knowledge-making in Canada. Interdisciplinary collaboration is facilitated and promoted by federal and provincial governments as well as by the University. As a result, some individuals engaged in popular interdisciplinary collaborations are also inadvertently promoting neo-liberal rationales for producing new knowledge for marketable gain.

As part of compiling the archive of texts for analysis, the analysis at the individual level was followed through by compiling separate mini-archives for each participant interviewed. The mini-archives allowed analysis of a much broader network of activity for each participant than is typical for phenomenological studies. It also led to formulation of a substantiated articulation of how I perceived that participants were projecting their professional identities prior to speaking to them. This perspective was then shared with participants during the interview, offering them opportunity to ‘correct’ my reading of their archive. My commitment to the phenomenological aspects of this research, and to ensuring that I was representing my participants in a way that they were comfortable with, were directly linked to my trying to make sense of my own professional identity. As Dehli notes:

The institutional practices and discursive forms through which policy documents constitute knowledge are implicated in and constituents of social relations of class, gender, race and ethnicity. They also produce conflicting subject-positions, although the manner in which subject-positions come to be taken up, or "embodied," is not given in advance (1993, p. 104).
Adding an exploration of how discourse is embodied and experienced is a unique approach that has allowed me to extend my analysis of discourse and governmentality of collaborative knowledge-production to its materiality and effects. It also allowed me to ‘read’ the experiences of participants through a critical perspective, highlighting in the process power relations and implications of the social relations identified in the Foucauldian analysis of the popular discourse of interdisciplinarity. This approach suggests a refinement of Foucauldian methodology that will allow a more situationally specific interpretation of discourse, governance and subjectivity.

10.2.2 Disidentification and reflexivity

In the context of studying subjectivity, agency and resistance, I drew on the concept of “disidentification” introduced by Tamboukou and Ball (see Chapter 2, page 23). According to these authors, disidentification is a continual interrogation of the conditions of our lives and a problematization of the stories we are told and that we tell (2003, p. 9). I initially planned to use this concept to study ‘resistance’. However, constructing and analyzing the archive, I realized the concept could also be used as a way to incorporate reflexivity into the research process.

Disidentification as reflexivity in the context of knowledge-making can be interpreted as the process by which the knowledge-maker studies him/her self as s/he studies others. Methodologically I did this in two ways. First, I chose to study a context and a discourse with which I was intimately involved. Second, I incorporated a lived experience perspective. In conducting this research I discovered that incorporating this form of reflexivity can be both productive and transformative.

Studying texts from different sources and perspectives offered insight into how UofT came to be a successful research-intensive university. I quickly found myself alienated by my ‘discoveries’, as I took note of the tarnished ‘enlightenment’ in which I have been reared, and the cracks in the ‘hallowed’ walls of progress to which I have contributed for close to 20 years while studying and working at the University. This sense of displacement, in retrospect, I can see as a form of disidentification. In problematizing the discourses of ‘expertise’, ‘making a difference’ and ‘collaboration’, I also problematized my role in academia and my choice to make a difference through knowledge-making. In deconstructing the rationales of the institution and its knowledge-makers, I was at the same time deconstructing my own rationales for engaging in academic work. And in troubling the environment within which I studied and worked, I was troubling my own sense of purpose. Similar to Dehli I began to “wonder how we move among discourses and the
positions they offer or withhold, and differently so” (2003, p. 140). The initial phases of this research were discomferring and challenging. The later phases, while also challenging, proved to be immensely rewarding, for after the initial sense of displacement came understanding and with understanding came empowerment. But I did not get there on my own. The productivity of ‘ethics’, in the Foucauldian sense, was not made visible until I began speaking to knowledge-makers. The 20 participants who generously shared their stories with me, showed me in their embodied discoursing how everyday practices can actually make a difference. I focused my analysis of their interviews not only on how they circulate or deploy research, but also how they experience their work. This allowed me to make visible an everyday materiality of discourse, which is not usually the focus of Foucauldian analysis. It also made me take note of the myriad possibilities afforded to knowledge-makers to pursue their own mandates of making a difference, and to effect change or impact the environment around them with positive consequences.

The positivity and productive potential identified by the majority of my participants was also in some ways troubling to me. I was well aware of the politics of knowledge-production, and the evidence accumulated over the past thirty years by feminist, anti-racist, post colonial and political economy scholars of academe’s “chilly climate” towards non-popular knowledges and perspectives, of the marginalization of difference and the stifling of diversity both conceptually and physically and the effects of these practices on faculty and students (Adams, 2000; Beagan, 2000; Haraway, 1989; Hunter, 2002; Muzzin, 2001; Muzzin, Baczynskyj, Vinci & Zankowicz, 2009). Similar to Dehli, I considered that part of the issue might be that I was too embedded and invested in maintaining the very discourses I was studying (2003, p. 140).

While it was beyond the scope of my study, I decided to also interview a few individuals who were not embedded in medicine and engineering. I did this, as I noted in Chapter 3, as another way to problematize my own location. Specifically, during the analysis of the interview transcripts I considered how I strategically deployed discourse in the context of meaning-making and was able to distinguish examples of how others resisted subjectification. This form of methodological reflexivity also provided insight to the process of subjectification and self-definition, an aspect of the materiality of discourse which would not have been made evident had I approached the deconstruction of the social relations of interdisciplinarity through textual analysis alone. In fact, it was in the context of conducting interviews with individuals working
outside my familiar context that I experienced the implications of what Butler describes as “imperiling the very possibility of being recognized by others” (2005, p. 23).

One of these moments was particularly transformative for me. I interviewed a social scientist who has held a number of administrative positions in the University and who had also engaged in critical interdisciplinary scholarship on topics related to medicine, but who did not work within medicine or engineering. At one point, the participant was describing interdisciplinary research undertaken in the 1970s that spanned departments and institutions. When I asked this participant if working with colleagues from other disciplines involved “working out differences in disciplinary training,” s/he made it very clear that the concept of ‘integration,’ as in the popular form of interdisciplinarity, did not apply to the type of collaboration s/he was describing:

No…. You’re 30 years ahead here. You’re not talking about the way it was at all. (Interviewer: Because integration is a big thing in some pockets right now.) Well it was utterly irrelevant at that point in time. The point was to try to come up with a coherent critique within, that was certainly trans-disciplinary in some way because of the issues, and I’m still doing it in a trans-disciplinary manner. Now in a quite different manner, of course, but once you look at the logic underlying many of the problems, you can apply it to any discipline. (Interviewer: So the logic could be applied to any discipline but were you assuming that there was a common starting point or that there could be a common starting point for all disciplines?) You’re asking questions which are coming out of the current situation. They’re not applicable. [Back then,] it was like you were looking at a concrete building with 100 metre thick walls made out of concrete and the height of the CN Tower and you had a little chisel and you were trying to make a little hole into that concrete bunker. That was our situation and you’re asking me if I looked at everybody else who was there chiseling away and we said hello and hi and let’s all chisel away and let’s see whether we can get a little hole in there that we can crawl through the 100 hundred metres of concrete, right?

In the context of this interaction, I became keenly aware of how I tried to constitute this participant’s identity through my own use of discourse. The participant very clearly resisted my labeling of his/her experiences with interdisciplinary collaborations as opportunities to “integrate” knowledge from different disciplines or opportunities to develop a “common starting
point.” I experienced this interaction as very difficult and uncomfortable because even when s/he gave me the example of her working together with others to chisel away at a concrete building, all I could see was the congruence of the effort and the possibilities of finding common ground. But my subsequent reading of the whole transcript offered insight into how the popular discourse of interdisciplinarity flowed through me as a researcher and more importantly, the ways in which this participant resisted my labeling. I was channeling expectations built into current approaches to interdisciplinary problem solving, as I perceived them: namely the rationale of ‘making-a-difference’ through pooling of expertise to solve a big problem. According to this participant, indeed there was a big problem that s/he and other critical scholars were “chiseling away” at, but it was not a “recognized problem.” That is, it was not a “strategic priority” for funding agencies or the academy and there certainly was not a critical mass of other like-minded academics to join voices with in order to make the issue a priority. The problems this scholar had tackled and the social justice work s/he has undertaken in the context were vastly different than the types of problems I was engaged in, and yet we both identified with critical approaches to research and social justice imperatives.

This interview, and particularly this segment of the interview, raised an important question related to my subject-position as a critical scholar working within the Faculty of Medicine and affiliated with an interdisciplinary research institute. What has made it possible for me to engage in critical scholarship within medicine at this point in time in a way that affords me the possibility to contemplate working across disciplines, integrating different perspectives (particularly critical perspectives) into medical education practice, and allowed me to use interdisciplinary collaboration as a modality to do so? Why was my experience so different than that of my participant? Would my participant acknowledge the work I was doing as ‘activist’ and would it matter if s/he (and other like activists) did not? Elsewhere I have argued that the capacity to collectively challenge institutional practices is mitigated when equity and diversity issues are too closely aligned with accountability practices (Martimianakis, 2008b). The connection between the opportunities afforded by the strategic and partial uptake of discourse for ‘making-a-difference’ and the implications for collectivization and social justice movements (including critical scholarship) will be further discussed below.
10.2.3 The governance of knowledge-production

My research exposed a specific regime of practices working to modify the relation of academics to their work. I have shown how the popular discourse of interdisciplinarity relates to neo-liberal knowledge economy discourse and how epistemic activities, including efforts to define, classify and evaluate interdisciplinary activity, contribute to the reproduction and promotion of one form of interdisciplinarity, closely associated with the OECD. The link to neo-liberal rationales was made initially because of this association with the OECD discovered in the analysis of epistemic discourses of interdisciplinarity.

Using what I have called a situated archaeological and genealogical approach (as described above), I explored how the discourse of ‘interdisciplinarity’ became a feature of university governance, contributing to the regulation and formation of subjects in interdisciplinary positions linked to medicine and engineering. The archaeological analysis I undertook revealed a specific recurring combination of discursive statements which seemed to contribute to a coherent narrative – a mantra of sorts. This mantra -- collaborate to diversify, diversify to innovate, innovate to make a difference, make a difference by integrating innovations into practice -- established a field of operation for being ‘interdisciplinary’ in contexts where the popular discourse dominated. While collaborative knowledge-making was not the initial focus, it became the focus when my analysis revealed that this mantra had collaboration as a starting point. I explored the relationships of these concepts with other dominant discourses such as accountability, excellence, expertise and also analyzed how they related to each other.

In the process, and consistent with a Foucauldian approach, I studied shifts in political, institutional and social rationales as they related to the role of education, the role of educators and the process of educating. I also explored the motivations of academics and administrators for pursuing their work in the way that they did as well as their experiences with fulfilling institutional expectations related to interdisciplinary knowledge-making. This analysis revealed a number of ironic relationships that characterise the new topography identified by my participants. In the context of promoting collaboration, competition for resources, rewards and legitimacy has increased. In the context of promoting diversity, normalization to one perspective is being encouraged. In the context of drawing in expertise from the humanities and the social sciences, technocratic solutions are favoured and promoted. In other words, my research has made visible how the applied sciences are privileged through reward systems which favour
outcomes over process and how specialization and associated dividing practices in education are promoted through collaborative approaches to knowledge-making that assume expertise is to be derived through disciplinary training.

Throughout this research, I have foregrounded the different ways in which the popular discourse of interdisciplinarity has been taken up and put to work in the context of UofT. The flexibility in thinking and doing called for by the popular discourse of interdisciplinarity allows knowledge-makers to project different identities in different contexts, but also to use the discourse to pursue their own priorities strategically, often linked to very specific rationales of what it means to make-a-difference. By linking the local to the extra-local I have made visible the importance of working through epistemological differences as a way to improve ‘team’ dynamics in collaborative knowledge-making.

In Chapter 4, I argued that discourses of ‘diversity’ and ‘integration’, component parts of the discourse of interdisciplinarity, have been taken up in such a way as to make possible both the popular forms of interdisciplinary knowledge-making and their critique within the University of Toronto. When interdisciplinarity is mapped onto a broader sociopolitical context, its links to globalized discourses and their technologies become evident. This research also made a connection between decentralized models of knowledge-making and distributed models of governance where oversight and responsibility for seeing through a process is divided across sectors. This can create opportunities for approaching the knowledge-making process with flexibility. However, it can also diminish opportunities to challenge decision-making and thwart the capacity of ‘stakeholders’ to collectively challenge overarching rationales. My work shows that while the popularized discourse of interdisciplinarity demands epistemological flexibility, rather than challenging the authority of disciplinary training, knowledge-making has instead become more de-centered as government and industry partnerships are normalized. Oversight of knowledge making is thus distributed and shared across sectors/institutions. What is generally perceived as an increase in freedom and flexibility in setting up cross sector and cross institutional collaborations, my research has shown, have actually resulted in a decrease in the capacity of academics to challenge decision-making and organize collective resistance to hegemonic practices.
I have also shown how the popular discourse of interdisciplinarity contributes to the normalization of expectations that the role of the university is to generate ‘useful’ and ‘relevant’ knowledge that is consumable. My research makes visible how historical asymmetries (i.e. what counts as knowledge, what forms of knowledge are used in decision making, how rewards related to knowledge are distributed, etc.) are reproduced through processes that serve to recode social mechanisms of exploitation. The most telling example of this is how the notion of acting in an entrepreneurial way is equated with acting morally, that is, engaging in knowledge making activities that help answer questions of social importance. Almost all of my participants embodied this aspect of the discourse.

I showed throughout this thesis how the process of domination (i.e. competitive gain through market advantage) is promoted through salvation metaphors of ‘making a difference’. Drawing from participant lived experience, I argued that a number of facilitative technologies have evolved that help academics fulfil the popular narrative, and which have inspired management approaches which capitalize on intrinsic notions of ‘making a difference’. In fact, a continuous thread throughout the thesis is the notion of facilitation - that is, specific administrative processes as well as attitudes and behaviours that enable knowledge-makers to pursue the logic of the dominant discourse. The interdisciplined subject is expected to be an expert, a flexible thinker, a team-player/collaborator, a multi-tasker, a facilitator and personable., though none of my participants felt pressured to fulfil a specific top-down mandate. This is not unlike what others (Davies & Bansel 2005; Davies, Gottsche and Bansel 2006; Dehli, 2010; Magnusson, 2000 and Walkerdine, 2006) have identified as the governing logic of neo-liberal states, where government takes an enabling role, providing individuals with the knowledge, powers and freedoms to take care of themselves. In the context of my work, the subject position of ‘facilitator’ is occupied by individuals and institutions who connect producers and users of knowledge, connect resources and knowledge makers and who bridge disciplinary differences.

The last two chapters documented specific ways that the popular discourse of interdisciplinarity relates to globalization and neo-liberal knowledge making including how the uptake of the popular version of interdisciplinarity is facilitated by rationales advocating for social responsiveness and accountability, such as calls for ‘making-a-difference’. My analysis of
participant experiences suggests that it is in the negotiations of these rationales that alternative forms of interdisciplinarity may gain visibility and allow individuals to negotiate careers which include space for transformative work and social advocacy.

In other words, I am arguing that the very conditions that have made possible the uptake of neo-liberal prescriptions of using collaboration to harness thinking for market advantage can prepare the ground for some forms of transformative work to take place within contexts where neo-liberal discourse dominates. And at the same time, the long history of critical scholarship conducted as part of social justice movements has made visible the many ways the social, cultural, economic and political are intertwined, preparing the ground for rationales that purport to harness market advantage to ameliorate social problems (such as the MaRS SIG group discussed in chapter 7). Facilitating these co-constituting practices, I would argue, are discourses of interdisciplinarity, which have uptake from both the left and the right of the political spectrum. However, more research is needed to make visible these social relations.

Throughout this research I have described the various ways the popular discourse of interdisciplinarity is being rationalized, showing in the process how common starting points can have different end goals and outcomes. I have also illustrated how a popular discourse may be dominating a particular setting while only being partially taken-up by individuals. Who, for example, can choose to diversify through collaboration in order to innovate conceptually, but not to generate an innovation or to challenge the status quo. Others may become implicated in the popular discourse as they try to innovate through strategic collaborations, and yet others as they try to harness its potential for effecting transformation and change. All of the above knowledge-makers will be recognizable as interdisciplinarians, since much of this effort will be conducted in the context of collaborative knowledge-making (the bringing of different expertise together) and collectively all will be contributing to the perpetuation of the discourse of interdisciplinarity. (Individually, of course, they may not experience the effects of the discourse as totalizing or hegemonic.) This flexibility afforded by the popular discourse of interdisciplinarity holds specific implications for equity projects, as the next section will describe.

10.2.4 Subjectivity and governance

While the first half of my thesis identified the scope and limits of the popular discourse of interdisciplinarity, the second half focused on its materiality, particularly how discourse is
resisted. To explore the materiality of the interdisciplined subject, methodologically I drew from Foucault’s later work and used the concept of ethics - that is, the strategic pursuit of individual notions of morality. This posed challenges on a number of levels. First, how does one draw out the co-constituting process of subjectification when exploring the effects of a discourse. On a more practical level, how does one ask people to comment on the effects of a discourse if they do not perceive the discourse to be operating on them – several of my participants for example did not identify with the term interdisciplinary, nor perceived their work to have anything to do with globalization or the broader socio-economic and political concerns which I have outlined.

I decided to focus on descriptions or opportunities for negotiating change in context where I had identified from archival analysis, the popular version of interdisciplinarity dominated. I also engaged in multiple readings of the interview transcripts. Once for evidence of how the popular discourse flowed through participants (that is when they reproduced the logic of the mantra in rationalizing their work and in projecting their identity). A second reading focused on moments when participants described as having the freedom to shape or change the environment of their work or they way they were perceived in the context of their work. These I came to see as moments of resistance or put another way, moments of agency – of working within the scope of operations of a particular discourse – to change its limits. The final reading allowed me to focus on examples where I was deploying discourse and reactions to my use of discourse. This reading operated as a form of methodological reflexivity drawing on the concept of disidentification introduced by Tamboukou and Ball (2003).

On the topic of subjectification an interesting finding emerged. I came to see subjectification as a dynamic process of forming and reforming consistent with forming and reforming of research relationships to generate new thinking promoted through popular interdisciplinarity. Participants, for example, spoke of creating opportunities to engage in research that inspired them personally and allowed them to make a difference outside the work they did to fulfill institutional priorities. In the process, the discourse is modified and changed through individual everyday practices, but cumulatively the results of sustaining neo-liberal agendas of economic progress arguably are still being pursued. The flexibility and potential at the level of subjectivity afforded by the discourse of interdisciplinarity makes engaging with it appear ‘safe’. That is, maintaining multiple professional identities in multiple contexts seemed to allow the strategic deployment of discourse for ‘making a difference,’ including critique of neo-liberal rationales. However, while evidence
of a partial uptake of this popular discourse afforded individuals the opportunity to make a
difference in their local context, they did so without compromising the overall neo-liberal
knowledge making agenda. In this regard, interdisciplinarity facilitates neo-liberal
governmentality as described by Foucault (2008), in that it succeeds in making social welfare an
individual responsibility by providing multiple opportunities for individuals to exercise
autonomy and choice as to how to make a difference. In the process, the overarching
assumptions built into the neo-liberal rationality, for example, that education is about preparing
the workforce and constructing consumable objects and subjects, is left unchallenged. Further,
my analysis suggested that equity issues are compromised by instrumental approaches to
collaboration that do not take into consideration different starting points. This is also exacerbated
by the lack of problematization of the discourse of ‘excellence’, which makes it difficult to
challenge epistemological racism perpetuated through the partial uptake of marginalized
perspectives.

While I explored rationales and their materiality as they relate to the popular discourse of
interdisciplinarity, I have not explored whether current popular approaches have delivered on
their mandate. For example, some of the study participants argued that federal and provincial
innovation programs have not yielded the expected results, and that interdisciplinarity as
operationalized within universities is not working. This may open up space for critiquing
rationales and renegotiating starting points with regard to what form interdisciplinarity should
take. This topic also has implications for the way we conceptualize the intersection between
institutional mandates and individual priorities.

The popular discourse of interdisciplinarity can also be perceived as a technology of governance.
The impetus to challenge the status quo through collective and overt resistance is mitigated by
everyday practices of renewal and transformation that are linked to intrinsic notions of ‘making-
a-difference.’ Understanding how this discourse works contributes to the literature on
collaborative knowledge-making and team dynamics. However, when operationalized, this
discourse does create challenges for knowledge-makers who wish to be interdisciplinarians but
who do not want to collaborate or who do not want to do it as ‘experts’ of a recognizable
epistemic field. Interdisciplinarians run the risk of being considered generalists without ‘depth’,
good at skimming the surface of topics but never the ones to go to when you need an ‘expert’.
Those who choose to work alone are marginalized by the popular discourse of interdisciplinarity
in several ways. Knowledge-makers who work alone cannot produce as much volume as those who work collaboratively. They also are challenged to secure the large-scale funding that research teams (in medicine and engineering) can obtain and this can have implications for their overall career success. This line of thinking is most appropriately studied through critical approaches that take into consideration relationships of power.

10.2.5 Perspectives on equity

As I have documented, instrumental or popular forms of interdisciplinarity can create competition and encourage dividing practices such as differentiation of institutions, specialization of training and so on, that then serve to reproduce historically entrenched hierarchies of what counts as relevant knowledge. My research provided some evidence that equity issues are compromised by instrumental approaches to collaboration and knowledge-making that do not take into account different starting points. However, this is an area that needs further exploration because while I explored the effects of neo-liberal politics on faculty careers, I limited this exploration to a class of academics who are in positions of power, have relative security and are recognizable discursively in terms of their activities, projected identity and aspirations in the context within which they work. As a result, the majority of my participants did not express what Walkerdine labels as border crossing – the internal struggles of ‘neo-liberal’ subjects engaged in projecting or resisting expectations associated with being “flexible thinkers” – as a debilitating challenge or barrier in their career (Walkerdine, 2006). Rather, as mentioned previously, they focused on the productive potential of working through barriers and differences. In fact, flexibility was seen and experienced in many ways as a position of power.

Similarly, while references to lack of time did surface in my exploration of participant work experiences, these references were not projected as negatively affecting knowledge-makers physically and psychologically in the same way that Davies and Bansel or Muzzin and colleagues describe (Davies & Bansel, 2005; Muzzin et al., 2009). The discourse of ‘excellence’ was not problematized throughout my research as both the University and knowledge-makers showed a steadfast commitment to the subject-position of ‘expert’. Furthermore, the absence of Aboriginal scholars in Medicine and Engineering was observed by participants but neither linked to the discourse of interdisciplinarity nor understood as a product of white Eurocentric epistemological racism. These issues offer an opening for further exploration by equity theorists.
In the context of medicine, for example, interprofessional approaches to education and practice (which I have argued are linked to the popular discourse of interdisciplinarity) are proliferating. The interprofessional movement is encouraging collaboration without purposeful consideration of relationships of power. As a result, professionals can be seen as asserting entrenched professional positions, thwarting in the process the collegial interaction interprofessional collaboration is supposed to encourage (Baker, Egan-Lee, Martimianakis & Reeves, 2010).

When do knowledge makers who work in settings where collaboration is encouraged or mandated assert their individuality? What rationales do they draw on to resist collaboration? Can critical approaches to research (that focus on making visible power relations) be implemented successfully in contexts with little or no familiarity with the historicity of these methodologies?

My research exposed an overlap between the popular discourse of interdisciplinarity and more radical forms of interdisciplinarity more closely associated with the social justice movement, suggesting that the answer to the growing popularity of critical approaches in medicine and engineering may relate to this overlap. However more research is required to make visible the materiality of competing discourses, in this case neo-liberal and social justice constructions of collaboration and making-a-difference.

Methodologically, the links between resistance to subjectification and intersubjectivity (shared experiences between people and agreements about knowledge) could be further explored, particularly in mainstream contexts such as the one I have studied. This connection is especially important for equity-minded scholars, as it could potentially reveal aspects of contemporary epistemological colonization now beginning to be documented. That is, instrumental forms of interdisciplinarity have produced contexts and forums where individuals from different epistemological starting points are working to produce products that make-a-difference through processes that encourage and facilitate a partial uptake of discourses. Intersubjectivity is thus accomplished as communities are created around a socially meaningful ‘outcome’. In the process, a certain familiarity (and favourable attitude towards) non-dominant knowledges and perspectives can be achieved (especially through knowledge translation practices) but the danger exists that this familiarity can create a favourable climate for currently non-popular knowledges and perspectives, without addressing the social, political and economic practices that have historically marginalized these perspectives in the first place. Thus, a partial uptake of social justice discourse in contexts such as medicine and engineering can potentially be read as a new
form of epistemological colonialism, resulting in subtler but no less damaging marginalization of perspectives (Hollenberg & Muzzin, 2010).

10.3 Personal reflections

As noted above, in the context of conducting this research I realized that my own knowledge-making was also implicated in fulfilling the story-line of the popular discourse of interdisciplinarity. My partial uptake of the discourse allowed me to pursue my own sense of making a difference for a marginalized population, social scientists in medicine, thus also fulfilling a personal commitment to equity work. I looked for specific examples of this in my previous research to include in my archival analysis and located one particularly explicit example.

In the fall of 2007, at a local interdisciplinary research symposium, I was asked, along with other conference participants whose work was to be presented in poster format, to perform a ‘one-minute wonder’ presentation to ‘promote’ my poster. The ‘one-minute wonder’ was to be a catchy introduction to the poster’s content and main argument and could take any format (song, dance, poem, slide-show etcetera). Such short entertaining introductions were thought to improve participants’ attendance at poster presentations and increase participant overall satisfaction at interdisciplinary research meetings. My poster presented results from a study exploring attitudes towards social science research in the Department of Psychiatry, University of Toronto. (I have described some of the findings of this work earlier.) The goal of this research was to document ‘barriers’ to the integration of social science into clinical teaching in an environment dominated by basic science perspectives. Thematically, the research was aligned with one of the priorities of the department to increase the integration of the ‘innovative knowledge’ produced within the department into clinical teaching, as a way to impact clinical practice in the long run. While conducting research that fulfilled this mandate, I also tried to expose how normalizing processes may be contributing to the marginalization of one sub-group of faculty scientists with social science backgrounds. The results contributed to the design and implementation of a faculty development program to ‘facilitate’ social science researchers and clinician scientists to productively work together in translating findings from social science research into relevant clinical teaching.
For the one-minute wonder, I chose to write and recite (with a physician colleague) a poem reflecting the context within which this study was undertaken and the motivation for pursuing this line of research, while in the process hinting at some of the study results. This is the poem:

*Integration of Social Science and Clinical Teaching*

*Why Now/What For*

Integrate social science in your research.
Partner say with a sociologist,
An economist, or an anthropologist.

*MD: But why now and what for?*

Because it will encourage collaboration
And result in innovation.
Interdisciplinarity after all
Holds the key to problems that are tall.

Social science
is *The* alliance!

So, improve Inter-professional relations.
Fulfill patient expectations.
Save some money for the institution.
Give everyone a happier constitution!

*MD: Not so fast!*

*Who are you to say*
*What my practice needs today!*

*There is much responsibility*
*In dealing with the critical*
*We need objectivity*
*And less of the political.*

You say it does not work
Empirical evidence is needed
And immediately you shirk.
My advice has gone unheeded.

Social scientists
Have knowledge you are seeking.
They’re careful methodologists
And can inform your teaching.

Give it a try and you’ll see
They’ll meet you half way.
Together you will learn to agree.
Let the change get underway!

After all I have made the investment
Don’t forget to give me an assessment!
Institutional priorities are such
Don’t hesitate too much.

Integrate social science in your vision
And learn to bridge the division
Between the naturally associated
And the socially negotiated.

**MD:** [Show Impatience and turn to walk away]

And if you still my words doubt
Before you decide to bail out
**Go to Poster number 6**

Their social science makes visible
Why things remain divisible
They validate your frustrations
About mandated collaborations
In empirical evidence
That holds immediate relevance.
(Martimianakis, Dewa, Yip & Hodges, 2007, Oct. 26)

The advocacy embedded in the above poem is twofold. First, it describes the research which documents and makes visible the unique challenges social scientists face in a clinical department in medicine committed to seeing intellectual innovation informing practice, and linking it to broader socio-economic priorities (i.e. facilitating interdisciplinary collaboration which would result in innovation that will make-a-difference). In the process, I was able to label and potentially disseminate pervasive attitudes towards social science methodologies in general still operating within this clinical setting. Second, I challenged the unproblematic uptake of calls for ‘collaboration’ and ‘diversification’. I placed the experiences of the ‘marginalized group’ in the context of a broader issue that affected members of the department in different ways, such as basic and clinical scientists who also had to fulfill mandates of demonstrating the ‘relevance’ of their findings. However, this was only a partial problematization, as I did not challenge the rationale that ‘diversification’ increases ‘innovation’. This rationale actually legitimated the activist work I was trying to do, namely remove ‘barriers’ for the career advancement of social
scientists choosing to work in this clinical setting. I thus used the operating rationale of making-a-difference through innovation, not to produce a marketable outcome, but to attempt to improve the conditions of work for social scientists appointed to the department.

While I am now able to ‘see’ how my past research activity relates to the discourses of interdisciplinarity and their uptake, the most important point for me is that while I was engaged in the above research I did not have a strategy for evolving critical work successfully in the department. That is, I did not explicitly strategize that I would need to problematize ‘collaborative’ knowledge-making and definitely did not problematize ‘innovation’ through diversification, in order to better make my case about pervasive attitudes towards social science research in the clinical department. My motivation was to improve the conditions of work for a group which I perceived to be inadvertently marginalized within the Department, the social scientists, and I turned to a theory and methodological approach that allowed me to expose their unique conditions. I was not thinking about interdisciplinarity at all, let alone the neo-liberal discourse of globalization and knowledge-making.

This is not unlike the way my participants spoke about their own activities and motivations. With the exception of one participant (working outside medicine and engineering) none of the knowledge-makers I interviewed spoke about their work as being ‘activist’ or challenging the status quo on a larger philosophical scale. My explanation for this is that it took concerted effort on my part to deconstruct and make visible the social relations that make possible the discourse of interdisciplinarity. This is after years of exposure to social justice theories from studies in political science and education. My educational background has arguably allowed me access to methods and ways of being/knowing ready formed to help me link my knowledge-making to broader social phenomena (exposure to which many of my colleagues have not had). In an everyday context, we are only ever partially exposed to the social relations of discursive formations of the scale of globalization and the neo-liberal knowledge economy (even though we experience their effects daily), and this makes it very difficult to strategically challenge the discourse as a totality. However, experiences and activities that trouble our sense of belonging, of being part of something, of having the ability to engage in something etcetera, can also become opportunities to negotiate, modify and even resist productively the subjectification of dominant viewpoints. The directionality of this negotiation (that is, whose interests will ultimately be served) will depend on whether we are committed to ‘making a difference’ for
marginalized groups or for ‘making a difference’ for our career, or for ‘making a difference’ for our institution, or for ‘making a difference’ for society at large through strategic problem solving and so on. As this research has shown, making visible the motivations, rationales and starting points of knowledge-makers as they engage in their everyday work is not only a way to draw out the relationship between discourse, governance and subjectivity, but also an opportunity to challenge, resist and counter the effects of hegemonic ways of knowing and doing.
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(The portion of the archive directly cited in this thesis)


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Appendix 1: Interview questions

PART 1 Demographic/Education

What brought you to this position/location of work?

During the course of your studies, did you actively pursue interdisciplinary research?

What have been influential texts for your development? (They do not have to be of an academic nature, they could include novels, poetry, popular press, etc.)

If you had to describe your professional identity in a couple of phrases what would you say?

PART 2 Institutional Location and Knowledge-making

Questions specific to Academic Knowledge-makers

What aspects of your work attract students?

How supported do you feel by your work environment (colleagues, students, supervisors) to pursue your research and teaching?

How often and in what circumstances do you distribute your C.V.? What aspects of your work is captured in your C.V. – what is left out and why?

Institutional Context

How does your institutional context impact the way you pursue your everyday activities?

Who are you accountable to and for what things? How do you demonstrate this accountability?

Can you describe how you typically go about your work? How do you organize your research? Where does the research take place? Who do you collaborate or work with to complete this research activity? How is your research funded?

Perceptions of Others

What gives your work credibility? Where and by whom?

Has anyone openly challenged your work? Can you elaborate?

Has anyone openly supported your work? Do you have a mentor?
On Knowledge-making

What do you consider knowledge?

Do you feel it is important to have an applied focus in your work?

What tools, technologies, methodologies or practices facilitate your knowledge-making?

Part 3 On Discursive Structure of Interdisciplinarity

Have innovations emerged from your work or from your personal life? If yes, How did you come to these innovations? (For example, what kinds of readings, actions, practices did you engage in?)

In what ways has diversity enriched your activities? Can you give examples?

How does integration relate to your knowledge-making?

How important do you consider collaboration in your work or personal activities? Can you describe recent collaborations and their outcomes?

How is your collaborative activity valued? In what ways do you get credit for collaborating? What aspects of collaboration are not formally captured? Does that matter to you?
## Appendix 2: Participant demographics

### FEMALE FACULTY MEMBERS

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Short Description of Participant Demographics

As the above table details eleven participants were female and nine were male. Eleven participants are currently in administrative positions (faculty and non-Faculty) and work in research related portfolios. Of the non-faculty administrators interviewed most were female. Three out of the five female non-faculty members were pursuing graduate studies (two in education and the third in the humanities). Eight individuals currently located or studying in Arts & Science Departments and in collaboration with individuals in Medicine and Engineering also took part in this study. Seven participants provided non-UofT perspectives as they either currently worked in a different University (3) or were trained and previously worked in another University (4). Three participants were simultaneously appointed to a department and an extra-departmental unit, and ten participants considered themselves as having an interdisciplinary background (either trained in an interdisciplinary subject or in multiple disciplinary subjects).
Appendix 3: Letter of recruitment

Dear [Name of Participant]

Have you ever wondered, during the course of your career, why certain types of research are valued over others at any given point in time? I propose to study just that in the context of today’s push towards collaborative research projects that propose to address strategic problems by drawing on expertise from various disciplines.

With this letter I am requesting your participation in this study. The goal of the study is to look at how professionals create knowledge in an environment that seems to encourage interdisciplinary research. I am very interested in learning about your experiences with interdisciplinary research and how you feel about changes in the way research is funded and rewarded. If you agree, your participation will involve being interviewed by me for about 1.5 to 2.0 hours at a location and time convenient to you.

I am a student at the Department of Theory and Policy Study at the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT). I am currently conducting a qualitative study under the supervision of Dr. Linda Muzzin to fulfill the requirements for a PhD Degree in Higher Education. The study is entitled: Discourse, Governance and Subjectivity: “Interdisciplinarity” and Knowledge-makers in Engineering and in Medicine.

Attached please find an information sheet and consent form outlining the project, and the steps taken to ensure participant confidentiality. In few days, I will call to confirm your interest in taking part in this study and to arrange a time for the interview if you are agreeable. If you decide to participate please read the consent form carefully. I will ask you to sign and date one copy and kindly return it to me at the time of your interview as well as provide you with a second copy for your records.

If you have any questions regarding the study, please do not hesitate to contact myself or my supervisor at the numbers below. I look forward to hearing from you.

Sincerely,

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Supervisor
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Tel. 416-978-1207
Email: l.muzzin@utoronto.ca
Appendix 4: Examples of discursive statements relating to interdisciplinarity

<table>
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<th>Institution/organization</th>
<th>Statement</th>
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<td>Ontario science centre (osc)</td>
<td>On July 26, 2006, the Weston family innovation centre – the cornerstone of the Ontario Science Centre’s $47-million agents of change initiative – was opened to invited guests and the public. &quot;The centre’s vision and the commitment of our donors and partners allowed this dream of a new kind of facility to become a reality,&quot; said Lesley Lewis, CEO, Ontario Science Centre. Named in honour of the Weston family who made an exceptional $15 million lead gift to agents of change through the W. Garfield Weston Foundation, the project was also supported by a significant $16.5 million contribution from the Government of Ontario, and by &quot;knowledge partner&quot; DuPont Canada, the department of Canadian heritage, national media partner the Globe &amp; Mail and other generous donors. These important contributions have enabled the creation of a groundbreaking 25,000-square foot (2325-square metre) facility and new visitor experiences both on-site and on-line. Galen Weston, president of the W. Garfield Weston Foundation put it this way: &quot;Innovation powers our world, but it takes inspiration, experience, and creativity to stimulate true innovation.&quot; Designed in-house by Ontario science centre staff, the dramatic new environment will inspire visitors to take on and find practical solutions to current world problems; merge art with science; and work with a variety of materials. Visitors will be challenged to think differently about themselves and the world. The architecture of the new space was designed by the renowned firm of Diamond and Schmitt Architects Incorporated.</td>
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<td>UCLA Magazine</td>
<td>With programs teaching graduate students to think beyond the traditional boundaries that separate disciplines, UCLA is nurturing the next generation of science explorers. Twenty years ago, there was no such field as bioinformatics. No neuroengineering. No materials to create devices smaller than the diameter of a human hair. If they existed at all, it was only in the minds of visionary scientists. Today, however, these are among the hottest new fields of inquiry, fertile treasure grounds that are being mined for scientific riches — more effective therapies to fight disease, answers to the mysteries surrounding the circuitry of the human brain, retinal implants for the blind, low-energy sources of light. The hunt for such new discoveries is not an easy one and requires the work of a wholly new kind of scientist, one who is trained to work and communicate across the boundaries of divergent disciplines. Cynthia Lee, Winter 2002, UCLA Magazine</td>
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Http://www.ontariosciencecentre.ca/aoc/wfic.asp

Http://www.magazine.ucla.edu/year2002/winter02_05.html
| IBM | Consumer products, 2010. Executing to lead in a world of extremes:  
Information exposes all. Consumers are becoming incredibly empowered through access to information however, wherever and whenever they want it. Megaretailers break the boundaries. Global megaretailers are rapidly expanding across geographies, channel formats and product/service categories, dictating the terms of trade to suppliers. Partnering becomes pervasive. Competition is no longer a solo game. Leading companies are teaming with alliance partners to create integrated, collaborative “value networks” that offer a stronger, more competitive value proposition. (p. 1)  
|---|---|
| Cisdal | Simply integration  
Cisdal is an it consultancy based in wellington, new Zealand. We specialise in designing, building and testing robust and reliable system integration solutions designed to work with and enhance your existing systems. Our integration solutions allow businesses to leverage their existing systems in new and innovative ways; or integrate new solutions and packages into their existing infrastructure. Our goal is to allow businesses to maximise their investment in their existing systems while still continuing to innovate.  
Http://www.cisdal.com/ |
| Deloitte and touche–south africa | The determinants of success in developing and deploying new services in the communications industry  
In today's turbulent times, communications companies need to focus in order to grow, right? Wrong! Cashing in on many of the most promising opportunities in the telecommunications industry requires just the opposite: a willingness to diversify across seemingly unbroachable industry boundaries. Consequently, large communications companies with broad operating scope have a unique - but possibly fleeting - opportunity to seize a potentially unassailable competitive advantage  
Company website - page last updated: 24 june 2004  
Http://www.deloitte.com/dtt/research/0,1015,cid%253d51504%2526pv%253dy,00.html |
| Ingenuity systems | Ingenuity partners: "integrate to innovate"  
Ingenuity systems operates an active partnership program to ensure our customers can maximize the benefits of systems that are relevant to their research easily and quickly. The program is designed to meet the requirements of scientists that operate within multiple applications and require research workflows to be streamlined, straightforward, and efficient. Benefits to end-user scientists: Greater accessibility; Customized user interface; Enhanced workflow; Increased accuracy; Benefits to bio-informaticians: Accelerate in-house development projects; Lower development costs  
Company website http://www.ingenuity.com/company/partners.html |
Integrate to innovate in the npp (i2i) measure: 2.2 project type: preparatory

The main objective is to create a partnership representing all countries in the npp area for the development of a main npp application at the second call in 2004. The main project aims to strengthen the complete innovative framework and process through building and integrating unique strengths of all regions and sectors to enhance a framework for sustainable businesses and communities into the future.

The ‘network of networks’ will enable this information and knowledge to be cascaded throughout the networks, forging dynamic connections both horizontally and vertically through sectors and the networks themselves, bringing ‘right’ and relevant information to the ‘right’ people at the ‘right’ time through integrating existing networks which have hitherto been ‘disconnected’. Expected results from the project include enhanced and inclusive communication channels, more fully informed individuals throughout the networks, the development of meaningful relationships which facilitate the sense of ‘belonging’ to the network, thereby gaining buy-in and real involvement from participants throughout the process resulting in true value being experienced.

Target area: greenland, faroe islands, iceland norway, finland, sweden and scotland.

Http://www.northernperiphery.net/preparatoryprojects.asp?intent=details&theid=53

In a complex, adaptive system, diversity, or heterogeneity--of components and the interrelations among them--generates complexity, which may in turn generate novel, emergent behavior. "adaptation" arises when a complex, adaptive system morphs by changing the rules of interaction among its component agents. Now for the analogy! Increasingly, scientists and engineers, educators, and entrepreneurs are working across many different disciplines and fields and in different sectors to make the connections that lead to deeper insights and more creative solutions. Discovery and innovation are now products of the pooled expertise and talent of many individuals. I do not mean that each person contributes a "unit of value" and thus helps to build the whole, like bricks in a building. Rather, successful outcomes depend on the interactions among diverse individuals. Something new happens in the process of integrating the different intellectual skills, experience, and perspectives of partners. A dynamic emerges that creates a whole \greater than the sum of the parts. (par 32-34)

Dr. Joseph bordogna
deputy director
chief operating officer
national science foundation
remarks, the 4th annual leadership initiative in science education: partners in innovation

Chemical heritage foundation
may 21, 2004

| **The Social Sciences and Humanities Research Council Of Canada** | “make connections to increase impact”  
(SHHRC’s) knowledge council, strategic plan 2006-2011, the final document distilled the conclusions of the consultation into three key ambitions: quality, connections and impact.  
These three ambitions now characterize SSHRC’s vision:  
To enhance the quality of, and support for, research and research training in the social sciences and humanities; To enable connections among disciplines, including those in engineering and the natural and health sciences, as well as between research and the larger community, in Canada and in the rest of the world; and To increase the impact of research and research training for the benefit of society.  
The priorities and principles of the science and technology strategy are directly linked to SSHRC’s ambitions of quality, connections and impact, in knowledge creation, the development of talent and knowledge mobilization. In other words, the strategy offers SSHRC an excellent framework within which to enhance the contribution of research and training in the social sciences and humanities to Canada and the world. For these reasons, SSHRC is actively contributing to the implementation of the science and technology strategy within its strategic priorities and will vigorously champion the social sciences and humanities as central to the federal research agenda. Indeed, the successful implementation of Canada’s science and technology strategy depends upon a top-quality, comprehensive, and balanced research community.  
Framing our direction: the social sciences and humanities pg. 3-4  
Http://www.sshrc.ca/site/about-crsh/publications/framing_our_direction_e.pdf |
| **Natural Sciences and Engineering Research Council of Canada** | “providing solutions to the complex problems of the world”  
The ongoing trend for greater interdisciplinarity in many research areas is widely recognized internationally. Interdisciplinary research evolves to meet the demands of many societal, environmental, industrial, scientific, and engineering problems that cannot be adequately addressed by single disciplines alone (see also guidelines for the preparation and review of applications in engineering and the applied sciences). Significant advances in research and development in the natural sciences and engineering increasingly involve a number of diverse fields, including those in the social sciences, humanities, and health sciences. Such advances can occur rapidly when people with vastly different experience come together and share their expertise. In fact, research conducted by industry and government is not usually organized along disciplinary lines; when collaborating with non-academic partners, interdisciplinary research is the norm.  
Interdisciplinary research relies on the strength of established disciplines to provide sound theory and methodology. It pushes the traditional boundaries of disciplines, helps ensure their growth and vitality as new and emerging lines of inquiry are pursued, and may lead to the development of new disciplines. Other benefits include sharing resources and facilities, building teams and networks, and removing duplication of effort in research. Barriers that inhibit interdisciplinary research and prevent the full realization of its benefits are also recognized internationally (e.g., discipline-based university departments and journals, lack of communication |
between disciplines, high-risk nature of the research, lack of critical mass in the community for the dissemination of results, peer review and recognition).


**Canadian Institutes of Health Research**

Nearly all of CIHR’s major strategic initiatives involve collaboration between two or more of CIHR’s institutes as well as partnerships with organizations that include other federal and provincial government departments and agencies, national and provincial funding organizations and relevant territorial departments, health charities, non-governmental organizations, and industry. Their purpose is to offer strategic funding opportunities focusing on a specific research agenda. In the case of four key strategic priorities, cihr’s governing council has specifically endorsed a joint, cross-cutting effort involving all thirteen institutes.

CIHR’s major strategic initiatives

Http://www.cihr-irsc.gc.ca/e/12679.html

**Canada Research Chairs**

STRATEGIC RESEARCH PLANS

Strategic Research Plans (SRP) are integral to the Chair nomination process. Each university must prepare an SRP and SRP Summary, which demonstrate how they will use funding from the Chairs to attract and retain world-class experts. Members of the College of Reviewers consult the SRP Summary when reviewing a nomination (http://www.chairs-chaires.gc.ca/program-programme/strategic_research_plan-plan_recherche_strategique-eng.aspx).

(U of T’s research plan. For a chair to be selected, he or she is required to be a good fit with each university’s strategic research plan. To become a chair, one should foster innovation and interdisciplinary collaboration according to these guidelines)

July 2008 - Strategic Research Plan for the University of Toronto

The advancement of excellence in research and innovation is a defining feature: our mission is to rank among the top 10 public research-intensive universities in the world and provide answers to the world’s most significant questions.... This process has defined academic and related infrastructure objectives which form the basis for the Strategic Research Plan (SRP) for the Canada Foundation for Innovation (CFI) and Ontario Ministry of Research and Innovation (MRI) programs, the Canada Research Chairs (CRC), as well as other government research and infrastructure programs. The University and its affiliated teaching hospitals attract over $800M per year in external research funding, and more than 100 productive Canadian companies owe their origins to research conducted at the University of Toronto and its affiliates. Although this scale of operation is large, the strategic planning process fosters distinctiveness as well as excellence; collaboration and synergy are strongly encouraged and the selective investment of resources is consistent with these aims. Resources to support research and innovation derive from government programs, private-sector partners, and other organizations in Canada and around the world (http://www.chairs-chaires.gc.ca/program-programme/srp-prs/toronto-eng.pdf)
| Networks of Centres of Excellence Program (NCE) | The NCE Secretariat fosters multi-disciplinary, multi-sectoral partnerships between universities, industry, government and non-governmental organizations. It supports academic research, the commercialization of products and ideas, and the development of significant Canadian business advantages. The partnerships that this initiative cultivates result in ideas that are transformed into economic and social benefits for all Canadians. It is built on a foundation of five central features:

- Mobilization of Canadian research excellence; Training of highly skilled personnel in Canada; Networking and partnerships with industry and other relevant partners;
- Transferring knowledge generated to user sectors; Promoting effective management structure.

The NCE Secretariat is aligned with the Federal Science and Technology (S&T) Strategy, Mobilizing Science and Technology to Canada's Advantage, and builds on the sustained investment made by Industry Canada and the granting agencies – the Natural Sciences and Engineering Research Council, the Canadian Institutes of Health Research, and the Social Sciences and Humanities Research Council.

http://www.nce-rce.gc.ca/index_eng.asp |
|---|---|
| Ministry of Research and Innovations, of Ontario | The Innovation Policy Branch assists the ministry through its:

- Integrated, evidence-based policy framework for research and innovation across government; Support for the Innovation Deputy Ministers’ Committee and the Assistant Deputy Minister’s Committee on Innovation;
- Arrangements to work horizontally with key ministries across government to ensure coordination of innovation-related activities.

The Research Branch manages MRI programs that fund leading edge research, provide matching funding for federally funded research infrastructure awards, celebrate Ontario’s top researchers and innovators and support early career researchers.

The branch is responsible for the delivery of the following programs: Ontario Research Fund program; Early Researcher Award program; Premier’s Discovery and Catalyst Awards programs; Ontario Research Development Challenge Fund.

The Commercialization Branch works to support technology transfer, technology uptake and commercialization in knowledge intensive industries. The branch also focuses on life science related activities for the ministry.

The branch administers the following programs: Market Readiness Programs; Ontario Research Commercialization Program; Ontario Commercialization Network Program; Ontario Centres of Excellence Inc.; Health Technologies Exchange Program; Innovation Demonstration Fund; Ontario Institute for Cancer Research.

http://www.mri.gov.on.ca/english/about/WhoWeAre.asp |
## Appendix 5: Main Challenges in Tertiary Education as Perceived by the OECD

<table>
<thead>
<tr>
<th>Domain</th>
<th>Main challenges for governments as articulated in report</th>
<th>Main challenges for institution, as deduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steering tertiary education</td>
<td>Articulating clearly the nation’s expectations of the tertiary education system.</td>
<td>Articulating clearly the institution’s responsibilities to learners and society</td>
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<tr>
<td></td>
<td>Aligning priorities of individual institutions with the nation’s economic and social goals.</td>
<td>Aligning priorities of individual knowledge-makers with institutions stated contributions to nation’s economic and social goals.</td>
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<td>Creating coherent systems of tertiary education.</td>
<td>Creating coherent systems of teaching, research and knowledge translation/application</td>
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<td></td>
<td>Finding the proper balance between governmental steering and institutional autonomy.</td>
<td>Finding the proper balance between institutional steering and academic freedom of knowledge-makers</td>
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<td></td>
<td>Developing institutional governance arrangements to respond to external expectations.</td>
<td>Developing reporting mechanisms to demonstrate responsiveness to external expectations</td>
</tr>
<tr>
<td>Funding tertiary education</td>
<td>Ensuring the long-term financial sustainability of tertiary education.</td>
<td>Ensuring the long-term financial sustainability of departments, EDUs, institutes, collaborative programs etc.</td>
</tr>
<tr>
<td></td>
<td>Devising a funding strategy consistent with the goals of the tertiary education system.</td>
<td>Devising a funding strategy consistent with the goals of the institution.</td>
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<td></td>
<td>Using public funds efficiently.</td>
<td>Demonstrating efficient use of public funds</td>
</tr>
<tr>
<td>Quality of tertiary education</td>
<td>Developing quality assurance mechanisms for accountability and improvement.</td>
<td>Developing quality assurance mechanisms for accountability and improvement of individual faculty.</td>
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<td></td>
<td>Generating a culture of quality and transparency.</td>
<td>Generating a culture of quality and transparency about academic work.</td>
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<td></td>
<td>Adapting quality assurance to diversity of offerings.</td>
<td>Adapting quality assurance to diversity of academic activities.</td>
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<tr>
<td>Equity in tertiary education</td>
<td>Ensuring equality of opportunities.</td>
<td>Ensuring equality of opportunities</td>
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<td></td>
<td>Devising cost-sharing arrangements which do not harm equity of access.</td>
<td>Devising cost-sharing arrangements between departments, extra-departmental units and collaborative programs which do not harm equity of access.</td>
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<tr>
<td></td>
<td>Improving the participation of the least represented groups.</td>
<td>Improving the participation of the least represented groups.</td>
</tr>
<tr>
<td>The role of tertiary education in research and innovation</td>
<td>Fostering research excellence and its relevance. Building links with other research organizations, the private sector and industry. Improving the ability of tertiary education to disseminate the knowledge it creates.</td>
<td>Fostering research excellence and its relevance. Building links between departments, extra departmental units the private sector and industry. Improving the ability of knowledge-makers to disseminate the knowledge they create.</td>
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<tr>
<td>The academic career</td>
<td>Ensuring an adequate supply of academics. Increasing flexibility in the management of human resources. Helping academics to cope with the new demands.</td>
<td>Ensuring an adequate supply of students Increasing flexibility in educational opportunities (i.e. timing of course offerings, breadth of course selections etc.) Helping students cope with new demands</td>
</tr>
<tr>
<td>Links with the labour market</td>
<td>Including labour market perspectives and actors in tertiary education policy. Ensuring the responsiveness of institutions to graduate labour market outcomes. Providing study opportunities for flexible, work-oriented study.</td>
<td>Including external perspectives in institutional policy development Ensuring the responsiveness of departments to graduate market outcomes Providing study opportunities for flexible, work-oriented study</td>
</tr>
<tr>
<td>Internationalisation of tertiary education</td>
<td>Designing a comprehensive internationalisation strategy in accordance with country’s needs. Ensuring quality across borders. Enhancing the international comparability of tertiary education.</td>
<td>Designing a comprehensive institutional internationalization strategy in accordance with national expectations Ensuring quality across disciplines Enhancing the international comparability of tertiary education through harmonization of performance indicators</td>
</tr>
</tbody>
</table>

(adapted from OECD Table 1 found in OECD, 2008d, p. 5)