Modern Canadian Universities, Mission Drift and Quality of Education

by

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Abstract

This study contributes to theory and public policy in Canada and globally. It uses mixed methodology and triangulation of evidence through policy documents (Bovey, Rae, Drummond); empirical studies and surveys (ranking, NSSE data, regression), CAUT/AUCC and Statistics Canada sources and qualitative sources -writings of university presidents (Bok, Kerr, Fallis), researchers (Rajagopal, Clark et al.) as well, talks with sessionals, teaching assistants and administrators. The framework consists of Altbach's four factors – democratization, the knowledge economy, globalisation and competition; the concept of mission drift and three ideal-types for university development – entrepreneurial, liberal education and deliberative. The thesis contrasts the classical college with the modern university system. The results show strong evidence for research domination, mission drift and a shift towards the entrepreneurial model. Quality is compromised by lowered requirements, compressed courses, less study time, large classes taught by sessionals and TAs, grade inflation and consumerist behaviour, while critical thinking and moral development are neglected.

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Introduction

This thesis is an exploration of the evolution of the modern university and its impact on the balance between teaching and research. In this introduction, I first present the theoretical framework for the study, which consists of four factors and two key-concepts, followed by remarks on the contribution of this study to Canadian public policy. A description of the organisation of this thesis is then presented.

Theoretical Framework

The theoretical framework of this study is based on the analysis of the growth of universities across the world in the 20th and 21st centuries. Phillip Altbach's categorisation (2005) explains this growth through four factors – democratization, the growth of knowledge economy, globalisation and competition. This thesis tests the hypothesis that research dominance has led to the need for revenue generation without regard for quality of undergraduate education. To briefly describe the four factors:

Democratization means opening up university education from the elite in a society to the population in general including under-represented groups in the population such as women, First Nations, immigrants, visible minorities, the poor, the first generation to attend university, and those with disabilities. With larger numbers of students and a wider range of capacities for learning, a greater effort is needed by universities to maintain the quality of education while meeting the demands of the individual and society.

The term knowledge economy is applied to the "soft" revolution where knowledge replaces physical resources as the engine of economic growth. According to the World Bank (1970), the four pillars of the knowledge economy are:

- Education and training
- Information infrastructure
- Economic incentives and institutional regime and
- Innovation systems

Universities have knowledge and innovation systems which need "human capital" to develop new innovations as well as to run the technology, both of which provide the basis for sustainable economic growth. The advent of the knowledge economy changed not only existing businesses, but also created new ones. Universities still play a crucial role, "not only providing brain workers, who man it, they also provide much of its backbone from laboratories to libraries to computer networks" (Altbach, 2005, p.3).

Globalisation has many meanings. In essence it means an integrated world market with free movement of goods and services, labour, capital, entrepreneurship and culture. With the development of the Internet, distances have been greatly reduced, facilitating the development of the world market. For universities, the impact has been both economic and cultural. On the one hand, it has led to "commodification" of education which is treated as an exportable good, earning revenue through foreign students and the establishment of overseas campuses. On the other hand, it has led to greater cooperation among researchers, both across the world and across departments.

Universities have always competed. Examples include athletic rivalries between Oxford and Cambridge, Harvard and Yale, Trinity and University College Dublin, University of Ottawa and Carleton University. However, in recent years the level of competition and the amount of resources expended on it have greatly increased, encompassing competition for students,

researchers, professors and projects. The reputation of a university influences the choices made by stakeholders such as students, governments and organisations and the institutions of civil society.

Influences from these four factors provide a plausible explanation as to why and how the classical college system evolved into that of a modern university. But, to look for a greater understanding of the impact of the dominance of research, I employ two key concepts – mission drift and the three ideal-types for the development of universities.

Mission drift.

A mission captures the essence of what an organisation does and why. For a non-profit organisation it also serves as a source of inspiration, defining the significance and importance of its work. A mission statement expresses the core values of an organisation, while the vision statement shows where it wants to go. Both are operationalised into a strategic plan which is realised through programs and activities, committing the whole organisation towards a goal. Mission drift means losing sight of the core values and activities, devoting resources to non-core priorities, and therefore upsetting the balance between values and activities.

Non-profit organisations can be classified in terms of their types of mission and financial objectives. They range from small to large organisations which need to prioritize their goals and balance their activities. Modern universities are complex organisations as epitomised by Duderstadt's (1995) "University of Michigan Incorporated." It could just as well be University of Toronto or University of Ottawa Inc. The main concern is not to drift from the core values, because (1) it may damage the reputation of the organisation among stakeholders and the public;

(2) donors may stop giving; (3) it may threaten the organisation's culture; and (4) the organisation may stray too far into the commercial realm, neglecting its social responsibility.

Weisbrod (1988, 2004), Jones M.B. (2007), the CAUT writers, like Tudiver (1999) and Turk (2000), all warned universities of these dangers. One of the clearest statements came from Rhodes, (1994 p. 180-1) "It is the undergraduate teaching and learning that is the central task...almost everything else universities do depends on it... it is through undergraduate education that the public encounters the university most directly... it is on undergraduate education that the health of the research university will stand or fall." Fallis (2007, p. 384) went further, saying that universities have compromised quality in undergraduate education more than in other areas. He admitted that the research mission is potentially the greatest disadvantage to undergraduate education. The tension between undergraduate teaching and advanced research has been well recognised, namely, the priority of research with its demands on a professor's time, and the pressure from the university administration to seek external funding for this research.

Three ideal types.

I constructed three ideal types for the development of universities, emphasising different aspects of the university system, their relationships, and the common elements among them. The first, the entrepreneurial type, has been well described by Burton Clark (1998, 2004). He studied several universities in Europe and America and found these cases to be successful due to their focus on applied research, leadership, integration in the market economy and competition. The conclusion of some of the proponents of this school would be the full integration of the "public" university into the private sector without any public subsidies.

The liberal education type emphasises “core subjects” in arts and sciences and a choice of subjects for students, and it believes in skills such as reading, writing, mathematics and communication. Research is necessary but basic research is favoured. Scholars like Axelrod (2002, 2007) and Fallis (2007), who represent this school, believe that some exposure to “liberal arts” among the professions is better than little or none at all. Fallis saw liberal education as being the bedrock of democracy and citizenship.

The deliberative ideal type, represented by scholars like Pocklington and Tupper (2002), and Hughes & Mighty (2010) of the “Guelph” school, emphasises “deep” knowledge and commitment to reflective teaching by faculty and reflective learning by students. Professors would be wise and would possess cross-disciplinary knowledge. Research for its own sake is to be avoided. Wary of corporate interests, this school wants universities to preserve their autonomy and to fight for the public good. Basic research is favoured. The authors argue that a lengthy program of learning for both undergraduates and graduates is required before they are capable of producing high quality research. Dimensions of teaching are well known to educators, but not all faculty members are able to put these into practice.

There is some agreement between the three schools on certain issues and disagreement on others. All three schools would agree that there is now an imbalance between teaching and research, while the liberal education and deliberative schools would agree that the research ethos is dominant, with a “publish or perish” attitude influencing hiring, promotion and tenure. All three would agree that not enough professors are hired to keep up with the growing student enrolments and that sessionals and TAs cannot substitute for experienced tenured professors. Both deliberative and liberal education scholars would agree on the qualities of good teaching.

They are: accessibility, fairness and open-mindedness, knowing of the subject and other disciplines, teaching ideas rather than information, humour, enthusiasm, respect for students and motivating them.

The disagreements between some proponents of the liberal education and the deliberative schools rest more on the depth, nature and quality of teaching/learning rather than on fundamental differences. The deliberative school demands higher standards for good teachers, insists on reflective teaching and learning (deep learning), goes further than liberal education in moral development, disagrees with "the myth of mutual enrichment" (i.e. research and teaching go together), advocates worthwhile research rather than research for its own sake, and suggests tackling "real" rather than pseudo-problems.

Contribution to public policy and theory.

Education is an important issue for Canadian governments and the public. And, according to AUCC, universities are involved in the entire experience from preschool to postdoctoral (Berkowitz, 2011). In every province, post-secondary education is the third largest item of budgetary expenditure, behind health, primary and secondary education. Post-secondary education, therefore, is a significant policy question relevant to political science.

My thesis makes a contribution to the ongoing debates on the quality of education in modern Canadian universities. A recent national workshop, "Transforming undergraduate education," held in March, 2011 (Charbonneau, 2011, March, June) and a recent book, *Academic Reform* by Clark, Trick and Van Loon (2011), both similarly argue that universities have lost their "foundational narrative thread" and that the character of the undergraduate experience has deteriorated in our lifetimes, especially in the last decades. The issue was also a subject of debate

among the leaders of the main political parties in both the recent Federal election in May, 2011 and during the provincial election in Ontario in October 2011.

This study tests the hypothesis that research dominance has led to the need for revenue generation without regard for quality, taking time and resources away from liberal education and instruction. This creates possibilities for mission drift and this can be explained within the framework of the three ideal types of development. Using a mixed approach with multiple quantitative and qualitative methods, my thesis shows increasing evidence of a shift toward the entrepreneurial ideal type.

Examining indicators, there is clear evidence that universities use global rankings to justify claims of excellence. Yet, these tables are based on research peer-reviewed publications, research impact and research excellence. There are no proxy, or actual, measures for academic experience and quality of education. These indicators are also used by students and decision-makers for enrolment and funding.

I examined the National Survey of Student Empowerment (NSSE) and found that it does not measure learning or teaching but provides a snapshot view of student experience which is purported to have remained stable over the life of the survey. In addition, the survey does not allow for comparisons between individual universities.

In order to extend further the use of the rich data from NSSE, I used data collected for University of Ottawa to test the hypothesis put forward by deliberative writers that "deep" learners obtain better outcomes than "surface" learners. I undertook a regression analysis to look into the statistical relationship between student grades–- the dependent variable-–and 15 other theory-informed independent variables that might impact on students' performance. I did not find

a significant relationship between student grades and either "deep" or "surface" learning, but did find other activities which had a significant relationship with grades. They are: internship, community service, interaction with faculty, hours spent on class preparation, hours of paid work, and parents' education. These findings proved to be relevant in explaining some elements of my thesis. I have used mixed types of methods, both quantitative and qualitative to illustrate the kind of evidence I will bring to bear. These methods are described in detail in chapter 3.

In conclusion, my thesis demonstrates the dominance of research over teaching in modern Canadian universities and, consequently, the need for revenue generation. This study hopes to make a contribution to the debate by demonstrating a growing trend towards the entrepreneurial ideal type of development which also provides indications of mission drift on the part of many universities.

Organisation of the Thesis

In Part I, the theoretical framework, Chapter 1–-adaptation of Canadian universities to the New Reality–- reviews the context, the impact of Altbach's four factors on the classical university structure and the adaptation to the factors by modern universities. The discussion in the first chapter draws the implications for modern universities and delimits a new framework–- the New Reality. Among other influences, these four factors have increased the influence of the "corporate executive," rather than the traditional academic, in the governance of a university. The New Reality also saw the introduction of new technology, the growth of "corporate planning" and a greater influence of market forces nurtured by governments and research-granting agencies.

Chapter 2 continues describing the framework by introducing the concepts mission drift and the three ideal types: entrepreneurial, liberal education and deliberative. A mission is

important for both a private profit-making enterprise as well as for a not-for-profit organisation such as a university. But, the focus of a private enterprise is profits, while, for a not-for- profit organisation, the revenue is a means of accomplishing its mission and not the end.

In Part II, methodology, Chapter 3, lays out the hypothesis, describes the mixed methods chosen because of the complexity of the issues involved, and the need to include data sources to undertake both quantitative and qualitative analyses within the above framework. The strengths and limitations of these methods are discussed. The quantitative methods are: 1) Analysis of ranking tables, which are used not only for competition between universities, but also for choosing universities by students and for their career decisions; 2) Analyses of National Survey of Student Engagement (NSSE); 3) Regression analysis of NSSE; and 4) Empirical studies. Qualitative sources include: 5) Policy documents on higher education in Ontario; 6) Secondary sources on North American, British, European and Australian universities; books and articles by university presidents and researchers; 7) Participation in teaching and learning seminars; and 8) illustrations from letters, conversations with sessionals, TAs and students. The chapter shows broad links between the methods and the framework of analysis for this thesis.

Chapter 4 examines the literature on 1) the adaptation of modern universities to the New Reality, 2) Mission drift in the universities, and 3) provides a short description of how the funding for the modern Canadian universities began and evolved into the current pattern.

In Part III, analysis and results, chapter 5 examines the measures/indicators for each of the three models and NSSE data, while chapter 6 uses regression analysis to test the deliberative theory of surface and deep learning. Chapter 7 gathers the evidence using "triangulation"–-policy documents, empirical evidence and qualitative elements--to show that the imbalance between

research and teaching has continued to grow, abetted and aided by government policy, research-granting agencies and market forces. Research was bolstered by Ontario and Federal government initiatives from 1990 to the present time to the detriment of teaching and the quality of education. Chapter 8 draws conclusions.

Part I The Theoretical Framework

Chapter 1

Adaptation of Canadian Universities to the New Reality

The seeds of the New Reality were planted in the 1960's, bringing about changes in the decades that followed. Louis Menand (2001) calls the period 1945-1975 a "Golden Age" of American higher education characterised by expansion, while in the Post Golden Age era, growth slowed down. The focus of this thesis is on the New Reality in the Post Golden Age era, which scholars seem to agree, is shaped by Altbach's (2005) four factors--democratization, knowledge economy, globalisation and competition–-demarcating it from the classical college system.

Democratization

The democratization of the university means making tertiary education accessible and affordable for the masses. The origins of a modern university are found in the transformation of the teaching colleges into large "complex conglomerates of diverse businesses" (Duderstadt, 1995), which arose to deal with "massification." In America, where the proportion of the population going on to higher education was higher than anywhere else, nearly a third graduated with a first degree and about a third of those obtained an advanced degree. This population was also diversified. Non-traditional students also did better than in most other countries. The majority of undergraduates were female; a third came from racial minorities; and more than 40% were aged 40 or over. Nearly 20% came from families with incomes at or below the poverty level. Half attended part-time, while 80% of students worked to help support themselves. Similarly, the numbers, and the proportion of adults with higher education qualifications, have

grown between 1975 and 2000 in the OECD countries, and in China and India (Altbach, 2005). The Canadian literature on this transition is scant, often needing updating, and there is little exploration of links between strategies adopted by modern universities and their impact on the quality of education. However, there is information on two measures which are linked to democratization: an increasing percentage of the population is involved in post-secondary education, and there is increasing access to post-secondary education for women.

In Canada, the transformation from the traditional to the modern university took place in the decade of the sixties. Prior to 1960 only 4% of high school graduates went on to university (Porter, 1985). With the establishment of community colleges and new universities, enrolment increased dramatically within a decade. University enrolment more than tripled between 1962 and 1982, from 171,300 to 573,964 and doubled again, reaching 1,047,700 students in 2005-6; enrolment is expected to rise again by another 70,000 (9%) by 2016 estimated by the Association of Universities and Colleges Canada, (AUCC, 2007a). Along with the rise in numbers, the demography of students attending universities has also changed. Women now form a majority in Canadian universities. Older or "mature" students are increasingly enrolling at universities. The numbers of undergraduate First Nations, immigrants, their children and those constituting visible minorities, as well as those with physical disabilities, have also grown. Universities must now consider how to adapt to these numbers without affecting the quality of education. Martin Trow (1972), writing for the Carnegie Commission, defined an elite system as educating 5-10% of the eligible age cohort. He argued that an elite system can expand up to 15%, but after that the original institutions grow so big that their character is changed. Mass education means enrolling 15-50% of the age cohort; beyond that it may be characterised as universal access. From training

the minds and the character of elites for career in government and the professions, the mass system calls for a broader role of training minds for all strata of society. However, the diversity and greater range of learning capacities among students in mass or universal education systems, as is true of secondary education, means a greater effort is needed by universities, not only to maintain the quality of education but also to meet the growing demands from the economy, society and individuals.

The Knowledge Economy

The term knowledge economy is applied to the "soft" revolution where knowledge replaces physical resources as the engine of economic growth. Peter Drucker (1965) first coined the term "knowledge worker" but the origins of the knowledge economy can be found earlier. They include the transformation of the industrialised world from predominantly manufacturing to service industries, the ideas of economists, such as Becker (1964) and Romer (1986, 1990), that gave a new meaning to human capital, which in turn, catapulted universities into the forefront of the economy. Universities provide knowledge, which combines both the "human capital" needed to develop and run the new technology, and Research and Development (R&D) or innovation which is seen as the basis for sustainable economic growth by economists such as Schumpeter, Solow and others.

In Canada, by 1990, the knowledge economy had fully emerged, with services providing the lion's share of jobs–-71.2% (Statistics Canada, 1994). Other studies, using occupation and educational attainment of the workforce, corroborate this transformation. Another Statistics Canada study (Beckstead and Vinodrai, 2003) found that between 1971 and 1996 the proportion of knowledge workers in the employed labour force increased from 14% to 22% and degree

completion among all knowledge-based occupations had moved up from 34% to 51%. Others make a similar argument through measures of employment, output and productivity increases, using input/output data from an industrial perspective (Gera and Masse, 1996).

A theory of "human capital" or "human development" provides justification for tertiary education on behalf of both individuals and governments while suggesting guidelines for measurement. Propounded by Gary Becker (1964) the theory states that investment in human capital is similar to investment in the physical means of production. Thus, expenditures on education, training, and medical care are investments in human capital that lead to greater well-being and increased productivity. OECD defines human capital as "the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well being" (Keeley, 2007, p. 29). Unlike physical investment, knowledge is expandable and self-generating (with experience the knowledge base expands), transportable and can be shared. Thus, human capital is substitutable but not transferable in the sense of fixed capital. A Stanford economist, Paul Romer (1986, 1990), built on the human capital theory. Unlike classical theory, he incorporated technology and the knowledge upon which it is based as intrinsic to the economic system. Knowledge has become the third factor of production in leading economies. Romer argued that economic growth is driven by the accumulation of knowledge; technological breakthroughs may be random, but they create platforms for further innovations; technology can raise the return on investment; investment can make technology more valuable and vice-versa. Earning "monopoly rent" on discoveries is an important incentive for companies to invest in R&D for technological innovation (Ernst and Young, 2011).

One measure of the benefits of university education is the earnings of graduates, which have increased steadily in comparison to those without university qualifications. Among graduates, the professions have gained the most, even when inflation and the opportunity cost of foregoing income while at university are taken into account. Further gains in earnings are made from "on-the-job" or related training undertaken by graduates. Jacob Mincer (1994) estimated that total investment in on-the-job training for the United States may well have been more than $200 billion a year or about 2% of Gross Domestic Product. The final figure for "life-long" learning by an individual would be even higher if both formal and informal knowledge gained at work or in retirement were counted, especially in light of Canada's aging population. This literature has led to a debate on what part of these benefits should be paid upfront by the students in terms of their tuition. Stager (1989) building on his 1968 thesis, "Monetary Returns to Post Secondary Education in Ontario," focused on tuition fees for a Council of Ontario Universities study. He compared the individual and social rates of return of selected undergraduate degree programs for 1960 and 1985 and concluded that the high total rate of return makes larger investment desirable. Even larger rates of return for individual graduates meant that students could pay a greater share of tuition, and science students could expect to gain even greater returns. His later study (Stager, 1996) extended the analysis to 1990. The Organisation for Economic Co-operation and Development (OECD) agreed with this view, but pointed out that low-income people should not be left out (Keeley, 2007, p. 123). The earlier Stager study did not distinguish by gender as there was not enough representation of women. The Bladen Commission Report (1965) recommended formula funding for universities, but wanted universities to have the freedom of setting their own fees, each separately, for "differentiation"

purposes and to preserve "autonomy." However, the Government of Ontario introduced formula funding (grants) in 1967 "evolving from complete autonomy to control" (Stager, 1989, p. 19) i.e. more provincial control. Presently, in a modified form this remains the basis of, or modus operandi for, most universities across Canada, where education is a provincial responsibility.

Canada as a nation generally spends less on R&D in terms of percentage of Gross Domestic Product (GDP) than other OECD countries and Canada is near the bottom rung of 12 innovation indicators compiled by the Conference Board of Canada (2012). For example, in the fiscal year 1989-1990, Canada spent 1.8% of GDP as compared to 2.6% for others (Lonmo and Anderson, 2003, February). This share has not improved, affecting Canada's productivity (Lynch, 2010). Universities are filling some of the gaps. From 1995 to 2004, the share of R&D in higher education consistently prevailed over R&D spending by business in the Atlantic Provinces as well in Manitoba and Saskatchewan, while it was about the same as business enterprise in Alberta. In 2004, the share of R&D spending was dominated by business enterprise in Quebec, Ontario and British Columbia (Rosa, 2004, April).

The knowledge economy has not only changed existing businesses, but created new ones based on information and knowledge e.g. Microsoft, Google, Nortel among others. Leading companies devote nearly a third of their investment to knowledge intensive intangibles such as research and development (R&D), licensing and marketing. Universities play a crucial role, providing brain workers and also "much of its backbone, from laboratories to libraries to computer networks" (Altbach, 2005, p. 3). This is reflected in the increased share of enrolment and research in disciplines such as computer science, high technology engineering, science, and business related programs.

To understand the knowledge economy (Post Golden Age) and particularly the emergence of "new technology" and its implications for universities, the Dutch government (Economic Affairs and Education) commissioned a study, "The use of Information and Communications Technology (ICT) in Higher Education–-An International Orientation on Trends and Issues" (Collis and Van der Wende,1999), which looked at the state-of-the-art practices, thoroughly and comprehensively covering Finland, UK, USA, Belgium and Australia. The study examined policy and strategy issues, educational aspects, costs and effectiveness. ICT included the information highway (Internet), computers (main-frame and personal) and related network systems, software (ICT applications), and interactive classroom. The study clearly pointed out that ICT is seen as a part of fulfilling a mission and not an end in itself. It tried to distinguish between the general efficiencies realised by ICT on both pedagogy and on the operations of a university as a whole, "focussing on IT to improve administration, research, teaching and learning" (p. 25).

Educational aspects of ICT include: 1) dissemination of information and publication; 2) communication between teacher and student and among students; 3) collaboration: group discussion, joint project work; 4) information resource handling: search engines and multimedia databases; 5) specific teaching and learning purposes: interactive tutorials, quizzes, simulations, tests, video conferencing; 6) course integration: www-based course support. ICT applications to pedagogical activities are: 1) general course organisation including administration; 2) lectures and other forms of instruction-led class services; 3) self-study: readings, practical exercises; 4) major assignments: essay, report, product, case study, synthesis; 5) testing; 6) communication and mentoring.

In ICT use for faculty, the study saw three stages: first, pioneer, where only some teachers are involved; second, some institutional involvement; and third, all instructors use ICT. It also found that the social sciences were the laggards behind the sciences in ICT applications. It rightly predicted the integration of distance education into the traditional university structure, mainly to ward off a challenge from the for-profit educational sector. The study rightly assumed universities to be a repository of knowledge and innovation and suggested three "strategies" for expansion into the societal mass market: 1) value-added for traditional elite university, which uses ICT to enrich student experience as a member of a high-service, high-variety and high-reputation educational community; 2) cost-based strategy for a new university, which uses ICT to deliver high-end programmes anywhere, anytime for a restricted range of degrees to a mass market; 3) hybrid: mass communication strategy for a devolved university using ICT to obtain low cost benefits from a central IT structure, while empowering innovation and student focus in strong academic faculties (p. 26).

In terms of costs and effectiveness, the study (Collis and Van der Wende, 1999, p. 17) stated, "compared with preparation costs of one hour of face-to-face teaching, the use of IT can multiply costs by a factor of 2 for video or broadcast teaching, by a factor of 50 for computer-based learning, and by a factor of 100 in the case of interactive television or CD-I." The most important factor against which costs should be measured is the number of students that can be reached with the educational product or service. Another study by Wetzel, Radtke, and Stern (1994, as cited in Collis and Van Der Wende, p. 100), suggested that distance education was cheaper than traditional university, thus, the "Open University" system is likely a cheaper system of delivery for tertiary education. In terms of learning, the report concludes that "it seems

reasonable to assume that student achievement will, at least, remain equal when using media or ICT to support education and training." The report suggested that new media should be focussed towards new kinds of outputs in the affective domain (feel good, self confident), psychomotoric (able to handle new technologies) and higher cognitive and meta-cognitive skills such as insight into global and complex problems, handling available information and solving problems. Traditional measurement methodologies cannot capture these; new measurement methods would need to be developed and applied.

Many of the Collis and Van der Wende (1999) study's recommendations are still relevant today more than decade later, but in a changed context. Now, nearly all instructors are expected to use ICT and its use is also diffused among most faculties, administration, and support services in a modern university.

At the national level, the Dutch study (Collis and Van der Wende, 1999) suggested "flexibility, internationalization, and de-regulation" to encourage competition and responsiveness. It recommended removing any restrictions (disincentives) on part-time and distance-education students; encouraging collaboration with business partners, and among universities, and the adoption of quality assurance and consumer information systems. It saw a "strong link between the introduction of ICT and quality of education" which was expected to improve; it advised that quality of education provisions be written into performance agreements. The study was in favour of encouraging cross-border services, but wanted adequate protection for the consumer such as information about status of the provider, quality of academic courses and value of the credentials.

At the institutional level the Collis and Van der Wende (1999) study's focus was on developing a strategic and economic rationale as well as an educational vision for expansion and flexible delivery. It recommended the institution focus on incentives for instructor engagement and study and respond to hidden costs, such as time spent by faculty on their own professional communication (e-mail), their own document processing (word processing) and the increased time spent on students' communications. It recommended that instructors blend face-to-face with distance teaching; develop the more actively-contributing students through group work, linking to other sources and submitting work via e-mail. And it recommended that instructors be responsive and flexible, while managing a balance between work and life (p. 118).

The growth of the knowledge economy in the last thirty years spurred innovation (R&D) and the growth of research universities where research professors were granted tenure. In the words of Louis Menand (2001, p. 7), "for the first time in the history of American higher education, research rather than teaching or service, defined the paradigm of the professor--not only in doctoral institutions, but all the way down the institutional ladder."

The literature indicates that the impact of the knowledge economy on the university is widespread and subject to diverse views. Some have argued that professors are over committed (Clark, Moran, Skolnik and Trick, 2009), others have advocated the use of more technology, and nearly all have agree with further expansion of higher education in one form or another. The challenge for modern Canadian universities is to provide high quality, liberal education for the new "digital generation" (the "always connected") on one end, and for "disadvantaged" individuals at the other (see Dretzin & Rushkoff, 2010), while being pressured by globalisation, competition and government.

Globalisation

Globalisation has many meanings. Eric Beerkens (2006) compiled over 100 definitions from diverse disciplines. In essence, globalisation means the free movement of goods and services, labour, capital, entrepreneurship and culture across national boundaries. By reducing distance, globalisation, along with the Internet, has transformed business, accelerating the trend towards an integrated world market. The role of multinational corporations is prominent. In economics, globalisation means the integration of production at the global level, such as a world car produced from parts made in different countries. Such a division of labour allows the use of "just-in-time" delivery methods reducing inventory costs, increasing efficiency and profits. In politics, globalisation can mean lowering of trade barriers and the trend towards regional and world government like the United Nations and its agencies. It may also mean Anglo-American hegemony in world affairs.

For universities, a distinction is sometimes made between globalisation and internationalisation, while at other times the two are used interchangeably. The former is most often used in the economic sense--the number of foreign students, economic benefits/costs and the exporting of education as a product (Altbach, 2005, p. 3). Internationalisation, on the other hand, usually refers more to the cultural side, that is, experience abroad or learning about international relations, global citizenship or cooperating in research projects at the international level. In "*A New World of Knowledge: Canadian universities and globalization,*" Bond and Lemasson (1999) went further, suggesting that university institutional processes should internalize the concept of openness to the world in all activities and organisational aspects, in order to act more directly in the international order. This would require a re-interpretation of the

university's basic mission in teaching and service. Many universities pay lip-service to global education in their vision, but actual experience can help define a person's world view.

Internationally, free trade is seen as the key to the economic growth and well-being of both the economy and individuals. Under the World Trade Organization negotiations the role of higher education was contested, but under the GATS negotiations it is regarded as an "exportable product" and is promoted. The mandate of the marketing unit of the Canadian Department of Foreign Affairs and International Trade is "the international promotion of Canadian education and training products, services and expertise," encouraging Canadian universities to work with overseas partners (China, Middle East) and to undertake exchanges and joint-projects, and to recruit international students.

Mazzarol and Soutar (2001), in their model on competitiveness in the global market for higher education, asserted that education, as an exportable product, is subject to the same supply/ demand and pricing pressures as any other commodity involved in global trade. The model highlighted the importance of environmental monitoring, management of internal resources, specialisation, niche marketing and branding. These should be supported by a forward integration strategy and strategic alliances. In their framework on higher education, they noted that the core product consists of the benefits or utility of product transfers to the student such as employment, earnings over lifetime and social benefits of studying abroad. The actual product is best described in terms of courses and programs offered. And, the augmented product consists of intangible elements such as brand image or reputation.

Canadian universities usually justify the recruitment of foreign students in terms of "diversity," "excellence" and in helping the third world. Foreign students also bring in revenue as

they are charged the "full-cost" of education. Canadian universities are marketing abroad directly. They participate in education fairs, market through Education Centres in Canadian Embassies/High Commissions, and solicit foreign students through agents, web sites, and through word of mouth.

Some 90,000 foreign students are currently studying in Canadian universities, representing 9% of the student population according to an AUCC media release (Bechard, 2010).

The universities with the highest percentage of undergraduate foreign students were: (Maclean's, 2011, November 7) Saint Mary's (20%), McGill (19.1%), Simon Fraser (18%), UBC (15.4%), Toronto (15.1%), Montreal (14%), Cape Breton (13.8%), UPeI and Waterloo (both 13%), Dalhousie (11.8%), New Brunswick (11.1%), Moncton (10.9%), Carleton (10.7%), Concordia (10%).

For graduate studies, the percentages are higher. The top ten were:
Alberta (41.7%), Brock (39.1%), Regina (39%), New Brunswick (33.2%), Memorial (31%), Concordia (30.7%), Saskatchewan (30.2%), Windsor (29.2%), UBC (29.1%), McGill 28.2%), Calgary (25%).

In terms of attracting numbers of foreign students, the United States is the leader followed by the United Kingdom, Australia, France, Germany, and Canada. Mazzarol and Soutar (2001), comparing higher education strategies for the global market, found Australia and New Zealand to be the most aggressive in marketing, while Canada was not as competitive as others.

Australian universities' international education, similar to the UK, is run as a fully commercial business and not as a process of cultural exchange or as a part of foreign policy. Nearly one in five Australian students is a foreigner, mostly from East and Southeast Asia,

paying full tuition. International education is crucial to the financial health of Australian universities, providing $1 in every $10. Foreign education has become the source of additional revenue for universities that have been subject to accumulated cuts in public budgets. The Australian experience might provide a guide for these universities and a salutary warning, suggested Marginson (2002). Enrolment of foreign students in Australia grew by over 15% a year over a decade. In some Australian universities, nearly a third of all students are international. One university earns 25% of its total revenue in this market. Tuition paid by foreign students has become central to maintaining core funding, and per student funding has been cut to nearly half of what it was in the 1985. Some of the consequences suggested by Marginson are:

- Business related functions dwarfed the traditional faculty activity.
- Non–faculty staffing grew faster than academic staffing and accounts for almost two-thirds of all labour hours.
- The student/faculty ratio rose from 13:1 in 1990 to 19: 1 in 2001.
- Business studies and Information Technology grew the fastest.
- A majority of graduates in these fields were foreign students.

Australian universities had become so dependent on foreign students that a downturn in the economy or a change in the value of foreign currency in source countries would impact on revenues and market share in Australia. Though revenue levels were maintained, the monies from the growing sectors did not flow to other parts of the university. They were ploughed back to maintain competitiveness, or used to augment the corporate side. In many universities, basic disciplines in humanities, social sciences and sciences are in difficulty. Disciplines unable to

generate short-term revenues have lost status in the eyes of university leaders and commitment to scholarship as an end itself has faltered even among some faculty.

The Australian international education has been shaped largely by university leader-managers--particularly entrepreneurial presidents and marketing units--rather than by faculty. To seize niche markets, some universities developed new programmes without regard for shared governance or faculty ownership of the curriculum.

To sum up, though commercial revenues flowed into the university system in the short term, the cut in per capita revenues, in the long term, "has placed the quality of teaching and research--on which Australia's global reputation ultimately rests--in question" (Marginson, 2002).

Perhaps the closest Canadian equivalent to the Australian programs are the English as Second Language (ESL) programs in Canadian universities and business schools. The ESL programs recover the full cost of foreign students, while the business schools charge higher tuition fees than the university charges for core courses.

One impact of globalisation is the increasing commercialisation in Canadian universities sparked by the privatisation of services and the perceived increased role/influence of multinational corporations. One view embraces commercialism (Clark, 1998). Another view, seen in a series of Canadian Association of University Teachers' (CAUT) publications, is against this trend and suggests ways of limiting this intrusion. Commercialisation of universities is associated with revenue sharing and marketing of goods and services analogous to the private sector. Models for partnerships range from a simple contract to complicated relationships between university researchers/departments and multinational companies involving the

development of intellectual property such as patents, trials for pharmaceutical companies, and prototypes. Multinational companies are now also providing services on the campus--cafeteria, book store, entertainment, and library journals--"homogenising" these services and undercutting local culture. Commercialisation may divert resources from teaching and service to commercial undertakings.

The impact of globalisation on universities is both economic and cultural. Education has become a tradable product in a more integrated world market, with universities attracting foreign students or setting up campuses abroad. It also means more commercialisation (multinationals on campus) and working with the private sector in research. Culturally, internationalisation means universities are more sensitive to globally related issues such as world citizenship, global examples in curriculum and collaboration in research with global partners.

Competition

Universities have always competed. Athletic rivalries between Oxford and Cambridge, Harvard and Yale are well known. However, the level of competition and the resources expended have greatly increased since the 1970s; universities are now competing both globally and locally for students, for "star" professors, and for researchers. The World Bank calculates that higher education expenditure amounts to $300 billion a year, or 1% of global economic output. The reputation of universities (Mazzarol and Soutar's (2001) augmented product) plays an important part in the choice made by students. In the global ranking of universities (Altbach, 2005), 17 of the top 20 universities are American; Oxford, Cambridge and Tokyo make up the others. American universities employ 70% of the world's Nobel prize winners, produce 30% of the

world's output on articles on science and engineering, and 44% of the most frequently cited articles according to a survey conducted in 2001.

Among Canadian universities, the University of Toronto was 24th in the world ranking, UBC 37th, McGill 67th, McMaster 90th, Alberta in the 101-152 range, Queen's and Calgary - 153-202. Dalhousie, Laval, Manitoba, Saskatchewan, Victoria, Waterloo and Western were in the 203 to 300 range. The top 10 in *Maclean's* (2006) reputational ranking of 47 Canadian universities for *best overall*, in descending order, were Waterloo, McGill, Toronto, UBC, Alberta, McMaster, Queen's, Simon Fraser, Sherbrooke, Western. The bottom five were: UQUAM, Trent, St. Thomas, Windsor, Moncton. (Maclean's, 2011, p. 150). These rankings are seen to be very important by university and government decision-makers and have an impact on the allocation of resources.

Both to compete with each other and not to be left out, universities use strategies such as "branding," advertising, and aggressive marketing among target groups-–18-25 years old, those graduating from high school, and the "mature" population returning to studies. The competition for those with "A" grade is so fierce that "discounts" and monetary incentives are offered to persuade them to attend a particular institution. Universities also compete for some of the lower grades, with conditional admission in a "qualifying year" and prescribed "remedial" courses. Competition for monies and projects from granting agencies is also fierce as almost all universities are engaged in research. But, there is no fierce competition for reaching the top of the teaching league, though some effort is being made by offering prizes for teaching, and voluntary courses are being offered in improving teaching methods for instructors and teaching assistants. There are debates about whether there are any significant differences in

"outcomes" (graduation) between research universities and others. Whether a student's learning is "deeper" in any particular type of university is still under contention. Different arguments suggest different personality types prefer different methods of learning (communicative, textual, graphic) and may have different delivery preferences. For some, on-line universities are an alternative to the traditional ones. Clark et al. (2009) argued they are cheaper than the Ontario system and recommended the expansion of Athabasca, an on-line university, as one alternative to cater to the expanding demand for higher education from the Toronto area for the next two decades.

On-line for-profit institutions (Phoenix, Meritus) also argue that they can provide high quality education at a more reasonable cost than public universities, especially for working persons who don't have time to attend university full-time. Apollo provides just-in-time education, 24 hours/day, which meets the needs of every individual. The Apollo Group, parent company of University of Phoenix, operates in many foreign countries – UK, Europe, China, India and Mexico. Its Canadian subsidiary, Meritus, is registered in New Brunswick. Phoenix has the largest internal enrolment (433,000 in 2009), among all US institutions.

In conclusion, Altbach's four factors – democratization, knowledge economy, globalisation and competition – provide a useful and plausible explanation of why and how the old college system evolved into the modern university. Louis Menand (2011, June 6, p. 79) suggested that "the system has become too big and too heterogeneous to work well for all who are in it." Further, he suggested, the exceptional phase in American higher education is coming to an end. From the 1960s, large populations kept on entering the system. The G. I. Bill, the baby boomers, then women, entered the university in droves, followed in 1980's and 1990's by racial and ethnic

minorities. “College was a gate through which, once, only the favoured could pass. For these groups, college was central to the experience of making it - not only financially but also socially and personally.”

Table 1 provides the main characteristics of and differences between the classical system and the New Reality. I will use some characteristics and indicators based on the old and the New Reality to test the hypothesis.

Table 1

Characteristics of the Classical College System and the Modern University

Variable	**Classical System**	**Modern University**
System	Elite	mass/universal
	teaching, some basic research	research dominance
Leadership	teacher-scholar	CEO
Student recruitment	informal, grade, money	formal, grade, money, marketing
	some competition	fierce competition
Student type	homogeneous - men	diverse – women, digital savvy
Core product	benefit few	individual & society
Actual Product	lecture, small classes	lecture, large classes
	direct contact with tenured professors	sessionals, TA's
	little technology, face to face	Info. highway, new tech
	full time activities outside classroom	working, no activities outside classroom
	limited choice of courses/ disciple	variety of courses/discipline
Support.	text, books, library	course pack, digital library, Internet
Learning	teacher-centred, social	self-learning
Expected outcomes		
Short-term	Graduation	graduation, high drop-out
Medium/Long-term	critical thinker, profession	skills; specialisation, job
Fiscal Outlook	growth, expansion, welfare state	slow growth, deregulation

Chapter 2

Mission Drift, Ideal Types

This chapter describes the concept of mission drift and the three ideal types.

Mission Drift—Theory for Non-Profit Organisations

Human capital theory sees investment in education as building blocks in terms of primary, secondary and tertiary or higher education, as well as on-the-job training after graduation. This study is concerned with quality of education in Canadian universities in terms of the ability to think critically and innovatively, with skills in language and numeracy as well as knowledge of subject matter content--competencies which would help launch graduates into their future careers and help them become better citizens.

Grounded in economic and organisational theory, a mission captures the essence of what an organisation does and why–-its raison d'être. The mission is at the core of its aspirations and hence direction. It has been much studied in the non-profit sector because it also serves as a source of inspiration by defining the significance and importance of the organisation's work (Phills, 2005, p.15). The vision and the mission of an organisation are realised by strategic plans through activities or programs. The concept of mission drift allows a non-profit organisation like a university to gauge the direction. Weisbrod (2004) contended that a not-for-profit organisation ought to avoid commercial activity in any form as this produces a "mission drift"–-a diversion of time, energy, and money away from a non-profit's mission. It could lead to competition for profits, and sponsors could back away. Jones, M.B. (2007), examining medical schools, concurred. Further, he suggested that internal factors as well as external, emanating from both the public and private sectors, such as government funding, grants and contracts, can lead to

mission drift. The multiple sources of mission drift include spending money on activities outside the institution's mission and investing to save private interest of individuals. Hishigsuren's (2004) case study, an evaluation of a microfinance program for poor women in rural India concerned with poverty alleviation and sustainability, operationalised mission drift in a period of expansion by measuring depth (type of clients), quality (service), and scope (variety of programs) of outreach during a period of expansion. Similarly, a comparison of two telecentres with a social mission, but with varying application of the meaning and extent of revenue generation, led one to fail and the other to expand and reach sustainability within a short time.

Mission drift means upsetting an organisation's priorities. For universities, it means pursuing revenue generation rather than academic interest, or a change in priority–-removing resources from the top priority such as teaching-–which could affect the quality of undergraduate education. Inefficient use of resources for mission activities could also be seen as mission drift according to some, such as not teaching enthusiastically with full commitment but only half-heartedly, or not using appropriate teaching methods in relation to new technology, or not devoting sufficient time for contact with students. Inefficient use of resources may also be found in areas such as evaluation of teaching by students or lack of certain services such as counselling or writing support. Other likely areas for mission drift could be partnerships, contracts, "incentives" for attracting "A" students, or even in peripheral areas such as real estate and overseas projects.

An organisation's mission statement expresses its core values, while a vision statement shows where an organisation wants to go. The mission is "translated" into plans and activities, committing the whole organisation towards achieving these goals. The minimum condition for

mission drift is to lose sight of the priority of the "core values/activities," devoting resources and energy to other "non-core" priorities, upsetting the balance between the two and lowering standards. Core products for universities are high quality of education (instruction) and basic research. Other products are applied research and community service. Collective bargaining agreements in modern Canadian universities stipulate that tenured faculty devote 40% of their time to teaching; 40% to research and 20% to community service.

Ideal Types—Entrepreneurial, Liberal Education, Deliberative

The concept of an "ideal type" is associated with Max Weber, a founder of modern social sciences, as a method of investigation and for explanation used in sociology, economics, political science and public administration. An "ideal type" is a theoretical construct for heuristic purposes with rational elements allowing one to learn about the real world. Weber developed "ideal types" for the bureaucracy and political leadership (charismatic). Other examples are found in economics such as the rational economic man, the market, or "models" based on various, often hypothetical, assumptions. The Stanford Encyclopaedia of Philosophy quotes Weber, "An ideal type is formed by the one-sided accentuation of one or more points of view" according to which "concrete individual phenomena are arranged into a unified analytical construct." In its purest fictional nature, it is a methodological "utopia that cannot be found empirically in reality." This is a basis of the scientific method advocated by logical positivists (Weber, 2007)

Pocklington and Tupper (2002) use the "ideal type" concept to sketch out day-to-day activities and the career of a fictitious professor focussing on teaching and research. Clark et al. (2009) view response by university leaders in terms of traditionalist (reformist continuum for the

purpose and forms of higher education) on one scale, and elitist (expansionist continuum for growth) on the other, eliciting four types of responses-–"traditional elitist," "reformist elitist," "traditional expansionist" and "reformist expansionist." Traditional-expansionist ideas have dominated the post-golden age scene, with enrolment expansion as the route to higher revenues and towards the more prestigious roles that characterised elite universities in the pre-baby-boom era.

Daniel Rich (2009) of the University of Delaware suggested categorising modern universities into entrepreneurial and engaged. The entrepreneurial is more self-reliant, self-directed and more attuned to the competitive demands and opportunities in the global marketplace for higher education. It emphasises applied research, commercial applications, labour market integration and business incubation. The engaged university, on the other hand, would be more public-regarding in its outlook with commitment to put knowledge to work in the service of society and would demonstrate the value of lifelong learning.

Based on criteria such as an emphasis on teaching/learning or on research (applied or basic), I derived, from the literature on modern universities, three ideal types that emphasise different aspects of the university system. These ideal types of universities are entrepreneurial, liberal education and deliberative education models. Heuristically, these ideal types focus on relationships between common elements in each type and key elements across types. The entrepreneurial school focuses on research, leadership, integration in a market economy and competition. The deliberative school emphasises "deep" knowledge and commitment to teaching by faculty and reflective learning on the part of the student. Research for its own sake is to be avoided, but undertaken for real problems with careful deliberation. While being wary of

corporate interests, basic research is favoured. The liberal education school falls in-between entrepreneurial and deliberative. It also emphasises an offering of "core" subjects in arts and sciences and a choice of subjects. George Fallis, (2007, p. 12) a former Dean of Arts and a liberal education scholar, wrote that undergraduate education must always be a liberal education and remains the central task of universities. "It must include study in the humanities and be an education for citizenship." He added that currently the humanities are marginalised as never before. Research is necessary and needed, but like deliberative scholars, basic research is favoured as compared to applied. Whether teaching and research go together or not, and to what extent, is a matter of debate within and across all strands of thought.

These three models allow me to follow the paths of evolution of modern Canadian universities providing an indication of divergence from core values/activities. They permit the use of existing direct indicators, proxy ones, and new ones in order to gauge change of direction.

Part II Methodology: The Research Hypothesis and Literature Review

Chapter 3

Hypothesis, Methods and Approach

This chapter begins by first stating the hypothesis. Second, it describes the mixed methods for obtaining the relevant quantitative and qualitative evidence that provide broad linkages to the framework i.e. Altbach's four factors, mission drift and the three ideal-types. Third, it outlines the general approach for this study.

Hypothesis: Research Dominance and the Resulting Quest for Revenue

The hypothesis is that in adjusting to the New Reality, modern Canadian universities experienced a mission drift by: a) giving priority to research at the expense of teaching and as a consequence b) maximising revenue generation without regard to quality of education. As illustration, the position taken by University of Toronto, a leading tertiary education institution, would represent well the stance taken by most other Canadian universities. President David Naylor of the University of Toronto (U of T), in a letter to alumni (Naylor, 2010), clearly stated the priority given to research: "Research matters in its own right as a contribution the university makes to the world. But it is also integral to our core mission of education. The research link is most obvious to graduate and advanced professional programs."

The evidence for this link is seen in global reputational surveys. The Times Higher Education-QS World University Ranking placed Toronto in the 9th position overall and among the top 15 in the world in engineering, life sciences, arts and humanities, natural sciences and social sciences. Similarly, the Higher Education Evaluation and Accreditation Council of Taiwan

(HEEACT) rated Toronto 11th overall, sixth in clinical medicine and first among universities in Canada in every field except agriculture.

In a research-focussed university, undergraduate education presents a number of major challenges, such as perverse incentives in higher education and advanced research across Canada that run counter to the needs of undergraduates. These incentives impact on teaching, the university experience, infrastructure (buildings, classrooms, laboratories, libraries) and student information systems. Part (b) of the hypothesis, the need for revenue generation, I contend, is a major pre-occupation of modern Canadian university leaders and is a consequence of giving priority to research. One "novelty" instituted at several Canadian universities is limited-term professorships with salary and research funding for only five years. Modern Canadian universities are also exploring limited-term scholarships, fellowships and chairs.

Mixed Methods

This section describes the mixed-method approach chosen to undertake both quantitative and qualitative analyses within the given framework, including the strengths and weaknesses of this approach and the links with Altbach's four factors.

The research question is a double one as illustrated by the basic hypothesis. Does the imbalance towards favouring research lead to the neglect of teaching in the pursuit of revenue maximisation? Does this, in turn, lead to the lowering of the quality of undergraduate education? In addition, is the concept of mission drift useful in understanding the Canadian university system?

The main strengths of the mixed-method approach are complementarity (quantitative and qualitative sources complement each other), stronger evidence through convergence,

corroboration, and triangulation. It can increase generalisability of the results as well as provide in-depth understanding (Bazeley, 2004). Its weaknesses are the purist contention that researchers should always work within either a qualitative or quantitative paradigm and that details of mixed research methodology remain to be fully worked out (Johnson and Onwuegbuzie, 2004).

My thesis proposes to use quantitative and qualitative data to investigate the hypothesis, involving performance measurements for each of the three models and looking for a shift, as on a continuum, in modern Canadian universities from the deliberative and liberal education models prevalent in the classical college system towards the entrepreneurial approach.

Quantitative methods.

The quantitative methods and their links to Altbach's four factors are described below.

1) Analyses of ranking tables include global, regional and national rankings of universities. These tables are used to measure "excellence" and reputation among universities. They are objects of fierce competition between universities and are used by university administrators and governments for decision-making and for direction. Students use the rankings to choose the universities they attend and for their career decisions. Data sources are from print and electronic publications from web sites.

2) Analyses of the National Survey of Student Engagement (NSSE), 2008. From 2006 onwards most Canadian universities participated in NSSE. The survey collects on-line, annual information directly from undergraduate students about their participation in programs and activities that the institutions provide for their learning and personal development. They reflect behaviours by students and institutions associated with desired outcomes of college. The data from NSSE are related to three of Altbach's four factors. For example, questions under the

umbrella of democratisation include data on age, sex, ethnicity, parents' income and the relationship of these variables to student participation and outcomes. A change in the type of disciplines studied would exemplify a shift taking place due to the growth of the knowledge economy, while information on foreign students and diversity would be related to the impact of globalisation. NSSE data also quantify some qualitative aspects of pedagogy such as learning by memorisation versus analytical, and skills such as reading, writing and mathematics. Data are from the University of Ottawa, Office of Institutional Research and Planning, and from some other universities' web sites and Internet postings.

3) A regression analysis using the rich NSSE data for 2008 University of Ottawa students is an attempt to test a theory of surface and deep learning and outcomes as propounded by the deliberative school. This method is an attempt to increase generalisability as well as in-depth understanding of the theory. Despite democratisation, modern universities claim to gear their teaching to "deep" learning, whereas memorisation still prevails. The regression analysis explores NSSE data to examine the statistical relationship between student grades–-the dependent variable –-and 15 theory-informed independent variables that might impact on students' performance.

4) Empirical evidence is gathered from pertinent studies, surveys and administrative data. The sources include universities, Statistics Canada, the Association of Universities and Colleges Canada (AUCC), the Canadian Association of University Teachers (CAUT) and journals like the *Chronicle of Higher Education* (CHE) and *Academic Matters*. Newspapers (*The Globe and Mail, The Ottawa Citizen, Le Devoir* and *The New York Times*) are informative, pointing to local case studies and trends. Specialised journals in teaching, research and education (many online) are

also useful. These sources are linked to Altbach's factors and the three ideal types through indicators or economic and statistical measures that support interpretation and validation of the hypothesis. Examples include: statistical series in CAUT's *Almanac of Postsecondary Education in Canada* 2010-2011 (CAUT 2011a); AUCC's *Trends in Higher Education, v3, Finance* (2008); and the seminal study, *Hidden Academics: Contract Faculty in Canadian Universities*, by Indhu Rajagopal (2002).

Qualitative methods.

The qualitative methods include:

5) Analysis of policy documents on higher education in Ontario as expressed in commissions and reports--from the 1960's to Bovey (1984), to Rae (2005) to Drummond (2012a) --and implemented by the government of Ontario. Tertiary education policies in other provinces follow basically the same pattern. These documents have advocated access to university by under-represented groups of the population such as Francophones, women, the First Nations, visible minorities, low income and those with mental and physical disabilities. Policy documents have also commented on teaching and research. With the growth of the knowledge economy, they encouraged research and partnerships with the private sector (sponsored research), made comparisons with other university systems–-U.S., UK, Australia and New Zealand-–extolled the need for diversity and institutional "differentiation" (rather than "competition"), and suggested ways of funding postsecondary education.

6) Secondary sources on North American, British, European and Australian universities include books and articles by university presidents, deans and researchers. Examples include Bok (2003, 2006), Kerr (1982), Fallis (2007), and Axelrod (2002, 2007) among others. Presidents

were often preoccupied with financial issues, but were also worried about the integrity of their universities and the quality of education as exemplified in Bok's dream (borrowed money for a dream university) which turned into a nightmare–-is everything for sale? What are the limits? Or, what is the right balance of priorities? Woodhouse (2009) argued that Canadian universities have sold out quality of education, values, academic freedom and integrity to corporations for research money. These are some of the intrinsic value issues a modern university contends with in a knowledge economy.

7) Participating in teaching and learning seminars at University of Ottawa. I attended the Teaching and Learning seminars, "Program of Instructional Workshops for Professors, Graduate Students and Postdoctoral Fellows," (Centre for University Teaching, CUT, 2009-2010). Seminars ranged from how to plan for lessons, good practice in undergraduate education, how to grade, technology, team building, motivation and diversity, to a three-hour interactive discussion on the speaker phone with Professor Ken Bain of NewYork University, the author of "What the best college teachers do" (Bain, 2004)**.** CUT also held separate seminars for TA's in political science (coordinator Professor Saurette, see notes, 24/09/2009, 13/11/09). This method provides data on teaching not found by other methods and complements the analyses on research.

8) illustrations from letters and conversations with sessionals, TAs and students. These include a letter from the President of University of Toronto to alumni (Naylor, 2010). I also followed up with some sessionals participating in the CUT seminars. I attended some of their classes to get a flavour of their teaching and talked to the instructor or students. The two "interviews" cited in my study (Dan and Desroches) were notes from talking to two typical science (here mathematics) and arts (here political science) instructors. These notes corroborate

the evidence on the human condition of sessionals gathered by Rajagopal (2002), Clark et al. (2009) and others. The plight of TA's became evident after attending one or two sessions with political science TA's. At every session, the new TA's seemed mostly inexperienced, from another province or institution, and likely not familiar with their professors. They also have pressures to perform well in their own program and courses.

Approach

An examination of the hypothesis on research domination and on mission drift in Canadian universities encompasses mixed methods--quantitative and qualitative--involving performance measurements for each of the three ideal types: entrepreneurial, deliberative and liberal education. Under all three the development of "human resources" is a fundamental theme. The entrepreneurial emphasises risk-taking behaviour, working closely with private sector in research, accepting its values and depending on it for revenue. Because benefits are seen to accrue primarily to the individual, it is seen to be legitimate that much of the cost of university is borne by the individual and that tuition is set by market forces. The deliberative and liberal education models emphasise the societal-good aspect of human capital and the intrinsic goodness of education for society as well as the individual. They favour public funding for universities, but would expect universities to promote autonomy and to fight for the public interest.

In the absence of precise measures of human capital, proxy measures or a cluster of characteristics is often used. OECD (1998, pp. 82-84) also advocated longitudinal studies and case studies to illuminate certain aspects. Also, there is agreement that university education benefits both the individual and the society. OECD measures of educational attainment of adult populations included the highest completed level of education, or the average years of schooling,

as a percentage of working age population aged 25-64. Adult literacy is another measure which looks at existing competencies and skills rather than educational attainment in the past. The measures relate education with employment and earnings, and work out separately private, fiscal and social rates of return. Expenditures on education are also related to national income (see OECD, Annex in 1998; Keeley, Annex, 2007). The main elements I want to focus on from the deliberative model are to the extent to which teaching staff has cross-disciplinary knowledge and commitment to "deep" teaching and learning, as well as measures of levels of sustenance for support staff and library resources. From liberal education, I have included teaching of humanities and core subjects, critical thinking and skill competencies. Much of the information on quality of education comes from NSSE, (2008), from seminar discussions, and from the writings of presidents, deans and researchers.

In Canada, provincial governments are responsible for education, but the federal government also funds research, student aid, aboriginal education and grants. Post-secondary education is one of the largest items of budgetary expenditure in every province in Canada. Canadian universities, each established by an Act of Parliament or a Royal Charter, typically have a bi-cameral structure--a Board of Governors and a Senate-–with a great deal of autonomy, and are expected to exercise their academic freedom in the "public interest." Many board members come from business or the professions in the local community, others from the university's senate, or they represent university interests (students, support staff). The board is responsible for a university's overall governance and management. It makes the financial decisions and implements policies and procedures that the university needs to operate efficiently. The Senate is responsible for sound management of academic issues on campus. It has powers to

create or abolish faculties, departments, schools and institutes. It regulates matters related to admission, programs of studies, degrees, diplomas and certificates. Canadian universities currently employ some 40,000 faculty members, who are responsible for teaching, research and decisions on the content and delivery of tertiary education. Most of the analyses will focus on Ontario, but relevant material from other provinces and universities will be brought in for illustrative purposes.

Chapter 4

Literature Review

The objective of this literature review is to provide justification for the framework and the methods chosen, and to flesh out evidence for the demonstration of the hypothesis. This review highlights three areas-–adaptation to the New Reality, mission drift in the universities, and the origins of the funding formula for the modern Canadian universities.

Adaptation to the New Reality

Mission statement, strategic plans and communications from a university's administration are a primary source for understanding its mandate, mission and responsibilities. Secondary sources include books, journal articles by academics, government documents and newspapers. University presidents and faculty provide valuable insight into the workings of higher education. Nearly every university has publications on its history. Internet and university websites are useful for information on overseas-–UK, US, European–-universities, as well as those in Canada. Among academic periodicals, *The Chronicle of Higher Education* (CHE) is insightful and *Academic Matters* also serves an academic niche.

Generally, literature on adaptation of modern universities to the New Reality is limited for Canada but is rich in the United States and Europe. In the United States, the diversity of the university system-–the Ivy League, the research universities, the state university system, and the virtual and corporate universities-–provides greater opportunities to experiment with different paths for adaptation to the New Reality. Case studies, lessons from success and failure from this literature, are useful for modern Canadian universities, at times providing insightful observations into situations which US universities may have already encountered and dealt with.

Literature on mission drift in universities suggests the imbalance between education and research. Both the deliberative and liberal education schools highlight this dichotomy. However, there is no agreement on its definition, extent, the fine-line or balance, except that the imbalance is overwhelmingly in favour of research, reinforced by the rewards system and governments, and that modern Canadian universities are moving more and more towards the entrepreneurial ideal type, away from the liberal education and the deliberative models.

Entrepreneurial.

The "entrepreneurial" school is epitomised by Burton Clark (1998) who looked at the process of transformation in research universities. These cases were a success, in his view, due to entrepreneurial leadership but also due to diversification of income, strengthened steering capacity, more outreach, collaboration with firms and public agencies, strong willingness to develop an adaptive outlook, attracting older students through professional development courses, and broadening of faculty culture to include inter- and trans-disciplinary areas alongside the disciplinary. For Clark (2004) "barriers" to transformation include dependence on government finance and student numbers; dominance of faculty by deans and administrators; the priority of financial considerations over academic judgement; and a vertical structure of command that frustrates new initiative . A logical conclusion to his argument would be to examine "for-profit" universities which have sprung up to meet the demand for tertiary education. Slaughter and Rhoades (2004) show how to "integrate" public universities in the private sector. Other American writers with similar views to Clark include Ben-David (1983), Cole, Barber and Graubard (1994), Nordlinger (1981), Pelikan (1992), Slaughter and Rhoades (2004), Wilson (1999) and Wolff (1969).

Liberal education.

In between the entrepreneurial and the deliberative views, the liberal education school emphasises liberal education, choice of subjects and citizenship. Further, applied learning, professional education and vocational instruction that embrace liberal education are seen to be superior to practical training in which liberal education concepts are absent. This school bemoans the modern university drifting away from its traditional focus, with liberal education being squeezed out by the "business" model. The humanities and social sciences comprise the core of liberal education. According to this school, the goal of all universities in Canada is to educate students to be critical thinkers, autonomous and well-rounded citizens who tolerate diversity of opinion, have specialised knowledge, participate in community life, care about others and have effective communication skills (Axelrod, 2002). The Accreditation Board for Engineering and Technology suggested that universities should focus on basic capabilities such as communication skills, ethical sensitivity, ability to collaborate, cultural awareness and understanding of the socio-political environment (Bok, 2006, p. 299). Connor (1999) decried the lack of moral knowledge and suggested teaching history and humanities, but ultimately would leave it to the individual student to make up his or her mind and to have the capacity for doing so. The psychologist, Kohlberg (as cited in Crain, 1985), argued that moral values are acquired in five stages from early childhood, similar to the acquisition of language. These stages are 1) obedience 2) self-interest 3) conformity 4) law and order and 5) human rights. The implications are that students would likely benefit from learning about higher level moral values, as they are "built" upon knowledge already acquired, leading to better understanding of citizenship. Stanley Aronowitz (2000), in *The Knowledge Factory,* argued that universities have become employment

agencies, churning out people to meet the needs of corporate America. Allan Bloom, in *Closing of the American Mind* (1987), argued that students are not particularly moral or noble, but docile, attributing this state of affairs to moral relativism, instant gratification and the poverty of students' education.

Axelrod (2007), a Liberal education scholar, suggested good professors are known and remembered for seven qualities-–accessibility/approachability, fairness, open-mindedness, mastery and delivery of academic material, enthusiasm, humour, knowledge and inspiration imparted.

The deliberative school.

The opposite view to Clark is taken by American academics such as Anderson (1993), Kerr (1982), Barzun (1993), Flexner (1994), and Readings (1996). Canadians include Axelrod (2002), Corry (1970), Marchak (1996), Pocklington and Tupper, (2002), Tudiver (1999), Turk (2000) and Hughes and Mighty (2010). The Canadians all argue that Canadian universities drastically and deliberately neglect undergraduate teaching, while promoting and giving priority to specialised research. They are wary of commercialism and want universities to preserve their autonomy and fight for the "public good." Pocklington and Tupper (2002) summarise the Deliberative School's arguments well. They contend that teaching ranges from "indifferent to abysmal." Classes are large, and are generally taught by sessional lecturers, teaching assistants or professors for whom teaching is a chore. The authors argue that a lengthy program of learning is required by undergraduates, or, for that matter, by graduates, to produce high quality research. Students need the breadth and depth of teachers engaged in reflective enquiry, which the sessionals and teaching assistants are unlikely to provide, but which would contribute more to

their largeness of vision and wisdom than academic publications. Further, students are interested in "larger" questions than the minutiae of new facts or "frontier research." From a university, students in the professions seek "facts, lore, know-how and polish to pursue successful careers." They have no need for research skills themselves but need to keep up with the knowledge produced by the latest research.

Pocklington and Tupper (2002) point out (entrepreneurial and liberal education scholars would also agree) that research has become the dominant "ethos" in all Canadian universities, regardless of their genre--whether medical-doctoral, comprehensive or mainly undergraduate--popularised by *McLean's* magazine's annual university rankings for Canada. The reasons include: concentration of research in the university, the "publish or perish" phenomenon, and prestige for the university. Professors spend more and more time thinking about and conducting their research, so that little time is left for teaching. Students are convenient "subjects" for study and provide cheap labour in the conduct of research. Further, when probed as to why a university cannot be turned into a research centre with no teaching, most faculty members would object and admit that the pre-eminence of teaching is axiomatic, teaching is the raison d'être of a university. Dimensions of good teaching are well known to educators, but not all faculty members will be able to put these into practice. Good teaching, according to Pocklington and Tupper (2002), includes: 1) being present where the students expect the teacher to be (at designated classroom, on time), designated times for meeting outside the classroom, and "not always pressed for time," 2) knowing the subject (its relationship with other discipline) and having thought out tough questions, 3) teaching ideas rather than information, 4) enthusiasm, 5) treating students with respect, and 6) taking students as they are and motivating them. Centres of Teaching and

Learning in Canadian universities have been trying to implement good teaching from the faculty perspective and from the students' perspective for the last twenty-six years as shown by teaching and learning web sites of Universities of Ottawa, Queen's and York).

Mission Drift in Universities

There is no agreement on the definition of mission drift among studies focused specifically on universities. For Fallis (2007), mission drift was evident in undergraduate education, weaker commitment to liberal education, marginalisation of the humanities, and the government's emphasis on economic growth which had been moving Canadian universities away from basic to applied research. A student-centred study of Syracuse University and the University of Arizona showed that the emphasis on teaching meant that faculty were left out of the "research" market (Geiger, 2004). Faculty retention became a problem affecting the reputation of the university in other areas. Adjustment measures were taken to re-balance the pendulum. Sir George Bain, Vice-President of Research at Queen's University, Belfast, as reported by Lucy Hodges, in the Independent 29/9/2002, deplored "mission drift" whereby funding mechanisms forced universities to increase their research in order to maximise their revenue. He felt the idea that Britain can support 106 first class research institutions strained the imagination. Mission drift for the Ontario Ministry of Training, Colleges and Universities is the growing tendency for sectors and institutions to overlap and become more alike and less different from each other. Zemsky, Wegner and Massy's (2006) approach is market-smart and mission-centred. They suggested using funds earned in the market to "reinforce a university's sense of itself as an institution of public purpose," emphasising change in the university's organisation and culture (2006, p. 9). Quality of education, for Zemsky et al. (2006) meant getting the most

out of the resources one has; adding as much value as possible for enrolled students-– transforming every student to the maximum extent possible given his or her talent and preparation--and focussing on education as a primary institutional outcome, not an adjunct to knowledge creation. Quality meant focussing on people as much as ideas (p. 141). “Satisficing,” working just enough to meet the minimum requirement, he also saw as mission drift. If a commercial partnership distorts a university’s priority, prevents the university from retaining or from changing its priority, or affects collegiality or established decision-making processes, then there is a case for mission drift. Governments and granting agencies can also lead to mission drift distorting the university’s priority.

In his presidential address to the Canadian Political Science Association, Nossal (2006) pointed out that the phenomenon of research domination had accelerated. In the past 30 years, he calculated that the enrolment of students doubled, but the professoriate increased by just three percent (p. 4). The push for research intensity has encouraged and legitimatised “the flight from the classrooms” of not only Canadian political scientists but also members of other faculties. Nossal (2006) attributed the survival of the balance between teaching and research in the Canadian university system to the professors themselves. Many more among them believe in the balance between the teaching and research missions than Pocklington and Tupper (2002) have led us to believe. But, the older generation in both the universities and in the professions, is retiring; and Nossal (2006) felt that the younger generation may not have the same commitment.

My literature review shows agreement among the three schools of thought on the imbalance towards research. Entrepreneurial supporters would argue for more research, more integration with the private sector and the market; liberal education and deliberative schools both

would agree that the research ethos is dominant with its publish and perish attitude influencing hiring, promotion and tenure, and relegating instruction and quality education to the back bench. All three schools would agree with Nossal (2006) and CAUT that not enough tenured professors are hired to keep up with the growth in student enrolment and that sessionals, TA's and animateurs cannot realistically substitute for experienced, tenured professors. The debates between the three schools and at times even within a group arises from the disagreement on the definition of mission drift, measurement, the extent of mission drift and what to do about it.

University Funding Formula--Governments and Agencies

Although under the Canadian constitution provinces are responsible for education, the federal government is directly engaged in funding research, student aid, aboriginal education and grants, while the provincial governments are major players in tuition, student numbers, structure of provincial higher education system, institutional governance and labour relations. Federal research granting agencies play an important role (Doern and Stoney, 2009; Lopriete and Murphy, 2009; Lapointe, 2009). However, this division is not neat; the provinces are also heavily involved in research. Quebec has a parallel system to safeguard its culture and each province has programs of financial assistance that include loans, bursaries, scholarships and income tax measures. In every province post-secondary education is the third largest item of budgetary expenditure, behind health and primary and secondary education (Tupper, 2009).

In the 1980's and 1990's, years of restraint, student numbers increased in Canada's universities, but provincial per capita grants decreased. Universities tried to increase revenues and cut costs, while tuition increases were frozen or closely controlled. Core and non-core funding is based on the number of students enrolled along with a weighting formula for

operating costs. This skews the distribution of money towards the sciences and graduate programs as they are given greater weight and cost more. CAUT's *Almanac of Post-secondary Education 2010-2011* (2011a), citing Statistics Canada/CAUBO calculations, shows total governments' share of operating costs in Canada was 84% in 1988, down to 58% in 2008; while tuition's share moved up from 12% to 35 %. In Ontario, tuition fees account for nearly half of the contribution to revenues. The real cost of teaching is not known. Roger Geiger (2004), who developed a sound system calculating real costs, compared 99 universities and concluded that research got the biggest share, not teaching, though most of the revenues came from student fees. This was also the case for Canadian universities. To quote AUCC (2006, p 4), "in 2005, universities cross-subsidized an estimated $4.3 billion of their internal funds to research, an increase of more than 80% over a decade earlier." Cross-subsidization means monies meant for instruction are used for research.

However, to better understand the nuances of government financing for Canadian universities for both teaching and research, I will examine briefly the allocation of financial support by formula, in particular, for Ontario. This is the principal method (based on enrolment, and Basic Income Unit (BIU) or weight of a programme, of allocation of funds to universities and colleges in the state system in the United States and in the Canadian provinces. The main aim of the formula is to "cap" government expenditure in an "envelope" (there is no limit to what universities could spend!), allocate monies to universities on a fair, equitable and impartial basis (block-grants); stabilise allocation in periods of high enrolment growth and buttress decreases ("corridors" and minimum "share" of funds), while allowing the universities autonomy

to hire instructors and to devise programs for Arts, Sciences, Social Sciences, and the Professions. Graduate schools are seen as training grounds for future instructors.

The evolution of the system is well described from its introduction in 1965 to 1985 by Monahan (1988) who saw the success of the formula in the past twenty years as providing "grounds for moderate optimism that this method of support for universities, which has supported both universities and governments well, will continue to be used in the allocation of support for universities in Ontario." With slight modifications, the formula is still in place. Monahan (1988) suggested that originally "two-thirds of the BIU represented instructional costs and one-third represented overhead costs of research" (p. 375). Over time, additional grants were given on top of the basic formula. These were: supplementary grant (seed for new programs, discontinued in 70's), emergent (small universities), bilingual, and Northern grants (Lakehead and Laurentian). One of the Bovey Commission's (1984) recommendations was implemented: funding would not be lost if enrolment was within the "width" of a university's "enrolment corridor" (4, 6, or 8 percent of upper or lower limit of current enrolment) providing the university was active in research. This proposal was intended to provide more research funds. The new Liberal government of Ontario with the Ontario Council on University Affairs in 1986 (Clark et al., 2009) developed five "envelopes": grants under formula (seven year rolling average), new enrolment (3% "corridor"), overhead costs of research, institutional programs (social, bilingualism, differentiation, Northern) and an "envelope" for costs of adjustment to programmes. In addition, "an accessibility adjustment envelope" was added to compensate for those institutions that had expanded at the time when support was provided at less-than-average dollar value of the basic income unit.

The Ontario Ministry of Training, Colleges and Universities (MTCU) defined the BIU, which, for each student enrolled the type of program and level together generate a funding unit. Examples of funding weights are: 1-3 for undergraduate programs; masters 3-4; and doctoral - 6. The weights for first year Arts and Science, General Arts and Science is 1; upper year Honours Arts, Commerce, Fine Arts, Law - 1.5; Applied Science, Engineering, Architecture, Upper Year Honours Science, Education, Nursing, Pharmacy, MBA - 2; MA – 3; MSc - 4; Medicine, Dentistry - 5; Doctoral - 6. Grants assume a full-time equivalent student of, on average, at least four courses per term, two terms for undergraduate and three terms for both masters and doctoral courses. There is a time limit for funding graduate students. The funding weight is applied to both the MTCU grant and a portion of students' tuition fees, thus the final grant per FTE student is not proportional to the funding weight. It is argued that revenue is the main determinant of cost--universities aim to raise as much revenue as they can and spend as much money as they can raise--which goes some way to explaining per student cost differentials with the same or similar production functions. Monahan (1988, p. 390) made a succinct observation that a formula based on enrolment fosters "unhealthy competition for students, encourages academic mediocrity rather than high quality, and promotes homogeneity rather than differentiation in programs or courses of study." His observations are somewhat justifiable in the light of experience in Ontario, and, one could add, Canada.

Formula funding like Ontario's, based on enrolment and Basic Income Unit (BIU), is commonly used to allocate funds to universities and colleges in the state system in the United States and provinces in Canada. In the modern Canadian universities, funding from government and tuition from undergraduate students-–the majority–-is the basis for institutional funding.

However, there is evidence that instruction monies cross-subsidise research. Formula funding promotes competition for students, academic mediocrity, and homogeneity in programs.

Part III Analysis and Results

Chapter 5

Measures/Indicators for the Three Models

The objective of this chapter is to find the best indicators for our models by examining the measures used by modern universities to claim "excellence" overall and in specific fields. These rankings are influential. Besides universities, others also use them to make choices--internationally mobile students and faculty, parents, governments, sponsors and private investors, academic partners and academic organisations, industrial partners and employers (Hazelkorn, 2007a). Scholars of the three models point to the need for more relevant indicators to satisfy their own objectives. All three models are concerned with teaching and research and all want to improve productivity and quality of education. Indicators act as a gauge towards these goals. Global indicators are based on research (mostly scientific publications) and measure "prestige" while teaching, learning and quality of education are absent or neglected. This lacunae persists even among ranking tables at the regional and national levels.

The first section examines global rankings. What are they? What do they measure and leave out? What are their characteristics and shortcomings? What are the implications for university, individuals, government and industry? The second section reviews national/regional rankings which are more robust than the international ones, but still lack the "quality" aspects of teaching and learning. Specifically, it examines Canadian measures-–MacLean's, Globe and Mail and NSSE. The third section assesses the usefulness of existing measures, or parts of them, for this study, suggesting "proxy" measures or questions as supplements in the exercise of triangulating evidence for the study's hypothesis.

International Rankings

Nearly all universities are preoccupied with their "reputation" as reflected in their rankings world-wide. National league tables have been common since the 1990's, but as higher education has become globalised, the focus has shifted to global rankings such as those published by the Shanghai Jiao Tong University in China (SJT), The Times Higher Education Supplement, UK, (THE) and the Higher Education Evaluation and Accreditation Council of Taiwan (HEEACT). Given the importance now accorded to these rankings, it is worthwhile examining them in detail.

Shanghai Jiao Tong University in China (SJT). SJT, which rates universities for their "excellence" in research, first published a league table in 2003. The criteria for university selection included the number of Nobel Laureates, Field Medalists, highly cited researchers, or papers published in Nature or Science. In addition, universities with a significant number of papers indexed by Science Citation Index-Expanded (SCIE) and Social Science Citation Index (SSCSI) were also included. More than 1000 universities are actually ranked each year and the best 500 are published on the web. There are some 17,000 higher education institutions around the world; many are excluded from these rankings (ARWU, 2009)

The indicators for quality of education are: Alumni and faculty winning Nobel prizes and Field Medals (Code: Alumni and Awards) with a weight of alumni 10% and faculty 20%. Alumni are defined as those with Bachelor, Masters and Doctoral degrees. Different weights are accorded to the different periods of obtaining degrees, with greater weight for recent graduates. Faculty is defined as working at the institution at the time of winning the prize. Quality of faculty is measured by highly-cited researchers in 21 broad subject categories (HiCi; weight 20%) and

papers published in Nature and Science (N&S; 20%). The broad categories are finally aggregated into five fields – science, engineering, life sciences, medicine and social sciences–-and five subjects–-mathematics, physics, chemistry, computer science and economics/business. Research Output is compiled by papers indexed in SCIE and SSCI (PUB; 20%) and per capita academic performance of an institution (PCP; 10%). Under PUB, "articles" and "proceedings papers" are considered. Data on the number of full-time equivalent academic staff are obtained from national agencies such as ministry of education, bureau of statistics, associations of universities and colleges and rector's conference.

The final indicator, Academic Ranking of World Universities (ARWU), includes ranking at world, regional (Americas, Europe, Asia/Pacific and Africa) and national levels with scores for Alumni, Award, HiCi, N&S, PUB, PCP and Total. "There appears to be a near obsession with the status and trajectory of the top 100," said Hazelkorn (2007b).

For the 2009 ARWU global ranking, the top 20 universities, except for Oxford, Cambridge and Tokyo, were from the United States. Harvard has been consistently on top of the ladder. Europe had 32 in the top 100. Among Canadian universities, Toronto was 27, UBC 36, McGill 65, McMaster 91. Others, Montreal and the University of Alberta, were in the 101 to 151 range. The 201-302 range included Dalhousie, Laval, Queen's, Simon Fraser, Calgary, Western Ontario, Guelph, Manitoba, Ottawa, Saskatchewan, Victoria and Waterloo. Carleton, Quebec, Sherbrooke and York were in the 402-501 range. On the regional, North American scene, Toronto ranked 20th, UBC 29th, McGill 44, McMaster 54. National rankings were: Toronto first, UBC second, McGill third and McMaster fourth.

The main criticism of the Shanghai methodology is that it favours natural sciences over those with other merits by relying on prizes, articles, conference proceedings and science publication indexes. An adjustment was made; a foot-note in the methodology reads, "For institutions specialised in humanities and social sciences such as London School of Economics, N&S is not considered, and the weight of N&S is relocated to other indicators" (Academic Ranking of World Universities, ARWU, 2009). Despite this adjustment, LSE does not appear in the top 100, let alone the top 20, and has been relegated to the 201-302 range. Another critique is that English speaking universities predominate. ARWU's own analysis shows US dominance with 55% of its institutions in the top 100 (30% for top 500), its share of world GDP is 23% with a share of world population of only 4.5 %.

Times Higher Education Supplement and Quacquarelli Symonds (Times-QS).

A rival league table, Times-QS, appeared in 2004 and continues to rank universities each year (THE-QS, 2009). It gives weight to outsider views such as other academics and recruiters of graduates. The final result is the ranking for around 600 institutions. The ranking is compiled from six weighted indicators. The first, Academic Peer Review (weight 40%) is a composite score drawn from an online survey (based on three years worth of responses totalling 9,383 in 2009) of subscribers to two databases–-World Scientific (180,000 email addresses) and the International Book Information Service (IBIS). Responses are aggregated into five subject areas from 68 specific subjects--Arts and Humanities, Engineering and IT, Life Sciences and Biomedicine, Natural Sciences and Social Sciences. The survey on knowledge of faculty, in addition to personal information (name, address, job title, university, department, number of years in academia), asks about familiarity with higher education research for different regions

and sub-regions–-Americas; Europe, Middle East Africa; Asia, Australia and New Zealand. Indication of quality of a university (five gradations of answers) includes high faculty/student ratio, international profile; number of citations received by faculty overall per faculty member; recruitment demand for students; reputation for high quality research; reputation for high quality students; satisfaction level of students, and other. Professors are also asked to identify up to five leading companies which are considered to make a significant contribution (intellectually or financially) to knowledge generation or research in their own field. The second indicator, Employer Review (weight 10%), is based on responses to online employer survey (3,281 responses in 2009) focused on graduate employability. The questions ask what disciplines employers are looking for and the number of graduates they expect to recruit in the next two or three years. Specifically, questions steer towards recruitment of MBA's, their salaries, and involvement in recruitment of MBA's in the past. For the third indicator, student/faculty ratio (weighting 20%), the methodology states, "clearly, it is not as satisfactory as a qualitative classroom evaluation as might be considered for a domestic teaching assessment, but it does speak to the notion of commitment to teaching, which ought to correlate strongly if not completely with the level of teaching quality." Two distinct datasets are gathered–-full time equivalent (FTE) students and full time equivalent (FTE) faculty. The data are drawn from undergraduate and post-graduate numbers supplied from government ministries, agencies and other third parties. The fourth indicator, citation per faculty (20%), is factored against the size of the research body. THE-QS gathers two data sets–-total citation count for the last five years and FTE faculty. In the first three years, results from Essential Science Indicators (ESI), a subset of Web of Science a database of citations maintained by Thomson Reuters, were used. In 2007, a

switch was made to Scopus to increase coverage of journals and increase the number of institutions. The fifth indicator, international faculty (5%), is based on the proportion of full time faculty that hold an overseas nationality. The sixth indicator, international students (5%), counts registered students with overseas nationality. With data and weightings decided, standard scores for each column of data are calculated to arrive at the overall score. Before 2007, the approach was to find the top scoring institution, award it 100 notional points and scale the remaining entries proportionally to that top performer. Since then, a standardisation method using z scores has been used.

In the top 20, thirteen universities are from the US, six from Europe and one each from Canada [McGill (18)] and Australia [National (17)]. In the US, the Ivy League is prominent, with Harvard (1) on top followed by Yale (3), Princeton (8), Chicago (7), MIT (9), Caltech (10) Columbia (11), Pennsylvania (12) Johns Hopkins (13), Duke (14) Cornell (15), Stanford (16) and Michigan (19). Among the Europeans, Cambridge (2), Imperial and Oxford both (5) were followed by Zurich and Edinburgh tied at (20). In the top 100, Europe accounts for 40 institutions, US - 32, Asia – 16, Australia and New Zealand - 8 and Canada – 4. The Canadian universities are: McGill (18), Toronto (29), UBC (40) and Alberta (59). In the 101-200 range, Canadian universities include Montreal (107), Waterloo (113), Queen's (118), McMaster (143), Calgary (149) and Western Ontario (151). The 201 to 300 group has Dalhousie (214), Ottawa (226), Victoria (241), Laval (258) and York (273). In the 301-401 class, Carleton (386) is accompanied by Manitoba (389) and Quebec (394). Concordia falls in the 401-500 range.

There are two major shortcomings to the Times methodology–-the bias towards research, and frequent changes from year to year. The weightings given to research and to science

publications in proxy indicators is at least three times more important than teaching quality, which is as much as if not more important in a university's mission (THE-QS World University Rankings 2009: weightings and normalisation). Further, the ranking is influenced by a subjective measure like peer review. With a change in methodology (2007) Harvard remained on top, but London School of Economics, considered by many to be among the top five of British academies, went down from 17th to 59th place.

The editor of the renamed Times Higher Education (THE) agreed with this criticism and replied to a reader's comment (THE, 2010; Baty, 2010), "One of the biggest problems with the old THE-QS methodology, which we will no longer use, is that the research excellence measure penalised the arts, humanities and social sciences. We are changing this. Because research excellence was previously based on simple count of citations, those disciplines with higher citation levels, mainly in the hard sciences, were unfairly advantaged. The new and improved 2010 rankings will make sure all citation data is properly normalised to take account of different citation levels between subjects." Times has even gone further and changed its data provider and analyst. Thomson Reuters will now provide all the data and analysis for World University Rankings, and the reputational survey will be managed by a professional polling and research company, Ipsos Media Ct. The study claims that it will capture in future, "data on institutions' research and teaching strengths, with teaching focused staff asked discipline-specific action-based questions to determine where the best undergraduate and postgraduate teaching takes place."

The Higher Education Evaluation and Accreditation Council of Taiwan (HEEACT). In 2007 HEEACT published its first Performance Ranking of Scientific Papers for

World Universities based on the quantity and quality of scientific papers. It employs bibliometric methods to analyse and rank scientific paper performance. From Essential Science Indicators (ESI), Web of Science (WOS) which included SCI, and SSCI, and Journal Citation Reports (JCR), 500 universities were ultimately chosen for inclusion. In 2008, recognising potential bias in ranking (differences between fields), it started to provide subject/field based ranking. HEEACT has three criteria. Research productivity (20%) is measured by two performance indicators (weighting 10% each)--number of articles of the last 11 years (1998-2008) and number of articles of the current year (2008). Research impact (30%) is indicated by the number of citations of the last 11 years (1998-2008, weighting 10%), number of citations of the last two years (2007-2008, 10%), and average number of citations of the last 11 years (1998-2009, weight 10%). Research excellence (50%) is measured by their H-Index of the last two years (2007-2008, weight 20%), which includes number of highly cited papers (1998-2008, weight 15%) and number of articles of the current year in hi-impact journals (2008, weight 15%). For each indicator the university with the highest number received a score of 100, the maximum points. Others were subdivided by their highest number and were converted decimally onto their scores. HEEACT fields are: agriculture & environmental sciences, clinical medicine, engineering computing, technology, life sciences, natural sciences and social sciences. Overall, in the top 20, American universities dominate, except for University of Toronto (8), Tokyo (14) Cambridge (15), Oxford (17) and London (20). Other Canadian universities in the top 100 included UBC (31) McGill (36), Montreal (71), Alberta (87) and McMaster (94).

In social sciences, of the 19 Canadian universities included, those in the top 100 were: Toronto (16), UBC (36), McMaster (65), McGill (74), Western Ontario (83), Alberta (86) and

Montreal (97). For engineering, from 13 universities, five were in the top 100 – Toronto (26), UBC (61), Alberta (75), Waterloo (76), and McGill (92). Natural Sciences produced three Canadian universities at the top from a crop of 10. Toronto (34) was once again in the lead, followed by UBC (46) and McGill (90). In life sciences four (out of 14) hit the top 100-–Toronto (14), McGill (30), UBC (36), and Montreal (61). In clinical medicine, seven were included (from 13) in the top 100–-Toronto (6), UBC (36), McGill (43), McMaster (46), Montreal (51), Alberta (75), and Calgary (91). The story in agriculture is slightly different, with UBC (1), Toronto (24), Guelph (28), Alberta (40), McGill (54), Laval (75), Saskatchewan (92), from a total of 21 Canadian universities on the list.

The main critique of this ranking methodology is that it only examines research papers for research productivity, research impact and research excellence. There are no proxy measures for teaching, academic experience, quality of education, student experience or satisfaction. Anglo-American domination is even more overwhelming--some 93% in the overall ranking and 97% in the social sciences.

Characteristics of international league table system (ILTS).

International league tables share five common characteristics (Salmi and Saroyan, 2007):

1. A cluster or a set of indicators as proxies of quality. One category is input, process and output indicators. Another, more elaborate, includes: beginning characteristics (such as student entry qualifications–-high school grade point average, selectivity); learning inputs (staff qualifications, ratio of staff to students, workload assignments, contract hours etc.); learning outputs (skill sets gained, retention and completion rates); final outcomes (employment rates, success rates in graduate school acceptance, job satisfaction etc.); research (publications, awards,

citations, impact factor, research budgets, research based chairs, number of patents etc.); and reputation (from a range of perspectives obtained from peers, academic administrators and employers). The more reputable league tables typically include multiple measures for each dimension (Salmi and Saroyan, 2007, p. 7).

2. A weighted score is given to each set or cluster of indicators. The weighting varies and often reflects the view or objectives of the publisher and data availability rather than a theoretical base. These weights are used to generate a single rating. The allocation of weights is subjective but an attempt is made for "balance" through a survey of peers, which may be satisfactory for research and reputation, but not for learning inputs and outputs. The weights and ranking formulae can change from one year to another, which does not allow for historical comparability.

3. Differences between pairs of institutions in rank can be made to appear larger than they really are. In reality small differences may not be statistically significant such as one institution at 90th percentile and another at 60th. This could lead to misrepresentation of the manner in which ranking is presented.

4. The international league tables consider the institution as a unit of comparison and do not differentiate between different types of institutions, their relative size, and extent of research intensiveness. This practice, also inadvertently disadvantages smaller institutions and those that are not research intensive, and as consequence are less likely to get high scores on indicators related to research and reputation (Brooks, 2005).

5. The reliance by league tables on peer review to generate data--the Times-QS is one such example--has been criticised on three counts: the halo effect, a bias in which the assessment of one quality influences the judgement of other qualities; being subjective due to the absence of

a common frame of reference for quality of raters; and being inaccurate because of lack of familiarity with programmes they have been asked to rate.

The common features between league tables and other approaches to university evaluation, such as accreditation, include indicators that probe into institutional resources such as faculty and student data, completion and retention rates, and heavy reliance on the peer review process. The differences are that accreditation emphasises programs and institutional performance against delineated, absolute standards and criteria. For league tables, comparison is relative, comparing one institution or program with another and ranking them. They are also different in the degree of emphasis placed on reputation and research output.

To counter these criticisms, the OECD announced a study called the Assessment of Higher Education Learning Outcomes, which, Richard Yelland, of OECD's Education directorate indicated, will offer faculty members, students and governments "a more balanced assessment of higher–education quality" (Labi, 2010). In the first phase, a feasibility study will look at ways to develop learning measures. Specifically, it is adapting the Collegiate Learning Assessment developed in the US to an international context. The online assessment will measure generic skills such as problem solving, critical thinking and practical application of theory. The questions are not specialised, so they can be answered by most undergraduates regardless of their field of study. Six countries are participating in the feasibility study and 14 in the full study. With 10 institutions per country and 200 students per institution, the sample will consist of 30,000 students. Karine Tremblay, coordinator of the project, noted that all existing rankings are based on available data, but vary in the criteria they emphasise. This is not a ranking exercise, but is intended to provide institutions with useful feed back through new measurements. Yelland added

that there will only be top institutions in the top 100, but the aim of the project is to see how other universities in the world are teaching and how well they are doing. Judith Eaton, President of the Council for Higher Education Accreditation, noted that the same sets of issues recur across borders and systems about how best to enhance student learning and strengthen economic development and international competitiveness (Labi, 2010).

The European Union (EU) has commissioned five European universities to compile tables which compare institutions that are similar in their mission and structure as it believes its universities, the oldest in the world, are underrated. Ellen Hazelkorn of Dublin Institute of Technology (University ranking, leagues apart, 2010), said the rankings measure their creators' objectives such as more state funding for research or status. Yet none of the league tables shows how well universities teach in practice.

One plausible explanation of Anglo-American domination is that many of the research publications, especially the prestigious ones, are in English, and much of the input data as well as the research, resource and reputational data, have already been gathered, entered into databases and treated for similar domestic rankings. They also have the resources and equipment for this type of exercise.

Implications and influence of ranking tables on institutional decision-making.

Before examining national and regional rankings, I look at the implications of rankings. Ellen Hazelkorn (2007a) undertook a survey of higher education institutions in 41 different countries and sought the views of higher education leaders about the role and influence of league table ranking system (LTRS). The questionnaire was divided into four sections–-overview of

LTRS in each country, importance of the ranking on institutional decision-making, and influence of the ranking on key stakeholders and on higher education.

Fifty percent of respondents thought the impact of LTRS had been positive on their institution's reputation, while 17% believed they had had no impact. Broadly, they felt the results of LTRS helped the development of their institution by helping their reputation, aiding their publicity, impacting positively in attracting students, forming academic partnerships and collaboration, and on programme development and staff morale. Over 50% of respondents used their ranking for publicity purposes, press release, official presentations and website. It was not the table itself that yielded these results, but how the institution used those tables/rankings in representing itself to the marketplace. Fifty six percent had formal mechanisms for reviewing their ranking, usually by vice chancellor, president or rector, but also by the governing authority. The results of the outcomes were incorporated into strategic plans or resulted in re-organisation to achieve higher ranking outcomes and deal with weaknesses (Hazelkorn, 2007a, p. 97). Peer benchmarking was a critical factor in institutional strategy to enter into partnerships and collaboration as well as membership in international university associations and networks such as Universitas 21, Coimbra and the European University Association (a sign of "quality" proxy). The study found that benchmarking/LTRS as "comparative" information greatly influenced students (70%) and parents (60%), while government, faculty, employers, benefactors and industry were in the 55% range (p. 101). The study found LTRS had impact on educational policy issues, especially through discussions in the media. Institutions were asked to answer 14 statements (true or false) on the impact of LTRS. An overwhelming majority (89%) said LTRS did not provide a full overview of an institution and instead favoured the strength of well

established universities and emphasised research and postgraduate strengths. LTRS established a hierarchy which did not promote diversity and differentiation among the institutions (p. 104). On the question of an "ideal" LTRS, a majority replied that the media ought not to develop it, but favoured an accreditation agency, a research organisation or non-governmental or international organisation. Greatest support with minimum doubt was given to indicators dealing with teaching quality, employment, student/staff ratio, research activity, publications and research income. The majority of respondents clearly indicated that they desired their institution to be ranked in the top 25% internationally. This was shown by the gap between current and desired ranking.

Regional and National Rankings

The earliest university rankings in North America were undertaken by the American Council on Education. In "*A study of the Graduate schools of America,*" Raymond Hughes (1925) used reputational ranking of 26 disciplines and 36 institutions. Newspapers and magazines popularised ranking. The Chicago Tribune's Chesley Manly in 1957 (Rauhvargers, 2011) published six different rankings: ten best universities, law schools, engineering schools, co-educational and men's and women's colleges. Most American and Canadian universities and colleges are also obsessed with their standings in university rankings and their sub-components or indicators, which monitor the state of and the progress made in attaining their objectives in relation to their strategic plans, recruitment and marketing. There are several "guides" that rank American universities and colleges. They include Princeton's *The 357 Best Colleges*, Yale's *Insider's Guide to the Colleges 2006*, *Choosing the Right College* by Intercollegiate Studies Institute, and *America's Best Colleges* by US News and World Report. The "niche" guides

include Black Enterprise Magazine's *50 Best Colleges for African Americans 2004* and *Gay Guide for Colleges 2004* by Out Magazine. Guides for specialties such as law, medicine, art, etc. are also available. Rather than for university decision-makers, the guides are aimed at providing information to prospective students, steering them to enrol. The guides supply the basic minimum information. The Princeton Guide, for example, gives information on academics--degrees offered, student/faculty ratio and popular majors; and on admissions-–average high school GPA, admission deadlines, tuition and financial aid. Information on student body includes total undergraduate enrolment, gender, out of state, number of student organisations. Some rankings include the library (Princeton is #2), what does the campus look like and its size (the most beautiful, Princeton is ranked #7). Much of the information is descriptive, the methodology is based on peer review (25%) or reputation judged by three administrators, said Lynn O'Shaughnessy (2009) in her article "Why US College Rankings are a Joke." The oldest, extensive linking of both national and international rankings is the US News and World Report with publications such as *World's Best Universities, America's Best Colleges* and *America's Best Graduate Schools*. The methodology is similar to the Times based on peer assessment by the same company, QS Quacquarelli Symonds, with similar weights applied to "national universities" and liberal arts colleges, universities, master's and baccalaureate colleges. The indicators include input measures, which reflect the 'quality' of students (selectivity: high school standing, SAT & ACT scores); faculty resources (compensation, terminal degree, student/faculty ratio, class size) and outcome measures (graduation and retention rates) and financial resources (per student, alumni). The "teaching and learning" indicators are still absent. Only 5% weight is given to full-time faculty, 2% to class size and 3% to student/faculty ratio (Morse, 2011). *US*

News publishes rankings for the top 400 universities world-wide, top 50 for Asia and top 50 for Europe; top 20 in Canada, as well as top 20 for Australia and New Zealand.

College Learning Assessment (CLA).

An alternative way of measuring "deep learning" by students and "value added" by institutions is College Learning Assessment (CLA) implemented by the Council of Independent Colleges (CIC), now also espoused by the OECD. The test provides a standard measure of higher order skills and competencies that are also the goals of undergraduate education–-critical thinking, analytic reasoning, problem solving and written communication. Instead of testing a student's knowledge of a particular discipline, CLA poses real world problems that students must address by analysing materials, evaluating evidence, synthesizing information, drawing conclusions and drawing their own arguments for or against a position (Council of Independent Colleges, 2008). Instead of multiple-choice, true/false, or short answer questions, CLA uses written student-constructed responses to open-ended assignments. Its key measures are: make an argument, critique an argument, and perform a task. The latter, the longest of the three, asks students to complete a real-world task, such as preparing a briefing report using a set of provided materials. For the 45-minute test, scoring rubrics or criteria form a standardised basis for measuring results. Using SAT/ACT scores as control, CLA reports whether students as a group perform at, above or below expected levels. CLA compares what students know at the start of college and when they finish, providing a measure of "value added" for the institution which is the main unit of analysis. The score can be tracked over time and benchmarked against similar institutions.

An actual score shows how students performed relative to their ability-–above or below expected–-for samples of first and senior year students. The second value-added score indicates how the aggregated first-year-to-senior gain in these high order skills compares to other institutions.

CLA is seen as one measure among others as a part of a portfolio of evidence of student learning. Several institutions in CIC/CLA consortium have experimented with triangulation of data, for example, between the "academic" measures of NSSE, CLA and Academic Proficiency and Progress (MAPP), another standardised outcomes test.

Most, among the 33 member CIC/CLA consortia have implemented or participated in the two programmes-–CLA assessment and CLA education. Most testify to benefiting from information from the two programmes. Benchmarking students on entry, then in the senior year, allows an institution to see how much progress they have made, how they compare with other institutions and how far they have to go. A CIC publication, *Evidence of Learning–-Applying the Collegiate Learning Assessment to improve teaching and learning in liberal arts college experience* (2008), reports the experience of over a third of total consortium members and how they used the assessment and derived benefits from it. For example, Linda De Merritt of Allegheny saw CLA as a tool to assess the whole of its curriculum, "The CLA became one of the pieces in our thinking of an overall assessment plan for the institution because it focuses on what we try to do in our general education requirements, in our majors, in our minors, and in the senior project–-namely to educate our students to think critically, analyse problems, find solutions and communicate in well written form persuasively and logically" (CIC, 2008, p.10). Edwin Welch, President of University of Charleston, said they were in a "visioning" exercise in

2005 and jumped at the chance to administer CLA. The test showed the effectiveness of the direction of the university. In 2005-2006, it had the highest value-added score among 100 colleges and universities that administered CLA. Welch said, "It helped us affirm that people really learn something in college. Critical thinking needed more focus as it was below expected" (CIC, 2008, p.11). For Barton College of Wilson, North Carolina, applying the CLA helped to change the campus culture. In the words of Terence Grimes, VP Academic Affairs, "The College's work with CLA proved to be the way to draw administration, faculty and staff members, and even trustees into a frank, sometimes difficult, but ultimately contested conversation about how well Barton was actually educating its students" (CIC, 2008, p.18). McCormick, Dean for Academic Affairs for Cabrini College, said, "Prior to Cabrini joining the consortium (2005-2008) nothing had emerged to help centre our assessment efforts." The initial CLA scores were not as high as he wanted, but the College found "we were a value-added institution, it wasn't just rhetoric." The Dean compared results with NSSE. Then he talked with departmental chairs and discovered that faculty members were the key. "CLA reinforced the College's commitment to 'intentionally develop' the students over the next four years" (CIC, 2008, p.20).

The next phase of CLA, 2007-2011, focused on engaging faculty members in using CLA, pairing or triangulating CLA results with others such as NSSE, and portfolio analysis, which provided more robust diagnostic information to use in targeting areas for improving the teaching and learning culture. More in-depth sampling was to be undertaken to obtain characteristics such as division, faculty, major, gender, race /ethnicity. Original members had sufficient experience to act as mentors to others. Faculty members were to be more fully integrated into the assessment

of CLA and to use the results to improve pedagogy, redesign curriculum and improve campus culture.

The majority of consortium members seem to be small universities and colleges. The large research universities have not bought into the benefits offered by CLA. On the other hand, CLA is a learning output measure which complements or supplements others such as NSSE, a process measure. One part of NSSE, the Academic section, measures aspects related to CLA (questions on essay writing, for example). The institutional value-added score is CLA's main feature but, a CHE article (Labi, 2010) reported scepticism about this claim. "I am skeptical about some of the instruments that can be used for this analysis" said Edward Marcal Grillo, a former Minister of Education for Portugal, representing a European education foundation. "The problem is not to evaluate but to do a comparison." Grillo wondered how one could effectively compare mechanical engineering students from institutions in Britain, Italy, Switzerland and the United States. Yelland of OECD's Education Directorate replied because it focuses on general skills, "part of it is going beyond content, to look at the way in which engineers actually use the knowledge they have" (Labi, 2010). CLA focuses on some skill outputs as well as beginning characteristics. It does not cover final outcomes, research or reputation. Issues related to what is good teaching, what the universities are providing, and the CLA impact on the process of student learning, still remain to be explored.

University rankings in Canada.

Two Canadian media companies, *Maclean's* magazine and the *Globe and Mail*, a daily newspaper, compile rankings of Canadian universities. I will also examine another survey, the National Survey of Student Engagement (NSSE), which is more regional (North American) than

national, but in which many Canadian universities participate. For NSSE, Canadian universities have banded together to arrive at "common data." As well, individual institutions receive data for their own institution from Indiana University's Centre for Postsecondary Research and Survey Research Centre.

Maclean's magazine. *Maclean's* ranks Canadian universities annually on a list of 14 indicators depending on the kind of university-–Primarily Undergraduate, Comprehensive, Medical-Doctoral–-with a view to better comparisons between universities that are more alike. Weights are allocated to each indicator. University of Ottawa, McGill and Queens are in the Medical-Doctoral group. Carleton is in the Comprehensive group, while Laurentian, Brock, Trent, and Bishops fall under the category Primarily Undergraduate. The latest weights for indicators are students/classes (20%), faculty (18%), resources (12%), student support (13%), library (15%) and reputation (22%). Retention and graduation rates are also calculated. The categories of indicators include: 1) Students (10%)--data on the success of the student body at winning national academic awards over the previous five years. Students are divided into out-of-province, international and graduate. Classes (10%) covers student/faculty ratio and includes all full-time students–-undergraduate and graduate–-and full time faculty. Information on 2) faculty includes awards and grants per full-time faculty (6%), social sciences (6%), science/medical (6%) over the past five years, including those from SSHRC, NSERC, CIHR. Other indicators are: 3) Resources, the amount of money available for current expenses per weighted equivalent full-time student (6%), and total research dollars (6%). This figure relates to the size of full-time faculty; income from sponsored research, federal, provincial and foreign government funding and from non-governmental organisations. 4) Student support includes scholarships and

bursaries (6.5%) and student services (6.5%). 5) Library (total holdings 1%, holdings per student 4-5%, expenses 5%), and 6) Reputation–-in the reputational survey (22%) views are solicited from university officials, high school principals and guidance counsellors, heads of a variety of national and regional organisations, CEO's and recruiters at large and small corporations. Respondents rate the universities as High Quality, Most Innovative, and Leaders of Tomorrow. Best overall represents the sum of scores (*Maclean's,* 2009, pp. 66-71). Much of the data comes from the most recent and publicly available sources. Statistics Canada provides the student and faculty numbers, total research income and the five financial indicators-–operating budget, spending on student services, scholarships and bursaries, library expenses and acquisitions. Research grant data are obtained directly from granting agencies. Data on students such as entering grades and graduation rates are obtained from university websites. Data on the quality of teaching in classroom (input from instructors) and on process of learning from students are not captured, but Salmi and Saroyan's (2007) other criteria are--beginning characteristics, learning outputs, and final output.

In 2009, under Medical Doctoral ranking overall, McGill was on top, followed by Toronto, Queen's, UBC, Alberta, McMaster, Calgary and Dalhousie (tied in the 7th place); Ottawa, Saskatchewan and Western (tied 9th); Laval (12) followed by Montreal and Sherbrooke (tied 13th) and Manitoba (15). In the Comprehensive Group, Simon Fraser led (1), followed by Victoria (2), Waterloo (3), Guelph (4), Memorial, New Brunswick, Carleton, Windsor, Regina and York (tied 9th) and Concordia (11). In the Primarily Undergraduate group, the Atlantic universities did well with Mount Allison (1), Acadia (2), UNBC (3), St Francis Xavier and

Wilfred Laurier (tied at 4), followed by Lethbridge (6) and Trent (7); while UPEI, St Mary's and Winnipeg are tied at 8th place, followed by Bishops (11), UOIT (12) and Brandon (13).

When *Maclean's* rankings began in 1991 the academic community objected to its methodology. These included, "poor wording and design, ranking all types of institutions together irrespective of their mission, size and mandate, and fusing a weighted index to arrive at one global score without disclosing the methodological framework" (Salmi & Saroyan, 2007, p. 11). Some changes were brought in but those negatively impacted refused to participate, such as Memorial and Carleton, in 1993. McGill and 15 others, including Manitoba and some Francophone universities, boycotted the exercise in 2005 and 2006 but provided similar information to AUCC for comparison purposes. *Maclean's* graduate survey created further tension between the academy and the magazine and more universities withdrew. The editors announced, in turn, they would use "freedom of access" laws to obtain the data to compile their rankings for those universities who decided not to participate.

A major objection was expressed by David Naylor, the President of the University of Toronto, in a letter, 23rd April 2006, to *Ottawa Citizen* in which he pointed out that U of T had shared or ranked in the first place in the medical-doctoral category for over twelve years. "Rankings and 'league tables' are a good measure of success in things like sports and sales, where winning generally comes down to a single number. But no single measure can accurately reflect even a mid-sized university, where hundreds of professors and lecturers teach hundreds of courses across disciplines as varied as engineering and religion. Such concerns go well beyond *Maclean's*." He used the analogy of two hands, one in boiling water, the other freezing in ice – the average temperature is just fine! He cited Dalhousie's 12th position as unfair, as it has a very

high reputation for post-doctoral studies among North American scientists. Such nuances, he contended, cannot be captured in a single score. U of T had worked for years to refine its own performance indicators and would be happy to work with *Maclean's* in developing one. Canadian universities have been complicit, en masse, in supporting a ranking system that has little scientific merit because it reduces "everything to a meaningless, average score," he said. Further, he found Maclean's data demands onerous and time consuming.

Common university dataset for Ontario (CUDO). In the fall of 2006, in his statement to U of T's Governing Council, David Naylor suggested developing a Common University Dataset for Ontario (CUDO), which would standardise definitions for a substantial array of key variables, and promote consistent analysis of each university's operations.
Table 2 lists the CUDO datasets collected since 2006.

Some progress has been made towards a common university data for Canada or CUDC based on CUDO, with initiatives taken by a number of universities and provincial sector organisations. A Canadian Council on Learning Report (2011) pointed out that universities from British Columbia and Ontario share seven common data categories, 12 sub-categories and 18 indicators. Quebec has also launched a process to develop a common dataset according to the Steering Group set up in 2007 to review Canadian Key Performance indicator Templates (CCL, 2011, p 62).

Table 2

CUDO datasets since 2006.

A. General Information	Address Information; Qualifications Offered/Awarded; Degrees Conferred by Program, for Male, for Female; Enrolment by
B. Admission	Applicants by Type and Program; Undergraduate Programs Admission Requirements; Entering Average Ranges by Program;
C. Transfer Admissions from Other Postsecondary	Enrolment of transfer Students; Number of Transfer Students (Applied and Registered); Transfer Credit Policies.
D. Library Collections	Monographs (print and electronic), microform, archives, music scores, maps and graphic material, audio material,
E. Student Life	Geographic Origin of First Year Students; Students Living on Campus; Activities Offered, Housing.
F. Student Experience	Results from NSSE Survey: Overall Experience--Undergraduate, Results from NSSE Survey: Graduate and Professional Students
G. Annual Student Expenses	Tuition; Ancillary Fees; Room & Board; and other Expenses; First Year Tuition and Ancillary Fees by Program.
H. Instructional Faculty and Class Size:	Number of Instructional Faculty Members; Undergraduate Class Size by Year Level.
I. University Revenues and Expenses	Revenues; Expenses.
J. Research:	Research Awards by Granting Councils.
K. Other Useful Information	Academic Plans; Key Performance Indicators-–Graduation Rate; Retention Rate.

Source: http://www.uottawa.ca/services/irp/eng/fact-figures/cudo/

The Globe and Mail. The *Globe and Mail's* annual Canadian University Report (formerly University Report Card) collects the opinion of over 40,000 students across Canada. Universities are classified as undergraduate, comprehensive, specialised and research intensive and by size–-large (over 22,000), medium (12,000 to 22,000), small (4,000 to 12,000) and very small (less than 4000).

Ranking is done by choosing among four major indicators–-Quality of Education, Campus Environment, Learning Environment and Research Quality. Each is broken down into sub-indicators. Quality of Education comprises of 1) Academic Experience (class projects, assignments written and oral); 2) Breadth of Academic Offerings (# of courses, space to cover required courses and ease of course registration) and 3) Teaching Quality Index (faculty knowledge, feedback, availability, interaction and satisfaction with TA). Campus Environment is made up from seven sub-elements–-athletics, library holdings and satisfaction, student life and activities, services and technology. Learning Environment includes class size, employment preparation and endowment revenue. Research Quality encompasses academic reputation and research publications. Ranking is not in absolute numbers but in four categories expressed in colour and bar-charts as top, middle, bottom and no ranking (Globe Campus Navigator, 2010).

The main source of data is from a survey of full and part-time students registered in the studentawards.com database, undertaken by Strategic Counsel, a market research firm. Other sources include Statistics Canada–-student enrolment, student costs, tuition and field of study. CAUT is the source for faculty, CUDO for qualifications of faculty. The Canadian Association of University Business Officers provides data on operating budget and total on research. The Canadian Association of Research Libraries is the source for library holdings, while Canadian

Interuniversity Sports supplies data on athletics. Canadian Mortgage and Housing Corporation (CHMC) provides information on average rent paid by students. Other sources include research fund granting agencies and Canadian Bibliometric Database for publications, average relative impact factor and number of citations.

The methodology was not clear in terms of the impact of the framing of questions on the responses and on potential sampling bias. Numerical ranking was rejected; instead, letter grades were adopted to reflect the mean scores that students gave their university for each question on the survey. From a maximum score of 5, A+ denotes a mean score of 4.6 and above, A from 4.4, A- = 4.2 in decrements of 0.2 to D for a score of less than 3.0. Fields of study cover Arts, Business and Commerce, Education, Engineering and Architecture, Health and Fitness, Sciences (Life, Physical and Computing) and Visual and Performing Arts.

Under the *Globe and Mail's* classification, large universities number 16; medium 11; small 17; and very small 12. Overall, for the most satisfied students, nearly all universities in the very small group, except one, received an A. Medium sized universities were next, followed by small, the large group was last, with only three A's out of sixteen. A similar hierarchy is also found for indicators such as quality of education, student-faculty interaction, teaching, class size, libraries and campus atmosphere. Students rated all universities low for food services (C's and D's), student services (mostly B's) and for the variety of courses (B's). For reputation, among the large universities, McGill and Waterloo were on top with A+, Toronto (St. George) and Western Ontario (A), UBC, McMaster, and Université de Montréal (A-). The very small scored four A's–-Mount Allison, Trinity Western (A+), Acadia and Kings Edmonton (A-); the medium–-Queen's

(A+), Sherbrooke (A) and Guelph (A-). Among small universities three scored (A-)--Dalhousie, St Francis Xavier and University of Toronto-–Mississauga.

The *Globe and Mail's* Campus Navigator and the Guide to Canadian Universities 2010 asked questions that measured student satisfaction rather than "quality" of education or learning. For example, nearly every result for the *Globe and Mail's* questions began with the phrase "satisfaction with" such as class scheduling or size or technology, library, infrastructure etc. It also stated clearly that the Guide was based on "student satisfaction survey" supplemented by "in-depth articles." Survey data varied with response rate. The *Globe and Mail's* methodology was not clear on how this is dealt with.

In general, David Naylor's view on ranking, coming from the president of a leading research university, is likely representative of the Canadian academia. To quote him (Naylor, 2006) "the state of performance measurement in higher education is deplorable. Inputs are confused with process indicators, processes are confused with outputs and outputs are confused with outcomes. The current obsession with ranking only adds to the prevalence of misinformation, in part because institutions–-not least our own–-have been too quick to advertise those rankings that put them in a favourable light, and criticise or downplay those that are less advantageous." He noted that the University of Toronto had posted its own volumes of institutional data online and was determined to continue developing its expertise and lead.

National Survey of Student Engagement (NSSE). From 2006, most Ontario universities and many other Canadian universities participated in the National Survey of Student Engagement (NSSE), which was launched in 2000 by Indiana University Centre for Postsecondary research in cooperation with its Centre for Survey Research, backed by Carnegie and Pew Foundations.

Some 643 colleges and universities participated in this survey in 2009. It is currently self-supported through institutional participation fees. The objectives are to collect information directly from undergraduate students about their participation in programs and activities that the institutions provide for their learning and personal development. The results provide an estimate of how undergraduates spend their time and what they gain from attending university. Items in NSSE represent "empirically confirmed" good practices in undergraduate education. They reflect behaviours by students and institutions associated with desired outcomes of college. The conceptual underpinnings are found in George Kuh's Conceptual Framework and Overview of Psychometric Properties (2003). He is the Director of Indiana's Postsecondary Research and founder of NSSE.

Institutions use data to identify aspects of undergraduate experiences inside and outside the classroom and for decision making purposes. More than 1300 different colleges and universities have participated in NSSE since 2000. Its widespread use has spawned other nationally used instruments such as Beginning College Survey of Student Engagement, the Faculty Survey of Student Engagement and the Law School Survey of Student Engagement.

The original questionnaire took 15 minutes; the most recent iteration is done on the web, but there are also paper versions. The source for this questionnaire is the NSSE website (NSSE 2008a) from which I retrieved the Canadian English version, 2008. For University of Ottawa, the Office of Institutional Research and Planning is responsible for the survey which is administered in February of each year and provided the codebook (NSSE, 2008b) and frequencies (NSSE, 2008c).

Question 1 covers class interaction and activities during the current school year. How often have you done the following? (The answers are on a scale of four–-very often, often, sometimes, never) An average is calculated.

Q 1

a - Asked questions in class or contributed to discussion

b - Made a class presentation

c - Prepared two or more drafts of a paper or assignment before turning it in

d - Worked on paper or project that required integrating ideas or information from various sources

e - Included diverse perspectives (different races, religions, genders, political beliefs) in class discussions or writing assignments.

f - Come to class without completing readings or assignments

g - Worked with other students on projects during class

h - Worked with classmates outside class to prepare assignments

I - Put together ideas or concepts from different courses when completing assignments or during class discussions.

j - Tutored or taught other students (paid or voluntary)

k - Participated in community based project as part of regular course

l - Used an electronic medium (listserv, chat group, Internet, instant messaging etc.) to discuss or complete an assignment

m - Used e-mail to communicate with an instructor

n - Discussed grades or assignments with an instructor

o - Talked about career plans with a faculty member or advisor

p - Discussed ideas from your readings or classes with faculty members outside class

q - Received prompt written or oral feedback from faculty on your academic performance

r - Worked harder than you thought you could to meet an instructor's standards or expectations

s - Worked with faculty members on activities other than coursework (committees, orientation, student life activities, etc.)

t - Discussed ideas from your readings or classes with others outside your class (students, family members, co-workers etc)

u - Had serious conversations with students of a different race or ethnicity than your own

v - Had serious conversations with students who are very different from you in terms of their religious beliefs, political opinions or personal values.

Q2 - Mental activities –a) Memorising, b) Analysing, c) Synthesizing, d) Making judgements, e) Applying theories or concepts to practical problems of new situations (very much, quite a bit, some, very little).

Q3 - covers reading, writing and assignments during the school year (very often, often, sometimes, never) - How much reading and writing have you done?

a - Number of assigned textbooks, books or book-length course packs (none, 1-4, 5-10, 11-20, more than 20).

b - Number of books read on your own, not assigned, for personal enrichment or academic enrichment (none, 1-4, 5-10, 11-20, More than 20)

c - Number of written papers or reports, 20+ pages.

d - Number of written papers or reports 5-19 pages.

e - Number of written pages or reports less than five pages.

Q4 - In a typical week, how many homework problem sets or problem-based homework assignments do you complete? How many more than an hour? How many less than an hour? (none, 1-2, 3-4, 5-6, 6+).

Q5 - The extent to which examinations in the current school year have challenged you to do your best work, circle one from very little (1 2 3 4 5 6 7) to very much

Q6 - How often have you done the following? (scale 1-4, very often, often, some times, never)

a - Attended an art exhibit, play, dance, music, theatre or other performance

b - Exercised or participated in physical fitness activities

c - Participated in activities to enhance your spirituality (worship, meditation, prayer etc.).

d - Examined the strengths and weaknesses of your own views on a topic or issue

e - Tried to better understand someone else's views by imagining how an issue looks from his or her perspective

f - Learned something that changed the way you understand an issue or concept

Q7 - Practicum, volunteer and additional courses: Which have you done or plan to do before graduating? (done, plan to do, do not plan to do, have not decided)

a - Practicum, internship, field experience, co-op experience, or clinical assignment

b - Community service of volunteer work

c - Participate in a learning community or some other formal program where groups of students take two or more classes together

d - Work on a research project with a faculty member outside of course or program requirements

e - Course in a foreign or additional language

f - Study abroad

g - Independent study or self-designed major

h - Culminating senior experience (capstone course, senior project or thesis, comprehensive examinations)

Q8 - Quality of relationship with people in your institution:

a - Other students (1 to 7) from 1 – unfriendly, unsupportive, sense of alienation to 7 – friendly, supportive, sense of belonging

b - Faculty members (1 to 7) from 1 – unavailable, unhelpful, unsympathetic to 7 available, helpful, sympathetic

c - Administrative personnel and offices (1 to 7) from 1 - unhelpful, inconsiderate, rigid to 7 helpful, considerate, flexible.

Q9 a) Captures hours of activity in a week on preparing for class, b) working for pay on campus, and c) off-campus, d) co-curricula activities, (organisations, sorority, fraternity, sports), e) relaxing and socialising, f) providing care for dependent living, and g) commuting to class.

Q10 Emphasis by institution on each of the following (very much, quite a bit, some, little) a) on studying and academic work, b) providing support to succeed academically, c)

encouraging contact among diverse students, d) helping to cope with non-academic responsibilities, e) support to thrive socially, attending campus events and activities, e) campus events and activities, f) using computers in academic work.

Q11 How experience at the institution has contributed to knowledge, skills and personal development (very much, quite a bit, some, very little):

a) In acquiring a broad general education, b) job or work related knowledge and skills, c) writing clearly and effectively, d) speaking clearly and effectively, e) thinking critically and analytically, f) analyzing quantitative problems, g) using computing and information technology and h) working effectively with others, i) voting in local, provincial or federal elections, j) learning effectively on your own, k)understanding yourself, l) understanding people of other racial and ethnic backgrounds, m) solving complex real-world problems, n) developing personal code of value and ethics, o) contributing to welfare of your community, p) developing a deepened sense of spirituality.

Q12 Overall, how would you evaluate the quality of academic advising you have received at your institution? (poor, fair, good, excellent).

Q13 How would you evaluate your entire educational experience at this institution? (excellent, good, fair, poor).

Q14 If you could start over again, would you go to the same institution? (Definitely yes, probably yes, probably no and definitely no).

Q15 – Q29

Q15 date of a) birth, Q16 sex, Q17 citizenship (yes or no), Q18) ethno-cultural background (14 sub-categories) Q19 To which ethnic or cultural group(s) did your ancestors belong Q20 current classification in university Q21 Did you begin university at current institution or elsewhere Q22 Since graduation what other types of schools have you attended Q23 a) student at institution full-time or less than full- time b) taking courses entirely online (yes or no). Q24 a) belong to fraternity or sorority b) student athlete sponsored by institution's department (yes or no), Q25 a) Student athlete sponsored by institution's athletic department (yes or no) b) on what teams Q26 grades at university Q27 housing Q28 a) highest level of education of father and b) mother and Q29 a) major taken b) second major

Most Canadian universities participate in the NSSE survey, which theoretically allows for limited comparisons, but not for rankings. These data are not necessarily accessible to the public but sent to the universities' Institutional Research and Planning Divisions or "clients" with information specific to an institution, which in turn, usually chooses to release selected information. Frequencies, averages and means are calculated for each question and clusters of questions. Demographic data on respondents (questions 15 and 16) are also supplied. The comparison groups for a Canadian university are "Ontario"–-the average of the means of 17 other Ontario universities; NSSE 2006, the average of the mean scores for all schools that participated in the 2006 survey; and other groups that have similar profile to a university, such as "Carnegie Peers" (17 US universities), who are comparators for University of Ottawa and for McMaster, for example.

In addition to mean and frequency reports for each question, clusters of questions make up five Benchmarks (BM)–-Level of Academic challenge (LAC), Active and Collaborative Learning (ACL), Student-Faculty Interaction (SFI), Enriching Educational Experiences (EEE) and Supportive Campus Environment (SCE). There are separate BMs for first year and final year.

LAC is made up of Q1(r), Q2 (b,c,d,e), Q3 (a,c,d,e), Q9 (a), Q10 (a). These are question on working harder than one thought; analysing, synthesizing, making judgements, and applying theories and concepts; questions on reading text books, and writing frequency and lengths of papers; hours spent on academic work; and extent to which an institution emphasises academic work.

ACL is made up of Q1 (a,b,g,h,j,k,t). These are: asked questions in class, made a presentation, worked with other students on projects during class, worked with classmates outside class, tutored, participated in community based project, discussed ideas from readings or classes with others outside.

SFI is made up of Q1 (n,o,p,q,s), Q7 (d). These are: Discussed grades or assignment with an instructor, talked about career plans with a faculty member or instructor, received prompt feedback, worked with faculty on other activities than course work; worked with faculty on research project outside course work.

EEE comprises of Q1 (l,u,v), Q7 (a,b,e,f,g,h), Q9 (d), Q10 (c). These are: used electronic medium, had serious conversation with “multicultural diverse” students; conversation with those of different religious, political and personal beliefs; interested or did a practicum or community service, studied a foreign language, studied abroad, independent self-design major, culminating

senior experience; hours of participation in co-curricula activities; encouraging contact among students from diverse background.

SCE has Q8 (a,b,c), Q10 (b,d,e). These are: relationships with other students, faculty and administrative personnel; institutional support to: succeed academically, cope with non-academic responsibilities and thrive socially.

How are results obtained annually from NSSE to be interpreted? Associate Vice-President, Pierre Mercier, Institutional Research and Planning (IRP) of University of Ottawa, commenting on LAC said, "One could argue that, at an average score of 50-55, there is room for all universities to provide more academic challenge to their students" (University of Ottawa Centre for University Teaching, (CUT, 2007). The opportunities for active and collaborative learning are fewest for the first year students. Presentations and discussions are difficult in a junior curriculum when combined with large classes. However, discussion of readings or ideas outside class can be fostered regardless of class size. SFI represents a definite challenge for the University of Ottawa and indeed for all Ontario universities as compared to our American counterparts. Although SFI improves for senior students, the situation remains difficult for all. These results raise questions about resources, which further analyses in relation to student/ faculty ratios and class sizes should help to answer. The very nature of student-faculty interactions needs to be addressed. On EEE Professor Mercier said, "Complementary learning opportunities and diversity of experience do increase for our senior students compared to juniors. Nevertheless Carnegie peers offer more, even though they are similarly large, research intensive and urban." On SCE he said, "Campus environment is perceived as reasonably supportive by junior students. For us as for other universities, the scores on this benchmark are in fact better

than those of the academic challenge. Nevertheless, there remains room for improvement as Carnegie peers do better. No single item could be identified as one major focus of attention." But the senior students are more critical. To a 2008 NSSE question 14 "if you could start over, would you go to the institution that you are now attending?" senior University of Ottawa students placed their school 52nd of the 53 Canadian universities ranked. Such findings and the budget crunch eventually led to the Zussman study (Denley, 2010) which found that overly large class sizes and lack of contact time with professors were exacerbated with the university's increased focus on research.

Whether there is a real difference or it is only their perception, more critical with passage of time, as Mr Mercier suggested, future surveys will help clarify. He suggested investigating the results question by question, drilling down by faculty, department and program. The results were communicated to President, Governing Board, Faculty members, administrative staff, Departmental Chairs, Academic Advisors, Students and the Provincial Government (CUT, 2007).

However, Canadian universities, even though they belong to the NSSE consortium, seem not to be able to "deliver" enough representation. For example, in the NSSE 2009 exercise, only 14 institutions from six provinces participated--four from Ontario, four from BC; three from Nova Scotia and one each from Quebec, Alberta and New Brunswick. The average Canadian institutional response rate was 43%, the highest rate achieved was 63% (NSSE 2009 Overview, p. 6). The response rate of students from participating institutions was 40%--quite normal for a web-based exercise.

What have Canadian Universities Learned from the NSSE Experience?

NSSE is well grounded in theoretical underpinnings–-participatory theories from sociology and political science, pedagogy--(levels of mental activity from Bloom's (1987) taxonomy), information about skills (not skill tests), time-management, and communication theories. It is meant to measure "student engagement" (self-reported) not satisfaction or skill. The implication is that the more students are engaged in the learning process, both in the classroom or laboratory and outside the classroom, the more they are likely to learn and develop.

Measurement is by proxy. NSSE, with the administrative data universities collect routinely, seems to meet the Salmi and Saroyan's (2007) league table criteria, the same as the World Bank's, of beginning characteristics, partially for learning inputs and outputs (information from the students only, self reported) and does not deal with final outcome, research or reputation (except as in Q13). A workshop held by the Higher Education Quality Council of Ontario on NSSE experience (Jones, G.A, 2007) concluded that universities are becoming aware of limitations of NSSE. It "focuses on student engagement rather than learning" and "the survey provides a snapshot view of the student experience, but does not provide longitudinal data in terms of tracking changing perceptions of students over time." The workshop recommended that NSSE should not be used as a direct indicator of institutional performance, as it does not measure student learning, but could form a part of a quality framework for postsecondary education in Ontario. Too much emphasis should not be placed on this one tool among others. However, institutions could be assessed in terms of how they are using and responding to research on student engagement and student learning in the context of institutional missions and goals.

The increasing complexity of the NSSE questionnaire from the original pilot means that students are getting tired of questionnaires/tests and end up not completing all questions. In the McMaster NSSE 2006, 837 first year students answered Q1 and 1022 "seniors." But, only 730 first year and 942 seniors answered question 15 on age. Totals are even lower for the Ontario Consortium's additional questions (Wood, 2007). Perhaps like HEEACT, NSSE may need to provide "incentives" for students to answer all its questions.

Indicators for This Study

For this study, I was looking for historical, consistent, well proven, indicators which would measure the expansion of university education from among youth completing secondary school and from the working age population, over the last forty years, on one side, and the "quality of education" (teaching/learning) on the other, bearing in mind the inclusion of indicators congruent with our three models of adaptation–-entrepreneurial, liberal education and deliberative. Most Canadian universities have good student information systems, databases on faculty and support staff, research activities and financial information. I have also checked Statistics Canada and indicators mentioned by HEQCO and OECD.

For long-term participation, I use Census data: one measure is the percent of the population 25-64 years old with university degrees. The other measure, from administrative data, is the number and percentage of youth 18-24 years old who enrolled in university over the past 40 years. These data also provide information on gender, enrolment, program; degrees, diplomas and certificates granted.

The closest existing measurements for the deliberative model's reflective teaching and "deep" learning approach, focuses on the classroom and outside interaction between teachers and

students. These would also be sufficient for the other models which are more concerned with "surface" approach to learning. NSSE collects information on student activities in and out of the classroom. SFI is the weakest among the NSSE benchmarks for modern Canadian universities. The issues are high student-faculty ratios and large classes. What is forgotten is the importance of quality of teaching that has a large formative influence on a student. For example, Paul Axelrod, Dean of Education at York University, suggested that good professors are known and remembered for seven qualities–-accessibility/approachability, fairness, open-mindedness, mastery and delivery of academic material, enthusiasm, humour and knowledge and inspiration imparted (Axelrod, 2007). Quality of teaching is now purported to be a priority in modern Canadian universities. One measure in this study will look at the numbers of faculty and time devoted to teaching. Another measure looks at the depth and breadth of a teacher's knowledge, training in teaching methods and classroom techniques. An American study looked at opinions and attitudes of 22,500 full-time faculty members 2007-2008 (Opinions and attitudes, 2009). Questions included hours spent teaching, preparing for teaching, committee work, highest priority at own institution, scholarly writing, depiction of own institution, and teaching methods used in courses. As sessionals, part-time instructors and teaching assistants teach a large part of the undergraduate classes, I also looked at their knowledge, training, tutorial techniques and outside interaction with students. For liberal education, the breadth of academic offerings is important, especially the teaching of humanities and the development of skills such as reading, writing, mathematical and critical thinking. Information on courses taught in humanities, social sciences, sciences and the professions, changes in numbers of students and proportions over time are available from university records/Statistics Canada.

A quantitative “cluster” around teaching and the classroom could consist of faculty/ student ratio, class size, texts, technology & learning aids, library holdings, reading, writing and project assignments. In terms of learning: frequency and quality of contact with professor, hours of activity preparing for class, working for pay, and participating in other activities such as organisations on campus also from NSSE.

Another promising area focuses around Question 2 of NSSE which asks students about emphasis on five areas of mental activities in their coursework. This issue will be explored in the next chapter under regression analysis.

Chapter 6

Learning Styles--NSSE Regression Analysis

In this chapter, I first look at styles of learning, particularly at the literature on surface and deep learning, the variables of main interest. Second, I discuss 15 other variables, discerned from literature, which could influence grades--the control variable. Third, in the data and method section, information from the NSSE 2008 survey is operationalised and a regression analysis undertaken leading to, fourth, the results, where the study finds six variables which have a relationship with grades. The fifth section is the conclusion. Learning style matters because it has a bearing on how knowledge is absorbed and retained.

Styles of Learning--Definitions and a Brief Literature Review

Theories of learning may be categorised as behaviourist, cognitivist, contructionist, humanist, and social/situational, each with its own purpose in education and with manifestations in adult learning such as behavioural change, capacity development, or self-actualisation reflected in such adult learning as skill development and training, development of intelligence, self-directed learning and socialisation (Mergel, 1998; Smith, 1999). Saljo (1979) developed five categories of learning-–quantitative increase in knowledge; memorising; acquiring facts, skills and methods; making sense of abstract meaning; and interpreting/understanding reality in a different way. Surface learning is related to Saljo's first three categories, while the fourth and fifth categories are related to deep learning. All deliberative scholars belong to the deep learning group as do many from liberal education. The entrepreneurial scholars favour surface learning.

Surface learning approaches are largely extrinsically motivated (effort is expended to get a particular grade or credit) and are concerned with trying to reproduce information without

seeking personal understanding. Memorising facts with only superficial understanding and the uncritical acceptance of ideas are hallmarks of a surface approach to learning (Hughes and Mighty, 2010).

Literature on surface learning can be traced to the Greeks such as Aristotle. In his essay on memory, *De memoria et reminiscentia* (Bloch, 2007), Aristotle grappled with the theories of memory and recollection. Other philosophers, following in Aristotle's footsteps, in 17th Century are Hobbes; in the 18th, Hume; in the 19th, Brown and Bain. The "giants" of behaviourism--a study of overt behaviour that can be observed and measured–-in the 20th century include Pavlov, Thorndike, Watson and Skinner. Pavlov is well known for his experiment of classically conditioning his dog to salivate in response to an external stimulus, the ringing of a bell. Skinner's science fiction book, *Walden Two* (1948), portrayed a utopian society based on operant conditioning. His *Science and Human Behaviour* (1953) applied this principle to social institutions, promoting the cause of "scientific method" in social sciences. His *Beyond Freedom and Dignity* (1973) provided a classic account of his all embracing vision of Behaviourism. Paul Saettler (1990) demonstrated the impact of behaviourism on educational technology in America through evolving stages-–behavioural objective movement, the teaching-machine phase, the programmed-instruction movement, individualised instruction, computer-assisted learning and the systems approach to instruction. Surface learning was associated with short-term memory, "rote" learning or memorisation and was perceived to be teacher-centred as in the traditional lecture in a university where students learn "passively" without much discussion or interaction.

Deep learning approaches are largely intrinsically motivated (the student has a genuine interest in engaging with the subject and extracting meaning for himself/herself in order to

understand and become expert). Critical analysis, the integration of new knowledge with prior understanding, application, the effective transfer of knowledge to new situations, and retention of the knowledge are the hallmarks of deep learning (Hughes and Mighty, 2010).

Cognitive psychology, the basis for deep learning, can also be traced to the Greeks. Socrates made a distinction between a "rhetoric" and "belief." Originating from the Gestalt school, cognitive psychology accepts the scientific method, rejects introspection (important in Freudian psychology), and accepts the existence of internal mental states such as beliefs, desires, motivation, opening up the "black box" constructed by the behaviourists. Jean Piaget developed the theory of adaptation through assimilation and accommodation in the 1920's. Learning in children does not develop smoothly, he postulated, but took off into new phases at 18 months, 7 years and 11-12 years (Atherton, 2011). Kohlberg, building on Piaget's work, argued that moral values are acquired from early childhood in five stages in ways that are similar to the acquisition of language (Crain, 1985). The implications are that students at the tertiary level of education would likely benefit from learning about higher level moral values (social contract, universal ethical principles) as these are "built" upon knowledge already acquired, leading to better understanding of citizenship. The key concepts of cognitive theory are: schema--an internal knowledge structure--and a three-stage information processing model-–sensory register, short-term memory and long-term memory storage. Meaningful information is easier to learn and remember. Deep learning shows integration of concepts into long-term memory involving the use of ideas, evidence, and personal meaning. For example, theories of language acquisition (Krashen, 1982) emphasises motivation and "attention" leading to "formal" learning, while

Maslow (1968), a humanist, emphasises affective and cognitive needs and the actualisation of the whole person through self-directed learning.

A summary of thirty years of teaching and learning research literature by Prosser (2010) showed that students adopt either surface or deep learning approaches, depending on their prior learning experiences, and their perception of their current teaching and learning environment. Further, student learning approaches are associated with the quality of learning outcomes. He also compared the research and teaching approaches of faculty. He suggested that a faculty's approach to research may be associated with that faculty's approach to teaching and that research norms of a discipline may be important to understanding the pedagogical inclination of the faculty.

On the whole, it is suggested that surface learning is associated with disappointing outcomes such as little retention, poor understanding of the material and less awareness of the discipline studied and of self-awareness as a learner. Deep learners are more engaged, have enhanced retention, better understanding of the material and the discipline, better interpersonal skill development, and more self awareness as a learner (Trigwell, 2010). Hughes and Mighty (2010) indicated that, "traditional pedagogic approaches" continue to predominate in Canadian universities. They explained that this "typically implies a lecture format, whereby the faculty member attempts to orally transmit content knowledge to students, who in turn take notes on what they heard and are assessed on their ability to recall and accurately reproduce such information" (p. 11, footnote 3).

I have looked at the relationship between learning styles and grades and I have formulated an hypothesis that these two pedagogic approaches impact on students' grades.

Control variables.

Time spent on preparing for class, asking questions in class, tutoring other students, receiving prompt feedback from faculty, or maintaining high quality relationships with faculty, and a favourable evaluation of overall experience in college, are likely to have a positive impact on grades (Kinzie, 2010, p. 141).

Feedback is likely to have a positive relationship with grades through communicating the direction and progress in learning course content and concepts. Behavioural theories stress rewards for the right behaviour, i.e. the right "answers," in tests or papers or communication in class, which in turn are reflected in grades. Cognitive theory focuses on bolstering internal processes such as self-esteem, while constructivists and humanists focus on self actualization, all of which contribute towards marks. The frequency, quality and nature of feedback can have an impact on an individual's grades, depending on style, personality, and experiences. Examples include immediate personalised feedback (Greenfield, 2008) and incorporation in principles of instructional design (Entwistle, 2010; Gagne, Briggs and Wagner, 1992).

Working hard. There is likely a positive relationship between the motivation for working hard and meeting or surpassing the challenge of expectations set by an instructor. The motivation could be a career or a goal. But a "stimulus" could be teaching students the importance of critical thought and the defences that impede it. For example, teaching about the abolition of slavery and how it changed the world, its direct experience and implications would have similarities for climate change and the food chain (Joordens, 2010).

Internship provides practical experience, knowledge and/or skills which would likely have a positive influence on grades. The benefits of internship, based on reinforcement theories

(Kohler, and Greenwood, 1986), are accepted in practices such as internship in medicine, articling for accountants and lawyers, “the ring” for engineers and practice teaching for teachers.

Community Service also provides practical experience likely leading to better grades. Liberal education scholars like Fallis and Axelrod and deliberative writers like Pocklington and Tupper, Marchak, Turk, Tudiver have argued that community service could lead to more reflection on the part of the individual and subsequently better grades.

A positive *relationship with faculty* can lead to enthusiasm for learning--attention, focus, persistence--and better grades. “Role–model” is a crucial factor in learning philosophy from ancient Greek and Roman times to modern Contructivist, Humanist and Social/Situational learning theories. However, most first-year classes in Canadian universities are now large, in the hundreds, making it difficult for a student to get to know the instructor, who may be a tenured professor, or a sessional assisted by teaching assistants. Data from a large research university (likely York, the authors do not specify) showed part-time and temporary faculty did 54% of the teaching; from a doctoral/medical university 55%, and in social science 59% (Clark et al., 2009, p. 103). Literature on the impact of class size on student performance for higher order academic skills and grades–-problem solving, written expression and critical thinking--showed that students in smaller classes acquired more of these than in larger classes (Schiming, 2009). The size or numbers of competitors in SAT examinations had a negative impact on how quickly and how well candidates completed the examinations (Psyched out, 2009).

I expect students who have more contact with peers, or with better *Quality of Relationship with Fellow Student,* to have better grades. With large classes, more team work and learning with peers, both in and out of the classroom, is required. Theories of andragogy or adult

learning--Maslow (1968), Rogers, (2003),--cognitive development (Piaget, Bruner, 1977), social/ situational--Bandura (1997), Lave and Wenger (1999)--attest to self-actualization and self-directed learning as long as a person is motivated.

The expectation is that the more time is dedicated to *Class Preparation,* the greater would likely be the impact on learning and grades. Today's undergraduates, with the explosion in information and "compression of courses," would be expected to spend more time at their studies than the students in the 1960's. An American study found, on average, undergraduates spent 23 hours per week on their studies in 1961 compared to 15 hours in 2003, regardless of discipline or hours worked at paid employment (Babcock & Marks, 2010).

Co-Curriculum Activities likely have a positive relationship with grades as they consolidate the theoretical aspects of curriculum content and concepts into "activities." Students who participate in co-curricular activities are three times more likely to have a grade-point average of 3.0 or better than students who do not participate (Stephens and Schaben, 2002; Schlesser, 2004). Specific activities may affect academic scores: one study found that playing sports, watching television, and participating in community service, improved academic performance, while playing a musical instrument did not (Fujita and Roberts, 2010).

There is likely a negative relationship between time spent on *relaxing a*nd *socialising* and time spent studying and thus an impact on grades. Socialising includes time spent on social networks, even in class. The more time spent socialising, the less time would likely be devoted to academic work. Students without Facebook studied on average 11- 15 hours per week, while those with Facebook only 1-5 hours a week, leading to "cramming" and poorer performance

(Banquil et al., 2009). In another study, Facebook users had GPAs between 3.0 and 3.5 while non-users had GPAs between 3.5 and 4.0 (Karpinski, 2009).

Paid work on Campus is likely related inversely to grades as less time is spent on studies. In Canada, the proportion of students in paid *employment* went up from 25% in 1976 to 40% for males and 50% for females in 2009. On average, students take five to six years to complete a "four-year" undergraduate degree. Just 29% of undergraduates at US public universities complete their degrees in four years, a further 26% take five or six years (Steele, 2010).

Paid work off-campus likely has a similar, negative, relationship to grades as paid work on campus.

Discipline: This study expects to find grade variations by discipline as these are found in all universities. Further, grade inflation has also had an uneven distribution among the faculties. For example in Princeton, in the period 2001-2004, in the humanities departments, A's accounted for 55.6 % of the grades; in Social Sciences 43.3%; Natural Sciences 37.2%; and Engineering 50.2%. At University of Waterloo, grade inflation during the period 1988-93 and 2002-2007 led to increases in average grades from 65% to 93% in music, 51% to 84% in fine arts, 39%-63% in drama and 43% to 57% in engineering (Wapedia – Wiki Grade Inflation). Côté and Allahar (2008) in *Ivory Tower Blues* argued that grade inflation has occurred--80% of students in the US and Canada report receiving A's and B's (p. 58).

Ethnic Background: To what extent does ethnic background influence grades? Some believe Asian parents prize education and push their children hard, providing motivation and support for success at university. The expectation is that Asians may have higher grades. Findlay and Kohler (2010) wrote that Canadian universities, like some of the US ones, are becoming "too

Asian." Although Chinese, Korean and Japanese Canadians make up 21.5 percent of Vancouverites, they comprise 43% of UBC undergraduates. A study by Robert Sweet, retired from Lakehead University, found that over 70% of Toronto District School Board students who immigrated from East Asia went on to university, compared to 52% for Europeans and 12% of Caribbeans. This contrasts with 42% for English speaking Toronto students born in Canada. The 2010 freshman class in Berkley, California, was 42% Asian.

Freshman/Sophomore differentials: The expectations are for differences in grades between freshman students and seniors (third of fourth year). The latter are more mature, have experience of the university system and have overcome the initial "cultural shock" of attending a university from the cosier and smaller atmosphere of a high school. Studies show differences in learning and grades between freshmen and sophomores in economics (Bonello, Swartz and Davisson, 1984), and in physics, nursing, mathematics and engineering.

Gender: For this study it is expected that women would have higher grades than men. Recent literature shows that from an early age, through elementary and secondary school, girls outperformed boys in marks, had a lower drop-out rate, higher school completion rates, and women had higher educational attainment among the 20-34 year old cohort. A recent OECD study (Statistics Canada, 2010b) commented on scores in reading, writing and mathematics for the Program for International Student Assessment (PISA) where girls outperformed boys in reading in every country and in every Canadian province.

Data and method.

The data were well covered in the previous chapter. This section operationalizes the control variables, undertakes regression analysis and sets out the results, followed by concluding remarks.

I used OLS regression to test the relationship between student grades-–the dependent variable–-and the 17 theory informed independent variables that might impact on students' academic performance. The data comprise 1,565 observations and are organised in cross-sectional design.

The independent variables and their operationalization. Memorise and analyse, the two variables of interest to this study, are captured by the Question, "During the current school year, how much has your coursework emphasised the following mental activities?" The choices are memorising, analysing, synthesizing, making judgements, or applying theories or concepts to practical problems. The feedback is operationalized for each mental activity by very little =1, some =2, quite a bit =3 and very much =4. Among the five mental activities, memorising is equivalent to surface learning--"***memorising*** *f*acts, ideas, or methods from your courses and readings so you can repeat them in pretty much the same form," while analysing, representing deep learning, is defined as "***Analysing*** the basic elements of an idea, experience, or theory, such as examining a particular case or situation in-depth and considering its components."

To the question on experience in current school year, "how often have you received prompt written or oral feedback from faculty on your academic performance?" the options are: never (1), often (2), sometimes (3), and very often (4).

To the next question on experience in current school year, "how often have you worked harder than you thought you could to meet an instructor's standards or expectations? The feedback is operationalized in the same manner--1 to 4--as in the above variable.

The question, "Which of the following have you done or do you plan to do before you graduate from your institution?" refers to practicum, internship, field of experience, Co-op experience, or clinical assignment, ***intern04,*** while ***volntr04*** refers to community service or volunteer work. Feedback is operationalized as have not decided (1), do not plan to do (2), plan to do (3), and done (4).

The question on quality of relationship, "Select the circle that best represents the quality of your relationship with (a) other students and (b) faculty members" provided a scale of 1 to 7. For other students, unfriendly, unsupportive, sense of alienation were coded as 1; while friendly, supportive, sense of belonging as 7. For faculty, unavailable, unhelpful, unsympathetic was code 1 and available, helpful and sympathetic 7.

The question on time asks, "About how many hours do you spend in a typical 7-day week doing each of the following?" a) Preparing for class (studying, reading, writing, doing homework or lab work, analysing data, rehearsing and other academic activities)? b) Working for pay on campus; c) for pay off campus and d) participating in co-curricular activities**;** e) relaxing and socialising**.** The time spent is operationalized as follows: students that spend 0 hours are coded as 1; 1-5 hours as 2; 6-10 hours 3; 11-15 hours 4; 6-20 hours as 5; 21-25 hours 6; 26 – 30 hours 7; for 30 hours and above, students are coded as 8.

The question on ethnicity states, "ethno-cultural information is collected to support programs that promote equal opportunity for everyone. Are you ... Select all that apply" Fifteen

variables reflecting each response are found in the data set such as White, North American Indian, Latin American etc. I chose one--***eth_ca5*** (Chinese)-–to test the hypothesis whether ethnicity matters or not.

The discipline or major, **majrpcod,** was created by NSSE staff from responses to the question, "Please enter your major(s) or expected major(s)" by recording them into 10 major categories and 85 sub-groups based on 2000 Classification of Instructional Programs (CIP). The major groups are: Arts and Humanities (1), Biological Science (2), Business (3), Education (4), Engineering (5), Physical Science (6), Professional (7); Social Science (8), Other (9), and undecided (10).

For the dataset, the University of Ottawa provided the information for each student on ***gender,*** operationalized as male1 and female 2, and on institution-reported class rank. The first, second, third year students at the university received the corresponding year as code while the and fourth and fifth were combined into 4. The unclassified were coded as 5 and left out. The first two years were treated as juniors, the rest as seniors (NSSE 2008b, p. 14).

The model is comprised of the following equation:

Student grade = Memorize X_1 + Analyse X_2 + Feedback X_3 + Workedhard X_4 + Internship X_5 + Community Service X_6 + Relation with students X_7 + Relation with faculty X_8 + Hours class preparation X_9 + Hrs paid work on campus X_{10} + Hrs paid work off campus X_{11} + Hrs Co-curricular activities X_{12} + Hrs relax and socialize X_{13} + Ethno-cultural – Chinese X_{14} + Primary Major X_{15} + Gender X_{16} + Class Rank X_{17}

Grades are an average of the credit value and the marks obtained for each course. They range from 62% or lower C- (coded as 1), to 85% and over or A (coded as 8). This dependent

variable is feedback to the question “What have most of your grades been up to now at this institution”?

Results.

The results of the regression are shown in table 3. Those with impact are in bold. The two main variables of interest are memorising and analysing, representing “surface” and “deep” learning. It seems that neither has much impact on the grades received by students at University of Ottawa. Thus, they are neither statistically significant nor substantially relevant. The reason is likely weakness in the theoretical underpinning. Statistically significant means the likelihood that a result or a relationship is caused by something other than mere random chance. P-value is the probability that random chance could explain the result. In general, a 5% or lower value is considered to be statistically significant. To be substantially relevant, an independent variable would likely contribute significantly towards explaining the dependent variable, as well as the nature of the relationship.

The “**bold**” variables in the table--internship, community service, relationship with faculty, hours spent on class preparation, hours of paid work off campus and class ranking–-are statistically significant. Internship and community service contribute to grades by providing practical experience and skill development leading to better understanding of reality and better integration of theoretical knowledge with practice. Deliberative thinkers see internship fostering reflection and critical thinking, thus better grades. Internships have historically, been an integral part of professional training such as medicine, law, engineering, teaching etc., and grades are given also for the internship itself.

Table 3

OLS regression on student grades of learning styles and other independent variables

Variable	Unstandardized Coeff. (B)	Standard Error	Significance
Memorize	.072	.054	.186
Analyse	.004	.066	.954
Feedback	.065	.064	.306
Workedhard	-.011	.064	.870
Internship, practicum	**.199**	**.052**	**.000**
Community Service	**.094**	**.052**	**.068**
Relation with students	.007	.038	.853
Relation with faculty	**.177**	**.040**	**.000**
Hours class preparation	**.131**	**.028**	**.000**
Hrs paid work on campus	-.076	.054	.157
Hrs paid work off campus	**-.065**	**.025**	**.009**
Hrs co-curricular activities	-.005	.046	.914
Hrs relax and socialize	-.006	.033	.865
Ethno-cultural – Chinese	-.043	.220	.844
Primary Major (majrprim)	-.001	.002	.401
Gender (Inst. reported)	.174	.108	.108
Class Rank (Inst.Reported).	**0.154**	**.036**	**.000**
Constant	2.723	.589	.000

Note. R^2 = .092; N=1,565; a. Dependent Variable: What have most of your grades been up to now at this institution?

Community service also has impact similar to internship. For internship, field experience, co-op experience or clinical assignment, 60% of NSSE respondents had a field experience or planned one and 40% had not decided or did not plan to do so. A plausible explanation of the positive relationship is the requirement of a "high average" to be eligible for internships, leading to "pre-selection." For community service, 71% of students in the NSSE sample had done or planned to do community service, while 30% had not decided and did not plan to do so.

The results show that quality of relationship with faculty has an impact on the grades. A positive relationship would inspire students to be enthusiastic, do the readings, participate in class discussion and obtain good marks.

The analysis also shows a positive relationship between time spent on preparing for class and grade scores; and negative relationships with hours spent working for pay off-campus or on campus and time spent on co-curriculum activities, or in relaxing or socialising. The results corroborate findings that the average time spent studying by an undergraduate today as compared to 1961 has declined to 14 hours a week from 24. That drop is found within every demographic subgroup, within every faculty and every type of college in the United States (Babcock and Marks, 2010) and likely applies to Canada. Plausible causes include the increase in the numbers and proportion of students working for pay, the lowering of university standards, or perhaps students have many different ways of learning.

The sixth variable in bold, classrank, shows that there are differences in the impact on learning and grades between being a freshman or a senior with a greater impact on seniors. Why is not clear. One plausible explanation is that junior students are finding their way, getting used

to the system and learning the basic concepts in the discipline. Seniors know their way around, are possibly more mature and may perhaps have more motivation as they are approaching exit into the job market.

Conclusion

The objective of this chapter was to examine the style of learning on students' grades which is important for absorption, retention, and transmission of knowledge. To do so, the paper looked at the literature on surface and deep learning, the variables of main interest, and discussed 15 other factors or control variables which could influence grades, the dependent variable. The data and variables from NSSE 2008 survey were operationalized. Neither of the two variables of interest, memorising and analysing, was statistically significant nor substantially relevant, likely due to the weakness of theoretical underpinnings. One such assumption has been that one style or the other predominates. However, it is likely that both styles coexist and may be complementary. Perhaps students are not consciously aware of their learning style or strategy, which they may have previously acquired in secondary school. The majority of professors, it is contended, continue to teach in the traditional lecture mode, which would likely act as a deterrent to "deep" learning. NSSE data are obtained from self-reporting by students and focus on student empowerment, not directly on learning. These data provide little information on pedagogic approaches, or on student learning style, much of which was used in this study.

Avenues of further research for the principle variables of interest could be in two directions: one, within the framework of deep and surface approach using the self-reported methodology and the other constructing a different, less subjective methodology analogous to time-series data used in economics such as GNP or prices. Another avenue is to focus on the relationships found between the dependent variable, grades, and each of the six independent

variables which reached statistical significance in this study. Further investigation would look at consolidating and clarifying the paths connecting theory and practice for practicum, community service, relationship with faculty, time spent on class preparation, paid work off campus and class rank. Plausible explanations for decline in time spent on studying, despite the explosion in information and collapsing of courses into shorter periods of time, need to be explored. Are students spending more time at work and taking longer to graduate? Are there so many ways of learning a subject that memorisation is not necessary? Have standards gone down? Are students disengaged? Should teaching be "helping students to learn" rather than "lecturing" as Zundel and Deane (2010) argue?

Chapter 7

Demonstration of Hypothesis

In this chapter, I bring together evidence for research domination, revenue maximisation and the quality of education in the university system. It triangulates evidence based on policy documents (provincial government commissions and reports), empirical data (studies and surveys), as well as qualitative information, to establish the validity of the hypothesis.

Evidence for Research Domination in the University System

Policy documents.

This section examines policies of the province of Ontario as expressed in commissions and reports and implemented by the government of Ontario. Tertiary education policies in other provinces follow basically the same pattern.

Starting from the early 1960s, when most universities in Canada were teaching universities, the funding formula of 1967 provided operating grants for both instruction and research. There was no guidance as how to fulfil these activities. The Bovey Commission on the Future Role of Universities (1984) argued for a "core research" function composed of scholarly inquiry, critical appraisal and weighing of evidence in all disciplines with educational activities. The commission further argued that certain universities had become involved in "resource-intensive research" and went beyond the 1967 formula. It also pointed out that research activities and associated costs were not distributed across institutions according to the same pattern as student enrolment. No coherent relationship was found between demand for research in each discipline and the number of students involved.

The most detailed and substantial examination of the relationship between teaching and research was undertaken by the discussion paper of Ontario Council on University Affairs (1994) and the subsequent *Report of the Advisory Panel on Future Directions of Postsecondary Education - Excellence Accessibility Responsibility* (Smith, David C.,1996). Ontario Ministry of Education and Training wanted to increase enrolment by 19%, be more accessible to under-represented groups such as women, francophones, aboriginals; give more emphasis to teaching and to help the movement between college and university without an increase in funding. The paper suggested changing the funding formula, separating funding for research and teaching and allowing the government to shift the distribution (Clark, et al., 2009, p. 15). Specific examples from the report include increasing the size of the Research/Overheads/Infrastructure envelope from $23 million to $100 million annually and the development of a research policy to cover basic and applied research in both the public and private sectors. Specifically, it mentioned strengthening industry collaboration with universities (Recommendation 5, p. 38) and ways of increasing private sector support for research (Chapter II). Strategies of differentiation, deregulation and adequacy are interwoven into the discussion and recommendations on the overall policy framework needed to achieve the objectives. Tuition fees were de-regulated, to be set at whatever level a university saw as "appropriate, program by program" on the condition that over a specified upper limit, it must distribute 30% of the incremental revenue as financial assistance to needy students (Recommendation 6, p. 42). Broaching the subject of relationship between teaching and research did not have salutary consequences. In Clark et al.'s (2009, p. 15) words, "neither action nor further discussion was initiated by the government on the report, and

when a subsequent government (Harris) moved to abolish the OCUA, the university community did not come to the Council's defence."

Instead, research continued to be bolstered by Ontario and Federal government initiatives. The Ontario Centres of Excellence (1987) was followed by National Centres of Excellence (Federal) in 1989; Canada Foundation for Innovation (Federal, 1997) for research in health, science, environment and engineering was matched by the Ontario Development and Research Fund. The arts, humanities and social sciences were excluded. Nearly all Federal budgets from 1997 to 2000 featured new investments in university research, the most significant being the hiring of 2000 new faculty members under the Canada Research Chairs (CRC) program. Ontario's six largest research universities accounted for 80% of CRC allocations in Ontario.

In contrast to previous commissions, The Rae Report, *Ontario a Leader in Learning* (2005), became the basis for McGuinty government's *Reaching Higher* plan for education in Ontario. It built on many of the recommendations of the Smith Report, but also changed directions for others. Like the Smith Report it was inclusive with special provisions for francophone and aboriginal students. Students, who were the first-generation to attend university and from low-income families were also targetted. Although tuition was frozen for two years, the plan followed closely the Rae recommendations in most areas, including student assistance, operational funding, graduate education and the creation of a Higher Education Quality Council. It committed to double-digit annual expenditure increases to higher education in a budget that saw expenditures of 15 ministries cut or held below inflation (Clark and Trick, 2006). The Rae report was far-sighted as it laid out a vision, strategy and indicators for measuring outcomes such

as improvement in quality of education and student experience. For the first time, multi-year funding was advocated. Unlike the Smith Report, teaching excellence for Rae meant that both teaching and research went together and should not be placed in conflict. But he was concerned with students' quality of contact time with professors and teachers (Rae, 2005, p.18). Teaching centres on campus were not mandatory, and "often it is teachers who need help most who get it least." The Council of Higher Education would work with institutions on research and identification of best practices in teaching excellence. Institutions had responsibility for teaching standards, curriculum design, student engagement and the development of teaching expertise in their faculties. They determined the appropriate configuration of teaching venues (large lectures, small tutorials, laboratories and shops, co-operative or on-site) and balanced teaching with other activities like research (p. 53). Under academic renewal, direct new investments were recommended towards teaching excellence and educational innovation so that students would have increased opportunities for meaningful contact with faculty, better facilities and equipment. The development of a single Ontario digital library was made as a distinct recommendation (Rae, 2005, p. 30).

In the Rae report, the rationale for research was, first, that it nourished excellence within universities by attracting great teachers and students from around the world, enriching the learning environment; second, that it nourished excellence outside institutions of higher learning by contributing to knowledge and innovation through basic research for long-term spin offs, and applied research and commercialisation for "immediate real world problems" (p.90). The Report also recommended a Research Council. In 2006 the Ontario Research and Innovation Council

was established, but was dissolved after two years, becoming a becoming a part of the Ontario Ministry of Research and Innovation.

Rae recommended the establishment of a Council on Higher Education reporting to the Premier to advise and co-ordinate research priorities and to allocate provincial funding, where appropriate, in collaboration with federal funding agencies. The Council would help set targets in participation and quality improvements and would report publicly on progress and performance. It would also encourage collaboration between colleges and universities. The McGuinty plan for higher education--*Investing in People: Strengthening Ontario's Economy*--meant an additional $6.2 billion for higher education following the Rae recommendations. *The Open Ontario Plan* (2010) proposed to increase the rate of post-secondary education from 62% to 70% as "70% of all new jobs would require postsecondary education," with increased spaces for 20,000 students. The government of Ontario would create a new Ontario Online Institute, which promised to bring the best professors in the top programs of Ontario universities into homes for those who wanted to pursue the new option for higher learning. Both the Council of Ontario Universities (COU) and the Ontario Undergraduate Student Alliance (OUSA) have developed their own visions of the Institute and how it should operate, and have analysed existing models, and made recommendations for Ontario. Athabasca Open University from Alberta is already providing this service. It has 190 separate agreements with 19 colleges in Ontario for degree completion. "Many graduates of diploma and certificate programs in Ontario's colleges continue on to complete a baccalaureate at Athabasca, without actually leaving their homes" (Clark et al. 2009, p. 158). This raises the whole issue of recognition of other open universities from outside Canada such as those in Britain, Australia, India and other countries.

The provincial budget of 2011 established a Commission on the Reform of Ontario's Public Services (Drummond, 2012a) to advise the Ontario government on how to return to a balanced budget by 2017-2018 by eliminating the deficit which stood at $16 billion in 2010-2011 and had been estimated to grow to $30 billion during that period. The Drummond commission's mandate did not permit any recommendation on tax increase (Drummond, 2012b). The difference from the 1990s was, first, economic growth would not help this time around due to the weak international economic situation and the erosion of Ontario's manufacturing base, and second, the Ontario government's focus was on reform/value-added, not just cost-cutting, whch would require greater efficiency.

The Commission (Drummond, 2012b) recommended an overall annual growth of 0.8% in program spending over a seven-year period. Health would grow by up to 2.5% a year, postsecondary education by 1.5% per year, primary and secondary education by 1% and social services 0.5%. Everything else would decrease by 2.4% a year. The report made 400 recommendations, of which 100 concerned health care, while 30 recommendations covered postsecondary education and 27 for elementary and secondary education.

The thrust of the postsecondary education (PSE) recommendations cover seven areas (Drummond, 2012a, Chapter 7) which would impact on university operations such as revenue maximisation, teaching and research, quality of education and on the structure of post-secondary institutions and relations between them. The recommendations were 1) restraint in growth, 2) differentiation and multi-year mandate, 3) reward for quality, 4) revise research funding structures, 5) maintain the overall cap on tuition fee increases, but simplify the framework, 6) re-

evaluate student financial assistance, and 7) generate cost-efficiencies through co-ordination.

1) Restraint. The report bluntly stated that 1% per year growth will not keep pace with the projected enrolment increases of 1.7% per year, nor with the general rate of inflation. To meet the challenge (Drummond, 2012 a; recommendation 7-1) "Ontario's postsecondary institutions must become more efficient to preserve, if not enhance, quality within tighter financing conditions" as one out of every sixth adult Ontarian adult would be enrolled in postsecondary institutions. The report also suggested reducing the growth of wages and salaries in PSE and to work with private sector to for buildings that do not qualify for government funding such as residences which provide a revenue flow.

2) Differentiation. Recommendation 7-4 urges the establishment of multi-year mandate agreements with universities and colleges to provide more differentiation and minimise duplication. The report would allow college students to transfer to university after two years, would grandfather existing degree programs in colleges and would not grant new ones. Further, government should "create a comprehensive, enforceable credit recognition system between and among universities and colleges. This is an essential feature." (Drummond, 2012a recommendation 7- 7).

3) Reward quality. The Commission proposed ways of improving the quality of education: first, to refocus resources and rewards towards teaching by providing more resources for experiential learning such as internships, self-assigned study, problem-based learning modules and international experience; second, flexibility in research and teaching with recognition of top performing teachers similar to that given to researchers; and third, formalising

research-only and teaching-only career paths. Some quality indicators suggested include: the use of indirect transfer systems; the rates of under-represented communities; space utilisation and class size; and outcomes such as student satisfaction, rates of graduation and postgraduate employment.

4) Revision of research funding structures. Drummond recommended (7-16) a re-examination of the research funding structures with a view to increasing commercialisation outcomes and more productive development investments, as well as offering provincial funding more strategically and efficiently (7-17).

5) Recommendation 7-18 simplifying the fee structure and maintaining the existing tuition ceiling, which would allow increases up to 5% per annum. Citing the case of Quebec, the report noted that a freeze on tuition was rejected as not practical and efficient.

6) The Commission recommended that financial assistance to students be re-evaluated without affecting affordability and access. The Ontario Student Access Guarantee that sets aside 10% of additional tuition revenue for bursaries and student assistance programs would be maintained. Student financial assistance should be re-shaped to take account of family income, to abolish both tuition and education tax credits, and to decouple grants and loans.

7) Drummond (2012a) saw efficiencies arising from consolidation and coordination in purchasing, from establishing a single pension administration, from more efficient use of existing capacity such as using buildings at night or in summer, from ceasing funding of international marketing of Ontario's universities, and from compelling post-secondary institutions to examine whether they can compress some four year degrees into three years by continuing throughout the summer (recommendation 7-29).

The Canadian Council on Learning, in its last report (2011, p. 7), also bemoaned the lack of co-ordination on the national level. “Canada possesses no national system of post secondary education. System connotes cohesion, strategic and coordinated planning across regional jurisdictions, and a set of agreed purposes and objectives, with policies required to achieve these goals. All these criteria are absent from the Canadian context.” The report concludes that Canada was falling behind other countries in PSE and that the threat to Canadian innovation and productivity as a consequence of incoherence in PSE is “enormously exacerbated by our poor performance in adult and workplace learning.”

In conclusion, although policy recommendations by provincial commissions (Bovey to Rae) touched on improvement of teaching, governments continued to tilt the balance even more towards research supported by universities, to the neglect of quality of education, while concentrating more on skills development and working with private sector. The Drummond Commission suggested ways of improving the quality of education along with better recognition of teaching and admitted to the subsidisation of research by Ontario universities. Whether the implementation of his plan, with greater enrolment and scarcer resources to meet the challenge, would redress the imbalance between research and teaching remains to be seen.

Quantitative evidence.

As a part of triangulation of evidence, this section presents pertinent empirical data-–studies, surveys–-to show neglect of undergraduate education by the replacement of tenured faculty by contract and teaching assistants, while at the same time increasing class size. The increase in the number of professors did not keep pace with the large increase in the number of students. This has an impact on contact with instructor and quality of education.

In her pioneering work, "*Hidden Academics: Contract Faculty in Canadian Universities,*" Indhu Rajagopal (2002) surveyed part-timers or contract faculty in universities across Canada to capture their attitudinal and interactive aspects of work and life in the academe. She also interviewed tenured or full-timers and university administrators for their perceptions of part-timers and reasons for employing them. The significance of her study is that it clearly established the existence of contract instructors who now play an important role. They make up as much as 40% of the teaching staff at most Canadian universities and certainly far higher proportions for undergraduate education, especially for the freshmen years.

Instead of tenured professors, some universities (Carleton, Ottawa, Manitoba, Windsor, York among others) have introduced the position of teaching associate along with the limited-term replacement professor and science lecturer (three or five-year term) to meet the demands of growing undergraduate population. These positions are "teaching only" and little research is expected. The Faculty Association opposes this development, arguing that it devalues the traditional professional role. "It changes the nature of academic appointment, by unbundling teaching from scholarship and service. To be an effective academic, you have to engage in all three" stated Vicki Smallman, spokesperson for CAUT (Farr, 2008). When popular instructor Al Pilcher's term contract with the Sprott School of Business at Carleton was not renewed in 2007, hundreds of students signed a petition on his behalf for renewal. The University argued that the business school's accreditation, funding and reputation hinged on its research capacity, and that when funding for a full-time tenure track position became available, it had to concentrate on hiring a professor with a track record in research as well as teaching. Pilcher, despite his teaching talents, did not have a PhD. The University of Manitoba Dean of Arts, Dr. Sigurdson,

acknowledged that term appointments are not ideal for scholars with a PhD who want to pursue a university career with a strong research component. These jobs are not a stepping stone to a tenure track. He elaborated,"that is where you would get tension and unhappiness, because the university cannot give them the time and resources they might like for research" (Farr, 2008, November 3; Sigurdson, 2007).

Data from a large research university showed part-time and temporary faculty did 54% of teaching; from a doctoral/medical university 55%, and in social science 59% (Clark, Moran, Skolnik and Trick, 2009, p. 103). Literature on the impact of class size on student performance for higher order academic skills–-problem solving, written expression and critical thinking–-showed that students in smaller classes acquired more of these than in larger classes (Schiming, 2009). The size or numbers of competitors in SAT (Scholastic Aptitude Test) used widely for college entrance examinations had an impact on the outcome (Psyched out,/2009). The Ontario Confederation of University Faculty Associations equated the growth in class size negatively with the quality of education (2008). They argued that the degree of intimacy had been traded in for a more impersonal classroom setting; essay has been traded for multiple-choice in examinations; tenured-track professors, on leaving, are replaced by part-timers. The conditions of work and the status of graduate assistants, teaching assistants and contract faculty at York university were the main reasons for a three month strike in 2008 affecting some 50,000 students (Carlson, 2009). Part-timers could not participate in academic committees nor have time for research. Rajagopal (2002) showed that full-timers as a group were both uncomfortable about hiring part-timers and were generally anxious to retain the teaching versus research distinction, believing that part-timers should do neither research nor service (p. 179). The reasons given by a

majority of administrators for hiring part-timers were: a freeze on full-time hiring, an attempt to maintain lower student to faculty ratio, and temporary replacement for a full-timer, maternity, sabbatical etc., (p. 202). Administrators sought flexibility (hiring, office space, infrastructure). Administrators' authority permitted a casual, utilitarian approach to part-timers that contributed to a hierarchy that was predicated on the devaluation of teaching (p. 192). Rajagopal (2002) classified part-timers as "Classical" or "Contemporary." The former were employed in professional schools where "real world" expertise was brought in to train lawyers, doctors, journalists, educators, etc. They had a choice not to work as they usually held other jobs. Contemporaries, on the other hand, often taught many courses and dreamed of full-time positions, while living a hand-to-mouth existence. They often had high qualifications–-PhD with publications–-but could not break into the tenure-track stream.

In summary, the system of "hidden academics" is well entrenched in the modern university, providing administrative flexibility to deal with large numbers of undergraduates by employing contract instructors and TA's to teach large classes. Tenured faculty avoid introductory courses, preferring research and graduate students. But, this combination affects student-faculty contact and quality of education.

Qualitative evidence.

The third type of evidence in the triangulation is qualitative which describes the work of individual instructors, TA's, their teaching experience, class size and their efforts to maintain quality of education despite the domination of research.

A sessional in political science with a PhD, "Daniel," has taught since 2000. Beginning with an introductory course, he progressed to a full course-load in 2005. Currently, he teaches at

the University of Ottawa with 160 students in one class (with two TAs for marking) and 90 in another class (three TAs). He spent two hours preparing for an hour's lecture two or three times a week, plus class time, e-mail and marking. The previous winter he taught everyday. During the first half of his course, he received over 1000 e-mails, 90% of which related to topics or issues he had already conveyed or explained to his students. So, now he strictly limits the use of e-mail to essentials, such as problems with the course website, late assignments, access by the disabled and dire necessity. His postings on virtual campus include: the syllabus, readings, assignments and lecture notes 6 to 12 hours before the lectures. He uses power-point for his lectures with tables and graphs. A textbook is assigned. Course-packs represent considerable work to compile and are used more often in third and fourth year courses. In addition, he mentioned, the university administration has cut allowances for photocopying. The previous year he had to pay for photocopying material out of his own pocket. His TA's did all the marking, as he felt that it was impossible for him to revise 20 or 30 papers. These were essays as he does not believe in "multiple choice" examination methods. Attendance in class could not be enforced. In some universities they use identity cards with chips to record attendance, like clocking in at a factory. Some instructors use "clicker" and "smart-phone" connections in class to obtain feedback from students in a large class. In any case, on average, a third of the students were absent from his class. Absenteeism in night classes exceeded that of day class. He felt that many students were immature, spoilt by "grade inflation" at high school or university, and showed disrespect in e-mails or through body language. He has received good evaluations from his students, but felt that undergraduates were not in a position to judge a professor. He describes his relationship with faculty as relatively fine, but there is not much conversation. He has applied for term-

replacement positions, but so far he has been unsuccessful–-the difference could have been $55k versus his current salary of $39k–-he could have taken the summer off to do research.

The relationship between contract teachers and teaching assistants is even more volatile than between full-timers and part-timers, influencing teaching/learning. The Rae report (2005, p. 17) stated "but it is often teaching assistants who have the most contact time with students." Every year universities provide orientation and "seminars" for teaching assistants. The "turnover" of TAs is obviously very high as these positions are often given to students who would only be in the program for a year or two at the most. Qualitative evidence suggests that TAs are often young, inexperienced, and confused as to their role. Professors and sessionals often do not clearly explain their guidelines and expectations. TAs have their own classes to attend and assignments to accomplish, while at the same time attending to their students, marking papers, and helping freshmen transition from school to university. A University of Texas TA Resource Guide (n.d.) lays down a checklist: Attend class, run discussion sections, hold weekly office hours, meet weekly with professor(s)/or other TAs, process tests, help administer and grade final exams, type and/or photocopy quizzes tests handouts; grade assignments, quizzes, exams, lab reports and maintain course grade records; advise students on the course or other academic matters, may guide students to resources for non-academic matters; in lab courses, participate in setup, preparatory meetings and cleanup; accompany field trips, organise equipment; run library errands and sometimes other errands on campus (Appendix II, p. 22). A syllabus content checklist is also provided (Appendix III, p. 23). The Guide points out: the TA should develop good relations with professor/instructor, draw up a semester plan and not work more than 20 hours a week. At TA and teaching seminars given by Centre for University Teaching (CUT) of

University of Ottawa (2009-2010), I discovered that often TAs were ill-prepared for their role. Departments, with CUT's help, provided orientation and educational seminars for those interested in improving on a voluntary basis, but attendance was sparse as other priorities were more important. Topics covered principles of good practice in undergraduate teaching, how to build a teaching team, grading, multicultural context, communicating in a large class, motivation, critical thinking, feedback, teaching as a topic of research, among others. The debate on the size of class was a constant theme at these seminars, especially for maths, science, biology and psychology; classes of 500 or 600 are not unusual. This debate is vigorous in the Ivy League. Jeffrey P. Filippini, (2001), wrote that a majority of math undergraduates were in classes of more than 200, while classes in English were less than 100. The Harvard Law School planned to cut class sizes from 140 to 80 students and to establish a House-like system of "law colleges" (Heineman, 2000). But according to Harvard faculty members, the anonymity of large classes is offset by the teaching ability of engaging and charismatic big name professors, who generally preside over big lecture courses. Because they are talented and well-known, they draw more students each time the class is offered. Because they need to put on a "performance" in class to keep students interested, presentations come out more polished than if they would be in a small class. Dean Harry R. Lewis said the "the point of an education is to become intimately familiar with the subject, not with the teacher; the bottom line on class size is what you make out of it and does not hinge on whether a given class has 10 people or 1000" (Studlien, 2000).

I attended a first year calculus lecture, 160 students, at University of Ottawa with the permission of the instructor and talked to six of the students after the class (2/3/2011). All said high school classes were smaller, but they learnt just as well in a big class. The teacher was good,

explained the material well and they had a textbook for reference. If they had any questions or problems, they would go to their TA or bring it up in discussion groups. One student said an individual teacher can make all the difference. He had a "bad" chemistry teacher and was put off chemistry ever since. Another worked nearly full-time at nights–-20 hours a week. "I need the money to continue my studies. Of course it cuts into my study time, but I don't have a choice." Although classes are not compulsory and no attendance is taken, most felt going to class was useful as not all information was found in the text, especially explanations. The professor confirmed, "I don't post my notes on the web, as I want the students to attend my class." For most of the lecture he used the old-fashioned blackboard to write out his concepts and work out examples. Most students took notes by hand and a few–-about 20–-entered the information directly into their laptops. Some professors argue that after a class size reaches a certain number, the benefits of having resources available online and on-demand outweigh those of gathering in a classroom. Joe Kim, a psychology professor at McMaster, has taught large, first-year, classes for more than three years. He began with a "blended-learning model"–-recorded lectures that students can watch anywhere anytime–-supplemented by tutorials led by upper level undergraduates. He has added a weekly live lecture in response to student demands. They wanted personal contact, "there is something about live lectures that cannot be replaced" he said (Church, 2011, p. 13).

A survey of 5,886 Canadian undergraduate university students was undertaken in the winter of 2010 about their favourite and least favourite classes on a scale of 1 to 9. The single most important factor was interesting subject matter, followed by an engaging teaching style and course/text materials. Class size, technology and teaching assistants came out much lower on the

scale. The study concluded that the impact of active and intelligent participation of other students in making a great learning experience, as advocated by scholars of teaching and learning (NSSE asks this question), had a surprisingly low effect on making a particular class a favourite or least favourite. Further, "most students are not actively interested in having smaller classes that they might participate more" but view the learning process somewhat passively, wish to be "engaged" or "stimulated." Their responses can be interpreted as simply wanting to be entertained (Usher: 2010, p. 6).

In conclusion, the debate on the influence of class size on teaching and learning is still raging but some basic understanding seems to be emerging. Most recent studies conclude that class size has no effect on the recall and retention of facts and information during a course as measured by student performance on objective questions or examinations. Scores on standardised exams two years after completion of a course are virtually identical between small and large classes. Class size does not make a difference in retention of academic information. However, there was a consistent difference between large and small classes in the attainment of higher-order academic skills such as problem solving, written expression and critical thinking. Students in smaller classes (less than 70) acquire more of these than in larger classes (Schiming, 2009, p.1). The literature showed that large classes are not an obstacle to acquiring "specific, course-related, factual knowledge" but that students in large classes are at a disadvantage in developing an ability to think better using skills beyond the basic acquisition of information. His recommendations included: 1) the best instructors should teach the larger classes. 2) Ideally, majors or potential majors should enrol in smaller sections of a given class, while non-majors enrol in the larger ones. 3) Registration information for students should include maximum class

size. 4) Even larger classes can appear "smaller" by using some of the teaching tools and techniques of smaller classes.

Qualitative data, the third part of the triangulation, reinforces the evidence from policy and empirical studies showing the abysmal teaching conditions suffered by "hidden academics," the effects of large class sizes and the relationship with TA's who are in a program for a short period. The literature shows that large classes are not an obstacle to acquiring specific course related, factual knowledge, but students in large classes are at a disadvantage in developing an ability to think better using skills beyond the basic acquisition of knowledge. Students also want to be entertained. The evidence on the devaluation of teaching and the dominance of research spurs on the administrators and the professoriate of modern Canadian universities towards the quest for revenue generation, the subject of the next section in this study.

Maximising Revenue Generation Without Regard to Quality of Education

In the first part of this chapter, I provided evidence--policy, empirical and qualitative--to show dominance of research over teaching. In this second part, I show how the efforts of universities to maximise revenue generation without regard to quality in order to further the priority on research, contributes to the lowering of standards. My evidence is based on university operational data, AUCC and CAUT reports and writings of university presidents like Bok (2003) and Naylor (2010).

Revenue generation has been on the mind of university leaders for quite a while. A special report by CHE (Selingo, 2005) on a survey of Presidents and Chancellors of 1,338 four-year colleges in the U.S. conducted in the summer of 2005 showed that their top priority, akin to that of a Chief Financial Officer (CEO), is financial issues which "permeate almost every facet

of the top job on campus" and "they have an obsession, day in and day out, with things related to finance" such as a *balanced budget.* It is a similar story for Canada. The new CEO-type leadership, replacing the scholar-teacher, is quite at ease lobbying governments, sitting on boards of companies, coaxing private sector companies and individuals for monies and endowments.

One response to government pressure for increased enrolment and privatisation of research, since tuition and grants are regulated, is for the universities to maximise total revenue to meet inflation and capital costs. Another mechanism is to anticipate full funding by carefully selecting the periods and programs to expand by betting they would be funded by governments within a few years. Expansion of graduate schools associated with prestige of instruction and research is an example (Clark et al., 2009, p. 45). In their quest for revenue, modern Canadian universities embarked on commercialisation, privatisation of services or partnerships with business, or with "petro-rich" sovereign states, setting up overseas campuses or departments or embarking on risky projects such as real estate. At times, in this process of making money, universities neglected to apprise their own interest, maintaining ethical standards and in the process compromising their autonomy and integrity.

In this section**,** first, I examine revenue generation and universities' finances, including monies for education, research, other purposes and the distribution of expenditures. Operating funds for Canadian universities come from provincial governments (per capita grants) and tuition from undergraduates. Research is mainly supported by the federal government. However, sponsored research (from government or private) is not "profitable"–-i.e., it does not pay for all the costs-–it loses money (Drummond, 2012 a). More sponsored research will not make it "profitable." Observations from university budgets lead to other relevant themes. Second, the

competition to expand graduate schools is costly, prestige-maximising, and can affect resources for undergraduate programmes. Third, commercialisation is seen as a means of closing the financial "gap," generating more revenue and increasing sustainability. So far, this goal seems "illusory." It does not seem to have been realised either in services or other sectors. But fourth, the issue of sponsored revenue, especially in relation to "Pharma" or "Big science" has, at times, led university authorities to compromise autonomy and to jeopardise integrity. Fifth, a principal mission of a university is to provide quality education based on institutional values. In the quest for retaining students and maximising revenue through "consumer incentives," universities may lower standards, which can affect the quality of education.

Revenue growth and finances.

All Canadian universities follow the same strategy of growth–-more and more enrolment--with competition for "A" students and competition for students who require "qualifying" or "remedial" courses. They are involved in marketing through "branding," advertising, and in recruitment of overseas students (who pay full tuition costs, three or four times higher than Canadians). Egged on by governments, they eagerly chase external research contract dollars. In 2009, there were 870,000 full-time students (734,000 undergraduate, 136,000 graduate) enrolled in Canadian universities, 279,000 part-time and 400,000 in continuing education. The numbers of full-time students has continued to grow for 14 consecutive years. AUCC crows, "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 plastics products." AUCC also notes

that its impact goes well beyond economic benefits (Trends v3, 2008, p. 4) and includes community service and innovation.

University finances are divided into five funds--general operating (GOF), special purpose and trust fund (SPT), capital, ancillary, and endowment. In reality over ***90% of the operating revenues of universities come from provincial government support*** (based on enrolment) and ***tuition fees paid by undergraduate students***, who are the overwhelming majority of the student population. These monies go into the GOF which supports "core" activities–-teaching and learning, including unsponsored research, or professors' own research interests for tenure or promotion and for fulfilling their "job" obligations. This research is supposed to be distinct from external contract research. The total GOF budget for Canadian universities was $16.9 billion in 2006-7. In the thirty years, 1978 to 2008, government's share of university operating revenue for GOF declined from 84% to 58% while the share of university tuition fees increased from 12% to 35% (CAUT, 2011a, p. 3). Students contribute three times the share they contributed 30 years ago. Ontario and Nova Scotia have the highest proportion (43%). Per student grants at $15,000 in 2006-7 were only marginally higher ($500) than in 2001-2; $6000 less than at the beginning of 1980's and $2000 less than at the beginning of 1990's. In comparison to US public universities, Canadian universities receive $8,000 per student less in grants. GOF covers salaries of teachers, support staff and administrators. It is also responsible for costs for the service part of the university's mission.

The special purpose trust fund (SPT) consists of revenues for purposes designated by either a government department or private sector donors. Funds in "lieu" of a tuition freeze, for example, would go into this fund or funds to transition the "double cohort" that came to

universities from the Ontario secondary school system at the abolition of grade 13, or funds for growth of graduate schools. ***Endowments*** are usually invested and the interest used for specific purposes. Endowments play a very important role in the finances of private universities such as Harvard, Princeton and Yale especially for meritorious students. For Canadian universities, endowments are less important. At the end of 2008, Canadian universities had accumulated some $9 billion in endowment funds, calculated at market value, which was a decrease of 20.3% over 2007 due to the recession. The University of Toronto led field with $1.3 billion, followed by UBC, McGill and Alberta. ***Capital fund*** is for expansion of buildings or major renovation of physical infrastructure and it grows sporadically. It was high after the 1990s with a one-time jump under the SuperBuild program in Ontario. It stood at $1.46 billion in 2006-2007. A Report for the Council of Atlantic Ministers of Education and Training found that much of campus infrastructure constructed in the 1960s and 1970s was old and needed renewal; electrical, plumbing and ventilation systems needed to be upgraded to bring in line with modern building codes, regulations and environmental sustainability. Roofs and exterior skins also needed major repairs. Canadian Association of University Business Offices (CAUBO) estimated the value of infrastructure to be $6.8 billion, of which $5.1 billion was for deferred maintenance and of that $2.4 billion was considered to be urgent (AUCC, 2009). The Canada Foundation for Innovation (CFI), established since 1997, also provides funds for research infrastructure such as state-of-the-art equipment, buildings and laboratories, but only up to 40% of eligible costs of infrastructure. The recent infrastructure stimulus also boosted the fund over $2 billion. However, as financing does not cover all costs, universities, especially in Ontario and Quebec, have to raise money

through debentures and cover debts and interest from their operating budgets, reducing amounts for teaching and related expenditures (AUCC, 2008, p.19).

Sponsored research, touted as a panacea for revenue and prestige, has increased in the last decade. In 2006-7, all external grants and contracts totalled $5.2B--$2.4B from federal sources, $1.7B from private sector, $790 million from provinces and $300 million from foreign sources. The three granting agencies–-NSERC, SSHRC, and CIHR–-distributed $1.7B in direct research grants. However, external sponsors ***do not*** cover ***faculty salaries (time)***, nor ***institutional costs*** which include operating and maintaining facilities, laboratories, libraries, computer networks, as well as managing the research process and ensuring safety compliance. Total institutional costs amounted to $1.7B, but, for unfunded research costs, it is estimated that "universities, at a minimum, need to spend close to $3.4B to support those research programs at internationally competitive levels" (AUCC, 2008). The impact of this ***cross-subsidisation*** represents about a ***fifth of the general operating and special purpose fund*** resources for all universities. And again, "a major portion of these research costs relates to faculty members' time devoted to conducting research with most of the time devoted to conducting research for external sponsors" (AUCC, 2008, p. 26). AUCC estimates that 55% to 60% of research performed by universities is externally funded. My point is that sponsored research is subsidised and costs money to the university instead of bringing in "profits." These resources are taken away from teaching and learning, even as competition for sponsored research is intensifying, using up even more faculty time.

The Canada Research Chairs Program (CRC), in 2000, further added to research activity with 2000 research professorships in 70 universities across Canada, with an investment of $2

billion over eight years. Administered by the three research granting agencies, 20% of the chairs went to social sciences, 35% health sciences and 45% to natural sciences and engineering. The distribution of chairs was related to research strengths and expertise of universities in terms of the amount of research monies they received. Toronto, with 253 chairs, was in the forefront. It was followed by UBC (147), McGill (139) and Université de Montréal (103), Alberta (97), Laval (81) and Calgary (77). In the period 2007-2009, additional federal investments in R&D--Centres of Excellence, Commercialisation and Research Programs, and Global Excellence Research Chairs--totalled $1.5B.

An **evaluation of these programs** found that universities had provided their own monies for research for the Chair and had reduced teaching loads. This is a good illustration of prioritizing research, increasing financial pressure on universities and leading them to revenue maximisation strategies. According to a survey of Chair-holders (Malatest, 2004, p. iv) universities provided, on average, $68,988 in research funding for the Chairs in the year (2002-2003). University support was highest for CIHR Chair-holders--$94,923. For Chairs originally from the nominating university, undergraduate teaching loads were decreased by 45% to 1.3 with no decrease at the graduate level. But, the teaching load of Chair-holders was half that of non-chair faculty (p. 39). However, supervision of graduates and other staff (technicians) by Chair-holders compared to other researchers shot up between 2000 and 2003 by 75.1% to 11.4% for post-doctoral fellows; by 53.3% to 15% for doctoral; by 46.8% to 2.1% for masters; by 83.8% to 24.9% for technicians and by 8.0% to 2.1% for undergraduates (Malatest, 2004, p. 33). Universities were also worried about funding in the future as the Chairs were for a limited period and the need to fill-in the void on termination.

Federal funding for sponsored research doubled between 1999 and 2004, increased by a modest 9% between 2005 and 2008. SSHRC continues to be underfunded compared to NSERC and CIHR. While 56% of full-time Canadian university teachers were in the humanities, social sciences and education, SSHRC received only 13% of federal granting council funds in 2007-8; similarly, arts and literature, human and social sciences and multidisciplinary fields received less than 10% of CFI awards (CAUT, 2011a, p. 44).

It is not at all clear how much ***time*** is devoted to internal research or external research, how much is "overlapping," and how much is devoted to administration and corporate purposes. Administration and corporate salaries have increased faster than professorial salaries. The Almanac demonstrates that enrolment grew faster than teacher salaries as did all other costs, and that the proportion of teacher salaries to other costs dropped from 31% in 1979 to 20% in 2008 (p. 2). Universities keep "obscuring" the issue, maintaining that education and research are "intertwined" providing "economies of scale" (AUCC, 2008, p. 22). Geiger (2004) disagrees. In his study of 99 research universities in the US he showed that research had become increasingly autonomous, expanding faster than class instruction or faculty resources.

The next fund, ***ancillary***, does not support activities directly related to teaching and learning, but contributes to GOF as gross revenues, rather than net to the activity, thus inflating the GOF figures (AUCC 2008, Appendix D). They are: 1) scholarships and bursaries or tuition aid, 2) health services, 3) non credit programs, 4) miscellaneous fees and sales of goods and services. In 2006-7, scholarships, bursaries and aid programs for students amounted to $1.1B, up from $350 million a decade ago and $130 million in 1977-78. In effect low-aid, low-fee policies may not net a university any more revenue in per-student terms than a high-fee, high-aid policy

as pursued by the Ivy League. Health services for students and treatment in some university hospitals is reported as university revenue. These should be treated as net (subtracted from revenues coming in from, say, tuition) or "flow through." Similar consideration needs to be given for non-credit programs--$300 million in 2006-7 for 400,000 courses, up from $250 million a decade earlier and $125 million in 1977. The argument is that these non-credit courses are for community service, or professional development in areas such as technology, language, communication skills or personal development (music, art, retirement planning), and do not contribute to degree programs. Sales of goods and services and miscellaneous fees are specially related to "corporatization" or "privatisation" supposedly to raise revenues. After the change in 1999 from "net" to "gross," accounting for some activities reported under sale of goods and services, revenues in the general operating fund appear inflated in comparison with the earlier period. Sale of goods and services and miscellaneous fees include bookstores, student residences, parking, food services, ticket sales from university museums, athletics, etc. The excess of revenues raised was supposed to "cost recover" and help pay for teaching and research! Sale of goods and services and miscellaneous income jumped from $385 million in 1998-99 to $915 million in 1999-2000 and to $1.2 billion in 2006-2007. And according to the AUCC report, all four items grew from $940 million in 1996-97 to $3.5 billion a decade later, the equivalent of 21% GOF and SPT "adding $2.6 billion to the gross revenues of universities without their ability to teach more students in credit courses or to conduct more research." Some of these revenues did not even cover all of their associated costs and ***had to be cross-subsidised*** from teaching and learning resources (AUCC, 2008, p. 25).

Graduate school education. The Rae report's rationale for expansion of graduate schools was that, with an increase in graduates, more would enter post-graduate studies. Ontario has fallen behind in the production of MAs and PhDs, compared to the US and OECD, for faculty renewal and needs of the Ontario economy. Clark et al. (2009, p. 45) stated that "there is evidence of prestige-maximising behaviour, especially in the university sector where prestige is closely linked to research and graduate studies." Rae recommended the doubling of graduate students in Ontario over ten years, establishing a separate fund to provide full-funding for planned growth, and capping funding for a maximum length of study for each student. The funding would be on a proposal basis, rather than a distribution formula, based on the capacity to meet graduation targets (Rae, p. 87).

As President Naylor (2010) suggested, the research link is most obvious to graduate and advanced professional programs as seen in reputational surveys. As Ontario and other provincial higher education systems impose no statutory limits on conferring graduate degrees, smaller universities can emulate the larger ones as long as governments are willing to fund them (Clark et al. 2009, p. 58). The big, research-intensive universities have done well in strengthening their research specialities–-the amount of annual funding for a PhD student is ten times as high as that of a first year Arts student (Clark et al. 2009, p. 62). The Ontario government's *Reaching Higher Plan* (Ontario budget, 2005) provided $220 million annually to expand graduate education by 12,000 students in 2007-8 and to 14,000 by 2009-10. In November 2010, McGuinty announced 75 international doctoral scholarships with $40,000 each year for up to four years. The government of Ontario would invest $20 million to support the program, while universities would contribute $10 million.

Highly rated departments are costly to set up and maintain. Doctoral programs are inherently expensive, as are medical programs. Some departments seem to have more money than others. Law and business seem to have more resources to spend (Geiger: 2004, p.54). This is corroborated by David Segal in the Sunday *New York Times*, (2011, July 16) "Law is a very lucrative business. Like business schools and some high profile athletic programs, law schools subsidise other fields in university that cannot pay their way." Supporting a faculty in active research and scholarship is directly associated with doctoral programs, high salaries, modest teaching obligations and a faculty research budget. Graduates demand a lot more time and energy than undergraduates, especially in supervision of their research. They also need facilities and space, library and laboratory resources. It seems quality of graduate studies is also compromised. Some graduate departments do not operate "full-time" but in cycles such as accepting students for doctoral studies every two years. This means a full complement of courses is not offered every year and builds up a backlog of suitable students for full-funding when it becomes available. It seems class size in graduate seminars has also increased. It is not uncommon to have 25-30 students in a graduate class which may be "stacked" i.e., MA, PhD, honours and others in the same seminar, same readings but with different requirements.

An article on "Doctoral degrees: The disposable academic" in the *Economist* (18/12/2010; p. 156), suggested that acquiring a PhD has a very high "opportunity cost" for the individual and society. First, there is an oversupply of PhDs in all parts of the world except for Brazil and China. "Even in Canada" the article claims, "where the output of PhD graduates has grown moderately, universities conferred 4,800 doctoral degrees in 2007, but hired just 2,616 new full-time professors." The story is similar for postdoctoral students (postdocs). In some

areas, five years as a postdoc is a prerequisite for landing a full-time job on a university faculty. Second, universities have discovered that PhD students are cheap, highly motivated and disposable labour. With more PhD students they can do more research, and in some countries more teaching with less money (p. 157).

"Prestige maximisation has become ubiquitous in US higher education (as well in Canada) in the late 20th century–-one of its most evident features," wrote Gordon C. Winston (1994) and the fact that every school can't be among the top five research universities seems not to dampen the enthusiasm to try. However, as a university is a not-for-profit organisation, it cannot offer "shares" or ownership (no longer true, see Silversides, "Merchant Scientists," *Walrus*, May 2008), but ***discretionary time*** where "excellence" and individual faculty member's interests come together. Often thrown into the bargain are a laboratory and equipment. Undergraduate teaching is thus sacrificed. There is no prestige or acclaim for the institution in undergraduate teaching as compared to a write up for a Nobel Prize in the New York Times or national media. Another study (Melguizo & Strober, 2007), using the National Survey of Postsecondary Faculty1999 (NSPF) and a regression analysis, found that "the results are consistent with the theory that faculty members are financially rewarded for enhancing institutional prestige. There is some evidence that the rewards are higher in science and engineering. Spending more time on teaching has no effect on salary, even in comprehensive universities and liberal arts colleges." Findings suggest that post-secondary institutions are emulating research institutions in their pursuit of prestige; the findings raise serious questions about the implications of the current reward system in higher education. My point is that prestige maximisation is costly and tends to take away resources from undergraduate teaching (instead of

wise, knowledgeable, inspiring, interdisciplinary), towards narrow specialisation in graduate school, affecting quality of education not only for undergraduates, but also for graduates.

Arising from this analysis of university finances, the next section examines commercialisation and revenue generation in the services to meet the shortfall. That discussion is followed by analysis of sponsored research, retention of standards in face of credentialism and finally, the change in leadership that is shaping the type of university into which institutions are evolving.

Commercialisation and revenue generation from services. Commercialisation means "the efforts within the university to make a profit from teaching, research, and other campus activities." Corporatization and commodification are also other synonyms denoting widespread distrust of business and business methods in academic circles (Bok, 2003, p. 3). Commercialism in universities has many strands, Bok (2003) identifies five: 1) the influence of economic forces on universities (e.g. growth of computer science majors); 2) the influence of a surrounding corporate culture (terms such as brand name, CEO etc.); 3) the influence of student career interests on curriculum (more vocational courses); 4) efforts to economise in university expenditure (more adjunct professors, the use of business methods); 5) attempts to quantify matters within the university which are not quantifiable, such as quantifying values in monetary terms rather than qualitatively. This study uses Bok's definition of commercialism which would likely be acceptable to all three of the schools of ideal-types–-the entrepreneurial, liberal education and deliberative. The disagreement would be on the "extent" of commercialisation and on the "limits" and safeguards for preserving a "balance" without compromising the integrity and quality of education. Bok (2003) illustrated this well in a lecture in which his dream became

a nightmare. Like a true "entrepreneur," he borrowed $2 billion to assemble the "greatest faculty, the finest facilities and the most talented student body the world had ever seen." The dream began well–-new buildings, renowned scholars, praises from alumni-–but the euphoria ran into trouble; each successive "dream" brought forth a more difficult, more controversial scheme to earn money to meet the escalating payments. Was everything in university for sale if the price was right? Would these sales change the behaviour of professors and university officials?

As seen in the previous section, "services" were not profitable. It is difficult to believe that such enterprises as cafeterias, run by multinationals like Chartwells, operate at a "loss," and are not providing universities with surplus funds but are actually being funded by the university. Similar arrangements exist for other chain-restaurants/cafes such as Subway, Pizza Pizza, Tim Hortons, Second Cup; book stores, athletics and a host of services including banks. It is likely that "partnership" arrangements permit the multinationals to "siphon" off profits for themselves, leaving universities with apparent "losses." Some argue universities lost more when they were directly responsible for services, but this was prior to the introduction of the New Management (Canada, Treasury Board, 2009) and "Business model" with "profit centres" in universities. Other ventures, which Bok (2003) showed as unprofitable in the long run, include athletics and stadiums. His "nightmare" led him to reflect carefully and seriously on this "pact with the devil."

There is ample evidence of likely profitability from many activities undertaken by university, but this is not reflected in the finances. For example, English as second language courses and testing services (ESL/ESP) provided by Carleton indicated net revenue generation and profitability in 2005. Nearly all other Canadian universities have their own ESL/ESP testing services, with McGill one of the biggest. Other examples of "cost-recovery" include MBAs and

medical “seats.” In 2010 McGill’s Desautel Faculty of Management moved to a self-funded tuition model from a government-funded one and raised the cost of 2-year MBAs for *all students* nearly 1700% from $3,500 to $59,000. New applications were not affected and even increased the following year. This is the high-fee, high-aid model followed by Harvard. Other business schools follow similar models but show “restraint” within an agreed range by accepting some funding “help” from their university. Dalhousie is selling ten first-year medical “seats” to Saudi Arabia for $75,000 each, at a price considerably more than for domestic counterparts whose tuition and funding amounts to less than $40,000 per annum. Dr Marrie, Dean of Medicine, said “we have got to find a way to run the place. This is one of those ways. We just need this money to function” (Bradshaw, 2011, p. A9). Foreign students are even more profitable. Studies from Australia indicate that in addition to three or four times higher fees than what the locals pay, they spend five to ten times more on other items such as food, accommodation, mobile phones, internet and other services.

The next section looks at the importance of sponsored research, “limits” to revenue generation and the need for constant vigilance which is advocated by deliberative writers in the mission drift literature.

Sponsored research--revenue vs. academic freedom and integrity. Sponsored research is big business with billions of dollars at stake. Yet, universities find it unprofitable as the analysis above shows--not all costs are covered. The difference has to be made up from teaching/learning funds. Although successive federal governments have increased targeted scientific research funding, allocations for independent, peer-reviewed projects through the three granting agencies, has fallen in real terms. Additional requirements, as already noted–-seeking a co-founder(s) and

commercialisation–-means that “the government has actively targeted new research funding to specific priorities that exclude the majority of academic researchers in most disciplines,” as well neglecting basic research, the “bread and butter” of many academic researchers (CAUT, 2011b, p. 2-3). Despite these constraints, Re$earch Infosource Inc. reports that research intensity--research income per full-time faculty position--rose from $73,000 to $167,200 in the decade 1999-2009 in Canada. The top 50 research universities reported a total increase in research income from $2.2 billion in 1999 to $6.24 billion in fiscal 2009. University of PEI’s research income increased from $3 million to $16 million during this period. Twenty three universities belong to the “$100 million club” i.e. have more than $100 million in research funding, while some 22 private sector companies also boasted membership. Some have close connections. The Perimeter Institute of Theoretical Physics and The Institute of Quantum Computing at Waterloo led to the development of computing science and engineering, attracting RIM and Open Text from the telecommunication industry. The pharmaceutical industry has close connections with the University of Toronto going back to Banting and Best and the discovery of insulin; Laurentian with mining; Victoria and Dalhousie with marine biology; Alberta with medical sciences and Calgary with the oil industry and McGill with the asbestos industry. University presidents sit on the Boards of many of these companies, while many company directors are found on university boards of trustees. Some deliberative and liberal-education writers are wary of sponsored research from private corporations whose values–-profit maximisation, secrecy, competitiveness–-are seen as diametrically opposed to those of university’s–-public good, collegiality, ethical research and the freedom to publish. The tobacco industry is well documented for manipulation of scientific research and misinformation over fifty years, trying to

avoid being labelled as causing cancer. Canadian universities received research funds, undertook research and were associated with the industry. In the *United States v. Philip Morris* case (2006), Judge Kessler found the tobacco industry guilty of fifty years of conspiracy to defraud the public which was still continuing (Cohen, 2008, p. 27). In Canada, some provincial governments (Ontario, Quebec, BC) have jumped onto the bandwagon and have sued tobacco companies for millions of dollars for impact on health and for treatment (Spurgeon, 2005).

A basic responsibility of universities is to serve the public good by preserving, transmitting and advancing knowledge. To do so, the importance of academic freedom and institutional autonomy is stated or implied in provincial legislation, in universities' policies and practices, such as University of Alberta's Research and Scholarship Integrity Policy (2009), and in collective bargaining agreements. The United Nations Recommendation concerning the Status of Higher Education Teaching Personnel (UNESCO, 1997) signed by Canada in 1997, clearly sets out their meaning. Paragraph VI A, 27, states, "Higher education teaching personnel are entitled to the maintaining of *academic freedom*, that is to say, the right, without constriction by prescribed doctrine, to freedom of teaching and discussion, freedom in carrying out research and dissemination and publishing the results thereof, freedom to express freely their opinion about the institution or system in which they work, freedom from institutional censorship and freedom to participate in professional or representative academic bodies." The environment in which they operate is democratic, free from fear of repression by state or any other sources, through self-governance and collegiality. They should also enjoy internationally recognised rights applicable to all citizens–-freedom of thought, conscience, religion, expression, assembly and association as well as the right to liberty and security of the person and liberty of movement (VI A, 26).

Institutional autonomy "is that degree of self-governance necessary for effective decision-making by institutions of higher education regarding their academic work, standards, management and related activities consistent with systems of public accountability, especially in respect to funding provided by the state and respect for academic freedom and human rights" (Par. V A, 17). Tenure constitutes one of the major procedural safeguards of academic freedom and against arbitrary decisions. It also encourages individual responsibility and the retention of talented higher education teaching personnel (IX B, 45).

Both academic freedom and institutional autonomy are linked together; a change in one leads to a change in the other and there are specific instances of persecution and dismissal of individuals who challenged the notion of knowledge being reduced to private goods for sale whether in medicine, marketing, tobacco, microbiology, microeconomics or international relations. Woodhouse (2009, p. 6) states "Such acts reduce the university's ability to engage in critical pursuit of knowledge which is subordinated to maximisation of stockholder value and the replacement of core functions of university with training for private market functions."

CAUT actively promotes and defends academic freedom and tenure, undertakes investigations of alleged violations and intervenes to bring about appropriate changes. Many cases provide evidence of breach of academic freedom or integrity–-Mary Brison at UBC; David Noble at Simon Fraser; Olivieri, Healy and Bombardier and University of Toronto and The First Nations University among others. Corporations involved include Xerox, Apotex, Eli Lilly, Research-in-motion (RIM), Pfizer and Merck among others. Some cases have been written about (e.g. "Big Pharma"), others lie hidden in obscure bureaucratic files or are more recent such as RIM directors and Dr. Ramesh Thakur's joint appointment at Waterloo and Wilfred Laurier

universities. The conflict of interest is usually between revenue generation supported by university administration and the company involved in sponsored research on one side and the university researcher/teacher upholding standards or ethics on the other.

One of the earlier cases concerns *Dr Vedananda*, a marketing professor in the School of Management at University of Manitoba, who on September 28, 1988 attended on campus a presentation by William Morrissey, a representative of Xerox. During the presentation, Dr. Vedananda challenged the claim that Xerox was the leader in the share of sales on the world market. Instead, he suggested, Canon was the leader. After the talk ended, discussions continued among the participants. Three weeks later, Dean Mackness of Faculty of Management, who had been recently appointed from the private sector (VP, Bank of Nova Scotia), sent a memorandum to Vedananda stating that his tone at the presentation was unpleasant and his "grilling" of Morrissey inappropriate as this could affect the working business relationship he was cultivating with Xerox and others. Vedananda was shocked. This came as a bombshell. He was not consulted or informed. The memo had a "chilling" effect on his freedom of expression and scholarly obligations. In December a grievance was filed through the University of Manitoba Faculty Association (UMFA) stating that his academic freedom had been violated, the Dean had censored his scholarly activities and he asked for retraction of the letter by the Dean and the President of the University. He stated that the Dean's actions had violated the university's collective agreement and he asked for any other remedy "just and reasonable." After a meeting between UMFA and VP Administration, Falconer, the university replied in a letter (Jan 17, 1990) that their "perceptions" were different, reiterating Vedananda's "rude" behaviour, calling it "grilling" but omitted any mention of academic freedom or "business interests" and said that the

grievance was “trivial.” For the next eight months, some nine days of full hearings were conducted. Among the witnesses only one, Professor Keith Wilson, who attended the presentation, deposited a sworn affidavit that “none of Dr. Vedananda’s remarks was unpleasant in tone, nor were the remarks unpleasant, rude or offensive and remarks did not constitute a “grilling” of any of the Xerox employees” (Woodhouse, 2009, p. 63). The university administration brought in heavy-weight “expert” witnesses who were not even present at the Xerox event but supported business interests. John Crispo, a well known professor of management at University of Toronto, argued that academic freedom does not apply to “cocktail party” and attacked the person, Dr. Vedananda, stating it was “not academic freedom but how confident are you in yourself and know your stuff.” He portrayed Vedananda as of “timorous nature” (p. 67). George Connell, former President of University of Toronto and University of Western Ontario, argued “strong links between university and business made good financial sense and did not endanger academic freedom,” while Pierre Yves Boucher, Executive Vice President of AUCC, looked at 48 collective agreements and in half he found “corresponding obligation to use academic freedom responsibly allowing others to hold a different point of view.” The impact of these hearings was that the letter became public knowledge, a “development plan” was exposed whose objective was to “privatise” and abolish certain departments in “low demand,” jeopardising some twenty academic positions and placing them directly under the Dean’s control. Dean Mackness had written a letter to his predecessor suggesting he could obtain contribution of $75,000 from corporations over the next five years. Mackness, in an open letter to faculty, stated the need to shift values. “Collegial system had not worked well in Faculty of Management and should be replaced by executive decision made by

the Dean" (Woodhouse p. 75). Minority groups were also threatened as there was talk of "foreign mathematicians" being part of the low demand.

A CAUT Committee of Enquiry was established "to determine the reasons for discontent with the conduct of the Dean of Management" and 20 faculty members in Faculty of Management passed a motion in Faculty Council (Woodhouse, p. 83) "Be it resolved that the Faculty of Management censure Dean William Mackness and express no confidence in his management of faculty." His style was dividing the faculty rather than uniting them.

On 24th March 1995, President Naimark of University of Manitoba addressed faculty and students of Faculty of Management. His purpose was to correct the "errors" regarding the "Development Plan." The university funded this plan with its own money--$3million--for the 20 academic positions not the business "Associates." But the real threat to university autonomy, he stressed, was Mackness' relationship with Associates, which superceded the Dean's contractual relationship both with the Faculty of Management and the University. It was easy for the role of a Dean to be seen as that of "a chief executive officer of a virtual corporation one might call the University of Management, with the Associates as its Board of Directors." Mackness' term as Dean was not renewed. Woodhouse (p. 90) concludes, "Through their teaching, scholarship, research and ongoing dialogue with one another, faculty showed the importance of a value system in which knowledge is shared with others, not used for private profit. Inspired by the university's mission which is inexplicably connected with democracy, it was they who upheld the idea of an institution as a fortress for freedom of speech, inquiry, and criticism of established truths."

The pharmaceutical industry is probably the best known example of conflict of interest that arises when revenues from corporate interests are involved. In 1998, the University of California at Berkeley signed an agreement with Novartis (now Syngenta). Novartis, a Swiss agricultural-biological company, funded a third of the *research budget* in the College of Natural Resources. In return, Novartis had exclusive patenting rights to a third of the discoveries generated from the department and allowed Novartis to occupy 40% of the committee that decided where the research money was allocated. The agreement was highly contested by both faculty and students. Dr Ignatu Chapela, an assistant professor of microbiology and a critic of generating engineering, lost his position at Berkeley and went on to become a centre of heated international debate (Borden, 2005).

In Canada, the Olivieri and Healy cases at University of Toronto are well known. Full details are available from the CAUT series, the *Olivieri Report* (Thompson, Baird and Downie, 2001) and *Let Them Eat Prozac* (Healy, 2003). Even after these two cases, U of T was embroiled in the Vioxx trials involving the conflict between Merck, the world's third largest drug company and Dr. Caroline Bombardier from U of T's faculty of medicine (Schafer, 2008). What follows is a short summary of the Olivieri case as an example of the conflict of interest involving issues of autonomy, academic freedom and integrity. Dr. Nancy Olivieri, professor of medicine at U of T, was the chief investigator at the Hospital of Sick Children (HSC) for clinical trials on deferiprone (L1) to reduce dangerous levels of iron in children suffering from thalassemia, a genetic blood disorder. Apotex, manufacturer of L1, originally (contract LA01: 1993) had a confidentiality clause for Apotex to control communication and publication of data for one year after the completion of trials. This was in conformity with U of T policy. The initial research was

funded by the Medical Research Council (MRC). The pilot study on L1 continued as a long-term trial (LA02:1995) with no confidentiality clause. Apotex's interest in partially funding the trials rested on safety for licensing the drug for reduction of chronic levels of iron in liver and other vital organs. Dr Olivieri also acted as consultant on a short-term basis for other international trial sites. After publishing a favourable paper to the drug in the New England Journal of Medicine in 1995, Dr. Olivieri found a loss of sustained efficiency of L1 for patients in her trials. She informed Apotex. But as soon as she tried to inform her trial patients and university authorities, Apotex cancelled both trials and threatened to take legal action against her. In 1997, Dr. Olivieri found a more serious risk: L1 might cause progressive liver fibrosis. She stopped using the drug on her patients. Apotex took steps to show L1 was safe and to discredit Dr. Olivieri. Unknown to her, Apotex funded Dr. Koren, one of her colleagues, and gave him the trial data which was re-interpreted and published as being "effective and safe." Meanwhile, Apotex promised U of T a donation of $55 million and, using this "new" information, convinced Dr Prichard, U of T's Provost, to write a letter to the Government of Canada opposing the proposed change in legislation for generic drugs. Following an unfavourable review of the drug by Dr. Olivieri in the New England Journal of Medicine in 1998, and a "review" of her work at HSC by Dr. Naimark from Manitoba, who had raised money from Apotex while President of U of M, she was dismissed. A CAUT and UTFA enquiry for the first time raised the issue of academic freedom and demanded her re-instatement. They included letters from Dr. Sir David Weatherall of Oxford University and David G. Nathan of Harvard, both experts in thalassemia and a call from former President of Harvard, Derek Bok. In January, 1999, Dr. Olivieri was moved to Toronto General Hospital where she could continue her research. Another settlement, mediated by Dr. Naylor, at

the time Dean of Medicine, gave compensation to Dr. Olivieri's colleagues and supporters for legal costs, their research and the abuse they suffered for their collegiality. The legal battles between Apotex and Dr. Olivieri were still not over at the time that Woodhouse was writing in 2009.

Medical schools are probably the most conflicted in terms of sponsored research. Some professors receive consulting fees from the same manufacturer of drugs that they study, serve on drug-company speaking bureaus, go on junkets and may have their own patents; universities obtain financial rewards from studies coming out favourably. There are international ramifications. Professors work on drug research with public funding, for example, for the third world, such as the AIDS drug, D4T. But drug companies may not be interested in the third world where patients cannot afford expensive drugs. Yet, universities may profit anyway from sales and patents. At times, sponsored-research contracts allow industry to dictate terms that violate academic freedom. The only way these become public, is to raise questions and to insist on openness.

Academic freedom and institutional autonomy are crucial for quality "objective" research, in the public interest, that upholds the highest standards–-scientific and ethical. The evidence from the cases I examined show conflict of interest, usually between revenue generation supported by university administration and the company involved in sponsored research on one side and, on the other, the university researcher/teacher, defended by CAUT, attempting to uphold standards and to stand up for academic freedom and autonomy. These are some of the clearest examples of mission drift.

The next section examines the efforts to maximise revenue and the type of education envisioned by modern Canadian universities as a part of their mission.

Revenue maximisation and quality of education

The type of education U of T wants to provide (for that matter, so do all Canadian universities) is to prepare students "to be global citizens," to be leaders and to confront issues cutting across national borders and traditional disciplines. To achieve this goal requires (Naylor 2010, p. 4) "intellectual rigour and depth, a capacity to think critically and flexibly, with a multi-disciplinary perspective, exposure to diverse cultures and values, and the ability to work outside one's comfort zone" and (Drummond, 2012a) "the ability to think critically, to express those thoughts clearly, and to apply knowledge to new areas and tasks."

As I have shown extensively, national and international ranking indicators, or student empowerment surveys do not measure the goals, the outcomes or the type of education described by President Naylor above. Most of these objectives are anchored in values, or in Bok's (2003) words, "specifically with principles that ought to guide academic pursuits and thereby enhance their quality and meaning" (p. 106). Examples of diminution of quality include raising prices and cutting the costs of courses as much as possible without losing students, thus not providing the best learning experience; dropping language requirements; and the academia itself not "living up" to its own ideals, such as the use of consumerist language and succumbing to grade inflation. Some scholars go further and argue that corporatization threatens not only the historic ideal of a liberal democratic education, but also the future of democratic thinking itself. Three factors explain this threat: 1) the emphasis on skills training eliminates critical thinking and a culture of criticism; 2) intellectual independence is weakened due to the corporate climate and bureaucratic

allegiance to an appointed chair rather than an elected scholar-researcher; 3) the promotion of a meritocracy myth that drives the work of graduate students, junior and senior faculty alike, that by keeping your head down, doing work, one day you will also become a "star" faculty (Westheimer, 2010). The reality is far from this dream as shown in the above analysis of contract instructors. Westheimer argued that the first two erode democratic thinking by curbing the habit of mind and heart that enables democracy to flourish; the latter attacks the heart by diminishing the power of the community to nurture collective meaning and worth.

The next section looks at four trends that show erosion of quality of education as envisioned by academic researchers–-consumerist language, reason for attending university, grade inflation and changes in programs chosen.

The language of consumerism has become prevalent at the highest levels of modern Canadian universities. While discussing enrolment, the Rae Report refers to students as "customers" (p. 17). University officials also label students as "consumers" or "revenue units," while professors are "resource units," "service providers," "learning guides" or "education managers." Graduates are "products" or "outputs." Evaluation becomes "quality control" and the whole process of education is "production." As language is not neutral, it suggests a basic misunderstanding of the nature of education and student-teacher relationship. The role of the teacher is not to sell a product or please the student, but to challenge a student, making him/her uneasy with what they have taken for granted, engaging in a dialogue. The measure of success is not satisfaction but intellectual growth. This can be a difficult and unsettling process – the opposite of the soothing and pleasing effect when buying a product (Turk, 2000, p.7).

A study of undergraduate sociology majors (Delucci and Korgen, 2002) showed the main purpose of higher education is economic–-75% of respondents said they attended college to make more money. Most students reported preference for courses that resulted in higher grades than learning. To the question, "I would take a course in which I would learn a little or nothing but would receive an A," 73% of respondents were in agreement. Similarly, 52.2% felt it was the instructor's responsibility to keep a student attentive in class. While, 42.5 % agreed with the statement, "if I am paying for my college education, I'm entitled to a degree," 23.6% of students expected to receive grades commensurate with their financial and personal needs rather than their academic performance. The students were also asked the amount of time spent on course work–-not sufficient hours for their credits (Delucchi and Korgen, 2002). The implication from this study suggests students have a consumerist approach to higher education. The results reveal a lack of commitment to learning for its own sake and students do the least amount of work necessary to graduate, while maintaining minimal intrinsic interest in what they are learning. Much of what students want to consume, which higher education has supplied in the past, is either in the process of erosion, such as high culture, or can be supplied by other sources–-vocational education or the Internet. In a postmodern world "the role of a traditional liberal arts education is devalued because consumer culture questions the assumption that liberal arts knowledge is relevant knowledge" (Delucchi & Smith, 1997).

The emphasis on customer service changes the professor-student relationship by giving authority to students as consumers who evaluate their instructors. This has led to leniency in grading to the extent that some believe that universities won't fail students (Teitel, 2008). It has also led to grade inflation. Côté and Allahar (2008, p. 58) in *Ivory Tower Blues* argued that grade

inflation had occurred in North America with 80% of university students in Canada reporting receiving A's and B's and 90% in the US. Côté's explanation was the need for the credential of a university degree, not the contents. He found it was not unusual for an undergraduate student to spend 15 hours a week or less at lectures and doing course work, which was the equivalent of a part-time job. However, every student applying to University of Western Ontario (UWO) needed an A average to be accepted, but an average student at a university ought to be getting a mark of C. In an interview (Laucius, 2011) he said "Imagine trying to enforce grading standards consistently when all students consider themselves to be an A student," he added. The same now applies to graduate students. Virtually all grad students now receive A's in their courses. "In grading essays I give students the grade I assess they deserve using a detailed grading rubric (which is usually in the B range), and I usually bump grades up to the A range so my grades are comparable with those assigned by other profs and so the students can keep their funding (students now have to maintain a 78 per cent average to keep their funding)."

The third "strand" affected by economic factors and consumerism is the major(s) chosen by students which has a large impact on the number, range and quality of courses offered by a university. In mid 80's Canadian universities loosened requirements for mandatory courses in English and other languages. Students also chose more professional degrees. Table 10.8 in Statistics Canada's Yearbook (2010a) shows enrolment and fields chosen by students for academic years 1994-95 to 2007-2008.

The trends show:

1) *social and behavioural sciences and law* as the most popular field with 147,720 enrolments (17% of total) in 1994/5. These fields remained in the first place with 189,831 enrolments (17.8% of total) for 2007-2008.

2) *Humanities* were second in popularity in 1994/95 with 139,254 enrolments (16.2%), but by 2007 they had dropped to number three-–166,551 with 15.6% of total enrolment.

3) *Business, management and public administration* grew fast from 123,222 enrolments (14.3% of total) to 176,883 (16.5% of total), to become the second most popular in 2007.

4) *Health, parks, recreational and fitness* grew by over 50% during this period, from 73,131 to 112,425 from (8.5% of total) to (10.5% of total) in 2007-8.

5) *Mathematics, computer and information sciences* remained about the same going up from 32,454 (3.7% of total), peaking at 46,000 in 2001-2, then decreasing to 32,442 (3% of total) in 2007-8.

6) *Architecture and engineering* grew by 40% from 63,657 (7.4% of total) to 88,164 (8.2%) of total in 2007-8.

7) *Physical and life sciences and technologies* grew by 22% from 77,112 (8.9% of total) in 1994-95 to 94,667 but proportionally remained the same at (8.2% of the total) in 2007-8.

The impact of the business cycle on enrolment is well illustrated by the growth, peak and stabilisation of employment demand in the computer and related industries. The growth of business studies and its core teachings could influence the values transmitted to students, away from the traditional "citizenship," "democratic" or community/public interest values espoused by universities. For example, the Board of Governors of business schools provided funds for "investment experience," allowing students to exercise real-world money management and risk-

assessment skills to prepare for careers at investment firms. The Sprott School at Carleton recently voted one million dollars for such a fund. Simon Fraser's fund stands at $10 million, while University of Wisconsin has $65 million in its fund (Aubrey, 2011). Several Canadian universities have initiatives that help student entrepreneurs to start up businesses, commercial concerns once considered beyond the scope of academia. Examples are: U of T's Heffernan/Co-Steel Innovation Commercialisation Fellowship; UBC's Entrepreneurship@UBC centre gives $25,000 to $100,000 in funding to companies started by students or recent graduates; Ryerson's Digital Media Zone nurtures student-led businesses and matches students with industry partners. (Bradshaw, 2011, p. A4).

Chapter 8

Conclusions

My hypothesis was that in adjusting to "New Reality," modern Canadian universities: a) give priority to research at the expense of teaching and consequently, b) maximise revenue generation without regard to the quality of education.

I constructed in Chapter 1 the New Reality, which contrasted the traditional College with the modern university system. My thesis examined Altbach's (2005) four factors--democratisation, knowledge economy, globalisation and competition--which transformed tertiary education from accessible and affordable for the elite only, to a system more accessible by a larger part of the population. Modern Canadian universities now include a majority of women at the undergraduate level, and have, to some extent, increased the entry of marginalised groups, such as First Nations, visible minorities, persons with disabilities, and first generation immigrants, into the university. I discussed human capital theory, demonstrating the benefits of university education both for the individual and society. An individual obtains a higher income; while society obtains stability by promotion of skills and attitudes such as critical thinking and tolerance for diverse points of view. Other contrasts between the traditional and the new include: from balance between teaching and some basic research, to research dominance; in leadership style, a change from teacher-scholar to CEO; in learning, a change from direct teacher contact in the classroom (tenured professor) to new technology (Internet, whiteboard, PC) with contact with sessionals/TAs. In the course of the research, I found additional contrasts such as many more students working at a job while taking courses, thus spending less time studying, while most courses are now confined to semesters, and therefore shorter in duration.

To test the hypothesis, two concepts--mission drift and three ideal-types of education were introduced--as ways to adjust to the New Reality. Mission drift is applicable to non-profit organisations analogous to profit maximisation for private enterprise, but with a different set of guidelines and values. The concept basically refers to organisations losing their focus on basic objectives and being influenced by secondary considerations to move in different directions. Based on the three ideal types of adjustment--entrepreneurial, liberal education and deliberative--I tried to derive indicators that would satisfy the main requirements for all three types to show change over time.

There is clear evidence that universities use global ranking tables to justify claims of performance and quality of education--the Naylor letter (2010) is an illustration. Others also rely on these indicators to make choices. In the quest to locate appropriate indicators to measure teaching/learning, I closely examined the International League Tables System, their characteristics and composition, as well as regional and national indicators. There is clear evidence that all global ranking tables are based on peer reviewed publications by faculty and that these publications are ranked for research productivity, research impact and research excellence. I found evidence of Anglo-American domination, bias towards science as well as a quantitative bias (# of citations). There were no proxy or actual measures for teaching, academic experience or quality of education. Regional and national indicators are more robust as more information is available, but have shortcomings similar to the international ranking tables. For example, in Canada the objective of the *Maclean's* and *Globe and Mail* indicators is to measure self-reported student satisfaction, not teaching or quality of education.

Next, my study examined NSSE, which looked more promising than the League Tables in assessing teaching and learning, especially the detailed individual questions. These in turn, are grouped into clusters forming five benchmarks--LAC, ACL, SFI, EEE and SCE. However, the results of each individual question are not available to the public for comparative purposes. The University of Indiana sends analysis of a university's own data back to that particular institution with calculations for the frequency and mean for each question for that university only. Comparative data are only available for the five benchmarks on an aggregated basis such as an Ontario average (17 Ontario universities) or Carnegie Peers (American participating universities). The limitations of NSSE are its focus on student engagement rather than on learning and that the survey provides a snapshot view of the student experience, but does not provide longitudinal data in terms of tracking changing perceptions of students over time. I agree with Glen Jones (2007) that NSSE should not be used as a direct indicator of institutional performance, as it does not measure student learning, but it could form a part of a quality framework for postsecondary education in Ontario. Too much emphasis should not be placed on this one tool alone. However, institutions could be assessed in terms of how they are using and responding to research on student engagement and student learning in the context of institutional missions and goals.

In this spirit, I undertook an Ordinary Least Square (OLS) regression analysis using NSSE data to look into statistical relationship between student grades--the dependent variable--and surface and deep learning. I examined 15 theory-informed independent variables that might impact on students' performance. The results showed that the relationship between the dependent variable (grades) and the following independent variables were statistically significant--

internship, community service, relationship with faculty, hours spent on class preparation, hours of paid work off campus, class ranking and parents' education. "Surface" and "deep" learning, or memorisation and analytical as defined by NSSE data in this study, did not have a significant statistical relationship with the outcome (grades). Further research may shed light on a plausible explanation.

In Part III, demonstration of the hypothesis, my thesis provided triangulation of evidence, based on policy, empirical data, and qualitative information, which went a long way towards supporting the hypothesis and showing the usefulness of concepts such as mission drift and the three models of university evolution. Although, policy recommendations by the Ontario Provincial Commissions (Bovey to Rae) touched on improvements in teaching, governments in Ontario, with the support of universities, continued to tilt the balance even more towards research, to the neglect of quality of education, while concentrating on working with the private sector and orienting the universities towards skill development. Evidence from empirical and qualitative data has clearly established that the increase in the growth of the numbers of tenured faculty has not kept pace with the growth in the numbers of students. Relatively, the ranks of administrators have grown even faster. The "hidden academics"--sessionals, teaching associates and TAs--make up as much as 40% of the teaching staff at most Canadian universities and certainly a far higher proportion for undergraduate education, especially in the freshmen years. The system is well entrenched, providing administrative flexibility for universities to deal with large numbers of undergraduates in large classes. Large classes, the evidence shows, militate against attainment of higher-order skills such as problem solving, written expression and critical thinking. Tenured faculty avoid introductory courses, preferring research and graduate students.

The evidence supports the observations of Professor Mercier, Associate Vice-President Academic of U of O, that opportunities for active and collaborative learning are fewest for the first year students. SFI (student/faculty interaction) remains a challenge not only for University of Ottawa but for all Ontario and Canadian universities as compared to their American counterparts.

The second part of the hypothesis follows from the imbalance towards research and the lack of tenured faculty. Along with the push by governments to work with the private sector and the desire of faculty to undertake research, I showed that these trends have led modern Canadian universities to maximise revenue generation while also contributing to the lowering of standards. The evidence shows the preoccupation of CEO-type leaders with revenue generation. They carefully choose periods and programs for expansion, anticipating that funding will be forthcoming for expansion of graduate schools, commercialisation of services and partnerships with business and "petro-rich" sovereign states. These strategies, at times, neglect the university's own interests, compromising ethical standards, its own autonomy and integrity. The evidence, based on operational data, AUCC and CAUT reports, and writings of university presidents like Bok and Naylor, is captured under five groupings.

First, the cost of research is such that money is taken from teaching to subsidise research costs. The Drummond Report (2012 a) corroborates this finding. An evaluation of Canada Research Chair Programs found that universities had provided their own monies for research chairs and reduced teaching loads, illustrating the priority given to research and increasing financial pressure for revenue maximisation. ***Second,*** the competition to expand graduate schools is costly and prestige-maximising, and can affect resources for undergraduate programmes. This pressure will be intensified as more employers are demanding a specialised master's degree

instead of a bachelor's. ***Third,*** commercialisation is seen as a means of closing the financial "gap"--generating more revenue and increasing sustainability. My investigation suggests that additional revenue to fill this gap does not seem to have been realised either in services or other sectors. Multinational companies seem to be making profits from campus services, like cafeterias and bookstores, but this does not seem to be shared with the modern Canadian universities. ***Fourth,*** government has actively targeted new research funding to specific priorities that exclude the majority of academic researchers in most disciplines. As well, the issue of sponsored revenue, especially in relation to "Pharma" or "Big Science," has led some university authorities to compromise autonomy and to jeopardise integrity. I found ample evidence in the cases of Drs. Vedananda, Olivieri and others where the administration and the sponsoring companies sided with revenue generation, while the researcher, with the help of CAUT, defended academic freedom, autonomy, ethical and scientific standards in the interest of the public. These are clear examples of mission drift. ***Fifth*****,** a principal mission of a modern university is to provide quality education--to form global citizens and to develop leaders who can confront issues across national boundaries and traditional disciplines. Students need to develop intellectual rigour and depth, to think critically and flexibly, with a multi-disciplinary perspective; they need exposure to diverse cultures and values and the ability to work outside their own comfort zone. These objectives are anchored in the intrinsic values of the institutions and are often explicit in their mission statement or vision but, modern Canadian universities seem to have forgotten them when it comes to action.

There is evidence of other trends that show erosion of quality of education and standards in relation to the type of education envisioned by modern Canadian universities. They are: the

use of consumerist language by the universities, economic or career related reasons for attending university rather than a thirst for knowledge among students, grade inflation, and changes in programs chosen which are more "entrepreneurial" and career related. Others include the university's dropping of language requirements, the students spending less time on studies and on academic-related extracurricular activities as compared to two or three decades ago, while the universities have increased the quantity of reading to be accomplished in less time (more half-year courses), and are providing the students with little or no contact with tenured, multi-disciplined, reflective faculty.

The concept of mission drift was useful for analysis. Previously, it has been used in both profit-generating private enterprises as well as for the non-profit organisations in relation to their mission, but with different values than those of universities. The motivation for private sector enterprise is "profits only," while universities, which are non-profit, ought to focus more on their mission, while using "profits" earned to improve the "core" product which is quality of education and academic standards (Zemsky et al., 2006). The danger for universities is to espouse private sector values (competition, benefit for individual, not sharing knowledge, consumerism) rather than the public interest values, including academic freedom, autonomy, and collegiality as advocated by liberal education and deliberative scholars. But mission drift can also be seen in smaller "incremental" items, such as launching into real estate, or gains by an individual faculty member not shared with the university. On the whole, the concept of mission drift has helped me gather evidence to focus on the imbalance between teaching and research, the priority accorded to research, leading to the quest for revenue generation to the detriment of the quality education. I have found ample evidence that modern Canadian universities are moving

away from the deliberative and liberal ideal types towards the entrepreneurial which includes large classes, increasing use of contract and sessional instructors and TAs, priority given to revenue generation, disregard of the integrity of the university, increasing research intensity, emphasising applied instead of basic research and lowering the quality of education by pandering to consumerism. How modern Canadian universities meet the challenges of the Drummond recommendations, while upholding the highest standards of quality of education and integrity of the university, remains to be seen.

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