MEMORIAL UNIVERSITY

THE HARRIS CENTRE
Memorial University

Supporting the Contribution of Higher Education Institutions to Regional Development within Atlantic Canada

Dr. Wade Locke, Department of Economics, Memorial University

December 2006

This research project was funded under the Harris Centre's Applied Research Fund. The intellectual property vests with the author(s). For more information about the Applied Research Fund or to obtain hard copies of this report, please contact the Harris Centre.

OECD/IMHE Project

Supporting the Contribution of Higher Education Institutions to Regional Development

Self Evaluation Report:

Atlantic Canada, Canada

Wade Locke (Memorial University), Elizabeth Beale (Atlantic Provinces Economic Council), Robert Greenwood (Harris Centre, Memorial University), Cyril Farrell (Atlantic Provinces Community College Consortium), Stephen Tomblin (Memorial University), Pierre-Marcel Dejardins (Université de Moncton), Frank Strain (Mount Allison University), and Godfrey Baldacchino (University of Prince Edward Island)

December 2006
(Revised March 2007)

Acknowledgements

This self-evaluation report addresses the contribution of higher education institutions (HEIs) to the development of the Atlantic region of Canada. This study was undertaken following the decision of a broad group of partners in Atlantic Canada to join the OECD/IMHE project "Supporting the Contribution of Higher Education Institutions to Regional Development". Atlantic Canada was one of the last regions, and the only North American region, to enter into this project. It is also one of the largest groups of partners to participate in this OECD project, with engagement from the federal government; four provincial governments, all with separate responsibility for higher education; 17 publicly funded universities; all colleges in the region; and a range of other partners in economic development. As such, it must be appreciated that this report represents a major undertaking in a very short period of time.

A research process was put in place to facilitate the completion of this self-evaluation report. The process was multifaceted and consultative in nature, drawing on current data, direct input from HEIs and the perspectives of a broad array of stakeholders across the region. An extensive effort was undertaken to ensure that input was received from all key stakeholders, through surveys completed by HEIs, one-on-one interviews conducted with government officials and focus groups conducted in each province which included a high level of private sector participation.

The Research Coordinator and Principal Investigator for this study was Dr. Wade Locke from Memorial University (Newfoundland and Labrador). Dr. Locke led the task of collecting data, synthesizing information from key sources and is also the principal author of this report. Dr. Locke was ably assisted by academic researchers at participating universities in all four provinces.

A Steering Committee provided support to this project, with representation from associations representing HEIs, economic policy organizations, and the federal and provincial governments. The Steering Committee served as a network for research and collaboration, providing input throughout the process.

Sincere appreciation is extended to the Researcher Coordinator, Steering Committee members and other contributors, as well as to the HEIs in the region for the valuable information and direction they provided. Special acknowledgement is given to the Harris Centre at Memorial University and the Atlantic Canada Opportunities Agency for their funding support of this project.

Elizabeth Beale
Chair, Steering Committee

Table of Contents

List of figures, maps and tables

Maps

Figures

Tables

Chapter 1: INTRODUCTION

The need for greater regional engagement of the higher education institutions (HEIs) is becoming increasingly accepted.[1] Accompanying this acceptance is a growing recognition that it must be integrated with longer-standing teaching and research functions if higher education's contribution to student learning, to knowledge exploitation by business, and to society overall in the Atlantic region is to be maximized. The local economy stands to benefit from HEIs more effectively exercising their so-called "third task," or social obligation. At the same time, the HEIs also gain important benefits including enhanced access to local undergraduate students, greater local social capital support, improved local funding partnership opportunities for both research and teaching, and opportunities for resource sharing (e.g., infrastructure, "knowledge workers," etc).

Given this recognition of the need for continually heightened involvement of the HEIs in the region and the understanding of the mutual benefits, the Organization for Economic Co-operation and Development (OECD) commenced an international research effort entitled: "Supporting the Contribution of Higher Education Institutions to Regional Development." Atlantic Canada was one of the last regions to join this initiative.[2]

To facilitate undertaking the required research and completing all of the tasks associated with this project, it was necessary to establish a research and collaboration network within Atlantic Canada. A steering committee with participation from HEIs and their respective associations, economic development and public policy organizations, provincial and federal governments, provided input and guidance during the consultative process.

The principal researcher, who was also the regional coordinator, established the research protocol, and was assisted in its implementation by academic researchers at other universities across the region. This working group facilitated the engagement with the 21 HEIs involved in this study.

The approach adopted in this exercise was to administer a survey (see Appendix A) to the 21 HEIs involved with this study. The categories included in this institutional survey were determined by the requirements specified by the OECD as part of its broader study. In addition, key informant interviews were undertaken with various provincial government contacts whose responsibilities included education or economic development. As well, a focus group was held in each province, which was targeted at specific topics that were relevant for the province in which the focus group session was held. The results of the focus groups are included as separate appendices. Finally, data was obtained from Statistics Canada and from the economic impact and value-for-money studies performed by the universities and community colleges.

1 In the context of this report for Atlantic Canada, HEIs refer to universities and community colleges.
2 Atlantic Canada consists of four provinces, specifically Newfoundland and Labrador, New Brunswick, Nova Scotia and Prince Edward Island (see Section 2.2 for more detail).

While this report represents a tangible output from this research exercise, it should be recognized that this is only a starting point. In addition to the regional Peer Review report of the independent OECD team and the OECD's final synthesis report for the 14 regions involved in this study,[3] a commitment was also made by the Steering Committee to produce synopsis reports designed to raise awareness of these issues with a broad audience within Atlantic Canada. As well, there is a commitment by the regional coordinator to construct a report that highlights the lessons learned for Newfoundland and Labrador from the regional engagement initiatives undertaken by the regions participating in this OECD study. These reports will be produced once the Self Evaluation and Peer Review Reports have been fully completed.

This exercise has already generated important benefits. It has raised awareness within Atlantic Canada and reinforced the importance of regional engagement by local universities and colleges. It has facilitated a comparison of Atlantic Canada's experience in this regard with other regions involved in the study. Finally, it has provided a forum for various stakeholders in the regions to discuss and reflect on the importance of HEIs being involved in regional engagement activities.

[3] This final report of the project will be entitled: *Globally Competitive, Locally Engaged - Higher Education and Regions.*

Chapter 2: OVERVIEW OF THE REGION

1. Introduction

This overview of Atlantic Canada describes its geography, provides a demographic profile of the region, offers an assessment of the region's social and economic situation by analyzing select economic indicators, and characterizes the region's governance structure. Including this brief introduction, this chapter contains five sections.

2. The Geographical Situation

The region of Canada chosen for this study is Atlantic Canada. It consists of Newfoundland and Labrador, Prince Edward Island, Nova Scotia, and New Brunswick, four independent provinces located on the eastern edge of Canada (see Map 1).

Map 1: Canada and the Provinces

It is important to appreciate that Atlantic Canada, as a region, is more of a conception than a distinct constitutional entity. The concept of Atlantic Canada was first utilized in 1949 when Newfoundland joined Canada. Prior to that time, the other three provinces were referred to as the Maritime provinces, a description that is still utilized today.

Interestingly, at various stages in their history, serious debate was given to amalgamating the three Maritime provinces and in earlier times, all three provinces were administered as parts of Nova Scotia.[4] As well, in 1960s there were attempts to forge a political union of the Maritime provinces (resulting in the Deutsch report in the early 1970s), and there have been subsequent efforts to build a regional economic union.

Within Canada, there are two levels of independent government recognized explicitly in and guaranteed under the Constitution of Canada, those being the federal government (Government of Canada) and the 10 provincial governments. In addition, operating within Canada, there are three territorial governments and thousands of municipal governments.[5] Unlike other countries, there are no separate, independent regional government structures within Canada. However, provincial governments can and do specify regional entities at the municipal level, which subsume previous independently-operating communities into a larger regional community.

Even though there is no constitutional or legislative basis for Atlantic Canada, the concept has served the Government of Canada well in terms of planning its programs on a geographical basis and when tracking the distribution of its programs on a regional basis.[6] For example, it is convenient for the federal government to note that the Atlantic regional office for one of its development agencies (the Atlantic Canada Opportunities Agency or ACOA) is located in Moncton, New Brunswick (N.B.), or that the Atlantic regional office of Justice Canada is found in Halifax, Nova Scotia (N.S.), or that the Atlantic regional office of Indian and Northern Affairs is situated in Amherst, N.S.

Although the Council of Atlantic Premiers (CAP) meet regularly to discuss issues of common interest, there are no separate elections for Atlantic Canada, there is no legislative assembly, there is no capital city, and there are very few voices speaking for Atlantic Canada on intergovernmental issues with either the federal government or with other provincial governments.[7] Moreover, the interests of the Atlantic Canadian provinces do not always coincide. For instance, Newfoundland and Labrador and Nova

[4] The Maritime Union initiative was pursued in 1863 and 1864 and created the opportunity and environment for the formation of Canada as a separate and complete country. http://www.collectionscanada.ca/confederation/023001-2983-e.html.

[5] The three territorial governments (the Yukon Territory, the Northwest Territories and Nunavut) come under the constitutional authority of the federal government, while municipal governments are creations of the provinces (territories) and derive their authority and responsibilities from the same.

[6] While the region of Atlantic Canada is a convention maintained by most federal departments, its usage is not complete. For example, Fisheries and Oceans Canada has split Atlantic Canada into a Maritime Region and a Newfoundland and Labrador Region.

[7] However, while the overall emphasis of intergovernmental issues is bilateral — involving the federal government and each of the four Atlantic provinces, there are a number of structures and committees that bring together the four Atlantic provinces to deal directly with the federal government in key areas such as agriculture, fisheries and economic development. Although not one of their most visible functions, ACOA does attempt to bring a measure of regional focus to federal-provincial issues. There is currently a Senior Officials Committee examining potential cooperation in the area of economic development. This committee is composed of the ACOA President and each of the Agency's Vice-Presidents, the federal Deputy Minister of Integovernmental Affairs, and Deputy Ministers of each of the provincial departments of intergovernmental affairs and economic departments.

Scotia were recently involved in a protracted legal dispute over the offshore boundary line between their provinces.

To summarize, Atlantic Canada is a loose association of adjacent provinces that have similar histories, comparable cultures and, at times, common interests. It is not really a separate region, but everyone understands what is encompassed by the term. In other words, the region of Atlantic Canada is a conception that works reasonably well within the Canadian context.

According to the most recent Statistics Canada data, Canada's population is estimated to be 32.6 million people as of July 1, 2006. Of this total, 2.3 million people reside in the Atlantic provinces. Atlantic Canada's share of the Canadian population has declined steadily over the past 30 years, falling from 9.4% in 1976 to 7.1% today.

The current population residing in each of the Atlantic provinces is: Newfoundland and Labrador — 509,700, Prince Edward Island — 138,500, Nova Scotia — 934,400 and New Brunswick — 749,200.[8] In the context of this international study, it is also important to note that Canada is a large country geographically with its population concentrated in small areas. The population of Canada is spread out over its 9 million square kilometres, which translates into a density of 3.3 people per square kilometre.[9] The corresponding densities for the Atlantic provinces are:

- Newfoundland and Labrador – 1.4 people per square kilometre;
- Prince Edward Island – 23.8 people per square kilometre;
- Nova Scotia – 17.2 people per square kilometre; and
- New Brunswick – 10.2 people per square kilometre.

Finally, the capital cities of each of the Atlantic provinces and their corresponding 2001 populations were:

- Newfoundland and Labrador – St. John's (99,182);
- Prince Edward Island – Charlottetown (32,245);
- Nova Scotia – Halifax (359,111); and
- New Brunswick – Fredericton (47,560)

To put the size of these cities in a Canadian perspective, the population of the national capital and the other provincial capitals in 2001 were: Canada - Ottawa (774,072); Quebec – Quebec City (169,076); Ontario – Toronto (2,481,494); Manitoba – Winnipeg (619,544); Saskatchewan – Regina (178,225); Alberta - Edmonton (666,104); and British Columbia – Vancouver (545,671).

[8] This 2006 data was taken from Statistics Canada website: *Population by year, by province and territory,* modified 2006-10-26.
[9] The population density estimates are based on the 2001 Census.

3. The Demographic Situation

As Figure 1 illustrates, the population of Canada has increased more or less steadily, averaging slightly less than 1% growth since 1971 (See Figure 2). The population in Atlantic Canada has exhibited more dramatic changes, with the region experiencing population growth up to the mid-1990s and declining thereafter. However, as shown in Figures 2 and 3, this is accounted for primarily by the population change within Newfoundland and Labrador. That province's economy was hit hard in the early 1990s when a moratorium was imposed on the ground fishery, an industry that accounted for a significant proportion of Newfoundland and Labrador's employment. The resultant loss of economic opportunities created an impetus for a protracted out-migration as people left to find jobs elsewhere in Canada. While the other three Atlantic provinces have had low growth rates in the last 10 years, the out-migration from Newfoundland and Labrador was enough to swamp these other population increases and cause an overall population decline across Atlantic Canada.

Figure 1: Population of Canada and Atlantic Canada – 1971-2005

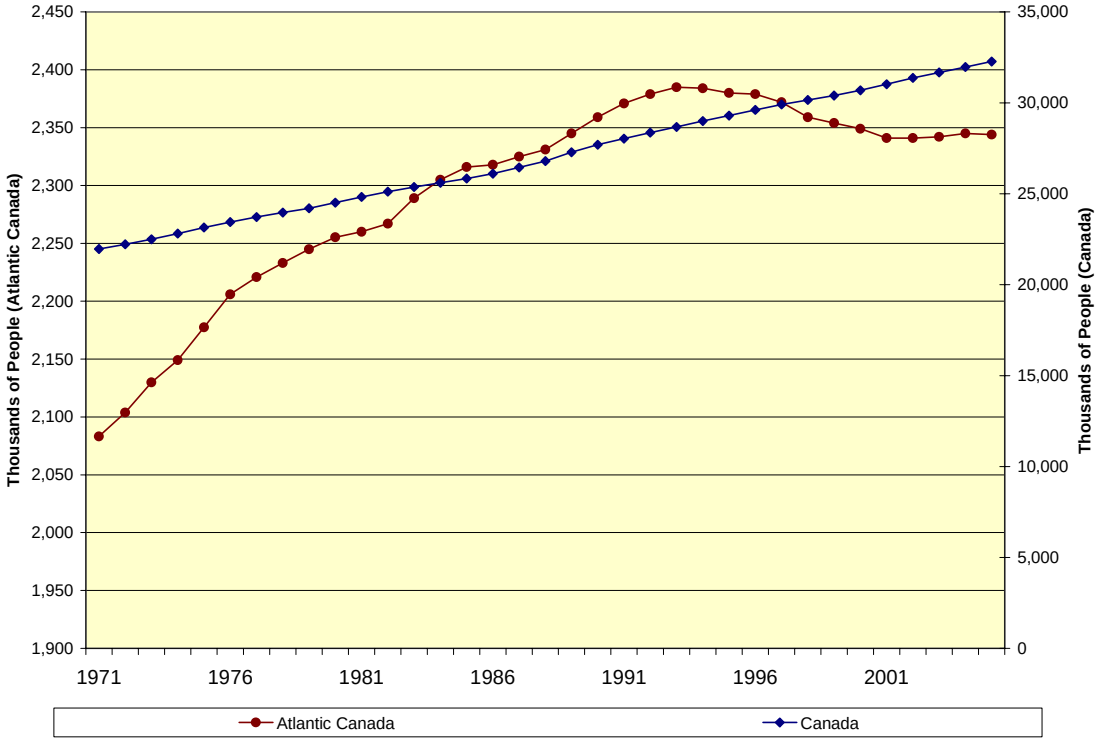


Figure 2: Population Growth Rates – Canada and the Atlantic Provinces in Five Year Intervals

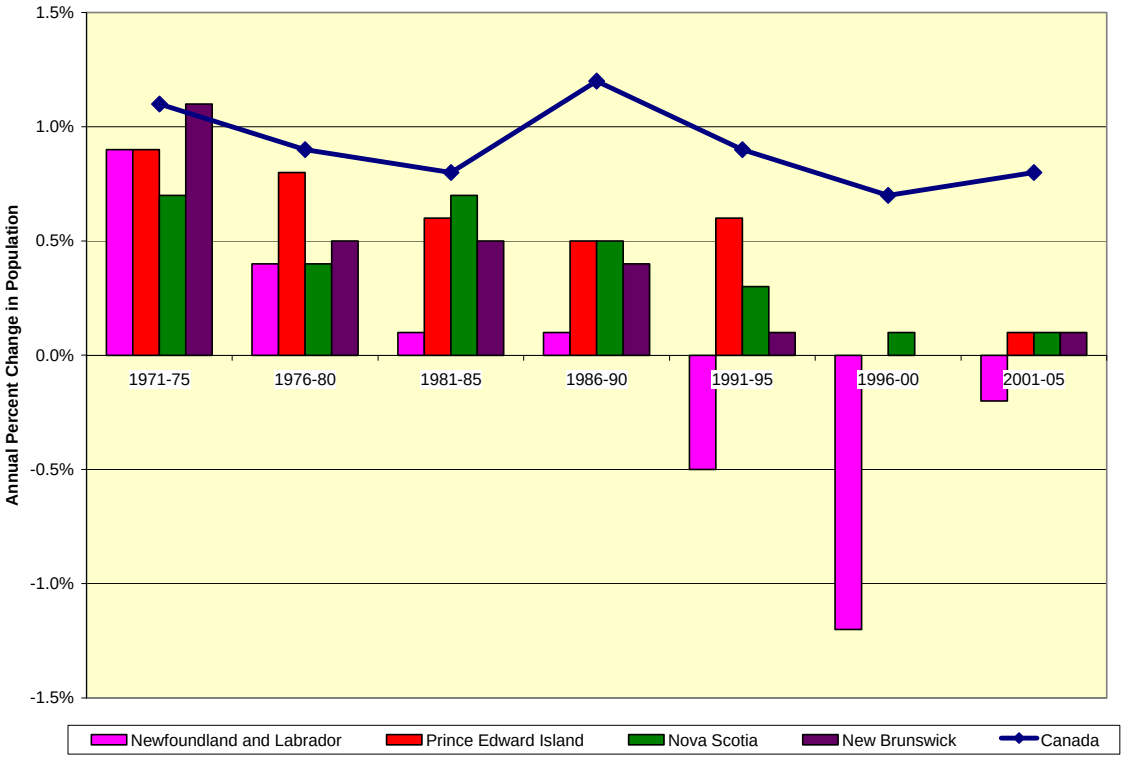
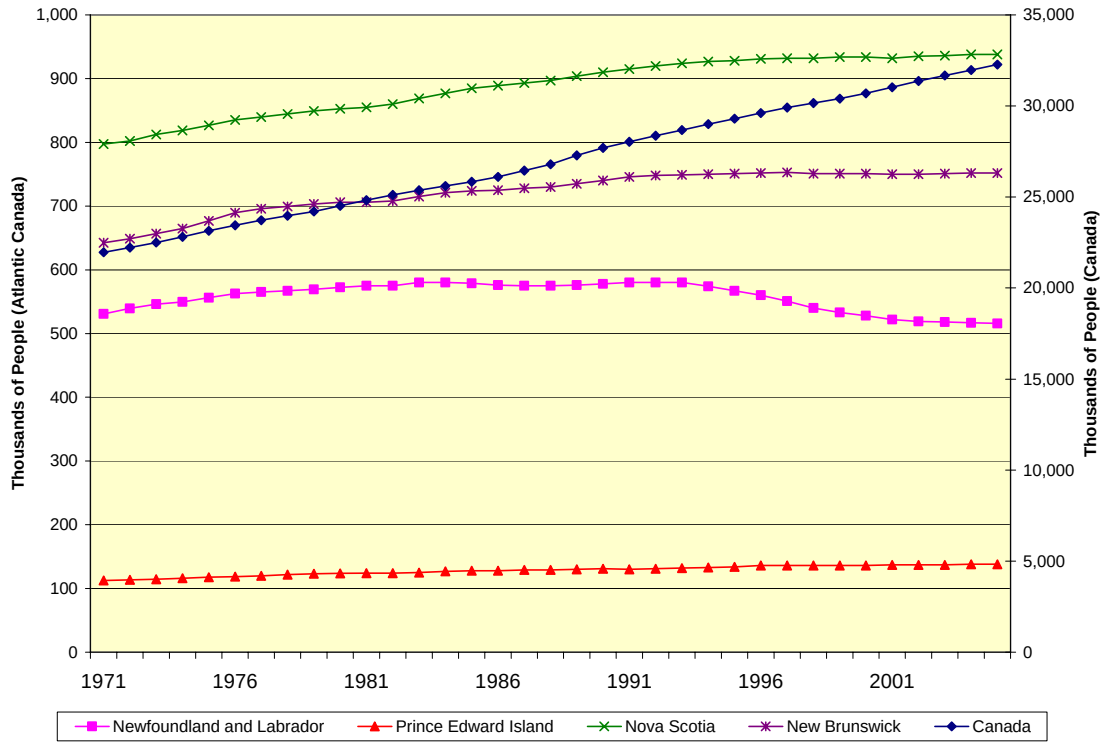


Figure 3: Population of Canada and the Atlantic Provinces: 1971-2005



The population pyramids for Canada and Atlantic Canada are presented in Figures 4 and 5 and compared in Figure 6 for the most recent census year, 2001. The age distribution of population in Atlantic Canada is similar to that which prevails throughout Canada, but the population in Atlantic Canada is slightly more concentrated in the older age groups. This characteristic is consistent with an area where relatively more young people have had to leave to search out long-term economic opportunities.

Figure 4: Population Pyramid for Canada – 2001

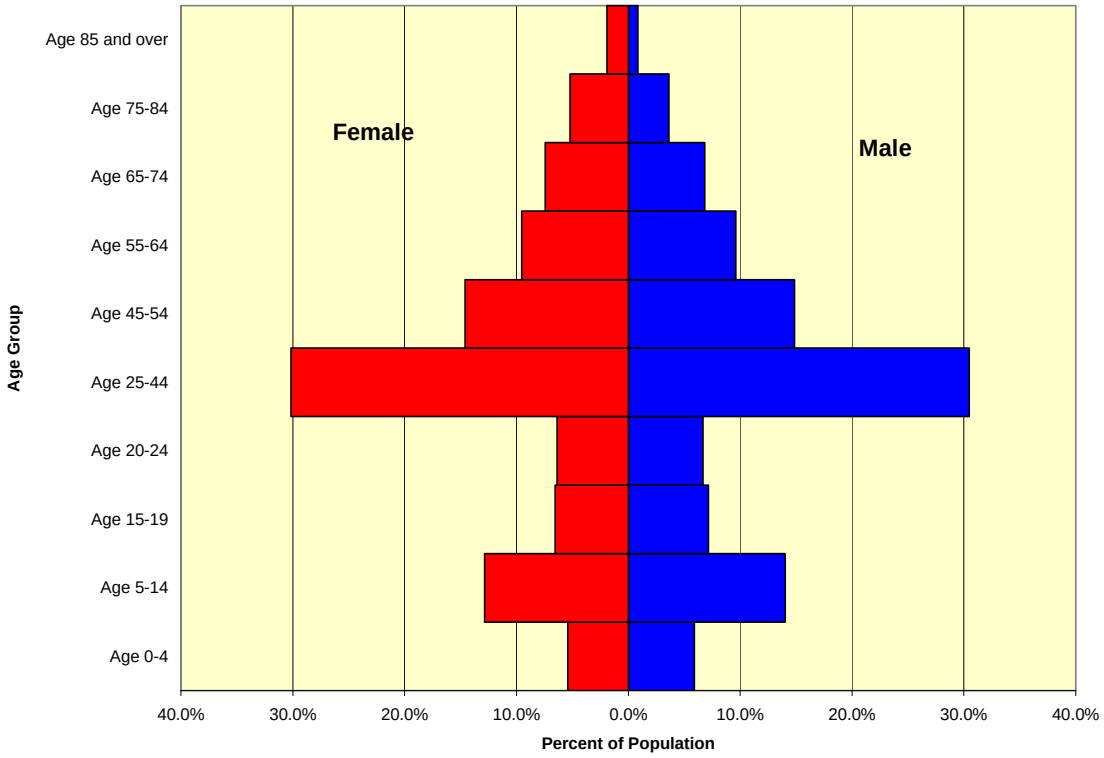


Figure 5: Population Pyramid for Atlantic Canada – 2001

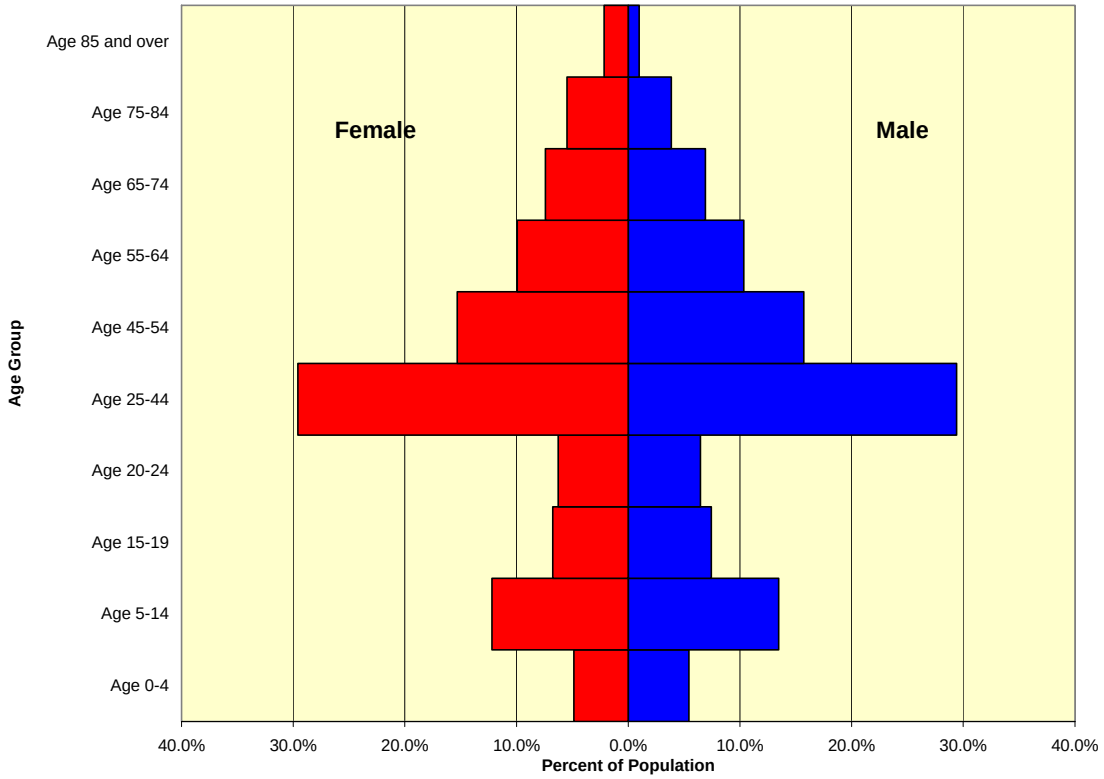
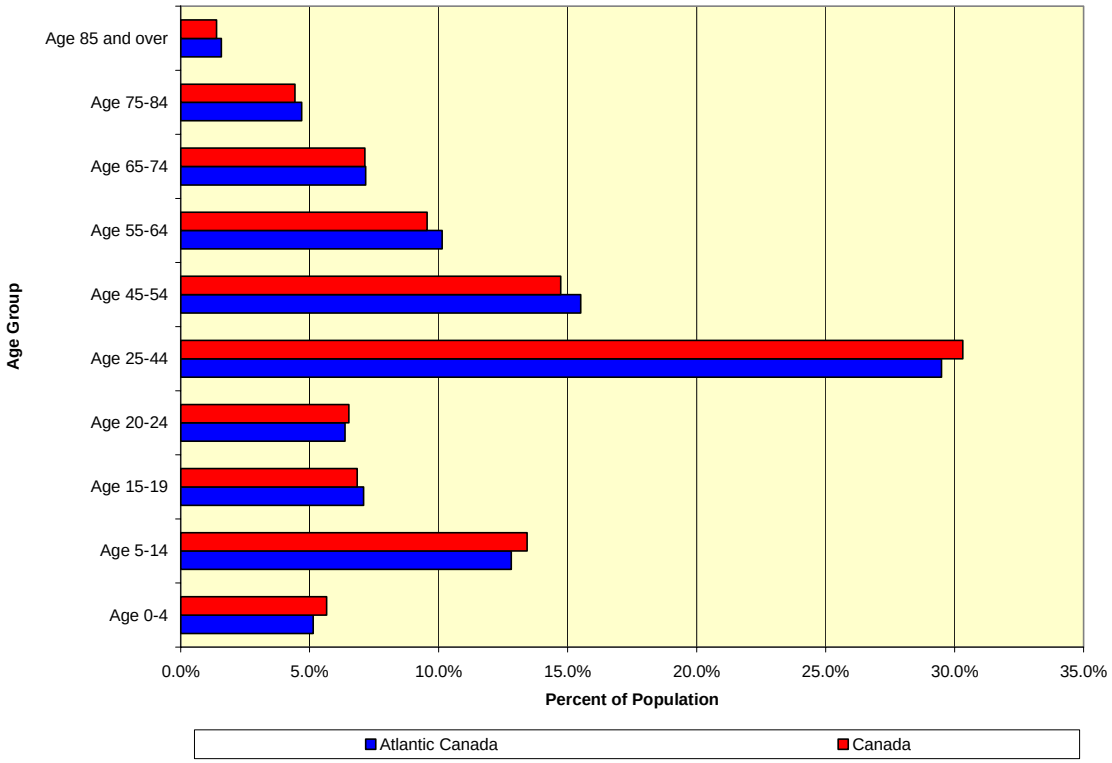
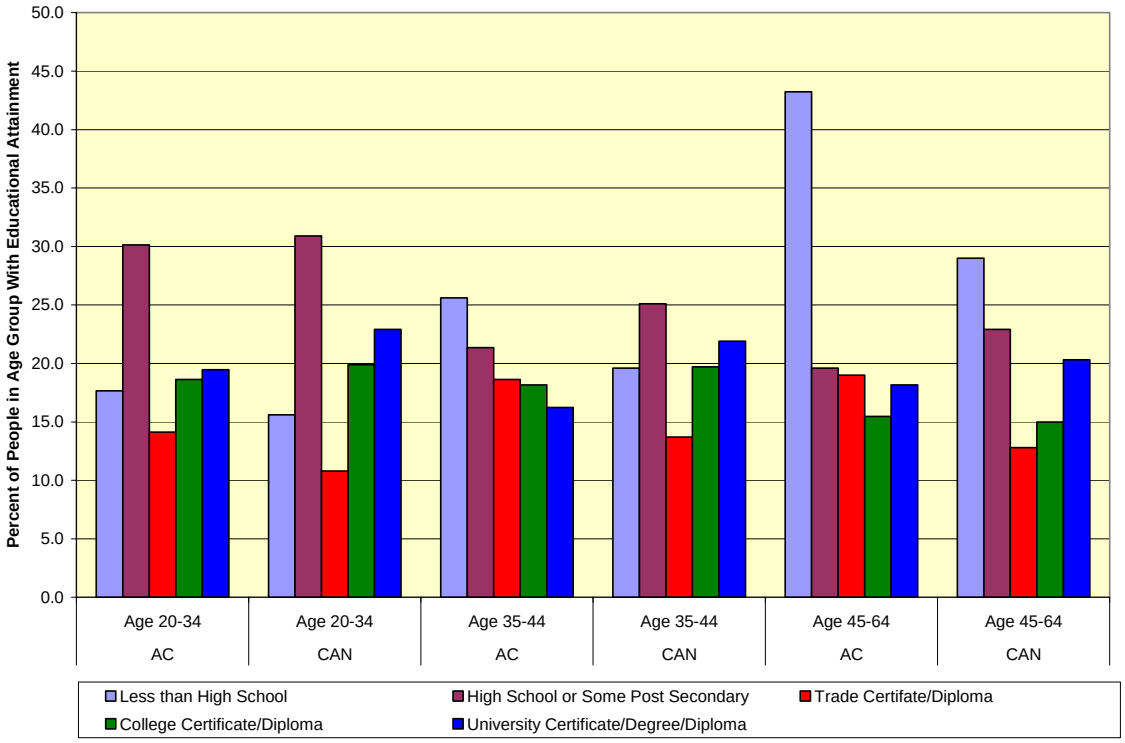


Figure 6: Comparative Population Pyramid – Atlantic Canada and Canada – 2001



In terms of educational attainment by age group in 2001, and relative to that observed Canada-wide, Atlantic Canada has a higher proportion of individuals that have not completed high school (see Figure 7). In fact, this is more pronounced for the older age groups. Furthermore, there is a noticeably lower percentage of Atlantic Canadians who have a college or university education than is observed throughout Canada. However, the proportion of Atlantic Canadians with trade certificates or diplomas is above the Canadian average for all age groups. That is, educational attainment is lower in Atlantic Canada than observed across Canada and post-secondary education has been more skewed towards trades for older workers in Atlantic Canada, but this situation is reversed when one examines the younger workers.

Figure 7: Comparison of Percent of Population by Age Group and Educational Attainment – Atlantic Canada and Canada: 2001

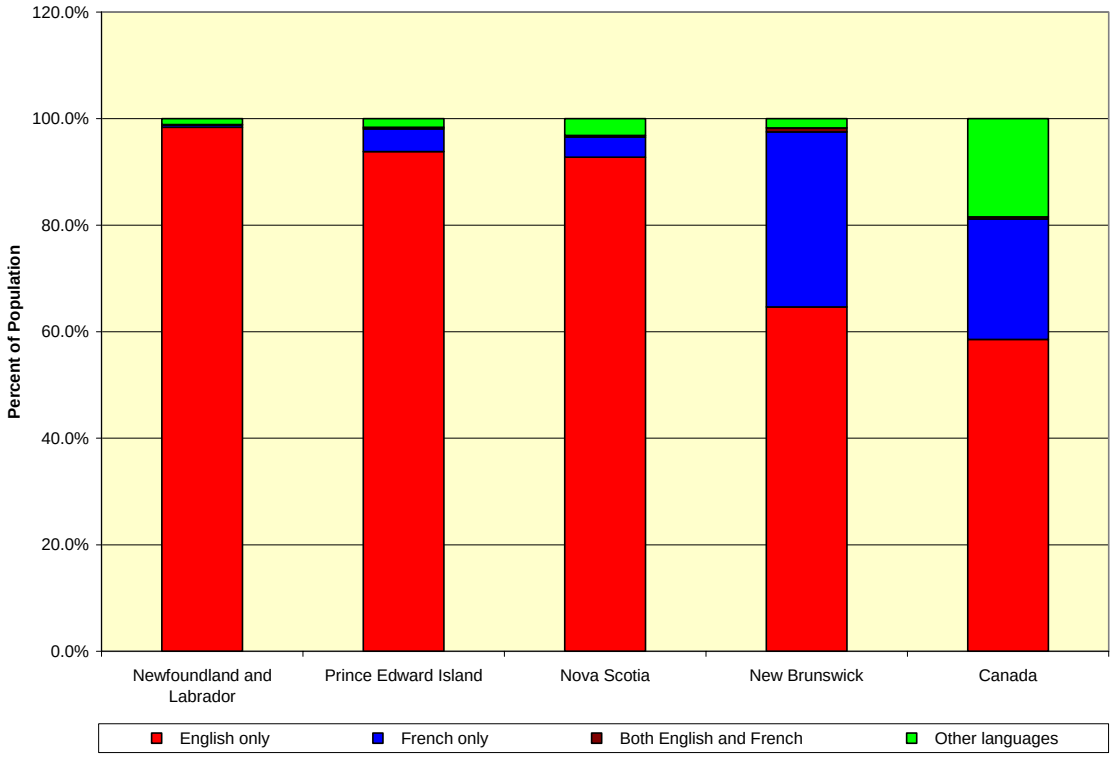


Interestingly, while Atlantic Canada has a lower proportion of its population with university degrees, it also has some of the highest university participation rates in the country. For example, in 2005, Nova Scotia has a 40.2% participation rate,[10] which was the highest in the country. This suggests that things are changing and to the extent that this translates into completion rates and these new graduates stay within Atlantic Canada, one should expect to see an improvement in the educational attainment statistics in the future.

[10] This is the university participation rate in the 18 to 21 year age cohort.

Provincial policies with respect to bilingualism vary considerably, even though Canada is officially a bilingual country. New Brunswick is the only officially bilingual province in Canada, reflecting the prominence of the French language and Acadian culture in that province. According to the 2001 Census and as illustrated in Figure 8, approximately 33% of New Brunswickers learned French as their first language, and 65% learned English. This contrasts significantly with the other Atlantic provinces. Newfoundland and Labrador has 98% English and 0.4% French, Prince Edward Island has 94% English and 4.3% French, while Nova Scotia has 93% English and 3.8% French. For Canada as a whole, 58.5% of the population first learned English, 22.6% first learned French, 0.4% first learned both English and French, and 18.5% first learned some other language.

Figure 8: Percent of Population by Language First Learned and Still Understood – the Atlantic Provinces and Canada - 2001



The final two characteristics of the population that have an impact on demographic trends are Aboriginal identity[11] and immigration status, presented in Figures 9 and 10. The Aboriginal population accounted for 3.3% of the Canada's population in the 2001 Census. This compares to 2.4% for Atlantic Canada. Even though the proportion of the population that identifies themselves as Aboriginals in Atlantic Canada is lower than for the nation, they still represent a significant demographic group within Atlantic Canada.

[11] According to Statistics Canada, aboriginal identity refers to individuals who identify with at least one Aboriginal group, that is, North American Indian, Métis or Inuit, and/or who reported being a Treaty Indian or a Registered Indian, as defined by the *Indian Act* of Canada, and/or who reported being a member of an Indian Band or First Nation.

Figure 9: Proportion of Residents with Aboriginal Identity in Atlantic Canada and Canada – 2001

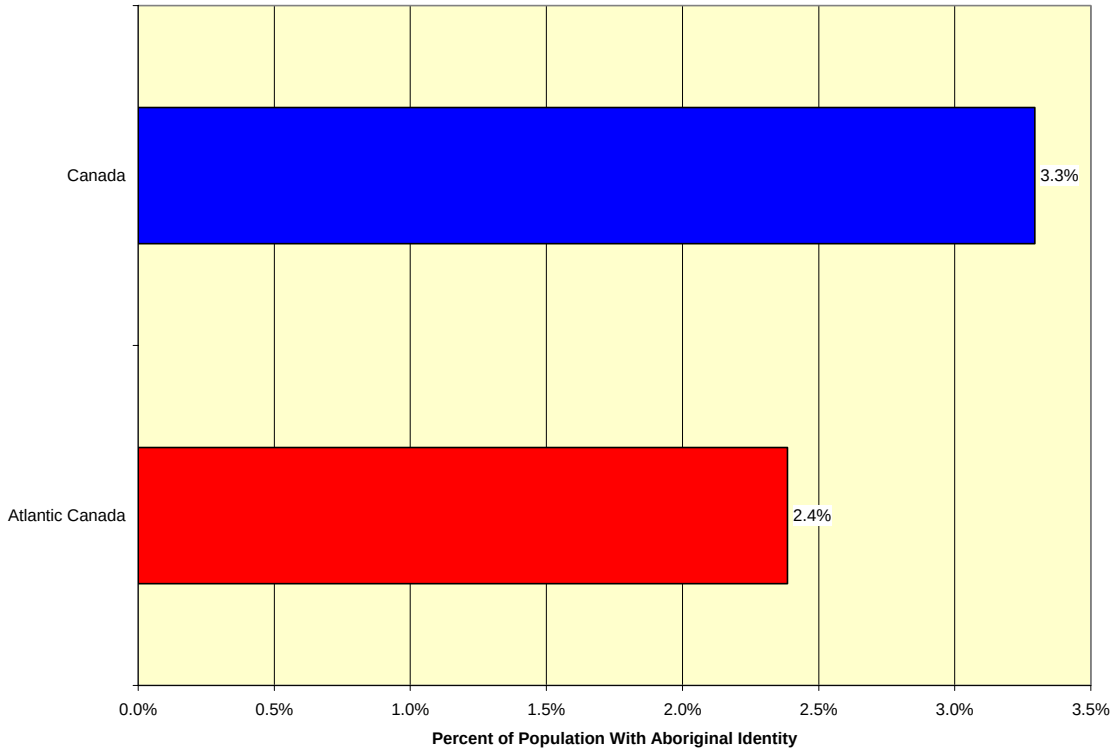
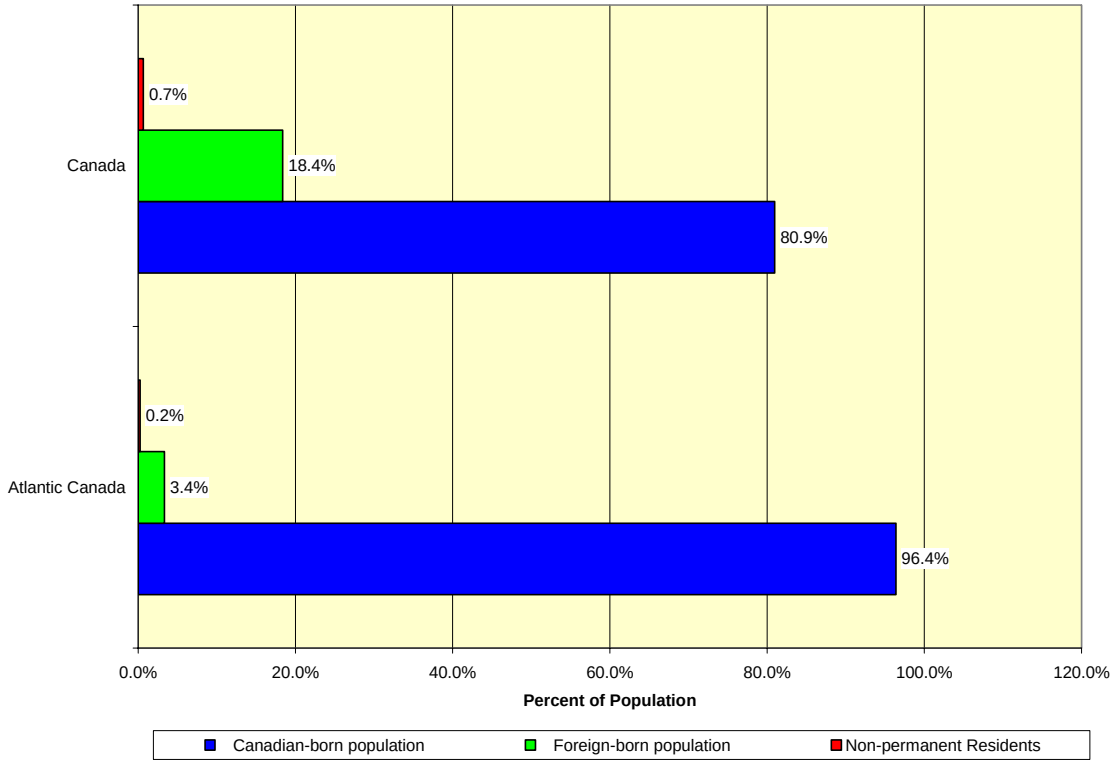


Figure 10: Immigration Status of Residents in Atlantic Canada and Canada – 2001



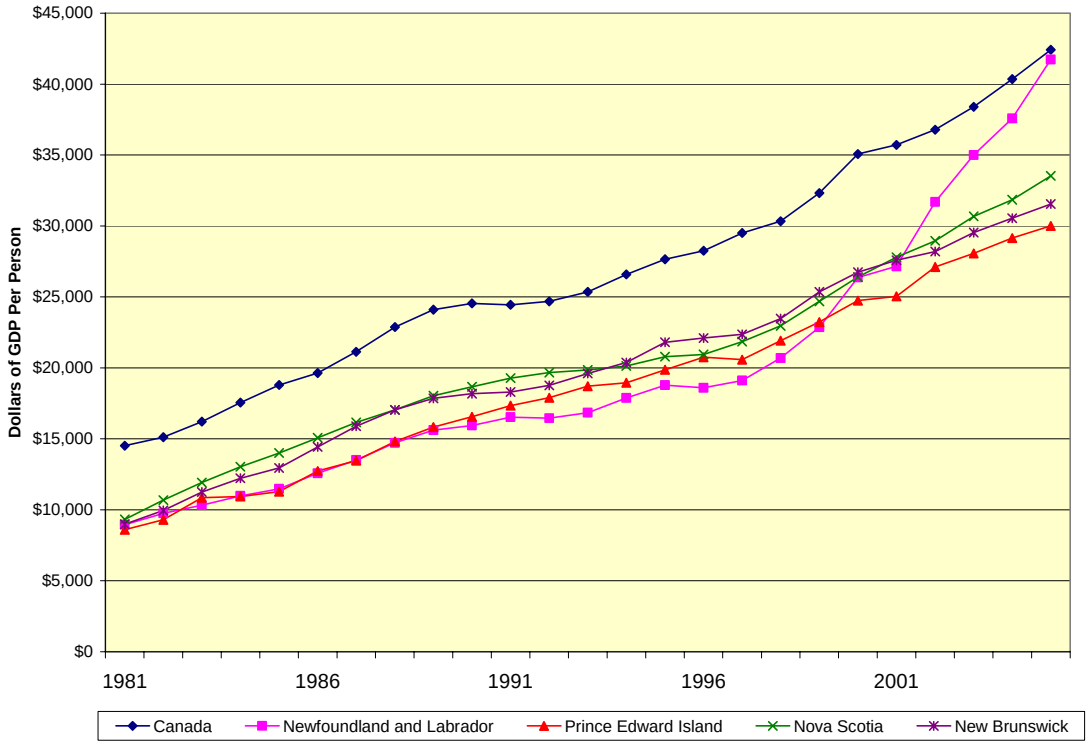
While Canada is now home to a significant population of new immigrants, these immigrants are less likely to settle or remain in Atlantic Canada. In Atlantic Canada, 96.4% of the population recorded in the 2001 Census was born in Canada, which compares with 80.9% for Canada as a whole.

4. The Economic and Social Base

This next section provides a perspective on the economic base in Atlantic Canada and the country. Since there are significant differences in the economic performances of the Atlantic provinces and some data is only available on a provincial basis, the following discussion focuses on individual provinces where appropriate and Atlantic Canada otherwise. The social and economic indicators that are considered in this section are: Gross Domestic Product (GDP) per capita; the growth rate in real GDP (i.e., nominal GDP adjusted for inflation); personal disposable income per capita; unemployment rates (percentage of the labour force unemployed); participation rate (percentage of the working age population participating in the labour force); the composition of employment by industry; the composition of the labour force by occupation; and the composition of income by source of income. In addition, total research and development (R&D) expenditure as a percent of GDP (a measure of research intensity), R&D performed by the business sector as a percent of GDP, and the composition of R&D performed by sector are dealt with in this section.

Figure 11 displays the time profile for GDP per capita from 1971 to 2005.

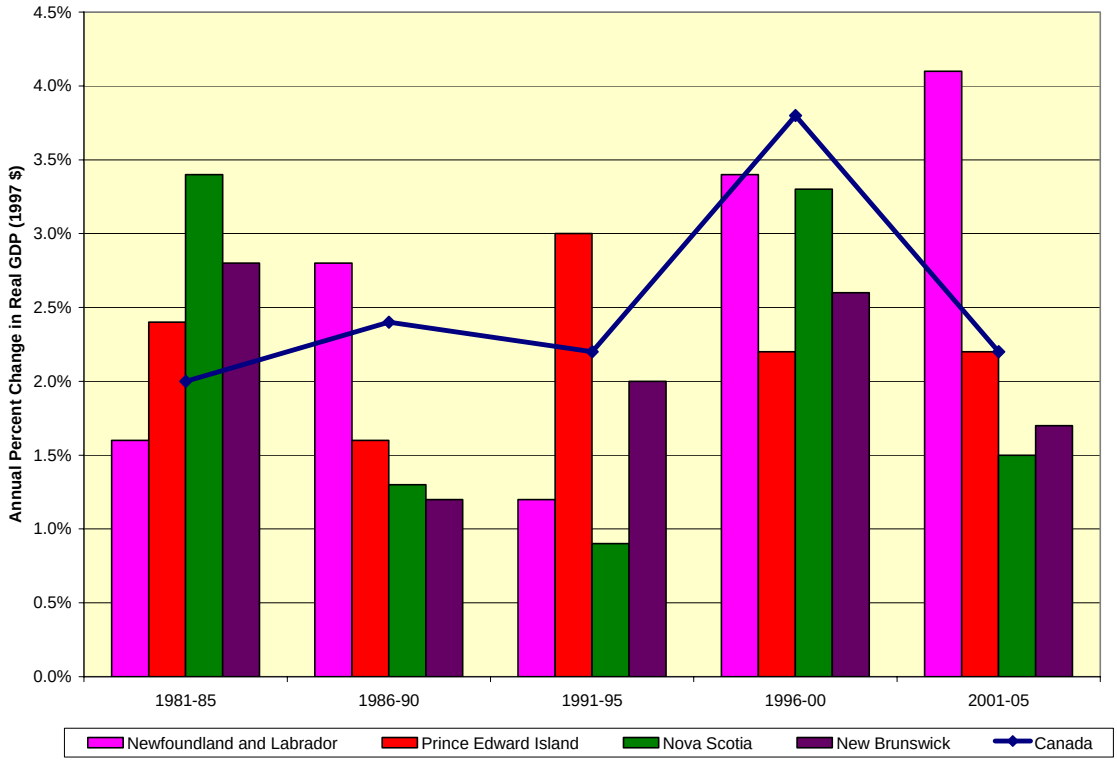
Figure 11: GDP Per Capita – Canada and the Atlantic Provinces (1971-2005)



In 2005, GDP per capita for each of the Atlantic provinces and Canada were: Canada - $42,413; Newfoundland and Labrador - $41,733; Nova Scotia - $33,530; New Brunswick - $31,552; and Prince Edward Island - $30,014. Clearly, the Atlantic provinces have had lower GDP per capita than the Canadian average over the whole time period. Further, with the exception of Newfoundland and Labrador, the gap between the Atlantic provinces and Canada has remained relatively constant. After 1997, the pattern exhibited by Newfoundland and Labrador changed dramatically, rising from about two-thirds of the Canadian figure to be almost equal to the Canadian average. This is explained by the development of offshore oil resources in Newfoundland and Labrador and the significant out-migration experienced by Newfoundland and Labrador throughout the 1990s.[12]

The economic growth rates, adjusted for inflation, experienced by each Atlantic province and Canada are presented for five-year intervals in Figure 12.

Figure 12: Real GDP Growth Rates – Canada and the Atlantic Provinces in Five Year Intervals



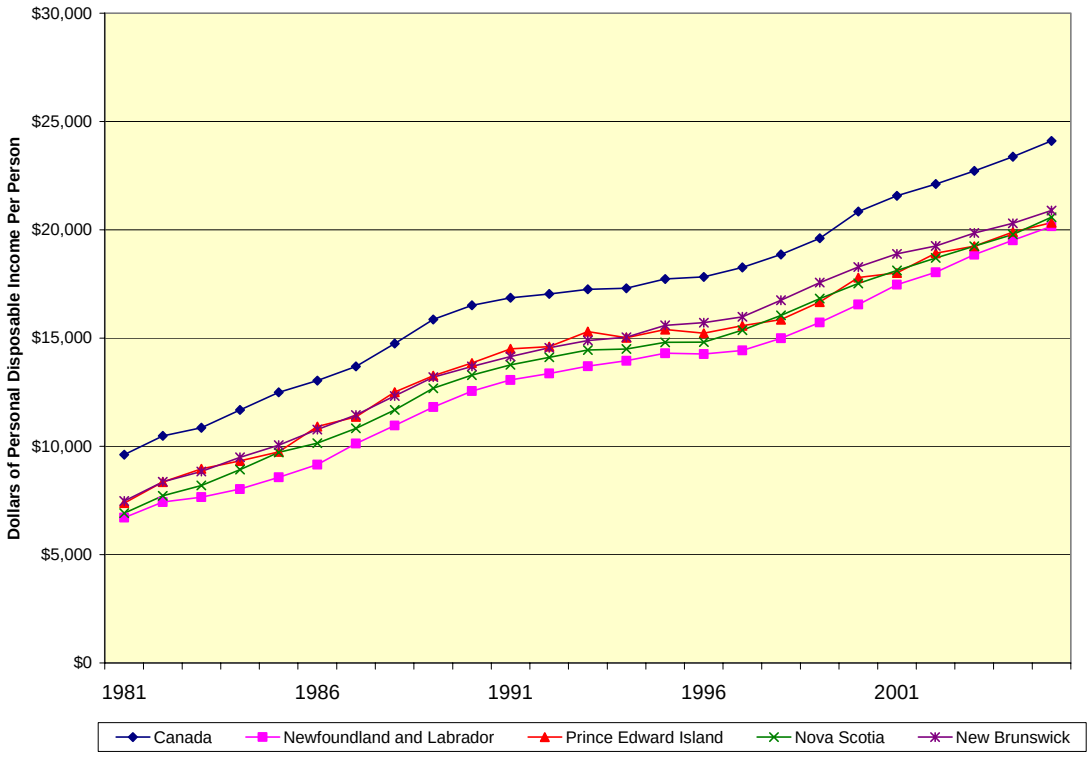
In the early 1980s, the rate of economic growth in the three Maritime provinces (Nova Scotia, New Brunswick and Prince Edward Island) exceeded that observed in Canada, but Newfoundland and Labrador's economic performance on this indicator fell short of that experience throughout the nation. By the late 1980s, this situation was reversed. In the early 1990s, national economic growth exceeded that in all the Atlantic provinces except

[12] The first oil to flow in Newfoundland and Labrador's offshore occurred in late 1997. As well, Nova Scotia also has an offshore gas industry, but it has been small in relation to the size of the Nova Scotia economy.

Prince Edward Island, and by the late 1990s, these provinces were catching up with the rest of Canada. For the period 2000-05, Newfoundland and Labrador was leading the country in terms of economic growth, far exceeding that observed on average throughout Canada. While Prince Edward Island was on par with the country during this time period, both Nova Scotia and New Brunswick performed below the national average.

Figure 13 illustrates that personal disposable income in each of the Atlantic provinces has been consistently below that observed for Canada as a whole. Moreover, one does not observe the convergence between Newfoundland and Labrador and Canada that was observed for GDP per capita. This is explained by the fact that the value of output produced by the oil industry contributes to directly to GDP, but it does not necessarily enhance personal income. In particular, retained corporate profits from the offshore oil industry are remitted elsewhere and do not form part of Newfoundland and Labrador's personal income base. Consequently, when assessing the economic performance and well-being of an area, it is important to consider more than one economic indicator. Given this caveat, unemployment rates and participation rates are also discussed below.

Figure 13: Personal Disposable Income Per Capita – Canada and the Atlantic Provinces (1971-2005)



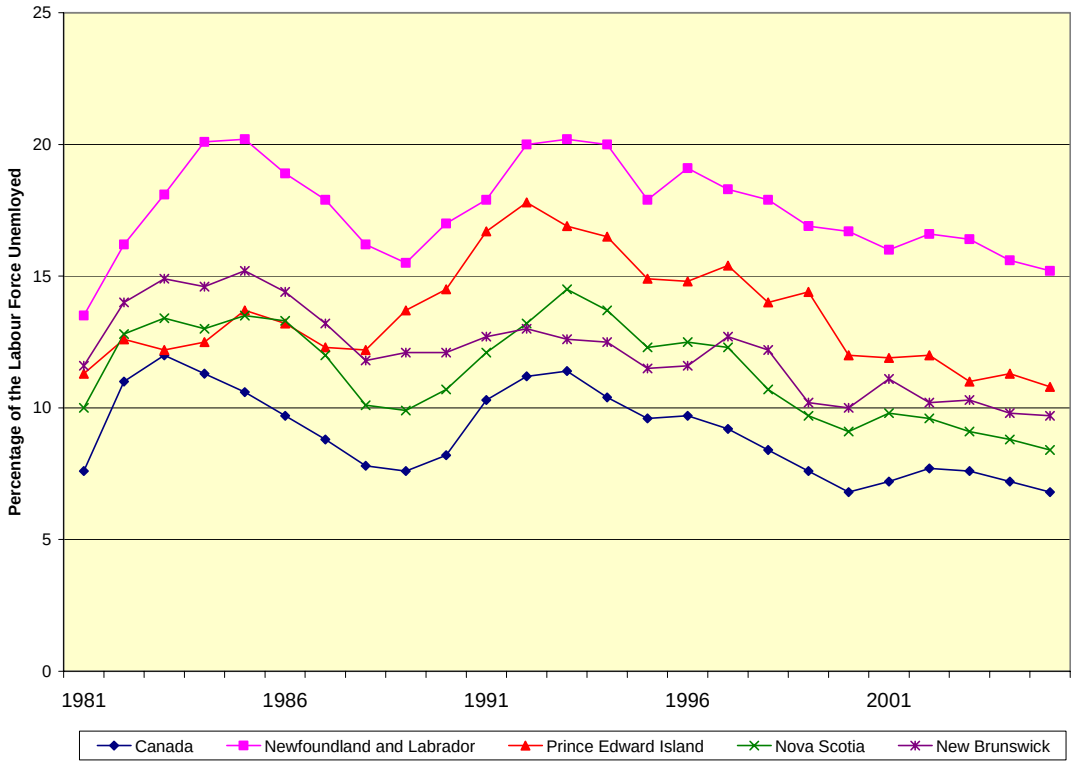
While the time profiles for unemployment rates in Atlantic Canada are presented in Figure 14, the measured unemployment reported for 2005 were as follows:

- Canada – 6.8%;
- Nova Scotia – 8.4%;

- New Brunswick – 9.7%;
- Prince Edward Island – 10.8%; and
- Newfoundland and Labrador -15.2%.

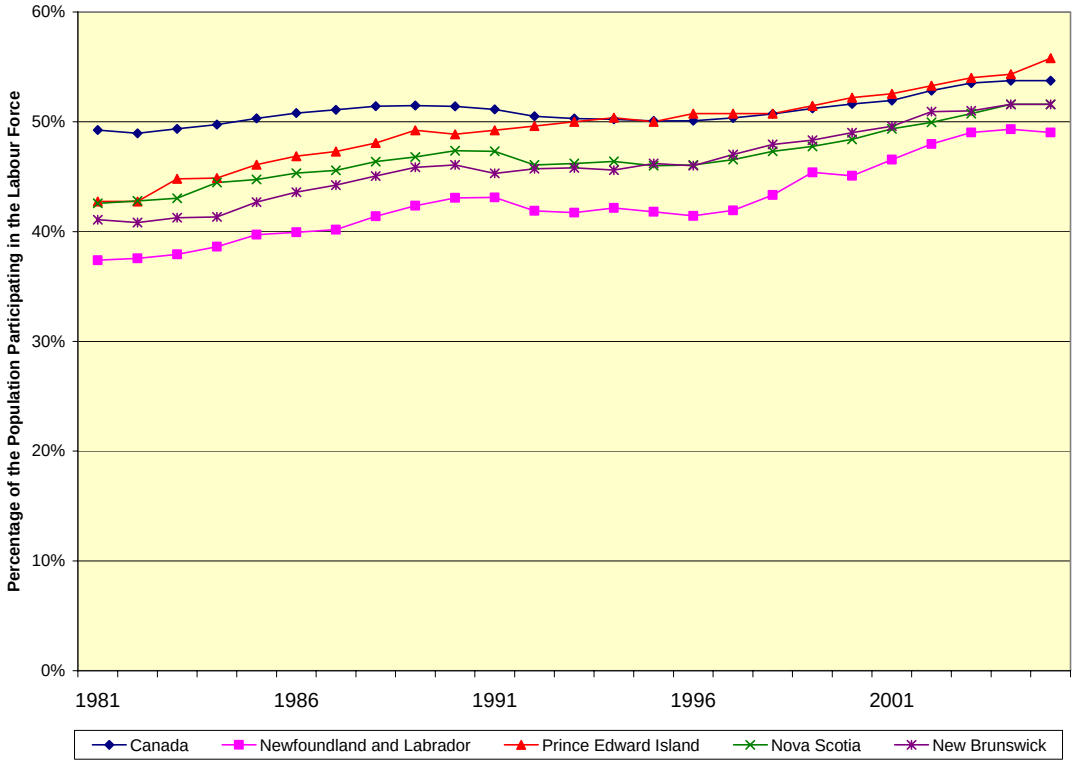
Unemployment rates in Atlantic Canada both fluctuate in response to changing economic circumstances and loosely track those observed throughout Canada. As well, there appears to be a slight convergence of unemployment rates in recent times. Yet, despite its tremendous economic performance, as measured by GDP per capita, Newfoundland and Labrador still has the highest unemployment rate in the country, more that twice that observed for Canada. Even though the unemployment rate in Nova Scotia is closer to that recorded for Canada, there still remains a significant difference in economic performance as measured by this parameter. The performance in Prince Edward Island and New Brunswick, as reflected in measured unemployment rates, falls between that observed in Newfoundland and Labrador and Nova Scotia.

Figure 14: Unemployment Rates – Canada and the Atlantic Provinces (1971-2005)



When the Atlantic Provinces and Canada are compared on the basis of participation rates, there are no significant differences. As indicated in Figure 15, they all fall in the range of 49% to 56% of the working age population. Moreover, the proportion of the population participating in the labour force has been increasing over time in Canada and in each of the Atlantic provinces.

Figure 15: Participation Rates – Canada and the Atlantic Provinces (1971-2005)



In Canada and Atlantic Canada, as is true in economies throughout the world, the service industry represents the dominate source of employment (see Figure 16). Employment in the resource sector in each of the Atlantic provinces is more prominent than for Canada as a whole. The resource sector is relatively more important in Prince Edward Island and Newfoundland and Labrador than in the other Atlantic Provinces. Manufacturing employment is slightly less significant in Atlantic Canada than throughout Canada. Employment in the health and education services industries constitutes a larger share of employment in Atlantic Canada relative to the nation as a whole, while the opposite is true for employment in business services.

As shown in Figure 17, business, management and natural and applied science occupations in the Atlantic provinces make up lower shares of employment than they do throughout Canada. Alternatively, sales and services, trades and health services represent a larger share of the jobs in Atlantic Canada than in the rest of Canada.

Another factor that distinguishes the Atlantic provinces from the country as a whole is the composition of income by source. Figure 18 illustrates the composition of income by source in 2001 for each of the Atlantic provinces and Canada. A higher share of income in Atlantic Canada comes from government transfers than it does in the rest of Canada. For example, about 12% of income in Canada emanates from government transfers and 77% is from earnings. The corresponding figures for government transfers and earnings, respectively, in the Atlantic provinces are: Newfoundland and Labrador – 21% and 69%; Prince Edward Island – 19% and 71%; Nova Scotia – 16% and 71%; and New Brunswick – 17% and 72%.

Figure 16: Composition of Employment by Industry – the Atlantic Provinces and Canada - 2001

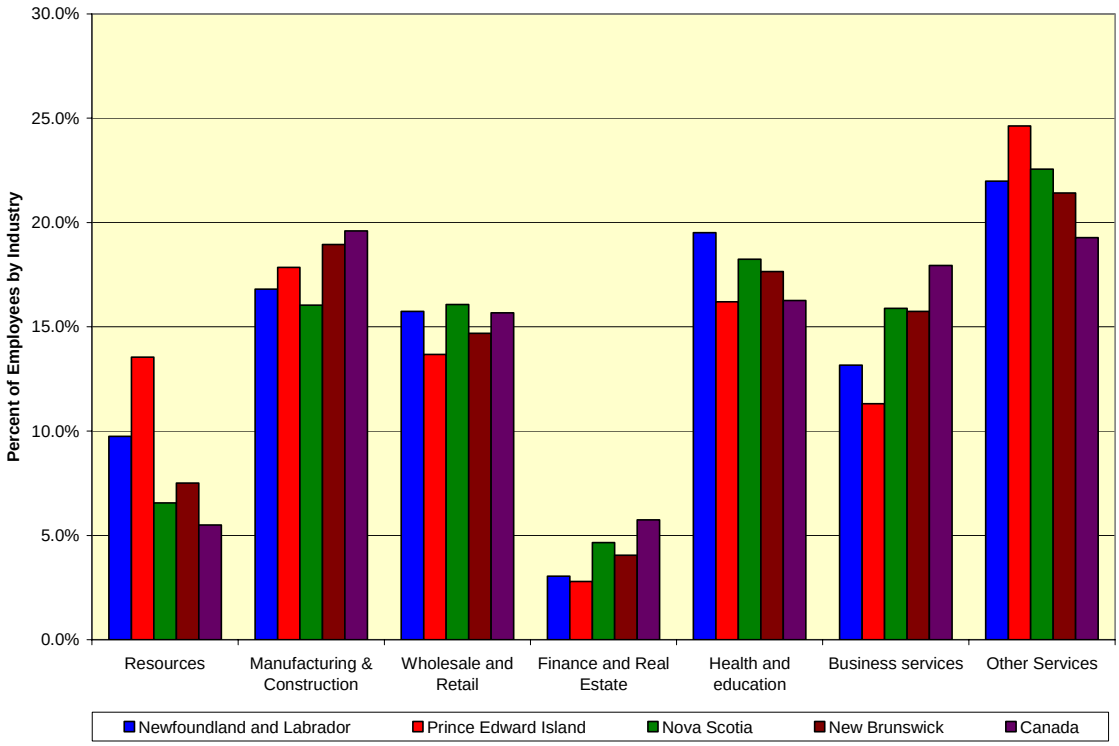


Figure 17: Composition of Labour Force by Occupation – the Atlantic Provinces and Canada - 2001

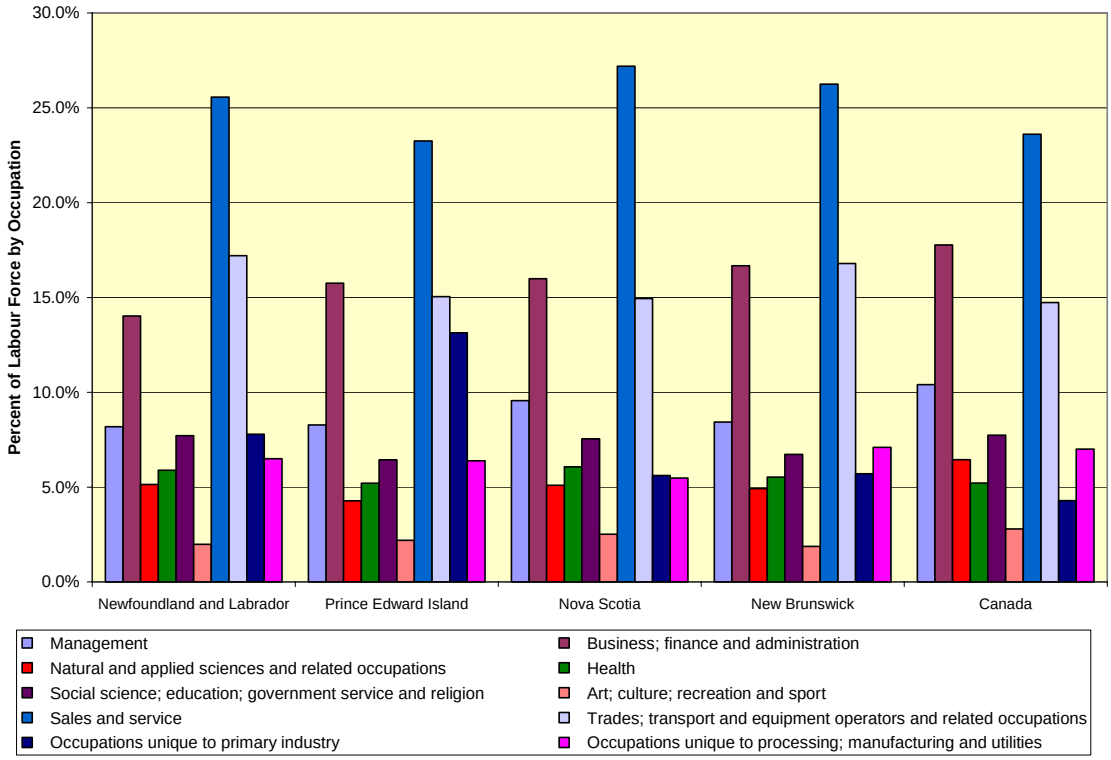
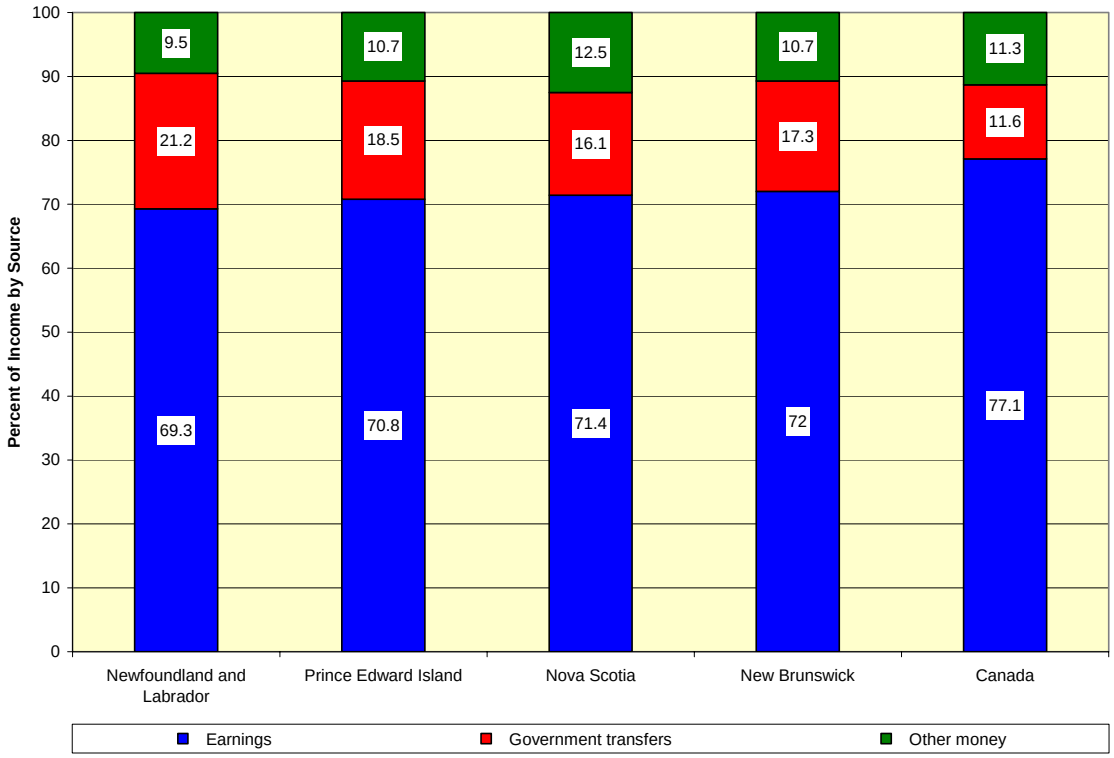


Figure 18: Composition of Income by Source – Atlantic Provinces & Canada – 2001



Figures 19 – 21 provide indicators of both the relative importance of R&D in Atlantic Canada and Canada and the importance of the R&D performed by each sector, those being — the educational sector, the business sector, the federal government sector and the provincial sector. The amount of R&D performed in Atlantic Canada relative to the size of the economy, an indicator of an area's research intensity, was about 1.1% of GDP in 2002 (the last year for which provincial data are available). For Canada as whole, this number was 1.9%, representing a significant difference. Interestingly, in 1988, the level of R&D relative to GDP was very similar in Atlantic Canada (1.4%) and Canada (1.5%). Yet, the relative importance of R&D has grown in Canada since that time and it has decreased in relative size in Atlantic Canada over the same time period.

Research and development performed by the business sector is more likely to be commercialized and translate into new products or processes that will generate innovation and improve productivity. However, as the data presented in Figure 20 illustrates, business expenditures on R&D in Atlantic Canada as a share of GDP are significantly lower than in Canada as a whole, and there is a widening gap in performance on this indicator.

Figure 19: Total R&D Expenditure as a Percent of GDP

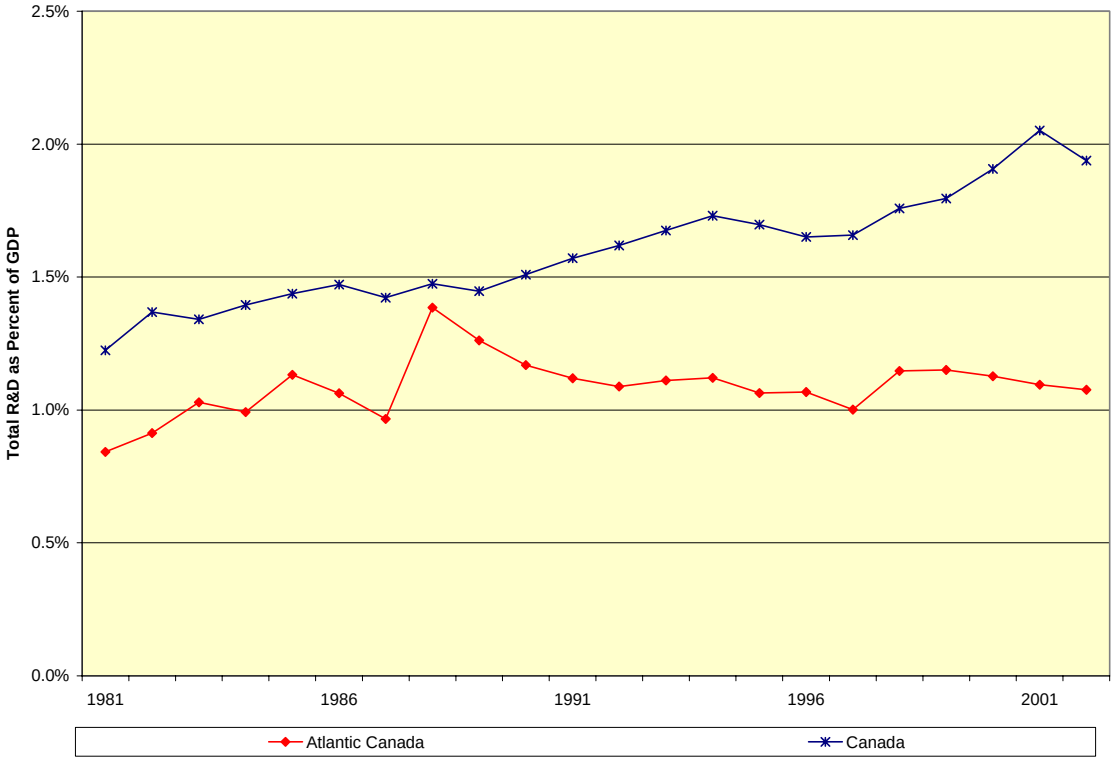


Figure 20: Business Sector R&D Expenditure as a Percent of GDP

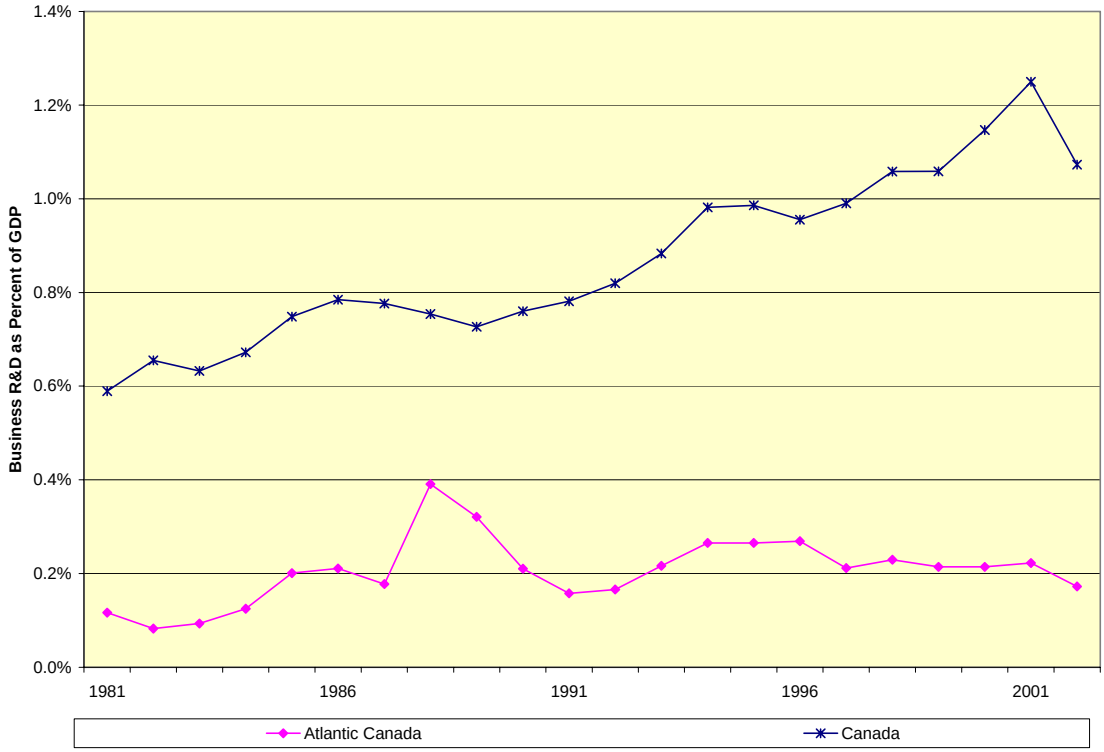
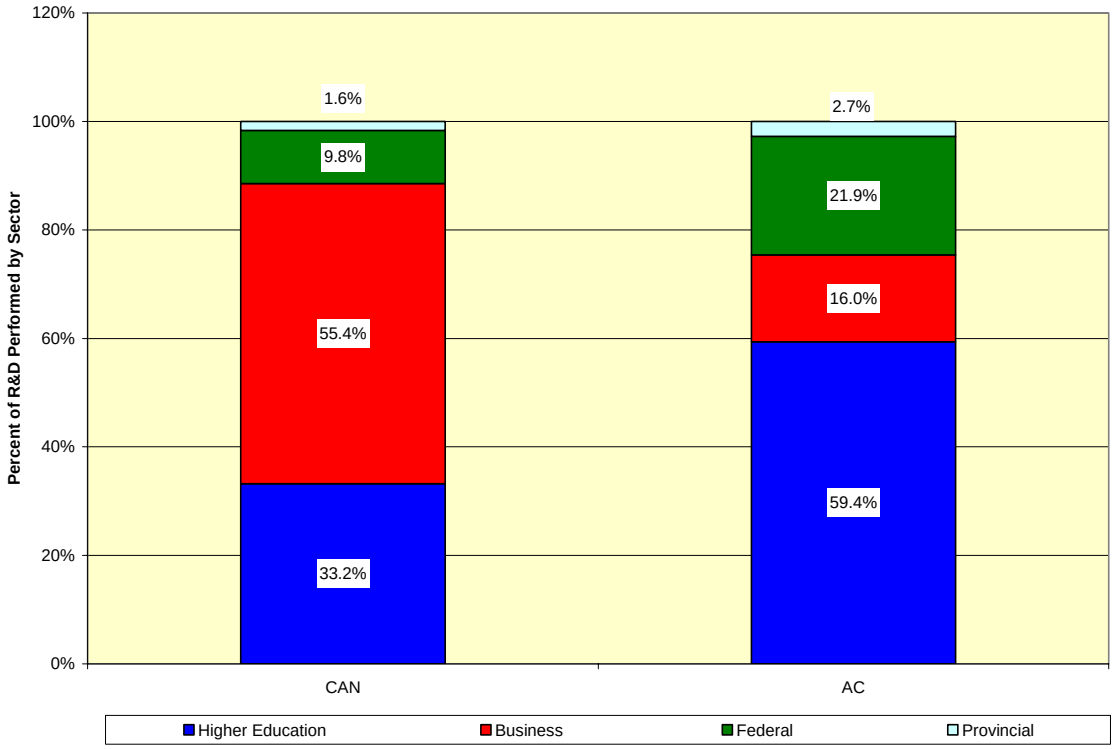


Figure 21: R&D Performed by Sector in 2002 – Canada and Atlantic Canada



This is corroborated in the next figure which illustrates that the business sector is responsible for 55% of the R&D performed in Canada, but only 16% in Atlantic Canada. In contrast, the education sector accounts for 63% of the R&D performed in Atlantic Canada, compared to 33% for Canada. The lack of business investment in R&D helps to explain the differences in productivity performance that are observed between Atlantic Canada and the rest of Canada. However, it also highlights the relative importance of building research capacity within higher education institutions as a conduit for innovative ideas and processes throughout the economy in Atlantic Canada.

5. Governance Structure

As noted above, there are two levels of independent government recognized explicitly in and guaranteed under the Constitution of Canada, those being — the federal government (Government of Canada) and the 10 provincial governments. While there are three territorial governments and thousands of municipal governments also operating within Canada, they operate through the Constitution authority of the federal government in the case of the territorial governments and through the authority and responsibilities granted them by the provinces and territories in the case of the municipalities.

There is no hierarchical relationship between the central and sub-central governments within Canada. Instead, the federal and provincial governments are independent of each

other and their existence is guaranteed within the Constitution.[13] Furthermore, the Canadian Constitution specifies that the federal government has paramount authority, or paramouncy, in the regulation of trade and commerce, national defence, foreign affairs, criminal law, public debt and property, and employment insurance, while the provincial governments have paramouncy in the areas of education, health, social assistance, civil and property law and the administration of justice, municipal affairs, licensing, and management of public lands and non-renewable natural resources, forestry, property and civil rights within the province and other matters of a "local nature." In addition, there are four areas where there is concurrency or both levels of government share responsibility. These include: 1) exporting non-renewable natural resources, forestry resources and electrical energy; 2) old age pensions and benefits; 3) agriculture; and 4) immigration.[14] Finally, Section 36 of the Constitution commits both levels of government to "furthering economic development to reduce disparities in opportunities."

The commitment of both levels of government to facilitating economic development, at least in principle, has direct implications for the current study. Specifically, both levels of government have an interest in facilitating the ability of higher education institutions to contribute to the goal of economic development broadly defined.

Another governance point worthy of note is that while education is distinctly a provincial responsibility under the Constitution, the federal government does transfer money indirectly to fund post-secondary education. This includes transfers under the Canada Social Transfers, resources provided through the federal government's $1 billion *Post-Secondary Education Infrastructure Trust* to fund university and college infrastructure and equipment needs, monies provided to the research granting councils and other types of funding such as the Millennium Scholars. Finally, given the focus of this report and the comparison of Canada in a broader international context, it is important to recognize that there is no federal or national department of education that would be found in other countries participating in this study.

[13] For good description of the constitutional relationships that exist within Canada, please refer to: Boadway, R. and Watts, R. (2000), Fiscal Federalism in Canada, Institute of Intergovernmental Relations, Queen's University, Kingston, Ontario.

[14] While there is joint responsibility for immigration, the federal laws take precedence should there be a conflict between legislation enacted by both levels of government.

Chapter 3: CHARACTERISTICS OF THE HIGHER EDUCATION SYSTEM

1. Overview of the national system of higher education[15]

The higher education system in Canada consists of universities and community and technical colleges. Universities are degree-granting institutions while community colleges offer both academic and vocationally-oriented programs of study leading to certificates and diplomas. The Council of Ministers of Education, Canada (CMEC) reports that Canada has 157 public universities and degree-granting institutions and over 175 recognized public colleges and institutions.[16] However, the umbrella organizations for universities and for community colleges report a slightly lower number for their membership. According to these organizations, there are currently 90 universities and colleges which are members of the Association of Universities and Colleges of Canada (AUCC)[17] and 150 community or technical colleges as members of the Association of Canadian Community Colleges (ACCC).[18] As Table 1 indicates, there were 990,000 students enrolled in Canada's university system in 2003-04, which, as indicated in a recent CMEC report, exceeded one million in 2004-05. As well, in a report commissioned by the Association of Canadian Community Colleges, it is suggested that there were approximately 1.5 million students enrolled in credit (one million) and non-credit (0.5 million) courses in Canada's community colleges and technical institutes.[19] The CMEC provides a lower estimate of the students enrolled in community colleges. In 2003, they report there were 736,000 full-time and part-time students enrolled in community colleges.[20]

As noted previously, there is no federal government department charged with overseeing education on a national basis. In response to this constitutional void, the CMEC was created in 1967 to act as the national voice for education in Canada and to represent Canada's position internationally with respect to post-secondary educational issues. The CMEC consists of Ministers of Education from the 10 provinces and three territories. This organization has created a forum through which common interests can be discussed. As well, this body publishes reports on the state of post-secondary education in Canada, medium-term estimates of changes in demand, and assessment of the capacity of the post-

[15] A good overview of Canada's educational system can be found at the Council of Ministers of Education, Canada's website: http://www.educationcanada.cmec.ca/EN/EDSys/over.php. Another excellent overview of Canada's post-secondary education system can be found at the Canadian Information Centre for International Credentials' (cicic) website: http://www.cicic.ca/en/page.aspx?sortcode=2.12.21.
[16] Council of Ministers of Education, Canada (2005), Education in Canada, http://www.cmec.ca/international/educationcanada.en.pdf, p5.
[17] The AUCC website at http://www.aucc.ca/can_uni/general_info/overview_e.html.
[18] Robison, M.H. and Christophersen, K.A. (2006), The Economic Contribution of Canada's Community Colleges and Technical Institutes: An Analysis of Investment Effectiveness and Economic Growth, A report prepared for the Association of Canadian Community Colleges, February 13, 2006, p.1.
[19] Robison, M.H. and Christophersen, K.A. (2006), The Economic Contribution of Canada's Community Colleges and Technical Institutes: An Analysis of Investment Effectiveness and Economic Growth, A report prepared for the Association of Canadian Community Colleges, February 13, 2006, p.1.
[20] CMEC (2005, p.5).

secondary institutions to handle anticipated changes in demand or supply.[21] For instance, in March 2005 the CMEC released its Post-Secondary Capacity Action Plan.

Table 1: University Enrolments in Canada by Program Level and Instructional Program

	1999-00	2000-01	2001-02	2002-03	2003-04
All programs	**847,500**	**850,575**	**886,605**	**933,865**	**990,385**
Education	66,275	66,120	69,090	71,650	76,335
Visual/performing arts and communications technologies	25,415	26,810	27,810	29,750	30,885
Humanities	119,370	124,255	130,220	137,675	148,820
Social and behavioural sciences and law	132,500	135,185	138,620	148,780	162,275
Business, management and public administration	134,365	136,015	142,650	153,040	170,850
Physical and life sciences and technologies	79,265	79,430	80,865	83,850	92,205
Mathematics, computer and information sciences	41,575	42,680	45,355	45,175	43,720
Architecture, engineering and related technologies	67,435	70,930	76,015	82,285	86,910
Agriculture, natural resources and conservation	16,420	15,340	14,765	14,335	14,445
Health, parks, recreation and fitness	74,855	74,380	80,640	84,765	91,410
Personal, protective and transportation services	375	1,050	1,050	950	1,215
Other instructional programs	89,665	78,380	79,455	81,550	71,260

Source: Statistics Canada: Table 477-0013

In Canada, post-secondary education in each province or territory is the responsibility of the respective provincial or territorial government. The CMEC describes the governance structure associated with Canada's post-secondary education system as follows:[22]

> *Universities are largely autonomous; they set their own admissions standards and degree requirements and have considerable flexibility in the management of their financial affairs and program offerings. Government intervention is generally limited to funding, fee structures, and the introduction of new programs.*
>
> *In colleges, however, government involvement can extend to admissions policies, program approval, curricula, institutional planning, and working conditions. Most colleges have boards of governors, appointed by the provincial or territorial government with representation from the public, students, and instructors. Program planning incorporates input from business, industry, and labour representatives on college advisory committees.*

While the provincial and territorial governments are the primary funding sources for post-secondary institutions within their jurisdictions, other funding sources come from the federal government research contracts, private sector contracts, donations, granting agencies, investments and tuition. In addition, students are funded through the Canada or

[21] For example, the CMEC estimates that 200,000 more students will access Canadian universities in the next ten years in a system that will be supply constrained in terms of instructors and physical infrastructure. CMEC (2005, p.11).
[22] CMEC (2005, p.5).

Quebec student aid programs, provincial loan programs available to student within each province, institutional scholarships and other scholarships.[23] Finally, the federal government also has an indirect role in supporting student education through its provision of tax credits under the Canada Education Savings Grant program and supporting students in college programs for up to three years if they meet certain eligibility requirements under the Employment Insurance Program.

The federal government is also a principal supporter of university research. Moreover, the federal government has established a comprehensive research strategy to position Canada in the forefront of the knowledge-based economy. Components of this strategy include, for example, the Canadian Foundation for Innovation, the 21st Century Chairs of Research Excellence, and the Networks of Centres of Excellence.[24] The federal government further funds university research through the research granting councils, those being the Natural Sciences and Engineering Research Council (NSERC), the Canadian Institutes of Health Research (CIHR), and the Social Sciences and Humanities Research Council (SSHRC).[25]

Canada's post-secondary education system has been expanding. Specifically, the level of university enrollment, as reflected in Tables 1 and 2, has increased by nearly 17% from 1999 to 2003. Enrollments in engineering and business-type programs have been experiencing the fastest growth. Above average growth rates were experienced in humanities, social/law-related and health-related programs. In Canada, the largest enrollment is found in business-related programs, but this is followed closely by social/law-related programs and humanities.

Tables 2 and 3 present data on enrollment by the part-time/full-time status of students across provinces. About three-quarters of students in Canada are enrolled in university on a full-time basis. Although this is fairly consistent across provinces, only 62% of university students in Quebec attend university on a full-time basis. On the other hand, only 37% of community college students in Atlantic Canada are enrolled in full-time study.[26]

Table 4 illustrates 2005 university participation rates for the 18 to 21 age cohort for Canada and each of the provinces.[27] The Atlantic provinces have some of the highest university participation rates in the country, with Nova Scotia leading the country with a 40% participation rate. As well, Newfoundland and Labrador is the second highest in the country, which is both remarkable and encouraging for the province with the lowest personal income levels.

---

[23] This would include approximately $285 million in scholarships and bursaries paid by the federal government under the Canada Millennium Scholarship Foundation. (CMEC (2005, p. 8).

[24] The Canada Research Chairs program and the Network of Centres of Excellence are now over five years old. It is remarkable that no new initiatives are on the horizon.

[25] CICIC (2004), p.10.

[26] However, students who are involved in regular academic programming are typically full-time students.

[27] The data for Quebec and Ontario are for 19 to 22 age cohort and Ontario is adjusted for the double cohort that resulted in the elimination of Grade 13 from their school system in 2003. As well, the data for Atlantic Canada is for 2006.

Table 2: University Enrollment by Registration Status by Province

	1999-00	2000-01	2001-02	2002-03	2003-04
Canada – Total	**847,500**	**850,575**	**886,605**	**933,865**	**990,385**
Full-time student	592,745	606,815	635,015	675,485	735,600
Part-time student	254,755	243,755	251,590	258,380	254,785
Newfoundland and Labrador – Total	**16,280**	**16,140**	**16,275**	**16,905**	**17,550**
Full-time student	13,495	13,465	13,530	13,955	14,445
Part-time student	2,780	2,670	2,750	2,950	3,105
Prince Edward Island – Total	**3,095**	**3,365**	**3,355**	**3,560**	**3,855**
Full-time student	2,610	2,790	2,785	2,950	3,250
Part-time student	485	575	570	610	605
Nova Scotia – Total	**37,605**	**38,815**	**40,575**	**41,895**	**44,765**
Full-time student	29,985	30,895	32,455	33,900	36,235
Part-time student	7,620	7,925	8,120	7,990	8,530
New Brunswick – Total	**22,375**	**23,650**	**24,310**	**24,655**	**25,555**
Full-time student	18,230	19,090	19,600	19,885	21,125
Part-time student	4,145	4,560	4,710	4,765	4,430
Quebec – Total	**237,855**	**233,650**	**240,665**	**250,810**	**260,060**
Full-time student	137,740	139,660	144,190	153,330	161,775
Part-time student	100,115	93,990	96,480	97,480	98,285
Ontario – Total	**312,315**	**320,110**	**335,725**	**360,285**	**394,710**
Full-time student	237,225	242,745	254,400	275,525	313,655
Part-time student	75,090	77,365	81,325	84,760	81,060
Manitoba – Total	**30,695**	**31,940**	**34,145**	**35,160**	**38,045**
Full-time student	20,865	23,350	24,825	25,230	27,845
Part-time student	9,830	8,585	9,320	9,935	10,195
Saskatchewan – Total	**31,450**	**31,480**	**32,095**	**34,255**	**34,560**
Full-time student	23,935	23,875	24,260	25,925	26,480
Part-time student	7,515	7,605	7,830	8,330	8,080
Alberta – Total	**81,550**	**76,340**	**79,130**	**83,445**	**86,300**
Full-time student	55,535	57,995	60,165	62,890	65,035
Part-time student	26,020	18,350	18,965	20,555	21,270
British Columbia – Total	**74,275**	**75,085**	**80,330**	**82,895**	**84,980**
Full-time student	53,120	52,955	58,805	61,900	65,755
Part-time student	21,160	22,130	21,530	20,995	19,230

Source: Statistics Canada: Table 477-0013

Table 3: Community College Enrolment by Province 2005-2006

College	Province	Full-Time Learners	Part-Time and Continuing Ed. Learners
New Brunswick Community College / Collège communautaire du Nouveau-Brunswick	New Brunswick	6,468	15,473
Holland College	Prince Edward Island	1,946	3,597
Nova Scotia Community College	Nova Scotia	8,400	12,600
College of the North Atlantic	Newfoundland and Labrador	7,775	10,287

Source: Atlantic Provinces Community College Consortium

Table 4: 2005 University Participation Rates in the 18 to 21 Age Cohort: Canada and the Provinces

Province	2005	2005 Adjusted
Canada	23.9	23.9
Newfoundland and Labrador	29.6	32.0
Prince Edward Island	23.2	30.4
Nova Scotia	40.3	33.3
New Brunswick	30.2	29.6
Quebec	20.6	19.8
Ontario	29.5	29.6
Manitoba	23.1	20.3
Saskatchewan	21.4	22.0
Alberta	16.3	22.0
British Columbia	15.0	22.0

Source: Association of Universities and Colleges of Canada

The number of degree, diplomas and certificates granted by universities, as indicated in Table 5, has increased from 174,000 in 1999 to over 200,000 in 2003, representing a 16.2% increase over the period. The fastest growing areas were:

- Personal, protective and transportation services - 172%;
- Mathematics, computer and information services – 36.4%;
- Architecture, engineering and related technologies – 35.4%
- Visual and performing arts and communications technologies – 35.3%; and
- Business, management and public administration – 34.3%.

Table 5: University Degrees, Diplomas and Certificates Granted by Program Level and Instructional Program

-	1999	2000	2001	2002	2003
Total, instructional programs	173,575	176,560	178,100	186,155	201,675
Education	22,290	22,540	22,155	23,580	24,930
Visual/performing arts, & communications technologies	5,200	5,375	5,900	5,945	7,035
Humanities	19,590	20,060	19,910	20,650	22,255
Social and behavioural sciences, and law	36,700	36,315	35,835	36,885	38,680
Business, management and public administration	31,630	33,215	35,130	37,955	42,470
Physical and life sciences, and technologies	14,605	14,730	14,820	14,290	14,750
Mathematics, computer and information sciences	7,710	8,450	8,785	9,750	10,515
Architecture, engineering and related technologies	12,800	13,305	13,985	14,970	17,330
Agriculture, natural resources and conservation	3,825	4,010	3,835	3,625	3,795
Health, parks, recreation and fitness	16,920	16,515	16,280	17,225	18,445
Personal, protective and transportation services	90	80	230	195	245
Other instructional program	2,210	1,960	1,235	1,080	1,230

Source: Statistics Canada: Table 477-0014

Information on the revenue and expenditures associated with universities and colleges is provided in Table 6. The university system as a whole received nearly $32 billion in revenue in 2006. Approximately 46% was derived from own sources such as tuition and the sale of goods and services, while almost 45% came from provincial government transfers and 9% was accounted for by transfers from the federal government.[28] As well, Table 5 indicates that universities spent approximately 19% on administration and nearly 4% on support for students.

Table 6: Universities and Colleges Revenues and Expenditures ($ 000)

	2002	2003	2004	2005	2006
Total revenue	**23,262,806**	**25,359,135**	**28,048,472**	**30,390,710**	**31,850,915**
Own source revenue	10,339,207	11,244,357	12,708,921	13,944,883	14,578,584
Sales of goods and services	8,132,232	9,026,491	9,865,103	10,843,777	11,333,439
Tuition fees	4,486,787	5,085,897	5,765,824	6,366,403	6,649,086
Other sales of goods and services	3,645,445	3,940,594	4,099,279	4,477,374	4,684,353
Investment income	396,046	370,231	821,554	900,089	945,312
Other own source revenue	1,810,929	1,847,635	2,022,264	2,201,017	2,299,833
Transfers from other levels of government	12,923,599	14,114,778	15,339,551	16,445,827	17,272,331
Transfers from federal government	1,922,197	2,270,560	2,564,931	2,767,845	2,902,432
Transfers from provincial governments	10,947,140	11,817,345	12,745,152	13,645,770	14,335,434
Transfers from local governments	54,262	26,873	29,468	32,212	34,465
Total expenditures	**23,454,251**	**25,590,341**	**28,050,725**	**30,385,993**	**31,842,146**
Education	22,989,436	25,091,972	27,475,075	29,781,257	31,211,530
Postsecondary education	22,717,330	24,820,214	27,206,559	29,483,800	30,902,499
Administration	4,662,921	4,717,093	5,161,947	5,580,693	5,861,237
Education	11,372,063	12,485,313	13,749,835	14,886,311	15,600,477
Support to students	718,845	818,445	960,656	1,063,972	1,111,258
Other post-secondary education expenses	5,963,501	6,799,363	7,334,121	7,952,824	8,329,527
Debt charges	464,815	498,369	575,650	604,736	630,616
Surplus or deficit	**-191,445**	**-231,206**	**-2,253**	**4,718**	**8,769**

Source: Statistics Canada: Table 385-0007

Revenues in support of vocational training in 2001-02 are displayed in Table 7. The level of support for vocational training was just shy of $9 billion in that year. The provincial governments contributed about 39% of the revenues needed for vocational training and the federal government supported about 25% of vocational training. Student fees accounted for approximately 27% for vocational revenues. Interestingly, the contribution of student fees to vocational training exceeded the 21% of university revenues that came from tuition. As well, the direct contribution of the federal government to vocational training revenues exceeded its direct contribution to university revenue by a significant margin. This difference in federal contributions can be attributed to the fact that college

[28] In addition, the federal government provides monies to provincial governments under the Canada Social transfers, which, while not conditional, is meant to help with the provinces' funding of post-secondary education.

students who meet the eligibility requirements can access federal Employment Insurance Program funding.

Table 7: Vocational Training Revenues – 2001-02 ($ Millions)

	Canada	N.L.	P.E.I.	N.S.	N.B.
Total, all sources	**8,916.10**	**242.9**	**47.7**	**204.7**	**402.8**
Governmental sources	5,737.40	178.8	30.2	123.2	336.8
Federal government	2,227.30	95.3	21.3	95.9	159.2
Provincial governments	3,508.70	83.5	8.9	27.3	177.5
Municipal government	1.5	0.1	0	0	0
Student fees[1]	2,381.80	51.4	9.8	70.2	57.9
Other sources[2]	796.9	12.7	7.6	11.3	8.2

Source: Statistics Canada: Table 478-0005
1. Includes all mandatory student fees for credit and non-credit courses paid by, or on behalf of, all full-time and part-time students
2. Bequests, Donations and non-Government grants, Investment income, Auxiliary Enterprises (Gross), Borrowings, Miscellaneous Interfund Transfer.

2. Regional dimension 'inside' the national higher education policy

As indicated previously, education is exclusively a provincial responsibility under the Canadian constitution. As such, the question about the regional dimension of national higher education policy does not have the same interpretation in Canada as its does in other countries participating in this study. In the Canadian context, national education policy is really an amalgamation of the common interests across education policy in each province. Nonetheless, the federal government does have a role to play in terms of funding research, providing financial support for students, and via the indirect funding of post-secondary education through programs such as the Canada Social Transfer.

For most of Atlantic Canada's universities and community colleges, there is a clear and explicit recognition of the importance of service to the community for their institutions. Specifically, an examination of the mandates, mission statements and strategic priorities of Atlantic Canadian Higher Education Institutions (HEIs) reveals that all of the 17 universities surveyed and all four community colleges report that local, provincial or regional service is part of their mandate, mission and/or strategic direction.

By way of illustration, part of Cape Breton University's mandate emphasizes *"partnerships with the people, cultures, and communities of Cape Breton and expanding connections to the wider global community, its peoples and cultures."* Memorial University articulates the role of service to the community through its mission statement, which includes the following statement: "*Memorial University recognizes a special obligation to educate the citizens of Newfoundland and Labrador, to undertake research on the challenges this province faces and to share its expertise with the community."* It is also the case for l'Université de Moncton that its service to the Acadian community is explicitly recognized. Its mission statement is: "*The Université de Moncton is … recognized in Acadie and in the Francophone world for the excellence of its teaching and*

its research and contribution to the development of Acadian society and society as a whole." Similarly, the University of New Brunswick's mission statement specifies the university's role as "*to serve as a source of information and expertise to help society understand and deal with the major issues and opportunities of our time.*" This is reinforced further in it strategic plan with a commitment to promote "*UNB's fundamental role in the economic, social and cultural well-being of the Province and Atlantic Canada.*" Likewise, the University of Prince Edward Island's mission is: "*to offer service for the benefit of our Island and beyond,*" while St. Thomas University considers its mission is to interact "*with the community beyond the campus.*" Saint Mary's mission statement, on the other hand, specifies that it is "*to serve the community from the local to the international level,*" and Mount Saint Vincent University's mission includes service to the community. In a similar vein, one of Acadia University's strategic priorities is to build community partnerships and collaboration.

Not surprisingly, the community college systems in each province also have similar goals in terms of service to the community. For instance, the Nova Scotia Community College (NSCC) indicates that "*connecting with communities*" is one of its strategic priorities, while Holland College's mission suggests that their efforts are directed at meeting or exceeding "*the needs of learners, industry/business in our community.*"

When asked to specify the focus of their regional engagement, all of the HEIs responding to this question report, as shown in Table 8, that their focus has been local or provincial. Furthermore, the majority of respondents also indicate that their regional engagement focus also includes Atlantic Canada. The priority focus for regional engagement of Atlantic Canada HEIs has been directed to the province in which the institution is located. However, there is also a significant engagement directed at the local community in which the HEI operates. As well, five universities (University of New Brunswick, Mount Allison University, St. Francis Xavier University, Nova Scotia Agriculture College and Acadia University) list Atlantic Canadian engagement as their priority focus, but three of these universities also report that their focus has changed recently to be more regional in scope. Another interesting illustration of local and provincial engagement is provided by the Université de Moncton. It is the only university in the region with three large campuses that are located in New Brunswick's three main French-speaking regions, namely in the Southeast (Moncton), the Northwest (Edmunston) and the Northeast (Shippagan).

It is clear that Atlantic Canadian universities and community colleges have a commitment to local/provincial/regional engagement broadly defined. Interestingly, as revealed in Table 9, this engagement is more voluntary than imposed, at least for universities. For instance, all four community colleges and three of the universities report that local/provincial engagement is imposed upon them, while all other universities indicate that it is expected that some of their resources be directed to regional engagement. Even though there is an expectation of regional engagement, there does not appear to be any specific funding that requires regional engagement. Rather, Atlantic Canadian universities report that because they are publicly funded, there is a general expectation that local or provincial engagement would be one of the activities in which these

institutions participate. In particular, Mount Allison University emphasizes that "the New Brunswick Innovation Agenda prioritizes education, the development of clusters of expertise, economic development and regional engagement. Universities in New Brunswick, through their teaching and research, contribute extensively to the successful implementation of this agenda.

Table 8: Regional Engagement Focus of Atlantic Canada's Post-Secondary Institutions

Institution	Local	Provincial	Regional	Priority	Focus Changed
Memorial University	Yes	Yes	Yes	Provincial	No
University of Prince Edward Island	Yes	Yes	Yes	Provincial	No
Université Sainte Anne	Yes	Yes	Yes	Provincial	No
Acadia University	Yes	Yes	Yes	Regional	Yes
Atlantic School of Theology	Yes	Yes	Yes	Equal	No
Cape Breton University	Yes	Yes	Yes	Local	No
Dalhousie University	Yes	Yes	Yes	Provincial	No
University of King's College	Yes			Local	No
Mount St. Vincent University	Yes	Yes	Yes	Provincial	No
Saint Mary's University	Yes	Yes	Yes	Provincial	No
St. Francis Xavier University	Yes	Yes	Yes	Regional	Yes
Nova Scotia Agricultural College	Yes	Yes	Yes	Regional	No
Nova Scotia College of Art & Design	Yes	Yes	Yes	Provincial	Yes
Mount Allison University	Yes	Yes	Yes	Regional	No
St. Thomas University	Yes	Yes	Yes	Local	No
Université de Moncton	Yes	Yes	Yes	Provincial	Yes
University of New Brunswick	Yes	Yes	Yes	Regional	Yes
College of North Atlantic (17 campuses)	Yes	Yes	Yes	Local/Prov.	Yes
Holland College (11 campuses)	Yes	Yes	Yes	Provincial	No
Nova Scotia Community College (13 campuses)	Yes	Yes	Yes	Local/Prov.	No
New Brunswick Community College (11 campuses)	Yes	Yes	Yes	Local/Prov.	No

Source: Self-Selection Survey

The difference between the community colleges and universities in terms of expected or imposed regional engagement is reflective of the difference in governance and autonomy described above for universities and community colleges. In fact, the difference between expected and imposed regional engagement may not be relevant if universities actually meet these expectations through their policies and practices.

Given the emphasis, through expectations or formal requirements, on local/provincial/regional engagement, the need to be internationally competitive and the pursuit of academic excellence, the possibility exists that there may not be perfect consistency between these objectives. Although most universities report that there is no conflict, emphasizing that quality and international competitiveness are the only path to economic or academic success, some universities report the existence of policy tensions between the regional/provincial/local engagement and the need for international excellence. For some universities, it has been difficult to achieve the correct balance between the two, while, surprisingly, other universities suggest that international

competitiveness and academic quality are complementary with their ability to participate effectively in regional/provincial/local engagement. Furthermore, some universities attempt to maintain this balance through its hiring practices and through the provision of funds for community-based projects.

Table 9: Atlantic Canada's Post-Secondary Institutions by Whether Regional Engagement has been Imposed or Expected by Government

Institution	Engagement Imposed	Engagement Expected
Memorial University	No	Yes
University of Prince Edward Island	No	Yes
Université Sainte Anne	No	Yes
Acadia University	No	Yes
Atlantic School of Theology	No	Yes
Cape Breton University	Yes	
Dalhousie University	No	Yes
University of King's College	No	Yes
Mount St. Vincent University	No	Yes
Saint Mary's University	No	Yes
St. Francis Xavier University	Yes	
Nova Scotia Agricultural College	Yes	
Nova Scotia College of Art & Design	No	Yes
Mount Allison University	No	Yes
St. Thomas University	No	Yes
Université de Moncton	No	Yes
University of New Brunswick	No	Yes
College of North Atlantic (17 campuses)	Yes	
Holland College (11 campuses)	Yes	
Nova Scotia Community College (13 campuses)	Yes	
New Brunswick Community College (11 campuses)	Yes	

Source: Self-Selection Survey

Community colleges recognize that they need to be global in their thinking, expose their students to local applications of state-of-the-art innovative research, and to be internationally competitive in terms of the education received by their students. They also acknowledge that this may conflict with need for provincial/local engagement, which, in turn, may generate tensions within the institution. A concern expressed in this regard is that to meet local needs, which is the raison d'être for the community college systems, they must have many campuses spread throughout the province in which they operate. Consequently, operational efficiencies may suffer unless they can be internationally competitive and attract out-of-province students to maintain the critical mass required to efficiently deliver their programs. The concern, as such, is that the focus of the institutions may get spread too thin and the quality assurance procedure required to ensure that students get relevant world-class education might not be maintainable or effective in the longer term. Yet, for the most part, the local needs for the community colleges trump the international agenda when there is a conflict.

3. Regional higher education system and governance

For the purposes of this study, the higher education system in Atlantic Canada consists of 17 universities which are members of the Association of Atlantic Universities (AAU) and four community colleges with 50 campuses and additional learning centers that are members of the Atlantic Provinces Community College Consortium (APCCC). The location of HEIs in Atlantic Canada is illustrated with Table 10 and Map 2.

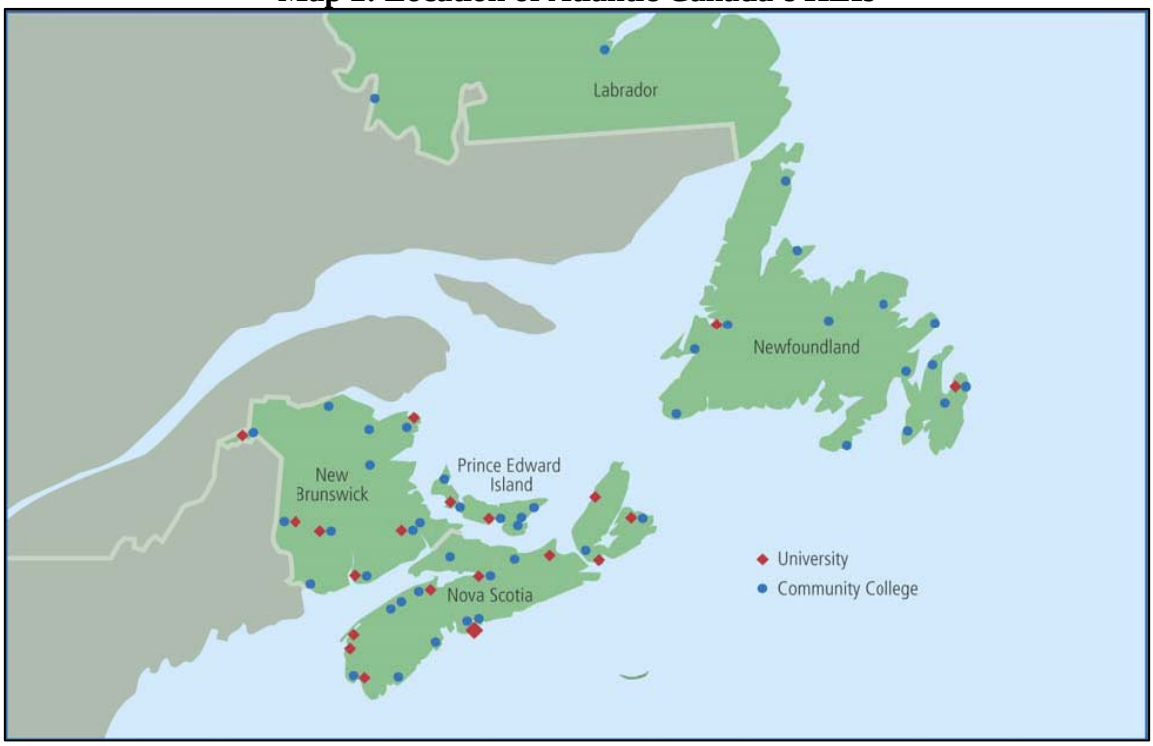
Table 10: Location and Year of Establishment for Atlantic Canadian Universities and Community Colleges

Institution	Main Campus	Year Established	Enrollment 2004
Atlantic Canada – Combined			153,091
Memorial University	St. John's, NL	1949	18,325
University of Prince Edward Island	Charlottetown, PEI	1969	4,049
Université Sainte Anne	Church Point, NS	1890	518
Acadia University	Wolfville, NS	1838	4,134
Atlantic School of Theology	Halifax, NS	1971	148
Cape Breton University	Sydney, NS	1982	3,584
Dalhousie University	Halifax, NS	1818	15,814
University of King's College	Halifax, NS	1789	1,043
Mount St. Vincent University	Halifax, NS	1925	4,592
Saint Mary's University	Halifax, NS	1802	11,975
St. Francis Xavier University	Antigonish, NS	1853	5,271
Nova Scotia Agricultural College	Truro, NS	1805	596
Nova Scotia College of Art & Design	Halifax, NS	1886	949
Mount Allison University	Sackville, NB	1839	2,478
St. Thomas University	Fredericton, NB	1910	3,234
Université de Moncton	Moncton, NB	1963	6,400
University of New Brunswick	Fredericton, NB	1785	12,725
College of North Atlantic (17 campuses)	Stephenville, NL	1996	21,355
Holland College (11 campuses)	Charlottetown, PEI	1970	6,436
Nova Scotia Community College (13 campuses)	Halifax, NS	1988	21,745
New Brunswick Community College (11 campuses)	Fredericton, NB	1973	7,720

Source: Self-Selection Survey but enrollment data for universities taken from the AAU economic impact report.
Note: College of North Atlantic was formed in 1996, but some campuses existed for over 40 years. As well, prior to 1973, several campuses in New Brunswick existed as trade or technical/vocational schools.

The post-secondary education system in Atlantic Canada consists of a mixture of older and more recent institutions, as well as larger and smaller institutions. In 2004, there were 96,000 students enrolled in universities and 57,000 enrolled in community colleges for a total of 153,000 full-time and part-time students. The Department of Education is responsible for post-secondary education in each province, except New Brunswick where the Department of Post-Secondary Education, Training and Labour is responsible for universities and community colleges.

Map 2: Location of Atlantic Canada's HEIs



Post-secondary education system in Newfoundland and Labrador[29]

The public post-secondary education system in Newfoundland and Labrador is composed of Memorial University of Newfoundland and College of the North Atlantic. The university has several campuses, specifically the main campus and the Marine Institute in St. John's; Sir Wilfred Grenfell College in Corner Brook; a residential campus in Harlow, England; and the Institut Frecker on the neighbouring French island of St. Pierre. The College of the North Atlantic has 17 campuses spread throughout the province, with its headquarters located in Stephenville on the west coast of the province.

In addition, the Newfoundland and Labrador Council on Higher Education, a joint initiative involving the Department of Education, Memorial University and the College of the North Atlantic, was established in 1992 to facilitate planning and coordinate activities in the post-secondary sector.

Post-secondary education system in Prince Edward Island[30]

Post-secondary education in Prince Edward Island is delivered through the province's one publicly-funded university, the University of Prince Edward Island, and Holland College, a publicly-funded community college with 11 training centres throughout the province. As well, the University of Prince Edward Island contains the Atlantic Veterinary College,

[29] The following information is taken from http://www.cicic.ca/en/page.aspx?sortcode=2.20.24.27.35.36.

[30] The following information is taken from http://www.cicic.ca/en/page.aspx?sortcode=2.20.24.27.30.31.

and Holland College is home the Atlantic Police Academy which serves all four Atlantic provinces.

Post-secondary education system in Nova Scotia[31]

Post-secondary education in Nova Scotia is delivered through 11 publicly-supported, degree-granting institutions and one province-wide community college, that being the Nova Scotia Community College (NSCC). The university system consists of ten English-language universities — Acadia University, Cape Breton University, Dalhousie University, Mount Saint Vincent University, Saint Mary's University, St. Francis Xavier University, University of King's College, Atlantic School of Theology, NSCAD University, and Nova Scotia Agricultural College and one French-language university — Université Sainte-Anne. The Nova Scotia Community College provides a province-wide system of training and education through its 13 campuses and a number of learning centres.

Post-secondary education system in New Brunswick[32]

Postsecondary education in New Brunswick is delivered through four publicly-funded universities with seven campuses throughout the province; a community college system with 11 campuses, one of which is the New Brunswick College of Craft and Design; and one regional post-secondary institution: the Maritime College of Forest Technology with an English-speaking campus in Fredericton and a French-speaking campus in Bathurst..

The province's post-secondary education system reflects New Brunswick's linguistic duality. The Université de Moncton, with campuses in Moncton, Edmundston and Shippagan, is the largest French-language university in North America outside the province of Quebec, while the other three universities: the University of New Brunswick with campuses in Fredericton and Saint John, St. Thomas University in Fredericton, and Mount Allison University in Sackville are English-speaking. Five of the province's 11 community college campuses offer programming in French, the other six in English.

Atlantic Canada's post-secondary education system

Table 11 indicates that the level of enrollment in Atlantic Canadian universities has increased by 18.4% between 1995 and 2004. Dalhousie University showed the biggest absolute gain with nearly 5,000 more students, which represents a 45% increase. The largest relative increase (70%) was recorded for the NSCAD University which corresponded to a gain of 390 students. Despite the growth in university enrollment, several universities experienced a drop in enrollment. The largest drop was experienced at the Université de Moncton, where enrollment fell by nearly 1,100 students or 14%.

[31] The following information is taken from http://www.cicic.ca/en/page.aspx?sortcode=2.20.24.27.33.34.

[32] The following information is taken from http://www.cicic.ca/en/page.aspx?sortcode=2.20.24.27.36.37.

Table 11: Enrolment for Atlantic Canadian Universities

Institution	Enrolment		
	1995	2004	Change
Atlantic Canada - Combined	80,934	95,835	18.4%
Memorial University	15,673	18,325	17.0%
University of Prince Edward Island	2,856	4,049	42.0%
Université Sainte Anne	365	518	42.0%
Acadia University	4,246	4,134	-2.7%
Atlantic School of Theology	102	148	45.0%
Cape Breton University	3,423	3,584	5.0%
Dalhousie University	10,920	15,814	45.0%
University of King's College	691	1,043	51.0%
Mount St. Vincent University	3,969	4,592	24.0%
Saint Mary's University	9,658	11,975	24.0%
St. Francis Xavier University	3,203	5,271	65.0%
Nova Scotia Agricultural College	616	596	-3.4%
Nova Scotia College of Art & Design	557	949	70.0%
Mount Allison University	2,600	2,478	-4.9%
St. Thomas University	2,234	3,234	45.0%
Université de Moncton	7,483	6,400	-14.0%
University of New Brunswick	12,338	12,725	3.0%

Source: AAU Economic Impact Study

Table 12: Enrolment for Atlantic Canadian Community Colleges*

Program/Institution	2004/05		1999/00**	
	Full-time	Part-time	Full-time	Part-time
Holland College				
Advanced diplomas programs	45	1	53	
Two-year diplomas programs	1,291	120	1,249	
One-year certificate programs	554	51	632	
Apprenticeship programs	433	335	312	
Other community college courses	557	3,049	592	
Nova Scotia Community College				
Advanced diplomas programs	174	2	192	0
Two-year diplomas programs	4,079	323	2,405	123
One-year certificate programs	3,654	263	4,450	218
Apprenticeship programs	0	1,850	0	920
Other community college courses	400	11,000	150	8,000
New Brunswick Community College				
Advanced diplomas programs				
Two-year diplomas programs	4,000	120	4,200	120
One-year certificate programs	2,000	50	2,100	50
Apprenticeship programs		2,500		2,500
Other community college courses	800	50	800	50

College of the North Atlantic				
Regular	5,949	407	6,909	625
General studies/dist learning	192	645	7	459
Contract/open learning	1,014	8	1,075	149
Apprenticeship	845	2	730	
Correspondence/distance		72	85	72
Continuing education	8,382***		14,474	

**The data in this table reflects the autonomous way in which each institutions captures and reports on its data. As a result direct comparisons are difficult to achieve.*
******* A change in accounting for part-time students makes comparisons to 99/00 irrelevant.*
**** No distinction given between full- and part-time continuing education students at CNA.*

Table 13: Select Statistics for Atlantic Canadian Community Colleges

	2004/05	**1999/00***
Holland College		
The percentage of your student body from within the province	60%	60%
The percentage of your student body from within Atlantic Canada	99%	99%
The level of full-time faculty	85%	
Percentage of full-time faculty which are female	40%	
The level of part-time faculty	15%	
Percentage of part-time faculty which are female	45%	
The level of full-time staff	95%	
Percentage of full-time staff which are female	60%	
The level of part-time staff	5%	
Percentage of part-time staff which are female	50%	
Nova Scotia Community College System		
The percentage of your student body from within the province	96%	98%
The percentage of your student body from within Atlantic Canada	98%	99%
The level of full-time faculty	610	533
Percentage of full-time faculty which are female	36%	
The level of part-time faculty	108	250
Percentage of part-time faculty which are female	48%	
The level of full-time staff	650	466
Percentage of full-time staff which are female	57%	
The level of part-time staff	242	235
Percentage of part-time staff which are female	70%	
New Brunswick Community College System		
The percentage of your student body from within the province	95%	95%
The percentage of your student body from within Atlantic Canada	97%	97%
The level of full-time faculty	800	800
Percentage of full-time faculty which are female	37%	36%
The level of part-time faculty	350	350
Percentage of part-time faculty which are female	76%	91%
The level of full-time staff	700	700
Percentage of full-time staff which are female	54%	50%
The level of part-time staff	150	150
Percentage of part-time staff which are female	64%	53%

	2004/05	1999/00*
College of the North Atlantic		
The percentage of your student body from within the province**	97%	N/A
The percentage of your student body from within Atlantic Canada**	98%	N/A
The level of full-time faculty***	817	643
Percentage of full-time faculty which are female***	39%	N/A
The level of part-time faculty***	N/A	N/A
Percentage of part-time faculty which are female***	N/A	N/A
The level of full-time staff***	590	474
Percentage of full-time staff which are female***	57 %	N/A
The level of part-time staff***	378	N/A
Percentage of part-time staff which are female***	N/A	N/A

** CNA excludes Qatar campus*
*** Data based on September 2006 enrolments*
**** Data based on 2005-2006 information*

Table 14 profiles enrollment at Atlantic Canadian universities by program and by type of degree. Enrollments for all types of degrees have been increasing from 1999 to 2004. While undergraduate enrollment has increased by nearly 12%, enrollment in graduate degrees has increased by 36%. The largest area of undergraduate enrollment growth was in the area of health, with engineering accounting for the largest growth in graduate enrollment.

Table 14: Enrollment by Program and Type of Degree – 1999 and 2004

	Bachelor's/First Degree	Masters	Ph.D.	Bachelor's/First Degree	Masters	Ph.D.
	1999			2004		
Atlantic Canada – Reporting Universities[1]						
All Programs	**75,195**	**6,364**	**521**	**83,874**	**8,680**	**712**
Humanities	9,211	268	130	11,571	328	82
Social Sciences	9,997	540	86	12,020	692	142
Education	3,873	1,173	6	5,667	1,585	34
Mathematics & Physical Sciences	7,701	574	71	8,000	868	117
Agriculture & Biological Science	3,232	200	78	3,790	235	87
Health Professional & Occupations	4,988	1,055	31	7,340	1,376	48
Engineering & Applied Science	7,989	678	104	7,528	1,294	149
Commerce, Management & Admin	12,845	1,514	0	12,702	1,794	23
Other University Enrollment	15,359	362	15	15,256	508	30

Source: Self-Selection Survey
1. Completed surveys were not received from the following universities: Université Sainte Anne, University of King's College, St, Francis Xavier University, and Nova Scotia Agriculture College.

Table 15 illustrates the degree awarded by level and by university. Overall, Atlantic universities awarded nearly 14,000 undergraduate degrees in 2004, up 31% from 1995.

As well, they awarded approximately 3,600 graduate degrees, representing a 69% increase over 1995.

Table 15: Degrees Awarded by Atlantic Canadian Universities

Institution	Degrees Award 1995		Degrees Award 2004		Change in Degrees Award 1995-2004	
	Undergraduate	Graduate/ Professional	Undergraduate	Graduate/ Professional	Undergraduate	Graduate/ Professional
Atlantic Canada - Combined	10,603	2,114	13,907	3,566	31.2%	68.7%
Memorial University	2,197	340	2,294	579	4.4%	70.3%
University of Prince Edward Island	453	55	533	91	17.7%	65.0%
Université Sainte Anne	54		45		-16.7%	
Acadia University	796	111	960	123	20.6%	10.8%
Atlantic School of Theology	1	13		13		0%
Cape Breton University	356		578		62.4%	
Dalhousie University	1,761	778	2,116	1,248	20.2%	60.4%
University of King's College	176		186		5.7%	
Mount St. Vincent University			587	469		
Saint Mary's University	972	234	1,200	259	23.5%	11.0%
St. Francis Xavier University	840	62	1,008	123		
Nova Scotia Agricultural College	73	3	63	7	-13.7%	133.3%
Nova Scotia College of Art & Design	156	8	197	11	26.3%	37.5%
Mount Allison University	458	4	481	1	5.0%	-75.0%
St. Thomas University	368		571		55.2%	
Université de Moncton	1,088	142	945	169	-13.1%	19.0%
University of New Brunswick	1,681	439	2,130	486	26.7%	10.7%

Source: AAU Economic Impact Study

As Table 16 illustrates, the majority of students that attend universities in Atlantic Canada come from within the province where the university is located. However, there are a number of exceptions to this pattern. For instance, only 35% of students who attend Mount Allison University come from New Brunswick; another 35% come from within Atlantic Canada; 23% of the students come from elsewhere in Canada; and 6% of its students are international. Acadia University (18%), Saint Mary's University (15%) and the University of New Brunswick (12%) attract significant shares of their students from international sources.

As Table 17 indicates, students attending Atlantic Canadian universities get integrated into the community as a result of the majority of them staying off campus.

Table 16: Origin of Students Enrolled in Atlantic Canadian Universities

Institution	Origin of Students Enrolled in Institution - 2004			
	Within Province	Rest of Region	Rest of Country	International
Memorial University	87.0%	5.0%	5.0%	4.0%
University of Prince Edward Island	81.0%	11.0%	4.0%	4.0%
Université Sainte Anne	70.0%	20.0%	5.0%	5.0%
Acadia University	45.0%	10.0%	26.0%	18.0%
Atlantic School of Theology	55.0%	10.0%	25.0%	10.0%
Cape Breton University	83.0%	5.0%	5.0%	7.0%
Dalhousie University	49.0%	13.0%	28.0%	8.0%
University of King's College	42.0%	7.0%	47.0%	4.0%
Mount St. Vincent University	75.0%	8.0%	5.0%	10.0%
Saint Mary's University	71.0%	8.0%	6.0%	15.0%
St. Francis Xavier University	64.0%	15.0%	21.0%	0.0%
Nova Scotia Agricultural College	71.0%	21.0%	4.0%	4.0%
Nova Scotia College of Art & Design	50.0%	8.0%	35.0%	7.0%
Mount Allison University	35.0%	35.0%	23.0%	6.0%
St. Thomas University	70.0%	21.0%	4.0%	5.0%
Université de Moncton	89.0%	2.0%	4.0%	5.0%
University of New Brunswick	68.0%	11.0%	8.0%	12.0%

Source: AAU Economic Impact Study

Table 17: Enrolment for Atlantic Canadian Universities

Institution	Student Accommodation – 2004	
	On-campus	Off-campus
Memorial University	13.0%	87.0%
University of Prince Edward Island	11.0%	89.0%
Université Sainte Anne	50.0%	50.0%
Acadia University	37.0%	63.0%
Atlantic School of Theology	10.0%	90.0%
Cape Breton University		
Dalhousie University	17.0%	83.0%
University of King's College	25.0%	75.0%
Mount St. Vincent University	8.0%	92.0%
Saint Mary's University	12.0%	88.0%
St. Francis Xavier University	42.0%	58.0%
Nova Scotia Agricultural College	32.0%	68.0%
Nova Scotia College of Art & Design	0.0%	100.0%
Mount Allison University	44.0%	56.0%
St. Thomas University	25.0%	75.0%
Université de Moncton	13.0%	87.0%
University of New Brunswick	20.0%	80.0%

Source: AAU Economic Impact Study

Seventeen percent of students who attend Atlantic Canadian universities do so part-time, as noted in Table 18. While this is fairly consistent across universities within Atlantic

Canada, there are several exceptions. For example, 47% and 46% of students attend the Atlantic School of Theology and Mount Saint Vincent University, respectively, on a part-time, while only 3% of students at the University of King's College are part-time.

Table 18: Part-time versus Full-time 2005 Enrolment for Atlantic Canadian Universities

Institution	Enrollment Status	
	Full-time	Part-time
Atlantic Canada - Combined	**83.0%**	**17.0%**
Memorial University of Newfoundland	82.4%	17.6%
Dalhousie University	85.9%	14.1%
University of New Brunswick	87.6%	12.4%
Saint Mary's University	75.6%	24.4%
Université de Moncton	81.1%	18.9%
St. Francis Xavier University	85.9%	14.1%
Mount Saint Vincent University	53.7%	46.3%
Acadia University	91.9%	8.1%
University of Prince Edward Island	85.4%	14.6%
Cape Breton University	81.9%	18.1%
St. Thomas University	91.5%	8.5%
Mount Allison University	88.6%	11.4%
University of King's College	97.1%	2.9%
NSCAD University	81.6%	18.4%
Nova Scotia Agricultural College	87.6%	12.4%
Université Sainte-Anne	78.5%	21.5%
Atlantic School of Theology	52.8%	47.2%

Source: Derived from AAU Economic Impact Study

The balance between teaching, research and service at Atlantic Canadian HEIs is displayed in Table 19. Consistent with most collective agreements in the region, faculty members at universities would normally be expected to allocate about 40% of his/her time to teaching, 40% to research and the remaining 20% to service either to the community or to the institution. Some universities have more of an emphasis on teaching. On the other hand, community college faculty members devote small amounts of their time to research because teaching is their primary responsibility.

Atlantic Canadian universities, as shown in Table 20, spent nearly $1.7 billion in 2004. Approximately 15% of this expenditure on average, or nearly $250 million in total, was directed to research. Some institutions were more research-oriented than others, as reflected by the shares of their expenditures directed at research. The universities that allocated the higher shares of their budgets to research were:

- Dalhousie University, with nearly 25% to research;
- Nova Scotia Agriculture College, with 23% to research;
- Memorial University, with 20% to research;
- University of New Brunswick, with 15% to research; and
- University of Prince Edward Island, with 11% of its budget to research.

Table 19: Balance Between Time Allocated to Research and Teaching in Atlantic Canada's Post-Secondary Institutions

Institution	Research	Teaching	Service
Memorial University	40%	40%	20%
University of Prince Edward Island	40%	40%	20%
Université Sainte Anne	15%	70%	15%
Acadia University	40%	40%	20%
Atlantic School of Theology	30%	40%	30%
Cape Breton University	33%	34%	33%
Dalhousie University	40%	40%	20%
University of King's College	30%	50%	20%
Mount St. Vincent University	50%	50%	0%
Saint Mary's University	40%	40%	20%
St. Francis Xavier University	40%	40%	20%
Nova Scotia Agricultural College	40%	40%	20%
Nova Scotia College of Art & Design	40%	40%	20%
Mount Allison University	40%	40%	20%
St. Thomas University	25%	50%	25%
Université de Moncton *(see note 3)*			
University of New Brunswick	40%	40%	20%
College of North Atlantic		100%[1]	
Holland College	3%	92%	5%
Nova Scotia Community College	10%[2]	90%	0%
New Brunswick Community College	0%	100%	0%

Source: Self-Selection Survey

1. *College of the North Atlantic indicated that it was difficult to estimate but it was not part of the regular teaching load so 100% was assumed.*
2. *Nova Scotia Community College reported that the research split is based on a comparison of the funding to Applied Research compared to the direct resources allocated to teaching college-wide. Teaching and research activities are still mainly isolated from each other, with most of the faculty work devoted primarily to teaching and campus based committee work.*
3. *The collective agreement in the Université de Moncton specifies that a faculty member's responsibility includes teaching, research and community service, but there is no breakdown of the shares to each.*

Table 21 illustrates how universities funded their operations in 2004. Approximately $800 million (47%) came from government grants, $460 million (27%) came from tuition and the $460 million (27%) came from investment, donations and other sources. There is a large variation in the percent of revenue raised by tuition in Atlantic Canadian universities, ranging from 13% to nearly 50%. The following institutions raised a higher share of their revenues from student tuition:

- Saint Mary's University – 49% from tuition;
- Mount Saint Vincent – 47% from tuition;
- University of King's College – 43%;
- Acadia University – 41% from tuition;
- St. Thomas University – 37% from tuition;
- NSCAD University – 37% from tuition;
- Cape Breton University – 35% from tuition; and
- St. Francis Xavier University – 32% from tuition.

Table 20: Institutional Expenditures by Atlantic Canadian Universities

Institution	Institutional Expenditures ($ Millions) - 2004			
	General Operations	Direct Research	Other	Total
Atlantic Canada - Combined	$1,148.1	$247.1	$274.5	$1,669.7
Memorial University	$229.9	$69.9	$44.4	$344.2
University of Prince Edward Island	$63.8	$8.9	$5.3	$78.0
Université Sainte Anne	$14.3	$0.2	$2.4	$16.8
Acadia University	$56.2	$5.3	$16.7	$78.1
Atlantic School of Theology	$2.0	$0.0	$0.3	$2.2
Cape Breton University	$36.0	$3.8	$2.7	$42.5
Dalhousie University	$254.7	$100.4	$50.0	$405.1
University of King's College	$10.0	$0.0	$2.6	$12.6
Mount St. Vincent University	$34.5	$1.2	$8.4	$44.1
Saint Mary's University	$69.6	$3.0	$23.9	$96.4
St. Francis Xavier University	$54.3	$5.5	$18.0	$77.8
Nova Scotia Agricultural College	$16.6	$5.8	$2.5	$24.8
Nova Scotia College of Art & Design	$12.2	$0.0	$0.7	$12.9
Mount Allison University	$28.9	$1.6	$17.1	$47.6
St. Thomas University	$21.0	$0.5	$8.8	$30.3
Université de Moncton	$82.5	$7.9	$37.3	$127.6
University of New Brunswick	$161.8	$33.2	$33.7	$228.8

Source: AAU Economic Impact Study

Table 21: Institutional Revenues by Atlantic Canadian Universities

Institution	Institutional Expenditures ($ Millions) - 2004				
	Government Grants	Tuition	Private & Investment	Other	Total
Atlantic Canada - Combined	$806.2	$464.7	$129.0	$329.2	$1,729.2
Memorial University	$216.3	$52.4	$17.8	$53.8	$340.5
University of Prince Edward Island	$44.9	$20.7	$5.5	$12.3	$83.5
Université Sainte Anne	$10.0	$3.3	$0.1	$4.1	$17.5
Acadia University	$26.1	$34.1	$5.7	$16.5	$82.4
Atlantic School of Theology	$0.8	$0.4	$0.5	$0.6	$2.3
Cape Breton University	$16.4	$15.0	$0.1	$11.7	$43.1
Dalhousie University	$172.7	$103.7	$41.0	$96.9	$414.3
University of King's College	$3.0	$5.4	$1.1	$3.0	$12.5
Mount St. Vincent University	$15.5	$20.5	$1.8	$6.4	$44.0
Saint Mary's University	$28.1	$50.7	$7.8	$16.1	$102.6
St. Francis Xavier University	$27.5	$30.7	$7.0	$31.9	$97.1
Nova Scotia Agricultural College	$17.8	$3.1	$0.0	$3.9	$24.8
Nova Scotia College of Art & Design	$6.9	$4.7	$0.3	$1.0	$12.8
Mount Allison University	$17.2	$14.2	$2.7	$14.8	$49.0
St. Thomas University	$9.7	$12.6	$2.3	$9.2	$33.8
Université de Moncton	$74.3	$25.2	$2.0	$18.4	$120.0
University of New Brunswick	$119.0	$68.1	$33.4	$28.6	$249.1

Source: AAU Economic Impact Study

The universities with relatively less of their revenue raised from student tuition were:

- Nova Scotia Agricultural College - 13% from tuition;
- Memorial University – 15% from tuition;
- Atlantic School of Theology – 17% from tuition; and
- Université Saint Anne – 19% from tuition.

4. Conclusion

Canada's higher education system is governed on a provincial basis as a result of the provinces holding full jurisdiction over the provision of education as entrenched in the Canadian constitution. However, to provide a national voice, the Council of Ministers of Education, Canada (CMEC) meets on a regular basis to deal with issues of common interest. Further to this national voice there are mechanisms within Atlantic Canada that provide a regional voice to institutional engagement in service to the region. This would include for example the Association of Atlantic Universities and the Atlantic Provinces Community College Consortium.

At the regional level, HEI's have a significant presence both in rural and urban regions through 17 universities and the 50 campuses of the four public community colleges. These institutions cater to full and part-time students enrolled in a very wide range of programs leading to levels of certification from advanced degrees, undergraduate degrees, diplomas and certificates. In addition, colleges and universities clearly and explicitly recognize the importance of service to communities, as is captured in mandates, mission statements and strategic directions of many of the institutions surveyed.

Chapter 4: CONTRIBUTION OF RESEARCH TO REGIONAL INNOVATION

1. Responding to regional demands

The relationship between HEIs and their key stakeholders has evolved over time. That interaction and engagement has increased as the institutions and the stakeholders have developed both a better understanding of mutually-beneficial partnerships and clearer parameters and expectations for these interactions.

Given the diversity of post-secondary education institutions involved in this group, it should not be surprising to learn that stakeholder engagement differs across institutions and provinces. The examples below outline the different paths of regional engagement for the region's HEIs.

The first illustration relates to Memorial University. In the 1960s, Memorial University had a community outreach division known as Extension Services. This division had a number of offices located in rural areas throughout the province. By the 1990s, this division was closed and the University's linkages to rural areas were vested in individual faculty members or groups of faculty who had an interest in this activity. By 2004, the University launched the Harris Centre with a mandate to coordinate and facilitate the university's educational, research and outreach activities in the areas of regional policy and development. The University has come full circle, even though the mandate of the two organizations differs.

The University of New Brunswick (UNB) has had a lengthy involvement with a number of stakeholders, including scholarly organizations, research collaborators, research partners, other New Brunswick and Atlantic universities and community colleges, voluntary sector organizations, government departments and agencies, and think tanks. This has come about from a combination of individual initiatives, the need to examine provincial/regional concerns as well as through the initiatives of senior university administrators working through various associations to meet needs identified at the time. The University of New Brunswick's most recent community initiative, "Next NB/Avenir NB," is designed to build linkages among researchers, educators and stakeholders, which will help to strengthen the future economic growth of New Brunswick

The evolution of regional engagement at Mount Allison University is explained by the institution as follows: through internal grants, endowments and strong cultural change on the part of faculty and administration, the institution has moved to recognize and reward involvement at the regional/provincial and community levels. The University President and his executive group have worked at each level to establish the needs and desire of government, community leaders, civic officials and individuals/volunteer groups through advisory committees, working groups and membership in established committees and consultative groups. The current state of affairs involves the sharing of ideas, funded research and expertise, community volunteerism and student-based leadership and community outreach projects and funding programs.

Voluntary associations and government initiatives help to cement the linkages between HEIs and their stakeholders and provide a forum for sharing of ideas. The Department of Education Steering Committee on Postsecondary Education in New Brunswick is comprised of representatives from the four New Brunswick universities, community colleges, regional agencies, and governmental departments and agencies. On a regional basis, the Association of Atlantic Universities (AAU), a voluntary association established in 1964, acts as an advocacy group for the 17 universities in the region to ensure there is public exposure of the universities' role in contributing to the economic prosperity of Atlantic Canada. The Maritime Provinces Higher Education Commission (MPHEC), established in 1974, assists universities in the Maritime region in resource allocation and utilization. The role of the MPHEC has now evolved to include a focus on improving and maintaining service to the university sector in the areas of quality assurance, data and information, cooperation action and regional programs.

Another illustration of how linkages have evolved is found in the experiences of the NSCAD University (NSCAD). For NSCAD, linkages on both a regional and local basis have developed through alumni and the Continuing Studies programs that currently engage 1,500 local residents on an annual basis. Although the level of engagement has been modest, with the University more directed to national rather than local issues, there has been a concerted effort over the past five years to develop stronger collaborative relationships across the province and within the City of Halifax. This includes service on municipal advisory committees, development of the research profile of the University with provincial partners, development of new commercial ventures particularly focused on retail spaces housed within the campus, provision of consulting services related to public art, and the recent establishment of a small satellite residency program in Lunenburg, N.S. As well, links have been established with regional and community arts stakeholders through curriculum development, internships, collaborations, visitors' co-sponsored gallery visits and via partnerships with the Atlantic Filmmakers Cooperative and Halifax Dance.

The community colleges maintain close linkages with their local communities. This is reinforced by the network of campuses spread throughout the provinces in which they operate. Moreover, community outreach has been part of the mandate of community colleges since their inception. How this outreach manifests itself varies slightly by institution, although there are many similarities. For example, Holland College suggests that although the linkages depend tremendously on preferences of the incumbent President, there is outreach through formal government channels, through Chambers of Commerce, Rotary, College membership on community/industry/HEI bodies and committees, and through the use of Advisory Committees for all full-time programs. Similarly, the Nova Scotia Community College system reports that campus principals are involved in community and economic development efforts and customized (contract) training efforts are focused on meeting specific training needs with local employers. On the other hand, the New Brunswick Community Colleges system indicates that it consults relevant stakeholders on local labor force needs and utilizes their participation on curriculum advisory boards.

The research focus and policies of most Atlantic Canadian HEIs incorporate a regional, provincial or local focus. This may take the form of being identified explicitly in the mission statement of the institution or in the objectives of the institution's strategic plan, or it may be evident through the actions of the institution in promoting projects that have involvement with local industry or communities. For some institutions, there are no explicit research policies with regional, provincial or local focus. Instead, this focus is reflected in research practices across the institutions. Several research projects in the Nova Scotia Community College system, for instance, focus on the development of rural communities through capacity-building initiatives. These initiatives include the development of a rural cluster of expertise in geomatics in the Annapolis Valley, flood plain mapping in the town of Oxford, N.S., and assisting Annapolis Valley grape growers in understanding micro-climates through remote sensing and weather data transmission. Similarly, the Office of Applied Research, College of the North Atlantic has focused on projects located at regional campuses that respond to local/provincial needs. Their provincial cluster of partnerships includes in excess of 10 public sector agencies and more than 100 private sector industries.

Selected illustrations of research with a regional, provincial or local focus at Atlantic Canadian universities include: Metropolis Atlantic (a multidisciplinary initiative to which a number of Atlantic universities contribute), which focuses on local immigration issues; the New Brunswick and Atlantic Studies Research and Development Centre at St. Thomas University; the Vaughan Chair in Regional Economics at Fredericton, which examines the economic, political and historical characteristics of Atlantic Canada; and the P.J. Gardner Institute's focus on small business problems in Newfoundland and Labrador.

While the focus of research activities primarily reflects the strengths and interests of the individual researchers, it should be recognized that research activities also draw upon the characteristics of the area in which the institutions are located. For instance, the University of Prince Edward Island has acquired a research specialization in Aquatic Health Sciences (cultivated and wild stock) and in island studies through the Institute for Island Studies, while Acadia University's research initiatives include sustainable ecosystems and estuarine research (through Acadia Centre for Estuarine Research) and research into local populations and communities through the Centre for the Study of Ethnocultural Diversity. At St. Thomas University, on the other hand, the Canada Research Chair (CRC) in Rural Social Justice focuses on the agricultural base of the community and the CRC in Qualitative Analysis performs research related to immigrants in the province. Memorial University's Oil and Gas Development Partnership and the INCO Innovation Centre project are other illustrations of a university drawing upon the characteristics of its area.

Another excellent example of university research drawing on the characteristics of the local area is found in Cape Breton University. Specifically, the Cape Breton area has one of the worst toxic sites in the country, the Sydney Tar Ponds. Given this situation, several local researchers at Cape Breton University are conducting research on this site. As well, in response to local drug abuse, the Community Partnership on Drug Abuse was

formed. The office is located at the University and several members of the University are directly involved in this Partnership. The Partnership provides research funding for projects directly related to the issue of drug abuse and also provides a forum for community involvement.

Likewise, NSCAD draws upon the local characteristics of Halifax in its research and outreach focus. For example, a new film program is based on the presence of a provincial film industry and the holder of the CRC in Contemporary Film and Media has a particular research interest in media and regional cultural identity. Also, courses in design have recently involved partnership with Capital Health in a series of projects known as Design for Health. This recognizes the fact that Halifax is a regional centre for delivery of health services.

The use of local characteristics is also found at Memorial University. In particular, research activity at this institution is focused on ocean science and technologies, minerals and mining, offshore oil and gas, North Atlantic archeology, Newfoundland and Labrador culture, rural and remote health, and population genomics. All of these areas of research have their roots in the specific circumstances of Newfoundland and Labrador.

The University of New Brunswick draws upon the characteristics of the Atlantic region. This would include Aquaculture activity, where the University has a Memorandum of Understanding between Huntsman Marine Science Centre and the Department of Fisheries and Oceans (DFO) on Coastal Studies. As well, the University is a network member agent with the Industrial Research Assistance Program (IRAP) to promote technical expertise to small and medium-sized enterprises (SMEs) and it is involved with the Canadian Potato Genome Project, which is funded by Genome Atlantic in collaboration with Genome Canada. In particular, its Potato Cluster is developing a policy for the important agriculture sector.

For 2005-06, the Université de Moncton has identified research priorities and niches in the following areas: information and communication technology area, and optics and advanced materials, based on the expertise of researchers and some of the major projects underway. Historically, one distinctive area of research to which the Université de Moncton has contributed is increased knowledge on linguistic minorities and their rights, with an independent national institute having been created on this topic and housed at the University. Another distinctive area of research to which the University has contributed is regional economic development. Since 1983, the Canadian Institute for Research on Regional Development has been housed in the Université de Moncton and many professors at the University have applied their talents with CIRRD to foster a better understanding of the subject and to provide new perspectives on the issue. In 2005, the CIRRD saw its mandate expanded to become the Canadian Institute of Public Policy and Public Administration.

Alternatively, Mount Allison University is a small university located in an area in transition from a natural resources and manufacturing-based economy to participating in the knowledge-based economy. The University's Rural and Small Towns Program

explores issues of rural economic development and rural renewal. Further, some researchers explore issues related to salt-marsh restoration and the potential climate change impacts of the dyked farmland that is characteristic of south-eastern New Brunswick.

Holland College's research priorities are determined, as well, by their training program areas and are related to local and regional industries. This includes, for instance, applied research in food product development that supports local and regional agricultural and fisheries producers and processors, as well as applied research in alternate and renewable energy resources which supports local and regional construction and environmental technology industries.

Similarly, the Nova Scotia Community College system draws upon the unique characteristics of the province and region for their research activity. One such example is the work that their researchers are doing in coastal zone mapping to determine the effects of global warming and storm surges on the Bay of Fundy. This work has been expanded upon to include projects in Indonesia, and along the North American eastern seaboard. In addition, their team's expertise in geomatics has been married with their own geographic characteristics to guide their research activities.

The Community College system of New Brunswick highlights the agriculture projects in potatoes located at the Grand Falls campus, the metals technology transfer facilities in Bathurst, and the fisheries project resident at the campus in Caraquet as illustrations of how its draws upon local characteristics for its research focus.

Finally, the College of the North Atlantic indicates that their research program prioritizes R&D activity related to local/regional/provincial needs. Examples provided by the College are: "Wind Turbine-Based Space Heating System;" "Renewable Energy from Oceans," and "Wireless Operations of Petroleum Installations."

Atlantic Canadian HEIs draw other stakeholders into the process in determining their regional/provincial/local research focus. The specific stakeholders included in this process differ by institution and province, but generally include local, provincial and federal governments, local businesses, professional associations, urban and rural communities, Aboriginal communities, non-profit organizations, research institutes, other regional universities and the college system. Moreover, these links have been established through different routes, including: consultations, partnerships, Memoranda of Understanding, collaborative research agreements, advisory committee participation, conferences, community workshops and fora, public presentations by the university presidents and college principals, events hosted by institutes within the HEIs, the work of the institution's technology transfer office, business partnerships, and, last, but not least, personal contacts with faculty.

Technology transfer offices are currently established at many Atlantic Canadian universities and community colleges including all the larger institutions. A regional network to encourage technology transfer and research commercialization has recently

been established. This is known as Springboard and its goal is to "enhance the efficiency and effectiveness of technology transfer at all universities in Atlantic Canada and to promote and accelerate the commercialization of technologies by Atlantic Canadian companies." By providing a network of resources, Springboard is able to ensure more equal access to resources among its 14 member universities, such as specialized staff and support services, to all universities in the region including smaller institutions. Springboard's activities include: delivering educational programs relative to intellectual property; planning networking events to bring researchers and business people together; supporting the creation of new companies based on platform technologies; marketing and licensing technologies; developing and managing proof of concept projects; assessing discoveries and intellectual property opportunities; liaising with industry; and facilitating industry-sponsored research. Springboard is supported by a $3.6 million contribution from ACOA's Atlantic Innovation Fund.

Community colleges are less likely to establish technology transfer offices, with the exception of the College of the North Atlantic which notes that its Office of Applied Research is equivalent to a technology transfer office. However, Holland College participates in technology transfer through its access to a regional body that offers assistance on technology transfer. As well, the New Brunswick Community College system has an agreement with the Office of Research Services at the University of New Brunswick, and they indicate that they are also in the process of signing a license agreement for "Flintbox" through Springboard.[33]

Universities which have a technology transfer office indicate that this office has a specific role in transferring the institution's technology to the region, province and community. For instance, the Genesis Centre at Memorial University has played a dual role in this regard, namely the traditional technology transfer role as well an important economic development role in Newfoundland and Labrador. In particular, the Genesis Centre has mentored new technology-based business ventures emerging either outside of or from within Memorial University. Moreover, wherever possible, the Genesis Centre licenses new technologies to maximize benefits for the province and the region, and it nurtures new technology-based start-up companies by providing incubation space, business and financial mentorship.

Similarly, the technology transfer offices at Dalhousie University and Acadia University identify potential partners for technology transfer or industry liaison/research collaboration, while the University of New Brunswick first seeks receptors in the form of local or regional entrepreneurs or companies and only expands to a national or international focus when there is a lack of regional receptors. Although there is no requirement to work with local/regional partners preferentially, the same pattern is observed in Prince Edward Island. Alternatively, Cape Breton University has very

[33] Flintbox is an online platform for marketing and licensing the outcomes of research taking place in and around universities. It allows organizations to describe and publish research projects online and associate products of this research for online license, purchase and download. Flintbox was developed at, and continues to be managed by UBC Research Enterprises, a wholly owned subsidiary of the University of British Columbia.

specific procedures for technology transfer. These are: first, determine who the technology belongs to and have it assigned to the University for technology transfer exploration; next, assess the patentability of the technology; then conduct a proof-of-concept and patent procedure if applicable; and finally, identify the technology transfer path which best meets the University's objectives and those of the communities within which it operates regarding R&D growth and economic development in the local, provincial, regional, national, and international context. This would involve, for example, whether to establish a new venture through the University Foundation or a separate venture; an identification of organizations with a receptor capacity for the technology transfer; and a decision of whether to sell or license the technology to an organization.

At the Université de Moncton, the mandate of the Innovation Support Bureau includes a focus on the regional market, especially through partnerships with small and medium-sized enterprises (SMEs). However, the Bureau only has a very small team of two people and this makes it difficult to engage in a large number of prospecting activities for companies. Another challenge facing the Bureau is the small size of firms and their lack of capacity to fully embark upon innovation projects.

Recognizing the importance of local businesses to the regional economy, Atlantic Canadian universities have attempted to meet the technology and innovation needs and demands of local SMEs in a variety of ways. This has been achieved through various institutes or outreach centres within the universities,[34] through federal and provincial funding programs that enable university researchers to address the particular problems encountered by SMEs;[35] through explicit institutional networking and commercialization initiatives;[36] through the technology transfer office performing a liaison function between local businesses with specific needs and their researchers with relevant expertise,[37] and through individual researchers being approached individually by businesses. In addition, some universities meet with companies to identify their needs and how the universities may serve those needs; deliver presentations on university capabilities; develop and undertake industrial-sponsored research projects; and implement new business development activities with industry and funding partners.

Community colleges also attempt to meet the technology and innovation needs and demands of local SMEs in a variety of ways. For instance, Holland College does this

[34] Examples include: Memorial University's Core Research and Instrument Training Network, Ocean Engineering Research Centre, Industrial Research Centre, Centre for Sustainable Aquatic Resources, Centre for Aquaculture and Seafood Development, P.J Gardiner Institute for Enterprise and Entrepreneurship and the Genesis Centre.

[35] These would include: ACOA's Atlantic Innovation Fund (AIF), NSERC's Collaborative Research and Development (CRD) grants, the National Research Council of Canada's Industrial Research Assistance Program (IRAP), NSERC's Ideas to Innovation (I2I), and Canadian Institutes of Health Research's (CIHR) Proof-of-Principle.

[36] This is illustrated by Mount Allison University's recent networking sessions (Rendezvous BioSciences and Rendezvous BioSciences Atlantic) that linked university-based researchers working in the Life Sciences with SME receptors and with venture capital and expertise.

[37] Acadia University's Office of Technology Transfer and Innovation performs this function.

through consultation with area businesses, both in relation to specific R&D initiatives and through regular dialogue with industry via their participation on training program advisory committees.

To meet the needs of small and medium-sized enterprises, Atlantic Canadian HEIs engage in extensive collaboration with other local innovation and technology stakeholders. Since the opportunities for stakeholder cooperation and collaboration differ by institution and province, a sample of the approaches used by universities and community colleges is provided below. The institutions and the stakeholders that they collaborate with are:

- Memorial University specified the NRC-Institute of Ocean Technology, Department of Fisheries and Oceans laboratories, Agrifoods and Agricultural Canada Research Station, and Canadian Forestry Service;
- Dalhousie University emphasized its close working relationships with national research laboratories and regional development agencies;
- University of New Brunswick listed the NRC-Institute for Information Technology, research institutes affiliated with other universities and the cooperation among the University of New Brunswick, Université de Moncton and Mount Allison University to coordinate their research-based business development activities within New Brunswick;
- At Université de Moncton, the Parc scientifique de l'Université de Moncton has allowed for partnerships to be created with the NRC to provide a Moncton location for the Information Technology Institute, and for an officer with the NRC's Industrial Research Assistance Program. Also, the Atlantic Canada office of NSERC is housed within the Parc;
- Mount Allison highlights the Atlantic Cancer Institute and New Brunswick's Research Productivity Council;
- University of Prince Edward Island has cooperation agreements with NRC, Agriculture and Agri-Food Canada, and the Food Technology Centre;
- Acadia and other universities collaborate through Springboard;
- College of the North Atlantic indicates that its Office of Applied Research facilitates links between industry and the College;
- Holland College suggests that they do form partnerships with other stakeholders where appropriate and where such laboratories and institutes exist;
- New Brunswick's Community College reports that SMEs usually contact individual campuses which, in turn, respond to demands according to their capabilities, both in terms of infrastructure and human capital; and
- Nova Scotia's Community College has partnered with other research institutes such as Dalhousie University, the Bedford Institute of Oceanography, hospitals (IWK Children's Hospital), research laboratories (Brain Repair Centre), research organizations such as Petroleum Research Atlantic Canada and Telecom Applications Research Alliance (TARA) and Innovacorp, a business incubator.

Notwithstanding the fact that HEIs, at least at the institutional level, may wish to be engaged with the community, province or region, the extent to which this is effective

depends on the willingness of individual faculty members and researchers to become engaged. This, of course, depends on the incentive structure faced by these individuals. In other words, it is important to know how regional engagement activities are rewarded or not within Atlantic Canadian institutions. In particular, a key question is whether promotion and/or tenure criteria are tied directly or indirectly to service to the community, province or region.

Promotion and tenure at universities in Atlantic Canada are tied explicitly to acceptable performance in the areas of scholarship, including research, teaching and creative and professional activities. However, academic service to the community may be acknowledged at the institutional level[38] and may count toward promotion and tenure decisions, but it is less clearly specified and more difficult to objectively measure. Even though these may be difficult to measure, the University of Prince Edward Island indicates that its tenure and promotion criteria include patents, applied research, technical reports and contributions to the community.

Another source of impact of HEIs on the region is via graduate education and industry research partnerships. An examination of the relevant policies that exists at Atlantic Canadian HEIs reveals numerous and distinct policies that vary by institution. The relevant policies identified by the institutions are described below.

- Memorial University - Institutional Animal Care Policy and Procedures; Policy on Ethics of Research Involving Human Participants; Policy on Integrity in Scholarly Research; Materials Transfer Agreements; Memorial University Policy on Postdoctoral Fellows; General Research Pool Policy; Contract Research Policy; Policy and Procedures on the Indirect Costs of Contract Research; Graduate Program on Integrity in Research; Responsibilities of Supervisors and Graduate Students; Sample Intellectual Property Agreement; and NSERC Industrial Postgraduate Scholarship Agreement.
- University of New Brunswick - Campus Academic Planning Advisory Committee Report, a Framework for UNB Planning; Office of the Vice-President Research Policies, which include education policies that cover graduate education and industry research partnerships; and the UNB Research Plan. As well, the University has been involved with Mathematics of Information Technology and Complex Systems - Internships programs; the Industry Liaison office works with companies to develop contracts involving students, and the website.
- University of Prince Edward Island - This is encouraged through practice, rather than being based in policy.
- Mount Allison University – The University has a graduate studies policy which governs the administration of their graduate studies program. In practice, they have supported the development of collaborative agreements between their researchers and spin-off companies primarily.

[38] This would include, for instance, Acadia University's Presidential Fellowship in Engaged Learning, to encourage and reward community based research which is outside the peer review process or being acknowledged in Cape Breton University's Research Digest or Board of Governors' quarterly report.

- Acadia University - Student IP policy; NSERC Industrial Postgraduate Scholarship program; Office of Technology Transfer and Innovation (OTTI) expects to help students with the development of applications; OTTI meets with graduate students to explain internal and external grant opportunities; the Department of Mathematics and Statistics has developed a new graduate program – an MSc in Applied Mathematics and Statistics. This program offers students an opportunity to get a Masters degree while gaining experience working and researching in industry. Students take courses that both prepare them for a work internship and help them write an MSc thesis. Students also spend up to eight months at a work internship gaining valuable experience in industry. They will then return to Acadia to complete a thesis, usually to be based on the research they completed during their internship.
- Nova Scotia Community College - in association with the Applied Geomatics Research (AGR) Group, the College offers an advanced diploma option in AGR. This diploma option enrolls eight students each year who work as graduate research assistants on active projects of the group, creating natural linkages with industry research partners. In collaboration with Acadia University, the College is introducing a new joint Masters in Environmental Studies. They are also working on a similar initiative with Dalhousie University. Finally, the college hires students as interns under grants received to perform research activity.

While most institutions have a single point of contact and/or coordinating structure through which companies can explore potential research relationships, not all institutes in the region report having this organization. Likewise, not all institutions maintain a database of faculty interests and competencies to help companies find faculty members that match their needs. As well, even when such a database exists, it is not always accessible and searchable on the Internet. Nor does every institution make efforts to simplify contract language and develop simplified partnership agreement forms.

The percentage of hiring of nationally prominent scientists (including endowed research chairs) with industry and/or entrepreneurial backgrounds has increased over the last five years. However, for most institutions, this increase has been incremental and steady, rather than dramatic. Yet, the increase in industry-research partnerships within Atlantic Canadian HEIs has been more pronounced for some institutions and simultaneously more modest in other institutions. For instance, Memorial University noted a dramatic increase in the last five years because of a deliberate effort on the part of the institution to increase the number and scale of research partnerships with industry, to focus research on areas of importance to the province but with global opportunities, and to take maximum advantage of funding opportunities that require industry partners. As well, the University of Prince Edward Island experienced a four-fold increase, while Acadia's partnerships doubled. Alternatively, Dalhousie University records a more modest increase, which it explains by the fact that clinical trial research has decreased across North America. In general, the community colleges report steady increase in partnerships with industry.

2. Research and innovation in Atlantic Canada

This section investigates the increasingly vital role HEIs play in the areas of innovation, commercialization and critical skills, not only in their regions but more broadly, in a globalizing economy. It provides an overview of HEIs' activities in areas such as R&D, innovation and commercialization. As well, this section further identifies other stakeholders that support innovative activity, such as government (federal and provincial) organizations and partners.

For the purposes of this discussion, this assessment deals primarily with research activities of a scientific or technical nature. Initiatives in social sciences are referenced when appropriate, but are not the main focus.

Atlantic Canada's gross domestic expenditures on research and development, or GERD, per real GDP, is below national levels, reaching 1.3% in 2003 compared to 2.2% for Canada. Further, a gap is emerging as growth has occurred at higher rates nationally than in the region.

Within the Atlantic region, HEIs play a proportionately greater role in R&D compared to the rest of the country. For example, Atlantic universities performed 63% of R&D in the region in 2003 at a total cost of nearly $510 million.[39] Further, the proportion of R&D performed by Atlantic universities has increased since the mid-1990s when the level was 44%. This proportion is notably higher than the national level, as universities performed 34% of the total in 2003. This level has risen only slightly from just under 28% in 1995.

Conversely, private sector firms have a greater presence in R&D elsewhere in the country. Nationally, companies conducted just over half (56%) of R&D in 2003, a level that has generally remained constant since 1994. However, in Atlantic Canada, the private sector performed only 19% of R&D in 2003 and 24% in 1994. The relative share of R&D conducted by governments in the region dropped from 32% to 18% during this period.

Clearly, HEIs play an important role in research within the region. At the same time, questions may be raised with respect to commercialization, that is, whether research is aligned with market needs given the relatively low presence of private firms in this activity. Various factors are identified as contributing to the lower participation in R&D among firms, including the degree of small enterprises in the region and the resources they have available to devote to research.[40]

There are a number of organizations supporting research-related activities in the region, many with affiliations to universities. While there is a wide variety of active initiatives and projects in the region, selected examples of more significant efforts are described below. Partner organizations may be directly affiliated with the university or simply have

[39] Statistics Canada, as reported in Gardner Pinfold Consulting Economists Ltd. (2006), T*he Economic Impact of Universities in the Atlantic Provinces*, prepared for The Association of Atlantic Universities, Halifax.

[40] Gardner Pinfold Consulting Economists Ltd. (2006), T*he Economic Impact of Universities in the Atlantic Provinces*, prepared for The Association of Atlantic Universities, Halifax.

a working relationship. Some broad areas of research are health sciences, oceans and marine sciences, and information and communications technology, among others.

Industry Liaison Offices – A common effort shared by universities in the region is the establishment of industry liaison offices (ILOs). The ILOs serve to link the academic community with potential industry opportunities. Key functions include technology licensing, networking with commercial partners, evaluating and protecting intellectual property, and others. Saint Mary's University shares resources of its ILO with Mount Saint Vincent University, both of which are located in Halifax, N.S. Support for this effort was provided by ACOA in 2000. To help maintain an appropriate commercial focus, ACOA stated a primary measure for the ILOs as being the amount of industry-sponsored research the universities are able to attract.

Other selected examples of research partnerships are provided here.

Memorial University, St. John's, N.L.
C-CORE - The C-CORE organization offers specialized engineering services in its work with national and international clients, and has a collaborative working relationship with MUN. The organization has been in operation for over 30 years and has more than 60 employees, including many engineers. They aim to apply advanced technology solutions to challenges encountered in offshore oil and gas production and transportation, gas transmission (on-land pipelines), mining, and pulp and paper. Areas of core expertise include intelligent systems, remote sensing, ice engineering and geotechnical engineering.

The Genesis Group - The Genesis Group is a support network for technology-based ventures seeking business guidance and capital. It offers resources intended to increase company success rates while preparing them to be "investor ready."

Marine Institute – The Institute is a leading centre of fisheries and marine training. As part of Memorial University, the Institute offers Bachelors' and Masters' degrees, along with diploma, certificate and vocational programs. In addtion, it conducts significant applied research.

Dalhousie University, Halifax, N.S.
IWK Health Centre – Dalhousie University has affiliations with local teaching and research hospitals. One example is the IWK Health Centre in Halifax, N.S. is a tertiary care health facility serving children, youth, women and families, primarily in the three Maritime provinces. It identifies research one of its organizational priorities, along with family-centered care, education and health promotion.

QE II Health Sciences Centre - The QEII Health in Halifax, N.S. is the largest adult academic health sciences centre in Atlantic Canada. In addition to the provision of health care services to individuals in the Maritime provinces, the QEII is active in health research. Affiliated with the Faculty of Medicine and Health Professions at Dalhousie

University, the QEII is the largest teaching hospital in Atlantic Canada with more than 1,500 individuals in a learning role within the healthcare complex.

Brain Repair Centre - The Brain Repair Centre (BRC) is a multidisciplinary collaboration linking more than 100 world-class researchers and physicians specializing in leading treatments and technologies in the field of brain repair. The Centre's research is dedicated to disorders such as Parkinson's, Huntington's, Alzheimer's, amyotrophic lateral sclerosis (ALS), multiple sclerosis and a range of others. The BRC is expanding its research infrastructure and equipment in its area of expertise. In partnership with the National Research Council, the Centre features a 4.0 Tesla MRI Functional Neuroimaging Unit that is located at the QEII Health Sciences Centre. The BRC and Dalhousie University are currently working on a prototype robotic, remote manipulated, drill for neurosurgical applications. Such procedures could enable care in remote communities.

University of New Brunswick, Fredericton and Saint John, N.B.

Huntsman Marine Science Centre - Located in St. Andrews, N.B., the Centre is focused on the advancement of marine sciences through basic and applied research, education, and provision of technical solutions for public and private partners. The organization offers university-accredited courses and acts as a centre for research in a variety of related disciplines.

Enterprise UNB – The University of New Brunswick, at its Fredericton campus, manages business incubation facilities for entrepreneurs. The facility supports business through the start-phase and provides linkages between the university and the business community.

University of Prince Edward Island, Charlottetown, P.E.I.

Atlantic Veterinary College - The Atlantic Veterinary College (AVC) is part of the University of Prince Edward Island. It is the only veterinary school in the Atlantic region and engages in research activities in biomedical sciences, companion animals, health management, and pathology and microbiology.

Community College Applied Research Activities

Community Colleges in Atlantic Canada are relatively new, but active players in contributing to the region's competitiveness and productivity agenda through research and innovation. All four public colleges in Atlantic Canada have dedicated resources and/or have established offices of applied research and innovation, and are engaged in approximately $30 million worth of projects. These projects are made possible through partnerships with granting councils, government funding, regional and community support, and in some cases, working in cooperation with universities.

College research projects tend to be very practical in nature and are designed in many cases to support local and provincial needs. For example, College of the North Atlantic recently developed an ocean wave-powered pumping system to support the aquaculture industry. That College has also established a Geospatial Research Centre to conduct research on ecosystems in support of the forestry industries. Nova Scotia Community

College has undertaken projects related to coastal zone disaster management, analysis of the Swissair 111 crash site, and habitat mapping on Sable Island and in the Western Arctic. Holland College is very involved in research related to learning, justice and food product development. The New Brunswick Community College has undertaken research in aquaculture and the development of bio-ethanol gas from potato spoils.

Federal Government Organizations

The following section describes key federal government organizations that support research-related activities in the region. They frequently work in partnerships with HEIs.

National Research Council - The National Research Council (NRC) is a lead organization for research and development. It has institutes located across Canada. Partnerships with HEIs and the private sector are an area of focus, as is contributing to regional economic development. The NRC institutes in Atlantic Canada are as follows:

- *NRC - Institute for Marine BioSciences, Halifax, N.S.* - The NRC-IMB specializes in aquaculture, natural marine toxins and advanced research technologies. The NRC-IMB recently launched a 30,000 ft² Industry Partnership Facility to facilitate partnering with start-up companies, other private sector partners and universities.

- *NRC - Institute for Biodiagnostics (NRC-IBD), Halifax, N.S.* - A satellite laboratory of NRC-IBD in Winnipeg, Man., the Institute in Halifax has among its priorities to support the development of a neuroscience cluster of activity (e.g., the Brain Repair Centre) in Atlantic Canada. Staff work in collaboration with Dalhousie University, hospitals and NRC-IMB.

- *NRC - Institute for Nutrisciences and Health (NRC-INH), Charlottetown, P.E.I.* - Institute scientists research how bioactive compounds improve human and animal health in areas such as neurological disorders, obesity-related disorders, and infection and immunity. Under the Institute's model in research partnerships, university, government and private sector scientists work side-by-side in furthering discovery, innovation and commercialization. The NRC-INH's new facility is under construction on the campus of the University of Prince Edward Island.

- *National Research Council - Institute for Information Technology (NRC-IIT), Fredericton, N.B.* - The Institute, one of several IITs across Canada, is focused on research and collaborations in information and telecommunications technologies with business, universities and government agencies. Research areas include artificial intelligence technologies, broadband visual communications, e-health, e-learning, software engineering, and others.

- *National Research Council - Institute for Ocean Technology (IOT), St. John's, N.L.* - The NRC-IOT is a national centre for ocean technology research and development. Staff conduct ocean engineering research through modeling of

ocean environments, predicting and improving the performance of marine systems, and developing technologies with the goal of benefiting the Canadian marine industry. In 2003, the Institute opened the Ocean Technology Enterprise Centre to support the development of new ventures in ocean technology.

Department of Fisheries and Oceans (DFO) – Bedford Institute of Oceanography (BIO), Dartmouth, N.S. - The BIO is Canada's largest centre for ocean research and a significant federal centre devoted to oceanography. Four government departments have a presence on the 40-acre campus, performing targeted research mandated by government or through partnerships. Staff also advise on marine environments including fisheries and offshore hydrocarbon resources, provide navigational charts for waters, and respond to environmental emergencies.

There are also several other government research organizations located in the Atlantic region focused on natural resource-based sectors.

Granting Councils and Related Programs

Federal granting councils are among the key sources of funding for R&D in the region. These include:

- *Natural Sciences and Engineering Research Council (NSERC)* – This source makes investments in skilled human resources, discovery and innovation through programs supporting university research in the natural sciences and engineering.
- *Canadian Institutes of Health Research (CIHR)* – This is the federal government's health research funding agency, supporting efforts in universities, teaching hospitals and research institutes while facilitating commercialization.
- *Social Sciences and Humanities Council (SSHRC)* - This arm's-length federal agency promotes and supports university-based research and training in the social sciences and humanities.

Other related programs are as follows:

Canada Research Chairs (CRC) – The Canada Research Chairs Program is part of a national strategy to heighten Canada's position in research and development. In 2000, the program was created to establish 2,000 research professorships in universities across the country by 2008. The Canada Research Chairs Program invests $300 million a year to attract and retain skilled professionals to such roles.[41]

Canada Foundation for Innovation (CFI) - The Canada Foundation for Innovation is an independent corporation of the federal government established to fund research infrastructure. Its mandate is to strengthen the capacity of Canadian universities, colleges, research hospitals, and non-profit research institutions to carry out leading research and technology development that benefit Canadians.

[41] A basic flaw of the CRC program is that it allocates Chairs mainly on the basis of past tri-council research awards, rather than meritorious proposals.

Indirect Costs Program (IC) - The Indirect Costs program helps Canada's universities and colleges by supporting a portion of the indirect costs of administering and managing research activities (e.g., library computer systems, upgrades to laboratories, and others).

While universities across the region access funds under granting councils, the three that generally have the greatest uptake are as follows:

- Dalhousie University, Halifax, N.S.;
- Memorial University, St. John's, N.L.; and
- University of New Brunswick, Fredericton and Saint John, N.B.

In total, these three universities accounted for an estimated 83% of this funding for university research in Atlantic Canada in 2004, with Dalhousie University accounting for 44% of the total. While a comparatively smaller institution, it is worth noting that the University of Prince Edward Island has significantly increased its overall research funding in the past 10 years.

Other federal programs of note are described here.

NRC Industrial Research Assistance Program, (NRC-IRAP), Atlantic Canada - The NRC-IRAP program provides technical and business-oriented advisory services, along with potential financial support, to growth-oriented small and medium-sized enterprises. Program staff draw on connections with Canada's universities and technical and community colleges. Industrial Technology Advisors work with clients throughout the region.

Genome Atlantic, Halifax, N.S. - Genome Atlantic is a not-for-profit corporation dedicated to mobilizing large-scale, world-class projects in genomics, proteomics, bioinformatics and GELS, as well as furthering economic development in Atlantic Canada. Partners include universities and other public sector organizations. The organization funds up to 50% of the total cost of projects judged to have potential to succeed in international genomics research, with the remaining 50% raised in conjunction with winning project and Genome Atlantic. The organization reports that results to date approach nearly $70 million. This relates to four projects and one platform established to date, funded by Genome Canada and local Atlantic Canadian partners, Genome Atlantic is part of the broader Genome Canada organization that has a presence across the country.

Atlantic Innovation Fund (AIF), Atlantic Canada Opportunities Agency (ACOA), Atlantic region - Under ACOA's broader Atlantic Investment Partnership, the AIF is designed to strengthen the economy of Atlantic Canada through development of knowledge-based industries. Assistance is provided to eligible R&D projects, including up to 80% of total eligible costs for non-commercial projects and up to 75% of total eligible costs for commercial projects. Contributions to private sector organizations are conditionally repayable based on commercial success. Contributions to non-commercial organizations, such as research institutes and universities, are non-repayable with conditions for private

sector partners. To date, three rounds of funding had been awarded at a total value of nearly $370 million.

Emphasis is placed on universities and other non-commercial institutions partnering with private sector organizations as a means of helping ensure a proven market need and the potential for commercialization. Further, ACOA considers applicants interested in working with partners from outside the region and the country, which can facilitate access to a greater breadth of commercialization expertise.

Trends in Revenues from Granting Council and Related Programs

The following section addresses revenues earned by institutions in the Atlantic region. There are a broad range of programs currently offered. However, Granting Councils and related programs are primarily highlighted here, given their relatively significant level of funding.

Table 22: Revenues from Federal Granting Councils and Related Programs, 2005-06 ($000s)[42]

Program	Atlantic Canada	Canada	Regional % of total
NSERC	$50,252	$816,210	6.2%
SSHRC	$22,603	$290,393	7.8%
CIHR	$21,079	$758,146	2.8%
CFI	$7,635	$93,792	8.1%
IC	$19,060	$259,056	7.4%
Total (5 programs)	$120,629	$2,217,597	5.0%

Source: Granting Councils and program administration.

In 2005-06, Atlantic Canada received a reasonable level of revenues from major Granting Councils and related programs. However, the proportion of revenues secured by Atlantic Canadian universities falls well short of national levels in many programs. For example, Atlantic Canada received 6% of NSERC national funds and less than 3% of CIHR national funds. (As a point of comparison, the population of the region is roughly 8% of the national total.) These two programs are focused on science and health-based activities respectively. By comparison, there is more equal performance in social science research, as SSHRC funding to Atlantic Canada was nearly 8% of national totals.

Table 23: Ten-Year Revenues from Federal Granting Councils and Related Programs, 1996-07 - 2005-06 ($000s)

Program	Atlantic Canada	Canada	Regional % of total
NSERC	$365,417	$5,648,664	6.5%
SSHRC	$94,803	$1,535,508	6.2%
CIHR	$133,963	$4,578,204	2.9%
CFI	$100,770	$2,643,138	3.8%
IC	$54,207	$727,756	7.4%
Total (5 programs)	$749,160	$15,133,270	5.0%

[42] Note that values for Canada Research Chairs and National Centres of Excellence are included in the amounts reported for the granting councils with which they are associated.

Source: Granting Councils and program administration.

Looking at the 10-year period from 1996-97 – 2005-06, a similar picture emerges.[43] The region received funding from the five selected programs, at a total of $750 million. However, this is only 5% of the national total of $15 billion. Contributions under the major health-related initiative CIHR was only 3% of the national total.

Table 24: Growth Rates - Federal Granting Councils and Related Programs, 1996-07 - 2005-06 ($000s)

	Growth – 5 years			Growth - 10 years		
Program	**Atlantic Canada**	**Canada**		**Atlantic Canada**	**Canada**	
NSERC	46%	63%		87%	98%	
SSHRC	217%	129%		664%	278%	
CIHR	110%	105%		215%	224%	
CFI	-88%	-97%		-77%	-89%	(total 8 years)
IC	14%	16%		na	na	(total 3 years)

Source: Granting Councils and program administration.

Looking at growth rates in revenues from these programs, Atlantic Canada's performance varies. Growth in NSERC funding has been significant, at 46% over five years and 87% over 10 years, indicating support for activity in scientific and engineering disciplines. However, this falls slightly short of national growth rates for the same time period of 63% and 98% respectively. While overall funding in Atlantic Canada under CIHR has been relatively low, growth rates are comparable to national levels at roughly 100% over five years and more than 200% over 10 years.

The following section provides an overview of how each of the Atlantic provinces and individuals HEIs fare with respect to granting councils and related program funding. As may be expected, the most significant allocations have been directed at larger universities. However, awards are distributed among the various institutions in the region. (Funding supporting social sciences through SSHRC is not covered in detail in the following discussion.)

Table 25: Provincial Overview – Share of Funds from Granting Councils and Related Programs to Atlantic Canada, by Province, 1996-97 – 2005-06

Province	**% of Funds to Atlantic Canada – 10-Year Period**
Nova Scotia	54%
Newfoundland and Labrador	24%
New Brunswick	18%
Prince Edward Island	3%

Source: Granting Councils and program administration.

[43] The CFI program began in 1998/99 and the IC program began in 2003/04. Data from all available years is included, but data for 10 years is not yet available.

As shown in the above table, Nova Scotia has secured over half of the funding from the five selected programs from 1996-97 to 2005-06, followed by Newfoundland and Labrador at nearly 25%. New Brunswick and Prince Edward Island follow at relatively lower levels.

Nova Scotia

Dalhousie University – Dalhousie University is generally the single largest recipient for many of the programs. Dalhousie University accounts for roughly 40% of the NSERC funds coming to the region over the past 10 years, supported by its DalTech engineering school and others faculties. Dalhousie has also secured nearly 70% of the CIHR funding coming to the region in the same time frame, a small portion of which was allocated to the IWK Health Centre in Halifax, N.S. This placed Dalhousie in a position of leading much of the federally sponsored health-related research in the region. It also earned 30% of the CFI funds to the region during this time.

Combining all institutions in the province, Nova Scotia earned half of the funds entering the region from NSERC, CFI, IC and SSHRC, and nearly 75% of those from CIHR.

Newfoundland and Labrador

Memorial University - As the only university in the province, Memorial was a significant recipient of funds under the granting councils, securing between 20% or more of funding from the various programs. The institution has been active in scientific and engineering-related research, securing 24% of NSERC funding to the region between 1996-07 to 2005-06. The institution also earned a reasonable share in health-related fields, with over 20% of CIHR funding. Overall, Newfoundland and Labrador secured a reasonable share of revenues from the programs, ranging from 20% to 30%

New Brunswick

University of New Brunswick – The University of New Brunswick was the single largest recipient in that province. It has fared reasonably well in scientific and engineering disciplines, earning close to 20% of NSERC funding between 1996-07 and 2005-06. Other NSERC awards went to institutions such as Mount Alison University, Université de Moncton and the Huntsman Marine Sciences Centre. Overall, the level of funding in support health-related research in the province is low, with just 2% of the awards under CIHR in the region during that time period. This reflects the limited number of health-related faculties and departments at New Brunswick universities.

Prince Edward Island

University of Prince Edward Island – The Island has significantly increased its overall research funding over the past 10 years. Funding has increased from just over $500,000 in 1996-97 to $4 million in 2005-06, an increase of 700%. The University of Prince Edward Island has fared reasonably well given the size of the province, securing anywhere from 2% to 3% of funds in the region under the granting councils from 1996-07 to 2005-06. The Island has received annual awards under CIHR approaching $1 million for the past few years. The Island has also done well with other programs, receiving 6% of CFI funds and 4% of IC funds in the time period.

Other Programs

Atlantic Innovation Fund - As noted, ACOA's AIF is a program focused on helping to bridge the R&D gap in Atlantic Canada. The first AIF funds were awarded in 2002 and the program announced its forth round of funding in March of 2006. To date, a total of $373 million has been awarded in the region under the AIF initiative. Just over 60% to date has been allocated to projects at non-commercial organizations, including universities, while nearly 40% has gone to private-sector projects. However, in the most recent round, the share is closer to an even distribution between the two. Heightened interest and comprehensive proposals from applicants shows potential progress toward increasing private-sector participation in research in the region. The following table outlines the distribution of AIF funds by province, for both commercial and non-commercial projects, under the three rounds to date.

Table 26: Share of Total AIF Funds Awarded in Region to Date, by Province, 2002 – 2006

Province	% of Total AIF Funds in Region to Date
New Brunswick	24.3%
Newfoundland and Labrador	26.0%
Nova Scotia	34.3%
Prince Edward Island	14.4%
Pan-Atlantic	1.0%

Source: ACOA.

Provincial Government

The provincial governments of each of the Atlantic provinces have identified research, innovation and commercialization as priorities with respect to economic development. Provincial strategies and budgets over the past few years in particular have outlined activities and funding to support related activities. Selected examples of provincial priorities and initiatives are described here.

InNOVAcorp, Halifax, N.S. – This provincial Crown agency is mandated to support early-stage Nova Scotia companies commercialize technologies and succeed in international markets. Three core areas include incubation facilities, mentoring and investment. InNOVAcorp manages the Nova Scotia First Fund (NSFF), an early-stage source of capital for Nova Scotia businesses that considers initial venture investments in the range of $100,000 to $1,000,000. Also, InNOVAcorp has developed a network of venture capital companies to create multi-investor syndicated deals.

The Nova Scotia Research and Innovation Trust (NSRIT) – This fund was established by the Province to support Nova Scotia research by providing funds for research infrastructure. Another function of this trust was to put in place an arms-length structure to deal effectively with provincial fiscal-year funding structures and decisions regarding research support and leadership within the research community. The

Council of University Presidents of Nova Scotia, through the NSRIT beneficiaries Committee, is responsible for NSRIT under a Memorandum of Agreement.

Since its inception, NSRIT has provided matching funds to allow Nova Scotia to take advantage of federal funding available for research projects through program such as the Canada Foundation for Innovation (CFI). NSRIT has mainly support the CFI-Research Chairs and New Opportunities Fund and Innovation Fund projects under $600,000. Projects requiring matching funds for more than this amount must apply to the Atlantic Innovation Fund for consideration before proceeding to NSRIT. To date, approximately $38 million has been provided to the fund.

New Brunswick Innovation Foundation (NBIF), Fredericton, N.B. - The NBIF is an independent corporation supporting innovation in order to improve productivity and advance the knowledge-based economy. With seed capital in the total amount of $35 million from the Province of New Brunswick, the NBIF makes leveraged investments in R&D and early-stage innovative companies in the province. The NBIF offers R&D investments involving academic institutions, including the Research Innovation Fund (RIF), the Research Technicians Initiative, and the Research Assistantships Initiative. The NBIF also offers other business investment vehicles, including a venture capital fund, the Enterprise Innovation Fund (pre-seed/seed), and others.

Atlantic Technology Centre, Charlottetown, P.E.I. – The ATC is intended to support growth of the Island's information technology (IT) and new media sector. Tenant firms in this facility have access to IT services (e.g., CISCO network, webcasting and video conferencing) in an environment intended to support new business growth.

Newfoundland and Labrador's Industrial Research and Innovation Fund – This fund supports research and development investments in targeted, high-growth clusters offering significant long-term economic development potential in such areas as advanced manufacturing, marine technology, biotechnology, pharmaceutical research, value-added natural resources, and the oil and gas industry. It is presently at $7.5 million per year and slated to increase to $10 million within a year.

Partnerships and Related Initiatives

Stakeholders work in partnership within the region help to leverage resources and enhance success of initiatives. Selected examples of key partnerships are provided here.

Springboard - (See previous discussion)

Telecom Applications Research Alliance – The Telecom Applications Research Alliance (TARA) in Halifax, N.S., is a unique facility that combines telecommunications R&D equipment with seed investment funding and business mentoring resources. The organization also hosts the Master of Engineering in Internetworking program in affiliation with Dalhousie University. The organization is a private enterprise that positions itself as both a place to develop applications and services for telephony and

Internet-based computer networks as well as a place to form dynamic connections with other member organizations.

Measurement and Evaluation

Effective measures and consistent tracking are important to ensuring project success as well as continuity of funding in the future. However, there are inherent challenges to measurement in this area. The timeframe can be significant in terms of moving through the commercialization process. In a sector such as life sciences, this can easily take 10 years or longer. Further, the complexity of the process creates difficulties, as a range of financial and other resources are required at different intervals of the research-commercialization process. As a result, there is no single measure that captures commercialization success as research moves from the discovery to market.

Given this complexity, a number of approaches are utilized in measuring research and commercialization success.

Universities

Some potential measures which can be used among universities in relation to technology transfer and similar activities are as follows:

- Number of disclosures;
- Number of option agreements or licenses;
- Amount of licensing revenue;
- Number of technology assessments;
- Number of patents filed;
- Amount of private-sector research money/contracts spend at university;
- Number of spin-off companies created;
- Number of interns supported;
- Number of information/educational sessions; and
- Other related measures.

ACOA AIF Program

The Agency has developed a "Results-based Management and Accountability Framework" for the AIF initiative. It is aligned with federal Treasury Board requirements for management of grants and contributions. It identifies possible evaluation methodologies including data review, interviews and surveys. As well, a formative evaluation of the AIF was completed in fiscal year 2003-04.

Efforts are made to help ensure applicants consider commercialization outcomes from the outset of research projects. A "results measurement guide" is included in the call for proposal document issued by ACOA. Applicants must identify success indicators at the proposal stage, which are categorized by program objectives as follows:

- Increasing activity in research that contributes to economic growth (e.g., new equipment, new employment);

- Increasing capacity for commercialization (e.g., new discoveries, technology disclosures, licenses, patents, and others);
- Strengthening regional innovation capacity (new alliances/partnerships with regional, national or international firms and research institutions); and
- Maximizing benefits from national R&D programs (expected leveraging of other national programs).

The targets for various success indicators stated by applicants at the proposal stage become part of formal contracts. Applicants must report against these indicators at regular intervals.

3. Framework conditions for promoting research and innovation

Although intellectual property rights are covered by various provisions in their respective collective agreements and, as such, may have different conditions attached to them, at Atlantic Canadian universities the inventor or the researcher generally owns the intellectual property rights. In community colleges, the institution owns the intellectual property rights.

Most institutions acknowledge that the national legal framework may be of limited support in research and innovation. Even so, contract, patent and copyright laws are important in facilitating and enabling collaborative research agreements with industry partners, patenting inventions, licensing technology to companies, and collaborating with financing and entrepreneurial groups to develop new companies to commercialize research.

The national legal framework and the ownership of intellectual property rights appear neither to be a significant barrier nor inducement to the formation of HEI-industry relationships. There were, however, a number of incentives and barriers identified by the HEIs.

From the perspective of the incentives provided to institutions, the formation of HEI-industry relationships represented a source of additional remuneration for the researchers and, as such, would probably induce researchers to enter into these relationships. Equally important was the fact that these relationships provide new and interesting areas of applied research available to faculty members, thus these relationships should stimulate intellectual curiosity and interest and, as such, should act as an incentive to form these relationships. Furthermore, relationships developed between HEIs and industry generate increased opportunities to place work-term students in an applied setting, further enhancing the educational process. Finally, there are numerous grants and programs available to provide research funding to match industry's investment and this creates an incentive for HEIs' research-oriented faculty members to enter into relationships with industry.

There are also incentives for the relationship between HEIs and industry from the perspective of industry. For instance, such a relationship provides access for industry to

specialised research facilities that may not be otherwise available under normal circumstances. As well, as part of this relationship, industry gains access to graduate students, representing a well-trained pool of potential employees that can be evaluated without huge long-term costs being borne by industry. Last, but not least, this relationship represents a relatively inexpensive way for industry to have their new products developed and evaluated.

Balancing off the incentives from the perspective of the institutions is a number of barriers. For instance, for some faculty members, the relationship with industry does not provide enough perceived return for increased workload that accompanies this relationship. In addition, for research-oriented faculty who are concerned with how they are perceived within their discipline, the research that comes out of this relationship may not be publishable through traditional academic venues, such as peer reviewed journals. While often not fully appreciated, researchers involved in these relationships may have difficulty in meeting the timelines established by industry. This, of course, will tend to discourage the formation of these relationships between industry and researcher located at HEIs. In addition, the lack of local companies with a research focus within the immediate area of the institution reduces the opportunities for the formation of partnerships. Another important and often not fully understood barrier is the lack of time to explore and develop partnership potential and to develop levels of trust required to invest in significant partnership ventures. Finally, another barrier that is sometimes encountered is that researchers and industry officials may have difficulty defining appropriate deliverables.

Likewise, barriers for industry in the formation of research relationships with HEIs include: (1) intellectual property disposition; (2) lack of confidentiality and the ability to protect trade secrets; and (3) different research cultures, for example, industry can have a short-term focus, while university researchers have a long-term focus.

Taking these incentives and barriers into account, HEIs in Atlantic Canada were asked how universities and community colleges could help stimulate innovation and knowledge transfer between their researchers and industry. Not surprisingly, given the diversity of Atlantic Canadian HEIs in terms of size, experience and focus, a variety of initiatives were offered. These included the following: through the establishment of industry liaison functions to assist with collaboration between researchers and industry; through the encouragement of local supporting networks and faculty collaboration; through the provision of more accommodating institutional arrangements; through the promotion a research culture in faculties; through the fostering administrative leadership that stimulates processes that lead to strategic interactions among scholars; through the recruitment and retention of talented faculty; through the encouragement of graduate students with the interests and skills to seek out opportunities for making contributions to future research; through the provision of support for multidisciplinary approaches to research and collaboration; through the encouragement of industry-university linkages and the exchange of ideas and information; through the creation start-up grants for outstanding recruited faculty; through the facilitation of scholarly exchanges through

workshops; and through an effective dissemination of information to industry and researchers.

Most, but not all, HEIs in Atlantic Canada have a single point of contact and/or a coordinating structure through which companies can explore potential industry/education training partnerships. To the extent that there is no single point of contact, it can represent another barrier enabling interaction between HEIs and local industries.

The programs that exist at the various institutions or in their provinces that encourage co-operative research between HEIs and industry are far too numerous to list. The programs have been listed in Appendix G. In addition to the programs that encourage co-operative research, a number of informal cultural practices guide and stimulate external partnering at Atlantic Canadian HEIs. These would include: innovation awards within the institutions; the nomination of faculty members for national awards such as the NSERC Synergy Award and the Manning Innovation Award; press releases; university newsletters; annual reports; and acknowledgement on the institutions' website pages.

In addition, there are many education or training programs at Atlantic Canadian HEIs that address the needs of key provincial industries. These are listed in Appendix H. Furthermore, HEIs have established pathways between the institutions and local firms in a number of ways. These include: technology transfer offices; research centres whose mandates are focused on small business and entrepreneurship; establishing a division tasked with contract training for businesses; partnering with industry on research grants; consultancy; co-op programs; career fairs; advisory committees; and internships and practica.

4. Interfaces facilitating knowledge exploitation and transfer

A number of mechanisms have been developed to commercialize the research base and to promote technology transfer between Atlantic Canadian HEIs and area stakeholders. These are profiled in Table 27. Most institutions are engaged in research contracts, collaborations, consultancy, intellectual property transactions, clusters and teaching, while only two institutions[44] listed science parks as a mechanism they utilize to promote technology transfer and encourage commercialization of research. The promotion of spin-off companies, incubators and labour exchanges are more mixed.

Even though there is some degree of commonality in the mechanisms utilized for technology transfer and commercialization, how they actually get implemented differs across institutions. For example, some institutions operate through the regional meetings of Springboard or the umbrella organizations such as the AAU or APCCC, other institutions utilize their industrial liaison office, still others employ inter-organization communications and collaboration, while other institutions utilize websites, workshops,

[44] The Scientific Park at the Université de Moncton is very important for the university since it houses innovative firms (incubator function), resource personnel and a new Medical Training Centre (a joint effort with the Université de Sherbrooke)

word-of-mouth, and contact with community and business leaders on various institutional boards.

Other stakeholders have a role to play facilitating the commercialization of research and the transfer of technology within Atlantic Canada. The federal government, for example, has an important role to play in funding technology transfer and industry liaison offices, the funding of the national granting councils, the provision of scientific tax credits, innovation funding through the AIF, and via financial assistance of spin-off companies and support for incubators through ACOA and the NRC. The provincial governments also provide funding in strategic areas, which include university research projects, equity financing for start-up companies and matching funds for federal programs.

When it comes to dissemination of research results, Atlantic Canadian HEIs exercise a variety of options in order to more widely disseminate their R&D and innovation initiatives beyond their contractual industry partners. One option is provided through technology showcases that display the technologies from each member of Springboard to the business community. These events are covered by the media and are well received by businesses. As well, some universities have access to independent websites for their technology transfer office and to Springboard's webpage, both of which offer another dissemination vehicle to reach stakeholders other than their contractual partners. Annual commercialization events,[45] seminars, research breakfasts with key stakeholders, trade shows and relevant trade journals and special events focused on niche sectors of the economy are other dissemination vehicles utilized by Atlantic Canadian HEIs.

Table 27: Mechanisms To Commercialize Research And Promote Technology Transfer For Atlantic Canadian Universities And Community Colleges

	Research Contracts	Collaboration	Consultancy	Intellectual Property Transactions	Promotion of Spin-offs	Incubators	Science Parks	Clusters	Teaching/training	Labour Exchanges
Institution										
Memorial University	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No
University of Prince Edward Island	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Université Sainte Anne	No	Yes	Yes	No	No	No	No	No	Yes	No
Acadia University	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Atlantic School of Theology	No	Yes	Yes	No	No	No	No	Yes	Yes	Yes
Cape Breton University	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Dalhousie University	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes

[45] These would include, for instance, New Brunswick universities' events such as "From Ideas to the Marketplace" in Fredericton; "Successfully Bringing Your Technology to the Marketplace" in Saint John; "From Research to Revenue" in Moncton; "Rendez-Vous BioSciences NB 2004" in Sackville; "Research, Development & Commercialization in the New Brunswick Forest Sector" in Edmundston.

Institution	Research Contracts	Collaboration	Consultancy	Intellectual Property Transactions	Promotion of Spin-offs	Incubators	Science Parks	Clusters	Teaching/training	Labour Exchanges
University of King's College	No	No	No	No	No	No	No	Yes	No	No
Mount St. Vincent University	No	Yes	Yes	No	No	No	No	No	Yes	No
Saint Mary's University	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
St. Francis Xavier University	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Nova Scotia Agricultural College	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
NS College of Art & Design	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
Mount Allison University	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No
St. Thomas University	Yes	Yes	Yes	No	No	No	No	No	Yes	No
Université de Moncton	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes
University of New Brunswick	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
College of North Atlantic	Yes	Yes		Yes					Yes	Yes
Holland College	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No
NS Community Colleges	Yes	Yes	Yes	No	No	No	No	No	Yes	Yes
NB Community Colleges	No	Yes	Yes	No	No	No	No	Yes	Yes	No

The institutional policies that guide and encourage potential faculty entrepreneurs are intellectual property rights policies sometimes contained in the collective agreements. These may require mandatory disclosure of inventions to the institution, specify the responsibilities of the faculty members, or detail individual versus institutional ownership rights. Also, institutions have specific policies in governing faculty consulting and contract research. In addition, all Atlantic Canadian universities and one-half of the community colleges have a single point of contact and coordinating structure through which faculty can explore potential technology transfer relationships. However, neither community colleges nor universities have proof-of-concept funding[46] for the development of research-based innovations, although universities can avail of Springboard's Proof-of-Concept fund.

While technology transfer is a well understood concept in the context of HEIs, the metrics chosen by these institutions to measure it vary across institutions. In fact, some institutions do not have formal approaches in place for measuring technology transfer. However, Springboard has established a 'Performance Measures' program in which all

[46]Proof-of-Concept funding is financial support at the very early stages of research commercializing for things such as feasibility studies, testing of prototype development, market research, business plans, etc., which are designed to bring research to the point where its commercial usefulness can be demonstrated.

14 members participate. This program has been designed specifically to address the point of missing metrics around technology transfer activities.[47]

For those institutions that have established technology transfer metrics, one observes that some institutions record annually the number of disclosures; the number of option agreements or licenses; the amount of licensing revenue; the number of patent applications filed; the amount of private sector research money spent at the university; the number of research contracts at the university per year; the number of spin-off or start-up companies created per year; the number of technologies assessed; the number of Assignment Agreements; the number of proof-of-concept/demonstration projects supported; and the value of equity in spin-offs. Interestingly, the amount spent on technology transfer activities is relative small for all HEIs in Atlantic Canada. For instance, no institution spends $1 million or more on this activity. Technology transfer has changed over the last five years at Atlantic Canada's HEIs. However, most of the reported change has been in terms of increased awareness of its importance for the institution. Moreover, for most institutions, the measurement of technology transfer has only become established within the last five years. Yet, Dalhousie University reports that there has been an increase in disclosures and license revenue; a decrease in patents due to lack of funds and a decrease in number of start-up companies. Alternatively, Memorial University indicates that the biggest shift has come from the focus on regional economic development. Memorial University's policy is to license a technology to a local company first, then go regionally, then nationally and only internationally if there was no other alternative. However, there is now there is a push to form spin-off companies if there is no receptor company in the region and the technology is broad enough to support a company.

How Atlantic Canadian HEIs deal with their technology transfer and industry-sponsored research functions are closely related. In some instances, these functions are either handled by the same individual or they work out of the same office. Even when they work out separate offices, which at times are in separate buildings, there is close collaboration between the two and the individuals oftentimes report to the same administrator. In fact, since there may be intellectual property issues associated with industrial research contracts, the technology transfer staff at certain institutions, when they are separate individuals, work closely with the research office in helping to draft relevant part of the research contracts.

5. Conclusion - SWOT analysis

Strengths

The Atlantic region has an extensive network of HEIs, including 17 universities as well as community colleges in all provinces. Although the bulk of the research capacity is concentrated in the region's three largest universities, those being Dalhousie University in Halifax, N.S.; Memorial University in St. John's, N.L.; and the University of New Brunswick in Fredericton, N.B, some smaller universities such as the Nova Scotia

[47] Details of these performance measures can be found on Springboard's website: www.springboardatlantic.ca.

Agricultural College and the University of Prince Edward Island have a sizeable and/or growing research presence relative to their size.

Furthermore, many of the universities and colleges have developed significant areas of expertise related to the strengths and interest of their principal researchers. Identification of niche areas of expertise and focusing limited resources in these areas may enhance current research efforts. As well, research priorities of HEIs reflect a close association with and understanding of the needs of the community.

Finally, universities and colleges are increasingly aware of their responsibility to encourage liaison between researchers and industry stakeholders in order to stimulate the commercial activity which will contribute to sustained economic growth.

Weaknesses

The presence of a large number of small institutions spread out across a large region is not conducive to building a consolidated base for research. While a number of smaller institutions have an outstanding record in liberal arts education, they have limited capacity to engage in research related to applied sciences and technology. Despite efforts to build alliances, effective partnerships and program integration across institutions has been frustrated by competition among institutions and a lack of commitment towards cooperative initiatives.

While federal funding for research at Atlantic universities has increased in recent years, most Atlantic universities still rank poorly overall in comparison to their counterparts in the rest of Canada. This situation is compounded by the fact that the financial position of the universities in Atlantic Canada is increasingly challenged by declining enrollment associated with an aging population and out-migration of young people.

A final concern is that the current system of intellectual property ownership (i.e., retained by university researchers rather than the institution) creates a disincentive to engage in commercialization.

Opportunities

In a region where the private sector makes a relatively small contribution to overall research performance, the role of universities has a particularly significant function. The federal government's continued focus on innovation should ensure that universities will be at the forefront of efforts to transform the economy of Atlantic Canada. Moreover, National funding for research has increased substantially over the past 10 years. As well, regional funding for research has also increased through federal institutions such as ACOA and the NRC, although there is increasing pressure to show tangible outcomes as a result of these expenditures. Finally, significant funds for R&D will likely become available from the regional oil and gas industry.

Threats

With the increased emphasis on commercial success as a criterion for further research funding, Atlantic Canadian universities may find it increasingly difficult to succeed. This

is exacerbated by the fact that the economy of the Atlantic region is characterized by a high proportion of small businesses that are less likely to partner with university researchers.

Although provincial governments in Atlantic Canada have increased their support for research and innovation, they face a limited capacity to invest in higher education compared to wealthier provinces elsewhere in Canada. This is problem is compounded by the fact that a ramp-up of research efforts at some of Canada's larger universities outside Atlantic Canada are drawing national and international funding to these institutions and away from Atlantic Canada.

Chapter 5: CONTRIBUTION OF TEACHING AND LEARNING TO LABOUR MARKET AND SKILLS

1. Localizing the learning process

Higher Education Institutions in Atlantic Canada draw extensively upon the specific characteristics of their area to aid learning and teaching. In particular, a number of their courses and programs have been designed to cater to the needs of the province, region or community in which they operate. It should not be surprising, given the mix of institutions covered by this study, that the approaches adopted with respect to localizing the learning process depend to some degree on the characteristics of the institution, the circumstance of region in which they operate and the mandate or mission of the institution involved.

For instance, the nature of community colleges in Atlantic Canada is to deliver programs that respond to identified local and provincial needs. Specifically, community colleges incorporate local needs into their programming decisions and determine which campuses will offer specific programs. Hence, one could argue that all of the programs are in response to identified local needs, although some courses have more of a local focus than others. These would include, for example, the College of the North Atlantic's Aboriginal Access program that it delivers in Labrador, tourism and hospitality programs of Holland College, and the general and customized training programs for specific trades to meet local skill deficiencies offered by all community colleges. Furthermore, the existence of those needs is determined through consultation with the various provincial advisory committees that contribute to identifying training and basic adult education needs throughout each of the provinces.

Even though the approaches adopted by the region's universities are more diverse, ranging from very precise to more general responses, each institution draws upon the local characteristics of its area to localize the learning process for its students. Some of the more general approaches have been exhibited by Acadia University, which works with local governments, industry, and organizations for developing service learning and other learning environments. It also takes advantage of the local environment and geographic characteristics for science teaching and research. This has translated into courses at the university on social, economic, and environmental needs of the area, including, for instance, "Sustainable Nova Scotia," "Acadian Culture," "History of Maritime Provinces," and "Flora of Nova Scotia."

The programming approach adopted by Dalhousie University is also a general one in that programs are in areas such as social sciences, health professions and law are informed by the fact that Dalhousie University is located in a regional centre for government, health care, law enforcement and justice. As well, since Halifax is located on the Atlantic Ocean, Dalhousie University's programs emphasize ocean and maritime subjects, in particular in the areas of science, engineering, management and law. In terms of catering to local or regional needs, Dalhousie University highlights that it is the sole provincial or regional provider of many academic and professional programs. Provincially, this

includes engineering, law, many arts subjects and science programs, and regionally, it includes medicine, various health professions, architecture, planning and dentistry.

An illustration of the specific approach to localizing the learning process is illustrated by Cape Breton University. For this university, much of its core Teacher Education programs were developed with local and regional teachers and school administrators. In addition, since Cape Breton Island is home to the only Gaelic community in the world outside Europe and the last of the numerous gaidhealtachs (Gaelic-speaking areas) that once existed throughout North America, the University offers Celtic studies courses in which students study Celtic language and history. This includes the contribution that the Celtic people have made to the development of western civilization and the cultural heritage of Cape Breton Island.

Cape Breton University also offers Mi'kmaq Studies courses. These courses are designed to familiarize native and non-native students with the history, language, culture, and socioeconomic development of the Mi'kmaq First Nation. As well, these courses are integral to maintaining and perpetuating the understanding and use of the Mi'kmaq language and culture. This is supplemented by the Integrative Science program. This program brings together science knowledge as conventionally understood, combined and enriched with understandings from the holistic world views of Aboriginal peoples, especially the Mi'kmaq First Nations in Atlantic Canada. Integrative Science is a concentration with Cape Breton University's Bachelor of Science, Community Studies (BScCS) four-year degree. The Integrative Science concentration, in combination with the degree's innovative structure, seeks to foster the understanding of science through diverse means, including: the new science courses; applied science courses; science research and community intervention skills courses; science opportunities as elective courses; and science experiences in the form of work placements. This program was initiated to provide a unique opportunity for Mi'kmaq students to study science in a way that embraces both traditional Mi'kmaq views and conventional views.

The NSCAD University (NSCAD) also demonstrates a specific approach to localized learning. In particular, several of NSCAD's discipline areas are focused on area history, issues and other characteristics. By way of illustration, courses such as Documentary Video, Documentary Photography, Canadian Art History, Entrepreneurship in the Visual Arts, Professional Practice, and Visual Arts in the Classroom cater specifically to the needs of Atlantic Canada, Nova Scotia, and Halifax by providing knowledge and skills to students and by building relationships with community stakeholders.

The University of Prince Edward Island's approach to localizing the learning process is another excellent example of how the specific characteristics of an area get incorporated. As an example, the University of Prince Edward Island utilizes local areas for student placements, co-op experiences, teaching and nursing practica, and Veterinarian internships. In addition, the School of Business draws upon the community for projects, speakers, student co-op placements, an advisory council, mentoring and case studies. The Faculty of Education teacher education programs are based on the Atlantic school curriculum and specialized programs designed to meet identified needs. The Atlantic

Veterinary College (AVC) takes into account advice received by an advisory council that is made up of representatives from the four Atlantic provinces and many final-year rotations in the AVC depend upon local or regional cases for submissions of clinical material.

The mixtures of general and specific approaches are provided by Memorial University, Mount Allison University and University of New Brunswick. Memorial University highlighted examples including how the Department of Folklore draws on the rich cultural background of the province to teach its program; the School of Music offers a program in ethnomusicology that draws from the musical tradition of the province; and the Faculty of Education teaches students how the work in rural and remote areas. Additionally, the Faculty of Engineering draws upon the offshore oil and gas sector in developing its curriculum; the Department of Archeology teaches graduate and undergraduate students by utilizing a number of archeological digs throughout the province; and the Marine Institute's applied focus utilizes information on the local fishery and marine transportation sectors in training its student.

Mount Allison University employs field work, in partnership with local non-governmental organizations and with local branches of Environment Canada, to provide students the opportunity to "get outside of the classroom" and into the local context. The University's distance education courses provide access to university courses off campus, which allows rural students an opportunity to engage with the institution. Furthermore, courses within the Departments of Geography and Commerce address issues of local importance, with the goal of providing guidance and information towards finding solutions to issues such as downtown revitalization or climate change impact and adaptation.

The University of New Brunswick offers the final illustration of a mixed approach to localized learning. In particular, the University utilizes the regions' specific physical and cultural attributes as examples and as case studies for student learning. For example, New Brunswick's forests play a significant role in its identity and economy. Drawing upon this characteristic, students use New Brunswick's forests and associated social/industrial context to learn to design and defend forest management practices. As well, nursing students use New Brunswick's hospitals and health care facilities to learn clinical practices, while biology students explore coastal problems and aquaculture management in the Bay of Fundy region with experienced researchers. Renaissance College students, in addition, interact with Native communities in the region to learn alternative value systems.

On a more specific level, many of the professional programs at the University of New Brunswick directly cater to community, regional and provincial needs. The Forestry faculty helps students acquire competence to participate in all aspects of natural resource management from industrial forestry to environmental regulation. Engineering programs help students acquire the ability to contribute to the areas of manufacturing, infrastructure development, and resource production and management. Education programs prepare students for meeting New Brunswick's primary and secondary education needs. Nursing,

psychology and kinesiology programs prepare students for helping meet the region's health needs, while law, business and leadership programs advance New Brunswick's legal, business and entrepreneurial needs, respectively. These programs prepare students for service in their respective disciplines over the medium to long term. Short-term needs are provided by both the College of Extended Learning, the outreach arm of the University, which offers a variety of courses and programs based on local, regional, and provincial demand, and the Saint John Campus which offers second language skills.

The Université de Moncton is in a unique position, being the only French university in New Brunswick and the largest in the region. In fact, the Université de Moncton sees its role in the context of the greater Francophonie, rather than from a local, provincial or regional perspective.

It is also important to recognize that the learning programs at Atlantic Canadian HEIs are tied in a number of different ways to reflecting and finding creative solutions on regional/provincial/local issues over the medium to long-term. While there may not be formal or institutional approaches, the raison d'être of a university is to promote reflective and creative thinking that leads to innovative solutions. In particular, faculty members in many areas naturally incorporate local issues into their classes to illustrate problems and to spur thinking. These may take the form of case studies, community-based clinical work, independent studies in public policy, and experiences in the field. However, there are also specific illustrations of HEIs finding creative solutions to local issues and problems.[48]

Furthermore, almost all of Atlantic Canada's HEIs have learning programs within their institutions that enhance the capacity of students to be entrepreneurial by taking advantage of regional/provincial/local issues and opportunities. These may be in terms of specific entrepreneurial programs offered by their faculties, schools or departments,[49] by specific research institutes or centres within the institution, [50] through co-op courses offered by the university or college,[51] various case study techniques utilized by their business programs, and teaching methods such as problem-based learning and self-directed learning that encourage entrepreneurial behaviours.

It is also interesting to examine how are students at the various institutions are integrated into the institution's area of influence (i.e., region, province or community), in terms of course placements, co-op programs, accommodation and volunteering activities. As

[48] This "Next NB/Avenir NB," a program that has been designed to involve public participation in strengthening public input in policy development in New Brunswick.
[49] An example of which is Cape Breton University's BBA degree. This program provides an opportunity, for interested students, to pursue a concentration in entrepreneurship. This would also include the Entrepreneurship & Small Business Program offer through the Nova Scotia Community College system.
[50] This would include, for example, Mount Saint Vincent University's Centre for Women in Business, Saint Mary University's Business Development Centre, Acadia University's Centre for Small Business Entrepreneurship, Mount Allison University's John Dobson Mircoenterprise Centre, and Memorial University's P.J. Gardiner Institute for Enterprise and Entrepreneurship.
[51] While most HEIs have a co-op option in their business and select other programs, the University of Prince Edward Island also has a regular and an entrepreneurial co-op option.

noted previously, most HEIs offer co-op programs.[52] As well, some programs have experimental learning segments or practica — this would include, but is not limited to, education programs, social work, pharmacy, medicine, nursing, law, veterinary medicine, journalism, hospitality programs at universities, and allied health, engineering, natural resources and information technology programs at community colleges.

Another important avenue through which students are integrated into the community is where they choose to live while attending the HEIs. As shown previously, the majority of students attending post-secondary institution in Atlantic Canada are housed off campus. Another way that students affect the community is through the volunteer activities that happen at all of Atlantic Canada's HEIs. This can take the form of formal volunteer programs,[53] student volunteer organizations,[54] course designed to enhance volunteerism,[55] and general volunteerism initiated by students and various student societies/clubs on campus.

For the most part, extra-curricular activities are not accredited at Atlantic Canadian universities and colleges. However, there may be awards that recognize student leadership qualities. To the extent extra-curricular monitoring exists, it is in the form of counting the number of students registered for different societies and clubs in order to ensure that various fees get allocated correctly to the student clubs and societies.

Within Atlantic Canadian HEIs, postgraduate activity is driven primarily by the personal interests of postgraduates and faculty members. However, some disciplines emphasize areas with regional relevance, especially if funding for postgraduate research is tied to the specific needs of the community.

Another way in which Atlantic Canada's HEIs affect their regions is by facilitating voluntary associations and coalitions of local expertise and knowledge around key strategic priorities within the geographic area of their influence. This has been manifested in a variety of ways by the HEIs within Atlantic Canada. For instance, HEIs often serves as a resource to these associations and sometimes the institutions' faculty and staff are active members of these associations. In some instances, there are designated institutes within the HEIs that enable the institutions' expertise to be connected to the voluntary associations.[56] In addition, some HEIs, such as Dalhousie University, partner with other universities, industry associations, local and regional economic development agencies, and community development organizations to achieve strategic priorities for their immediate area and throughout the region. This could include specific initiatives such as "Next New Brunswick/Avenir Nouveau-Brunswick," which serves to facilitate linkages between the university community and the people of New

[52] For example, about 20% of Dalhousie University's course offering are co-op.
[53] This would include, for instance, Mount Allison University's Leadership Certificate program, where students have the opportunity to volunteer with local organizations.
[54] Examples of which are: Volunteer Acadia Centre, Acadia University, Memorial University's Student Volunteer Bureau, Mount Allison University's Yellow-Ribbon society and the Society of All Nations,
[55] An illustration is the University of New Brunswick Kinesiology course that is given in volunteering and community
[56] Memorial University's Harris Centre performs this function in Newfoundland and Labrador.

Brunswick.[57] Alternatively, it might encompass the University of New Brunswick's coordinating activity around coalitions of regional expertise and knowledge focused on key regional/provincial strategic priorities. These would include, for example, the Meighen/Molson Professorship in Atlantic Salmon Research,[58] the Vaughan Chair in Regional Economics,[59] and Dr. J. Herbert Smith/ACOA Chair in Technology Management and Entrepreneurship.[60]

Similarly, the University of Prince Edward Island works closely with organizations to be relevant and helpful for the good of Prince Edward Island and the region. Faculty members are key facilitators in provincial organizations, such as P.E.I. Literacy Alliance, P.E.I. Association for Newcomers, and the local group of Canadian Parents for French. Moreover, faculty members belong to many boards, councils, and related associations. These include the Canadian Veterinary Medical Association, P.E.I. Vet Med Association, Maritime Regional Swine Network, and the Chair of Genome Atlantic.

The region's smaller universities and community colleges also perform this role. For instance, Acadia University achieves this through academic programs, student initiatives, and other activities, while St. Thomas University highlights its efforts in the areas of social justice and human rights. In addition, l'Université de Moncton notes that there are many opportunities for collaboration and a closer relationship between staff and faculty members in our university and community stakeholders at every level. As well, Cape Breton University indicated that it has many partnerships and liaisons with outside organizations with regard to strategic priorities. With regard to teaching and learning issues, the University is a member of the Association of Atlantic Universities, the Society for Teaching and Learning in Higher Education (STLHE), and the STLHE Educational Developers Caucus. The Cape Breton Partnerships is bringing together considerable knowledge, skills and experience of Cape Breton's business and community leaders to build a vision for growth and prosperity.

[57] This initiative has been designed to increase understanding and strengthen public input in policy development, through four main facets, namely: (1) research, (2) publications, (3) on-line participation, and (4) public sessions.

[58] Meighen/Molson Professorship in Atlantic Salmon Research is a recreational fisheries partnership consisting of the New Brunswick Department of Natural Resources and Energy, the Cloverleaf Foundation and Wildlife research unit within the University of New Brunswick. This partnership provides the scientific support required for the management and sustainability of the socio-economically significant recreational fishing industry of Atlantic Canada.

[59] The Vaughan Chair serves as the focal point for research in the economic, political and historical characteristics of Atlantic Canada. Both faculty members and graduate students make up the research team.

[60] The Dr. J. Herbert Smith/ACOA Chair in Technology Management and Entrepreneurship is in partnership with the Atlantic Canada Opportunities Agency in response to an identified need for providing training in business management skills to engineers and others involved in technology and entrepreneurship. The objective of this partnership has been to enhance business and industry in Atlantic Canada and in particularly the growth of small entrepreneurial firms involved in technology-based ventures.

Likewise, NSCAD University encourages and supports associations with many arts organizations, cultural institutions and educational groups. Examples include Visual Arts Nova Scotia, the Film Studies Association of Canada, and the Canadian Conference of the Arts.

The community colleges also play an important role in participating with and facilitating coalitions with voluntary organizations to meet the strategic priorities identified in their area. Specifically, Holland College participates in many community-based organizations in support of community and provincial development. In addition, the Nova Scotia Community College has a high degree of involvement in community and economic development organizations, including regional development authorities, chambers of commerce, municipal government and rural community networks. Their campuses often offer the use of campus facilities and expertise in support of local agencies. Similarly, the New Brunswick Community College facilitates these coalitions through active partnerships in developing training programs, through use of College facilities for conferences, seminars, workshops, and so on. Finally, the College of the North Atlantic highlights that it has many staff and administrators involved in volunteer commitments in communities. These include regional economic development boards, development associations, chambers of commerce and others.

2. Student recruitment and regional employment

Most of the recruitment activities are focused on provincial recruitment first, then regional recruitment, and then national recruitment. Dalhousie University recruits nationally, which results in half its students coming from outside province. However, it does have provincial and regional quotas on some health program enrolments. On the other hand, Memorial University and University of Prince Edward Island primarily serves students from within their respective provinces. Likewise, the community colleges recruit mostly from the local area and the province, even though there is broader geographical representation for some of their programs.

Atlantic Canada HEIs do not have collaborative partnerships or quota arrangements with other post-secondary education institutions to manage regional recruitment. However, various articulation agreements exist between institutions and universities that lead to collaboration on recruitment efforts through, for instance, the Atlantic Association of Registrars and Administrative Officers (AARAO). The AARAO is responsible for organizing collaborative recruitment events, such as school fairs in Atlantic Canada, Ontario and Western Canada, for the region's HEI, but there are no quota arrangements.

In an attempt to increase regional/provincial/local recruitment, Atlantic Canadian HEIs have utilized a number of mechanisms. These have included creating recruitment offices, which are tasked with recruitment efforts on behalf of the institution. These efforts have included: increased school visits; on-campus visits and special events; on-line and in-person communications; recruitment fairs; scholarship receptions; portfolio development

workshops and review days;[61] advertising through television, radio and print media; and recruitment scholarships.

In addition, its is important to mention EduNova, which was created with the support of ACOA, the government of Nova Scotia and all levels of the education sector. This program was designed to support international student recruitment and international program opportunities for education institutions.

A key recruitment instrument for students is the level of scholarships available through the educational institution. Atlantic Canadian HEIs support for students through scholarships has increased significantly.[62] Moreover, the types of scholarships available have changed;[63] the application process has been streamlined, making it easier for qualified students to receive funding;[64] and more students are accessing scholarship support.

In May of 1998, the federal government introduced the Canadian Millennium Scholarship Foundation. The purpose was to provide students in financial need with 100,000 scholarships over 10 years, worth a total of $2.5 billion. While not all institutions are benefiting to the same degree, the experience of HEIs in Atlantic Canada is that this scholarship fund has made a positive and significant impact on improving access for students in need. However, there is anecdotal information that students in this region are not faring as well with this program as students from other parts of the country, largely due to the per capita nature of the funding allocated.

For some students, employment with the educational institution that they are attending is an important mechanism through which they fund their education. Hence, student employment at the HEIs represents one way through which Atlantic Canadian post-secondary institutions can contribute to accessibility at their institutions for a subset of students.[65] In the last five years, student employment at Atlantic Canadian HEIs has increased. In addition, in terms of international recruitment, the ability of international students to work legally off campus was seen as a positive development.

Community colleges are engaged in more extensive monitoring of the flow of their graduates into the labour market. While labour market analysis is normally undertaken by the respective provincial government or national agency (Service Canada), community

[61] These portfolio development workshops and review days are undertaken by the Nova Scotia College of Arts and Design.
[62] Dalhousie University, the University of New Brunswick and the Nova Scotia Community College report that the value of scholarships and bursaries at their institutions have increased by approximately 70% in the last five years, while Cape Breton University reports that funds available for scholarships and bursaries and scholarships have doubled.
[63] This would include the University of Prince Edward Island's Inspiring Excellence awards and Memorial University's entrance scholarship program.
[64] NSCAD University's internal application process has become more streamlined and simplified. Applications are available online and the Internet list of scholarships is updated regularly. Workshops are conducted each semester to help students learn about the application process.
[65] Memorial's Undergraduate Career Experience Program (MUCEP) is an example of an on-campus employment program for undergraduate students aimed at providing job experience.

colleges do track employment outcomes of their graduates through annual sectoral and graduate analysis. There is certainly less formal monitoring at the university level, but there is tracking of graduates at the faculty and professional levels and as part of broader provincial or regional studies. This would include Newfoundland and Labrador's Career Search, which documents the employment status of post-secondary education students two years after graduation; the MPHEC's regional longitudinal (five-year) study, and Statistics Canada's Survey of Earned Doctorates. In addition, to participating in provincial and federal government surveys or with the MPHEC, the monitoring may also involve consultation with industry or professional associations, members of community college advisory committees, and major employers within the province.

Although within certain HEIs specific initiatives or practices exist to support graduate enterprise as an instrument to retain graduates in the local area or to recruit alumni to return to the area, these are not widespread. To the extent they exist at all, they consist primarily of trying to link students with local industry and organizations and cooperation in publicizing employment through some alumni networks. However, some community colleges do introduce students to funding and services options for business start-up.

3. Promoting lifelong learning, continuing professional development and training

Another important function of post-secondary institutions is their promotion of lifelong learning and continuing professional development and training. The approach adopted by Atlantic Canada's HEIs is multi-faceted. This would include, for instance, professional schools, such as Engineering and Medicine, offering continuing professional development to their graduates; distance education and distributed learning departments providing credit and non-credit courses at the graduate, undergraduate diploma and certificate level to students in remote sites; departments, colleges, divisions, or centres tasked with continuing education or extended learning; contract learning for specialized training; and adult basic learning courses are offered through the community college systems.

Unlike the practices in other countries, there are no external or independent enterprises, such as separate and independently-run business schools, established within HEIs to extend professional education provision to the region/province/community. Yet, there are training programs within Atlantic Canadian HEIs that are self-financing or are funded on a cost-recovery basis.

The number and mix of external partners that are involved with meeting the area's training needs differ by institution and province. This includes, for example, partnerships between the province's universities and between the universities and the community colleges system. As well, it may include professional associations, particularly in the health disciplines. In some provinces, it would include provincial and federal government departments and agencies. Other partners could be local businesses, school boards, provincial development authorities, and, in some instances, private training schools.

There are numerous mechanisms in place at Atlantic Canada's HEIs to increase access for learners who have been traditionally under-represented in higher education.[66] Dalhousie University, for example, has long had a "Transition Year Program" for First Nations and Indigenous Black students. Its Law School has a support programs for both groups. The University also has entrance scholarship programs for both groups at the graduate and undergraduate levels and it has a Black Student Advising Centre and a Native Student Centre and Advisor. As well, it is developing specialized programs for First Nations students who wish to enter health programs.

Cape Breton University, keeping with the mission statement, has the Mi'kmaq College Institute that allows Mi'kmaq students, educators, scholars, and researchers of Mi'kmaq cosmology to establish a curriculum and research agenda, which contributes to the achievement of the educational and community goals set by the Mi'kmaq communities. Cape Breton University has innovative courses which bring together conventional western science knowledge and understandings from the holistic world views of Aboriginal peoples, especially the Mi'kmaq First Nations of Atlantic Canada, as well as some of the other projects and partners of the Toqwa'tu'kl Kjijitaqnn / Integrative Science Program.

The University of Prince Edward Island has developed a Transition Program and is developing a Bachelor of General Studies aimed at mature students. Services are available for students with learning disabilities, and the ACE Program has been developed to give a university experience to students with cognitive impairment. Similarly, Acadia University is increasing its ability to serve under-represented populations. It has created research centres to work with under-represented groups, increased resources for individuals with disabilities, and improved access to adult learners locally, provincially, and regionally.

Mount Saint Vincent University has a mature student admissions policy for those who have not completed the formal requirements of high school. There is also a prior learning assessment policy that allows students with non-traditional education and work experience to submit portfolios for credit assessment. Adaptive technologies and supportive special services are available for those with sensory and/or learning disabilities. Efforts are made to recruit students from ethnic minorities and Aboriginal communities (e.g., the Education Faculty is actively seeking partnerships with Aboriginal communities to provide teacher education).

Along the same lines, the University of New Brunswick has a mature student admission policy. Many adult learners use the part-time option as an entry point to degree credit study. Others start with non-credit and move to degree credit study. The University also has a Prior Learning Assessment policy that promotes access. It has, as well, a degree completion program (Bachelor of Integrated Studies) that provides greater flexibility than most degree programs. Finally, the academic preparation provided by the Saint John campus is specifically targeted to international students and new immigrants.

[66] This includes ethnic minorities, returning adult learners, aboriginal peoples, and individuals with disabilities.

Memorial University, likewise, does have some programs in place that have been specially designed to meet the needs of Aboriginal students in Nursing and in Education. The University also has support programs in place for non-traditional students, though these are geared to students who have enrolled at the University. Other than the above, the University does not yet have programs to attract traditionally under-represented groups. However, the issue was prominent in the government's White Paper on Public Post-Secondary Education and has been a focal point in the University's deliberations in developing a new strategic plan.

Acadia University is increasing its ability to serve under-represented populations. It has created research centres to work with under-represented groups, increased resources for individuals with disabilities, and improved access to adult learners locally, provincially, and regionally. Alternatively, St. Thomas University has targeted scholarship funding and l'Université de Moncton has some bursaries that it offers to adult learners enrolled in its credit courses. NSCAD University, as well, has established a teen bursary fund through private donations that gives highest consideration to students with financial need and who have demonstrated interest in the visual arts. Students who participate in the program are selected and recommended through a process established by the Halifax Regional School Board.

Another interesting approach is found in Saint Mary's University. Through its Division of Continuing Education and Saint Mary's at the World Trade Centre, the University offers executive and professional development programs, flexible scheduling and extensive offerings of seminars, certificates and diploma programs, and customized training.

The community colleges also have programs targeted at under-represented populations. For example, Nova Scotia Community College identifies traditionally under-represented population as high priority for the college. In particular, returning adult learners comprise two-thirds of learners in diploma programs. The College delivers most of the Adult Learning programming in the province, enrolling more than 1,000 adults each year. More adult learners on income supports are sponsored by federal and provincial governments to attend the college, which provides additional learning supports through a network of campus-based retention and employment specialists. This program improves employment outcomes markedly for sponsored students. Furthermore, the College establishes and tracks explicit diversity targets and resources are in place to attract, support and retain students from Nova Scotia's Aboriginal and African Nova Scotian communities. Specially designed outreach programs are developed and delivered in partnership with these cultural communities. As well, the College actively champions and provides accommodations to learners with disabilities. Currently, over 7% of the student body have identified as such and are being accommodated to overcome disabilities – more than the aggregate total of all other post-secondary institutions in the province combined. Disabled college graduates experience labour force participation and employment rates that are more than three times higher than the overall working-aged population of disabled adults in Nova Scotia. Learning centered accommodation to

disabled adults is also among the targeted results expectations and tracking in the College's Balanced Scorecard reporting to its Board of Governors.

The College of the North Atlantic has placed a high emphasis on addressing under-represented populations. This includes: programs for Women in Trades, Aboriginal access, Comprehensive Arts and Science program, Adult Basic Education Levels II and III and Level I (Literacy). Also, the College just received funding to hire six new Disability Service Coordinators to assist students with needs.

New Brunswick Community College achieves this through seat reservations, directed activities such as contract training with aboriginal communities, or special incentives such as scholarships for women in non-traditional programs. In addition, Holland College designates 20% of post-secondary program seats for adult education students and 20% for direct from high school students.

4. Changing forms of education provision

Over time and around the world, the modes for delivering of education have evolved and become more flexible. This would include satellite campuses, accreditation networks, on-line courses and outreach centres. While the patterns observed in Atlantic Canada's post-secondary institutions are equally innovative, the multi-territorial education provision is not perceived as a problem for maintaining institutional coherence. Since individual academic units are responsible for course and program development for both on-line and traditional courses, Atlantic Canadian HEIs maintain institutional coherence in the face of these innovative approached to program delivery.

One illustration of innovative approaches to education delivery is at Memorial University. It offers about 250 courses via the web. In addition, the University has partnered with the community college system to offer first year university studies at select college campus throughout the province and it has a number of transfer articulation agreements with the College of the North Atlantic and with other institutions in Atlantic Canada. The University also offers some cohort programs whereby a combination of distance and local delivery is used to provide programs to more rural areas.

Dalhousie University, likewise, has been innovative in its approach to program delivery. Its School of Nursing has a satellite program at Yarmouth; its Business School offers an Master of Business Administration program for financial institutions with many of its students being in Ontario; the Social Work Department offers graduate and undergraduate programs nationally through distance education; there is a growing use of WebCT; and the School of Public Administration has developed a full suite of on-line courses.

Similarly, the University of New Brunswick has flexibility in some disciplines, but there is less in others. Nursing, for example, has extensive flexibility by offering nursing at several satellite campuses and through distant as well as face-to-face learning activities. Although there are a few examples of educational partnerships with external educators,

the Faculty of Business Administration and Capital Airways offer a joint Aviation and Operation Management Program. The primary mechanism to facilitate provision for flexible education is the College of Extended Learning, which is the University's outreach arm. The university, as well, runs a First-Year at Home program in the Miramachi and offers the complete Bachelor's of Nursing program at two satellite sites — Bathurst and Moncton. Finally, about 70 credit courses are now available on-line from the university.

Being as innovative as its Atlantic Canadian counterparts, the University of Prince Edward Island has web courses and outreach centres to connect broadly as well as evening courses to accommodate working students. Their Master of Education program is offered in Alberta and soon to be offered in Nunavut.

Another innovative approach to course delivery is found in Mount Saint Vincent University, which offers some of its courses through broadcast television. This is in addition to approximately 200 degree-credit courses offered per year via on-line technologies and graduate education courses face-to-face in various communities throughout the region. As well, Mount Allison has a satellite campus in Moncton as part of a partnership with the Moncton Flight College. This partnership enables students to attain a pilot's license and an undergraduate degree simultaneously.

Other universities within the region that also offer distance and outreach courses are Acadia University, St. Thomas University, Cape Breton University, and Saint Mary's University. The community colleges, as well, offer on-line and correspondence courses; have "satellite" campuses for adult education activities; are engaged in transition programs within the K-12 system targeted at high school students "at risk;" participate in joint articulation committees with local universities; and have established outreach centres for adult learners.

Clearly, post-secondary institutions in Atlantic Canada are drawing extensively upon new forms of information and communication technology-based (or ICT-based) course delivery to enhance educational opportunities to a wider group. In addition to distance education, this would include teleconferencing, videoconferencing, blended solution formats (ICT and face–to-face), CDs, learning management systems, VoIP technology (Elluminate Live), and televised courses with either WebCT sites or VoIP technology.

The barriers identified for developing distance education at Atlantic Canadian HEIs were: (1) cost – it may cost as much as $30,000 to produce one web-based course; (2) academic units may prefer to offer courses on campus and resist distance courses or as one institution put it, "traditionalism blocks experiment;" (3) human resource limitations in the form of a lack of qualified faculty willing to delivery courses through this format; (4) it may not be part of the institution's strategic plan so that there is no institutional target for its long-term development; (5) some course content (e.g., visual arts) may not be amenable to this format; and (5) bandwidth limitation available to students in rural communities.

As these barriers indicate, there are tensions between place-based and virtual forms of education provision in Atlantic Canadian HEIs. In most universities, there are those who do not believe that distance education provides as rich an educational experience as more traditional modes of instruction. In other words, some people believe that virtual education is not "good" education and therefore reject it.

Higher Education Institutions in Atlantic Canada are certainly engaged in province-wide/region-wide delivery of extension courses. While some institutions offer personal interest courses, but do not make extensive use of extension courses per se, other institutions devote specific centres or divisions to the delivery of these continuing education programs throughout their respective provinces.

5. Enhancing the regional learning system

In all provinces, there is a coherent vision of the education system. For example, the Government of Newfoundland and Labrador recently prepared a White Paper on Public Post-Secondary Education that clearly articulated the government's priorities for post-secondary education for the coming years. One of the basic tenets of the paper was a single university system and a single college system. It also reaffirmed the need for the college and the university to engage in meeting the social and economic challenges faced by the province. As well, the Government of Nova Scotia has a provincial strategy for Education, which is referred to as "Learning got Life II: Brighter Futures Together."

Similarly, the Government of New Brunswick has a Quality Learning Agenda. It is composed of four interdependent policy statements, including: (1) early childhood development, (2) kindergarten to Grade 12 (quality schools), (3) post-secondary education and training (quality post-secondary opportunities), and (4) adult and lifelong learning. These policies provide a framework for education, which is part of the New Brunswick Prosperity Plan. In addition, the Government has called for a review of post-secondary education through a Commission. With the Premier's call for a Commission and a policy agenda based on the learning process as a continuum, evolving from childhood to K-12 to post-secondary education to adult and lifelong learning, there are indications that a coherent vision of education is beginning to take shape in New Brunswick.

On Prince Edward Island, there is a single university (University of Prince Edward Island) and a single community college (Holland College), with systems for collaboration (e.g., the President of each institution is an ex officio member of the Board of the other institution). Primary, secondary and post-secondary education responsibilities are all under the Department of Education. There is a high degree of access to and interaction with government.

The HEIs in each province have a mixed perspective on whether there is a need to develop education on a provincial basis. This ranges from the belief that the existing implicit, informal process is flexible and decentralized whereas a provincial formulaic approach would inevitably be ill-informed, rigid and mediocre. Then there is the view

that there will always be areas in which the education system can be further developed and cooperation between the college system and universities needs to be strengthened. This latter perspective is reinforced by the view that there is the need to create a seamless continuum for learning from early childhood to K-12, to post-secondary education to adult and lifelong learning, with consistency across institutions for the transfer and credentialing of students within the linguistic reality of provinces such as New Brunswick.

Since education in Canada is a provincial responsibility, there is a provincial vision of education rather than an Atlantic Canadian one. Yet, from an Atlantic Canadian perspective, there appears to be many cross-province or regional collaborative initiatives. This collaboration is particularly illustrated in the K-12 system with the development of the Atlantic Curriculum. When the post-secondary level is considered, there does appear to be more efforts to engage in regional dialogue and to cooperate on issues of common interest. For instance, there are several groups that work together on educational issues across the Atlantic region. The broadest group is the Council of Atlantic Ministers of Education and Training (CAMET). The CAMET group is composed of the Atlantic ministers of education and training, "… [Its] purpose is to provide the framework for joint undertakings of the four provinces in the needs of public and post-secondary education." As well, the universities and community colleges within the region have agreed in their individual consortia to promote common interests — the AAU and the APCCC. Another vehicle for cooperation and coordination is the MPHEC, which is responsible for monitoring a collaborative educational system in the three Maritime provinces, including avoiding duplication at the post-secondary level and encouraging the sharing of resources.

In other words, while the universities' academic planning exercises takes place within a framework of institutional autonomy and is not normally guided by an externally generated vision, there is an evolving coordination in areas such as health profession planning and education and a limited regulation of graduate programs through the MPHEC. Likewise, there is coherence at the regional level and a willingness to work together in areas of mutual interest for the provincial community colleges systems. This is being manifested through regional consortia and inter-provincial partnerships, programming and funding agreements.

For the community colleges, the Atlantic Provinces Community College Consortium (APCCC), established under the Council of Atlantic Premiers, is the "inter-provincial mechanism promoting and supporting the strategic development of regional collaboration, coordination, and sharing of resources among the Atlantic community colleges." The corresponding group for universities within the region is the Association of Atlantic Universities (AAU). This "is a voluntary association of the 17 universities in the Atlantic region and in the West Indies, which offer programs leading to a degree or have degree-granting status. The AAU represents the interests of universities across the region… The AAU also provides a forum where university executive heads reflect, consult and collaborate… define common objectives and positions; develop strategies to promote, … the highest ideals of post-secondary education; and exercise leadership to

promote the objectives of the collective. One of the fundamental roles of [the] Association is to create greater awareness and understanding of the important contribution of universities to the social and economic development of the Atlantic provinces."

The final vehicle for coordination, at least in the Maritime Provinces, is the Maritime Provinces Higher Education Commission (MPHEC). This is an "agency of the Council of Maritime Premiers" that acts as a "regional agency for post-secondary education (PSE)." Established in 1974, its initial mandate was to "assist the Provinces and the institutions in attaining a more efficient and effective utilization and allocation of resources in the field of higher education in the region." In June 1997, the MPHEC received a renewed mandate. The primary orientation of the Commission has been re-directed toward "improving and maintaining the best possible service to students as life-long learners," primarily within the university sector. This is to be achieved through four key areas of intervention: quality assurance, data and information, cooperative action and regional programs."

There are procedures in place to support regional/provincial collaboration between HEIs in Atlantic Canada. For instance, HEIs in Newfoundland and Labrador are influenced by the Council of Higher Education. However, given the single university – single college nature of the post-secondary education system that exists within Newfoundland and Labrador, collaboration between the two systems normally is managed at the institutional level. As well, like similar institutions in the other Atlantic Provinces, Memorial University and the College of the North Atlantic are members of the AAU and APCCC, respectively. In addition, HEIs in the other Atlantic Provinces also come under the influence of the MPHEC.

Given that a significant amount of collaboration and cooperation already exists at the Atlantic Canadian level which is in response to specific needs, it not at all clear that the effort and resources required to develop education programs on an Atlantic Canada basis would be warranted. One could argue for regional thinking to be applied to professional programs (medicine, health, veterinary studies, education, and so on), but it is less clear that a regional perspective is needed for liberal arts and sciences programming. This does not imply that there could not be more regional partnerships, which could, and given recent experience, would likely respond to realized needs.

Atlantic Canadian post-secondary institutions were asked what data analysis has been performed at their institution or elsewhere to establish the demand and supply of different types of higher education "product" within the region/province. Their responses to this question were mixed in that some institutions reported having no analyses, while others engaged in occasional studies and some institutions have formalizes regular analyses. For instance, within the University of Prince Edward Island, student demand for programs is monitored reasonably closely through analysis of MPHEC data, longitudinal analysis of course-taking behaviour, and capturing keystrokes on web search pages. It is not, however, the central determining feature in academic planning for the University. In a similar manner, l'Université de Moncton requires that the creation of new programs in

the University be subject to needs assessments. In particular, the process of assessing programs includes consultation with employers and professional organizations that accredit or bring together graduates from these programs.

Another illustration of a comprehensive demand and supply analysis of program offerings is found at the University of New Brunswick. Within that university, the Student Recruitment and Marketing Office undertakes, on a cyclical basis, different types of analyses. This would include, for example, competitor and market analyses. Different offices examine, on an occasional basis, the supply of higher education products — for example, the degrees generated and the percentage of professionals educated by the University that remain in the province; the amount of research conducted; and the number and value of grants and scholarships awarded.

Alternatively, other universities undertake periodic studies, but they are not a main focus at the institutions. Memorial University, for example, notes that two studies were undertaken recently to address the education needs of the province. One was done external to the University and examined the post-secondary education needs of the central regions of the province. The other study, currently being undertaken by the University and not yet available, examines the post-secondary education needs of Labrador. As well, there has not been a lot of work done to examine specific areas of need with regards to disciplines within the university sector, though some labour market demand analysis has been done for the skilled trades. In a similar vein, Dalhousie University reports that the MPHEC reviews some data in relation to new program proposals and the Dalhousie University Senate review of new programs requires a rough estimate of the level of demand for new programs.

On the other hand, community colleges tend to undertake extensive analyses of the demand for and supply of the educational products that they are offering. By way of illustration, Holland College conducts a comprehensive environmental scan every three years and updates it regularly. It also relies heavily on third party research, such as that available through Statistics Canada, the Conference Board of Canada, Service Canada, the Atlantic Provinces Economic Council (APEC), and ACCC. In addition, the college will often consult with key employers as well as provincial government departments, particularly Department of Technology. On occasion, ACOA has funded market analysis.

This attention to analysis is also found in the Nova Scotia Community College. Specifically, the College works closely with provincial and federal government departments to better understand demographic forces and occupational needs in the province and region. There is always a connection back to the types of programs and delivery design that best responds to such needs.

The same focus on analysis is observed at the New Brunswick Community College. The College performs labour market analyses to determine whether there is adequate labour market demand to mount college programs. Follow-up surveys are conducted with graduates in the year following graduation which help the institution determine the

employment levels of graduates, the proportion of graduates from each program working in areas directly or indirectly related to their training, and the students' feedback about the quality and relevance of the programs they completed. Using this information and other pieces of information, program evaluations are also conducted to examine whether certain programs should be modified, expanded or eliminated.

Finally, the College of the North Atlantic works closely with provincial government and sector partners to determine demand and supply. As well, it regularly reviews applicant data, programs with waitlists, employer feedback/demand and graduate success.

As well, for some institutions, there are formal needs assessments that inform the design of education and training programs. A specific illustration is the needs assessment undertaken by Memorial University's School of Nursing and College of the North Atlantic in developing a nursing program for Aboriginal students. This included meeting with representatives of the respective groups and determining what additional programming was needed to address their unique needs. In addition, some institutions conduct focus group sessions, interviews, market analyses, qualitative and quantitative studies and surveys to obtain information for decision making with respect to programs needs. Furthermore, within the Maritime provinces, for-credit programs are approved through MPHEC and internal to the various universities, new program proposals are normally assessed in terms of "need" and "employment prospects" for the graduates. In addition, periodic external program reviews are undertaken at Atlantic Canadian HEIs.

A review of the education/training partnerships at Atlantic Canadian HEIs reveals that institutional partnerships have generally increased during the last five years.[67] For example, Memorial University has entered two agreements with the Cape Breton University to offer a Masters of Education in information technology and a Bachelor of Education program to Cape Breton students. As well, the University of Prince Edward Island has developed, a joint Master of Education with Université de Moncton.

While there is a common application process for individual community college campuses within each provincial community college system, there is no common application across provinces or across universities. There are, however, credit transfers between HEIs within provinces and across the region. These have been maintained through individual articulation agreements. In addition, the community college system in Newfoundland and Labrador partners with the university to offer students first-year university courses at a number of campuses throughout the province. As well, Nova Scotia universities have agreements between universities on the delivery of specific program.[68] Within New Brunswick, transfer credit recognition among university-level institutions is addressed in the Pan-Canadian Transfer Credit protocol. Transfer credit recognition between New Brunswick's university-level and non-university sector is addressed by means of a general transfer recognition document in New Brunswick. More recently, the

[67] Dalhousie University reports no change, the University of New Brunswick indicates a 100% increase, while the New Brunswick Community College system had only an incremental change.

[68] This would include Engineering at Dalhousie University and other joint programs it has with King's, Saint Mary's, and Mount Saint Vincent University.

universities and colleges within New Brunswick have focused on credit recognition as a key part of articulation agreements for applied degree programs. Similarly, within Prince Edward Island there are various articulation agreements in place and block transfers are considered and approved where appropriate.

Another important issue associated with transforming the learning system with Atlantic Canada is the extent to which HEIs within the region promote gender equity in participation in their institutions. It ought not to be surprising that all HEIs recognize the importance of promoting gender equity in higher education, but it might be surprising to learn that for most programs, gender equity, in terms of number of participants, has already been achieved. For example, 60% of Memorial University's undergraduate population is female,[69] Dalhousie reports that there is now gender/equity in most of its professional programs, while the University of Prince Edward Island reports that the serious under-representation of males in most programs, and their relative underachievement with respect to scholarships, awards, and entry to selective programs, is a cause for concern and is receiving attention in the University's current academic planning. In addition, Mount Saint Vincent University was founded as a women's university. It now has 80% female students and 60% female faculty.

Furthermore, collective agreements at universities within the region promote gender equity in terms of hiring. This has resulted in targeted recruitment and promotion as well as specific fellowship programs for female doctoral students and scholarships available to women in technology programs.

Despite the fact that general gender equity has been satisfied in Atlantic Canada's HEIs, there are still areas within post-secondary education, such as engineering, technology and science, where gender equity is yet to be achieved. In fact, there are programs such as Memorial University's Women in Science and Engineering that try to encourage more females to enter "non-traditional" fields. Another illustration is the delivery of Techsploration programming through community colleges to junior high and high school girls. This program is designed to encourage female enrollment in trades and technology programs where women are still underrepresented.

6. Conclusion – SWOT analysis

Strengths

Institutions of higher learning contribute significantly to the social and economic development of the region. This is demonstrated through universities and colleges focus on programs and services that focus on local and provincial needs. This focus takes many forms, from very specific needs such as: programming to support the local tourism industry; provincial training needs for healthcare providers; providing special programs to serve Aboriginals and; delivering training in both languages to meet the language needs of its residents.

[69] In fact, under representation of males is also a recognized problem for Memorial University. The problem is especially severe in Nursing, other heath services and Education.

Universities and colleges, although differing in approaches, are responsive to student needs through their recruitment processes, the provision of scholarships and in assisting students with opportunities for employment to mention a few. Institutions also recognize and continue to address, through multi-faceted approaches, the lifelong learning needs of people and continuing professional development and training requirements of regional business and organizations.

Weaknesses

There is no clear approach in how programs and services are provided on a regional basis, although there is a coherent vision of the education system at the provincial levels.

Interestingly, the network of University Business Development Centres was not brought up by the universities in their responses to the survey. These centres use the services of MBA grads to assist SMEs with business plans and the like. These centres could be a more integral link in pointing to some commercialization opportunities for university-based research, but they could also be pointed to as an example of university-based services assisting the business community. The fact that they were not mentioned indicates that they are not well know by the universities and could be better integrated in the system.

Opportunities

There are many regional initiatives that are undertaken by regional consortia which provide a forum for dialogue, sharing and avoidance of duplication. As well, Atlantic Canada's HEIs embrace changing methodologies and combinations of programs and institutions to achieve their goals sometimes in spite of competing demands, infrastructure and resistance by the "traditional" academic community.

Threats

In Canada, education is a provincial responsibility. As such, educational policy and science and technology policy and regional economic development policy, which are federal responsibilities, may not always reinforce each other for maximum effectiveness.

Chapter 6: CONTRIBUTION TO SOCIAL, CULTURAL AND ENVIRONMENTAL DEVELOPMENT

The overview of the Atlantic region makes clear that the Atlantic provinces face significant social and economic challenges. In particular, net out-migration and an aging population, especially in rural areas, present substantial challenges to long-term community sustainability. The contribution of HEIs to social, cultural and environmental development is seen by many institutions and stakeholders as a potentially beneficial contribution to address the needs of communities and the region overall. Much has been written in recent years on the centrality of knowledge workers for success in the new economy. Richard Florida's work on the creative class has also highlighted the potential benefits of attracting and retaining artists, designers, and other people involved in creativity and innovation. The quality of life of a region, tolerance of differences and environmental awareness are all seen as crucial for success.

Higher Education Institutions can play critical roles in their communities, provinces and the region to support social, cultural and environmental development. The self assessment survey revealed a range of contributions, but also demonstrated that these are far less developed or recognized than the traditionally core roles of education and research.

1. Social Development

Atlantic Canada's universities and colleges did not identify social development as a significant activity. There are some examples where they provide community access to facilities for services such as health and medical, welfare advisory, cultural exchange, indigenous support, and access for religious institutions. They also provide community access to expertise support.

Dalhousie University is a good illustration of this type of access. Health Services at Dalhousie currently accepts new patients from its students, alumni, staff and faculty. As well, although they no longer accept new patients from the external community, they do continue to serve patients who were on their roster before this change took place. Health Services are provided by a private clinic with 10 doctors; space within the University residence system is provided at internal rental rates; and operating costs for rent, utilities, supplies and some staff is supported by a University Health fee paid by all students.

In general, no facilities are provided for welfare advisory services by Atlantic HEIs. However, Dalhousie University's housing department rents residential space to the Choices program (a program for teenagers in difficulty) run by the IWK Hospital and funded by the government.

In terms of support for Indigenous peoples, numerous HEIs report programs to assist First Nations peoples to attend higher education institutions. Similar supports are provided through scholarships based on need, including support for single parents attending university. Dalhousie University highlights its Transition Year Program (TYP). This

program offers full financial support for an academic transition year to Black and Indigenous First Nations students from Nova Scotia who do not otherwise meet full admission criteria. The TYP program is run by the Continuing Education department and has both allocated space and staff.

Numerous institutions also support Chaplain's offices, in addition to those which have theological programs. Chaplains are employed by their respective church organizations.

Finally, on an on-request, as needed basis, university and college staff and faculty experts provide advice and serve as volunteer consultants or board members to various projects in the community, at their discretion. Many institutions maintain lists of experts to assist organizations in accessing the faculty and staff who may best meet their needs.

Another way that some HEIs contribute to social development within the region is by partnering with the community in the provision of social services. For example, Nova Scotia Community College enables on-campus day care and community recreational facilities operated by community partners. It is also a local contractor with Service Canada, providing Employment Resource Centres at four campuses in rural communities.

Memorial University's Faculty of Medicine has established an international reputation in rural health delivery, including the utilization of telemedicine. The Faculty partners with health boards throughout the island and in Labrador, to assist with recruiting and in linking doctors with best practices for medical services in regions with dispersed populations. The Memorial School of Nursing places a similar emphasis on programming that meets the needs of the province.

2. Cultural Development

Another important route through which post-secondary institutions influence the local area is through the provision of facilities, expertise or learning program support for cultural groups. Each institution approaches this in a slightly different manner.

In many cases, HEI cultural facilities are important components of the community infrastructure. Memorial University makes its School of Music available, which is used regularly by the performing arts community. Its Reid Theatre is also utilized for performances that are not directly affiliated with the institution.

Dalhousie University rents its theatres and concert halls to community groups and professional cultural organizations and the Dalhousie Art Gallery regularly cooperates with local/regional artists and other galleries. Dalhousie's Rebecca Cohn Centre for the Performing Arts is a major arts performance space. This Centre includes a performance auditorium, which is home to Symphony Nova Scotia, an art gallery and a dance studio. St. Thomas University has theatres and performance venues and staff who work cooperatively with cultural organizations, while Mount Allison University's Owen Art Gallery is available to display the works of local artists. Similarly, Acadia University contributes to culture by providing access to faculty expertise and facilities, while Mount

Saint Vincent University operates a small art gallery whose facilities are open to the public and can be used by non-profit groups.

The University of New Brunswick provides facilities to a number of cultural groups. These facilities include, for example, space for conferences, workshops, meetings, the art galleries, and libraries which are open to the external as well as the internal university community, the chapel, recreational facilities, gyms, arenas, pools, residences in the summer and other facilities for social and cultural uses such as dramatic presentations, readings and lecture series, musicians-in-residence, and concerts.

For community colleges, Holland College responds to request for use of facilities and access expertise, but does not have a specific policy. As well, facilities at the New Brunswick Community College campuses are generally available to the community on a "not-for-profit" basis and learning program or expertise support can also be arranged, provided there is no cost to the College. The College of the North Atlantic also provides access to its facilities, but it is on a campus-by-campus basis.

The HEIs also engage their communities with cultural programming, often utilizing their on-campus facilities, but also through outreach. Dalhousie University, for instance, has an International and Exchange Students (ISES) Office, which maintains relationships with local multicultural organizations. A number of the ISES social events for students each year are co-events with other local universities, particularly Saint Mary's University and Mount Saint Vincent University. However, Dalhousie University does not specifically provide services to local cultural groups outside of the campus community.

Memorial University's School of Music and the Division of Fine Arts provide a significant amount of support to the arts. In particular, the University played a major role in the re-establishment of the Labrador West Music Festival. The School of Music regularly sends ensemble groups throughout the province and the School of Fine Arts at the Sir Wilfred Grenfell College campus of Memorial University, based in Corner Brook, is very active in the western part of the province in particular. The Grenfell College fine arts program is increasingly recognized as a provincial resource within Newfoundland and Labrador, and is also attracting students from outside the province, who contribute to the region's arts scene through their activities.

The University of New Brunswick points to the fact that its Centre for Musical Arts and the University's Arts Centre are components of the College of Extended Learning (Personal and Cultural Enrichment Division). Both run community programs in addition to programs for on-campus students. The Centre for Musical Arts runs a program of music lessons as well as concert series, summer music programs for youth, and so on. The Arts Centre runs a variety of community programs (e.g., writers' workshop, youth programming, and fine arts offerings) and is most recently developing offerings for seniors.

While the University of Prince Edward Island suggests that it is open to anyone and everyone interested in post-secondary education and does not target particular "cultural

groups," they are receptive to any and all enquiries that involve access to their facilities, expertise, and learning program support capabilities. Moreover, the University provides meeting space for cultural and community groups such as the Children's Storytelling Festival. As well, the University of Prince Edward Island has an active fine arts program which features creative arts courses and classes offered by leading island artists. It has a Department of Music that offers a Bachelors program in Music and Music Education. In addition, it has a Theatre Arts program that both teaches the craft and regularly brings top quality theatre performances to Island audiences. Additionally, arts education is supported through the Bachelor of Education Integrated Arts course, all of which takes place in community arts venues.

Cultural development is an important part of the Université de Moncton's mandate, given the significant role it plays in the status of Acadian culture. The University has a large number of cultural groups in poetry, dance, choir singing and theatre. These groups often organize sessions that are open to the public at large. Professors will also give a great deal of their time to ensure greater vitality in Acadian cultural expression. Given the history of the University as being founded by a group of Catholic priests, the University supports staff and facilities for a small but vibrant congregation.

The NSCAD University's mission is to advance the visual arts through education, research and production. It does so through its regular academic program, its continuing education program, library, gallery, lecture program, art supply store and commercial enterprises. Indirectly, its students and faculty contribute to the cultural vitality of the city and the province through their work on a daily basis. At a formal level, it participates on a continuous basis in committees, colloquia, conferences, meetings, other non-profit organizations, government relations, with the purpose of supporting the visual arts and creating a climate that recognizes their creative and economic value.

Other Nova Scotia HEIs support cultural development in their communities by supporting the arts. This includes Acadia University, which has several programs that support and enhance the arts community, including Arts Acadia and Saint Mary's University has a performing arts program, an Artist-in-Residence, and an art gallery. In addition, Mount Saint Vincent University maintains a small art gallery whose facilities are open to the public, while Cape Breton University supports the theatre arts by providing a 337 seat theatre, which manages a Youth Drama School and hosts a full season of plays that are open for involvement by faculty, staff, students and the general public.

Post-secondary institutions in Atlantic Canada have not, in general, established mechanisms through which their stock of cultural facilities can be jointly managed and marketed to the regional/provincial/local community.

Post-secondary institutions in Atlantic Canada also encourage sports development within their communities. This includes providing the community access to varsity sport competition, intramural program for their students, use of the facilities and staff for

coaching clinics, summer camps for children, running elite sports camps, and use of facilities by the community for recreational purposes.

3. Environmental Sustainability

It is interesting to examine whether post-secondary education institutions in Atlantic Canada consider whether their institution is a practical demonstration of best practice to address environmental issues of concern to the region. Approximately one-half of the HEIs highlight the progress that they have made in recent years at becoming more environmentally friendly and point to specific illustrations of environmentally-friendly initiatives (such as recycling, energy efficiency measures, and others). However, these institutions do not hold themselves up as models of best practice and readily acknowledge that there is more that can be done.

On the other hand, about the same number of HEIs indicated that they did meet this standard and could be considered models of best practice in the region. In support of their claim, these institutions point to large recycling programs on their campuses; their utilization of leading-edge technologies to monitor and maintain low environmental emissions from their central heating plants; their utilization of environmentally-friendly materials on campus; their implementation of tree-planting and composting programs; through their re-use of historic buildings; their compliance with recommendations provided by regular environmental audits; and their insistence of whole-building "green" design practices for new buildings.

The Nova Scotia Community College system is about to be formally recognized for providing environmental leadership in sustainable building design by receiving a LEED (Leadership in Energy and Environmental Design) designation.[70] As well, Dalhousie University is a signatory to the Talloire Declaration of International Environmental Sustainability and it monitors these issues through the Senate Committee on the Environment.

There are several examples of joint initiatives between Atlantic Canadian HEIs and other regional stakeholders that demonstrate environmental sustainability possibilities for the region. These include Dalhousie University's co-generation gas-fired facility that shares heat with another university, a large hospital, municipality, and the provincial and federal governments. The University of New Brunswick has launched the Environmental and Sustainable Development Research Centre[71] project with Community Watershed Associations and a research association has been developed between the Biology Department, the Canadian Rivers Institute, non-governmental organizations, industries,

[70] The LEED Green Building Rating System® is an international standard for developing high-performance, sustainable buildings.

[71] The Environment and Sustainable Development Research Centre serves as a link between the University of New Brunswick and government, industry, and the non-profit community on a wide range of issues related to environmental management and sustainable development. This centre works to enhance the understanding and adoption of sustainable development principles through education, outreach, research and community involvement.

and provincial or federal government departments.[72] Yet another illustration is the joint initiative between School of Business, University of Prince Edward Island and the province's Bio-alliance partnership. Likewise, Acadia University works with the Town of Wolfville, along with other regional/provincial/local agencies, on environmental sustainability, while Saint Mary's University has the Ocean Management Research Network.

The Corner Brook campus of Memorial University, Sir Wilfred Grenfell College, is partnering with the College of the North Atlantic, the City of Corner Brook, the federal and provincial governments, and community and industry partners, in the establishment of a Centre of Environmental Excellence. This will advance environmental programs at Grenfell College, but will also link teaching and research with the development of environmental best practices in the region, develop environmental industries, and seeks to become a centre of excellence in environmental technologies and practices that can be applied throughout Newfoundland and Labrador.

Except for programming initiatives, the Atlantic region community colleges did not report similar environmental partnering or environmental sustainability activities.

4. Conclusion – SWOT analysis

Atlantic Canadian HEIs demonstrate the following strengths, weaknesses, opportunities and threats in the area of social, cultural and environmental development:

Strengths

The HEIs provide significant physical facilities for the social and cultural enhancement of their communities, provinces and the region. In many cases the teaching hospitals, daycares, theatres, conference facilities, art galleries, recreation and other facilities are the major – or only – such facilities in their community. This is particularly the case in rural areas, where the smaller universities and the community colleges are often the largest employer. The human capital which universities and colleges attract and retain in their regions is perhaps their greatest contribution to social and cultural development.

Examples of social and cultural programming demonstrate the significant contribution HEIs make to the quality of life in their communities. Sports and recreation programming provides activity for youth, contributing to health and recreation, and varsity teams provide the basis for community pride and entertainment. Outreach programs also demonstrate that HEIs are able to extend their benefits far beyond their immediate community, to benefit citizens, organizations and communities throughout (and outside) the region in which they are based.

Approximately half the universities reporting indicated a commitment to environmental best practices, which provides a positive model for other institutions and a start in the reduction of environmental impacts.

[72] This association involves a number of research programs related to understanding environmental effects of human activities on land and waterways in the region.

Weaknesses

While making a significant contribution to the social, cultural and environmental development of their communities and regions, it is clear that this pales in comparison with the commitment of Atlantic Canadian HEIs to linking teaching and research with economic and technological development and, especially in the case of community colleges, labour market training. Core teaching and research in social sciences, humanities, sciences, medicine, social work, and education, amongst others, underpin advances in social and cultural development in society, but there is much less attention to the extension of this teaching and research. Professional schools may be an exception because of their close ties with practitioners.

The fact that the self-assessment survey did not result in findings highlighting the significant role of HEIs in attracting and retaining knowledge workers could be seen as a weakness. While researchers interested in the knowledge economy explore the prerequisites for knowledge regions and creative communities, this thinking does not seem to have permeated HEIs. As labour markets tighten, knowledge workers are in greater demand, and quality of life is increasingly a critical factor for attraction and retention. Contributions to the social, cultural and environmental development of their communities are essential for HEIs to attract the faculty, staff and students they need. If successful, this virtuous circle generates improvements to the economy, cultural dynamism and diversity of the community, further enhancing development.

Opportunities

Because of its relative underdevelopment, increasing the contribution of HEIs to social, cultural and environmental development is an obvious opportunity to enhance the role of HEIs to regional development. The first step to achieve this is awareness, with which this OECD study may assist. A next step would be capacity building for regional cooperation, in the area of social, cultural and economic development. The next and final chapter elaborates on mechanisms for promoting greater regional cooperation.

Another opportunity consistent with the lessons of this chapter is the potential role of universities and colleges in attracting more foreign students (and faculty) to Atlantic Canada. The Atlantic region, like most largely rural areas, receives far fewer immigrants than large metropolitan areas. Many of the immigrants who do move to Atlantic Canada do not stay, but move onto larger centres. This is partly a product of job opportunities. It is also a reflection of the "chicken-and-egg" problem of a current lack of immigrants limiting the opportunities for new arrivals to establish linkages with people of similar backgrounds. Having a receptive, welcoming environment is a critical element of keeping new immigrants in a community.

Universities and colleges have the potential to play such a key welcoming role. Most universities, and many colleges, have a far higher percentage of foreign students and faculty than the community at large has foreign residents. Universities and colleges also provide a welcoming environment, where all students, no matter where they are from, face similar challenges and conditions. For the one or two or five or more years that

students attend HEIs, they have the receptor environment that enhances the chances that they will settle in the area.

The President of Memorial University has highlighted this potential as a key opportunity in the University's current strategy development. Key research initiatives, such as the Atlantic Metropolis project, are also emphasizing this potential. For Atlantic Canada, with net-out migration, low fertility rates and aging populations, this presents a fundamentally important opportunity. The same can be said for Atlantic Canadian HEIs, which must address declining populations of high school students in the region, if enrollments are to be maintained.

Labour market shortages also create opportunities for groups not previously well represented in HEIs. Visible minorities, First Nations peoples, and people with disabilities are seeing demands for their employment like never before. Universities and colleges will be needed to adapt programs and services to meet the education and training needs of these people, and employers and governments will be keen to support these efforts. Examples of positive responses to this opportunity are evident throughout the region, but more will be needed.

Finally, increasing concerns over global warming and other environmental challenges, present definite opportunities for HEIs. Universities and colleges are critical to the innovation process, and the social, economic and technological capabilities of HEIs are essential to mitigating and, if possible, reversing climate change, and in developing ways to adapt to the new conditions. At its most fundamental level, this may in fact require cultural change. The HEIs are better positioned than any other institution to meet these challenges.

Threats

Addressing weaknesses creates opportunities. Failure to do so creates threats. If the demographic challenges raised in Chapter 1, and discussed as an "Opportunity" above, are not successfully tackled, Atlantic HEIs face declining enrollments, decreased funding, eroding infrastructure and less ability to contribute to the social, cultural and environmental development needs of the region. Institutions which fail to adapt will face the most severe threats. The university culture, in particular, is rooted in time-honoured traditions of curiosity-based research and academic freedom. Emphasis on teaching and research will continue for most faculty, but reduced funding and enrollments will place severe strain on the sustainability of institutions – and the number of institutions – in their current form. Increasing regional cooperation and exploring new and innovative ways to contribute to social, cultural and environmental development will be the best way to preserve core teaching and research, as well as leveraging it to benefit communities and regions.

Chapter 7: CAPACITY BUILDING FOR REGIONAL COOPERATION

Atlantic Canadian HEIs indicated a significant awareness of the importance of regional engagement. Both formal and informal mechanisms exist to identify regional, provincial and local needs. In light of the governance structures of HEIs and the fact that the Atlantic region does not have an actual administrative or governance presence, most mechanisms are focused on the province, or in the case of smaller universities and community college campuses, their more immediate sub-provincial region. There are numerous examples of Atlantic cooperation, however. This self-evaluation initiative, carried out in conjunction with the larger OECD study, may enhance this cooperation further.

Beyond the mechanics of ways to identify and engage with local and provincial needs, there are significant measures to evaluate the impact of HEI-regional involvement. There is also awareness of the need to look internally - to build institutional capacity building, address human resources and financial administration policies and procedures and strengthen organizational culture in support of regional engagement. The HEIs play a crucial role in the regional development of Atlantic Canada, they are aware that they do, and they indicate a willingness to take the steps necessary to do even more.

1. Mechanisms to promote HEI-regional involvement

Countless formal and informal mechanisms are used by Atlantic Canada's HEIs to understand local and regional needs and promote involvement. The level of importance is indicated by the fact that they almost always start at the top – the university or college president and other senior executive. Section 7.4 will highlight how the executive of universities and colleges are placing greater emphasis on regional engagement. The catalysts for this increased emphasis have been a combination of external and internal influences.

Provincial governments have at times identified significant social and economic problems in which they would like the institutions to get involved. By way of illustration, Newfoundland and Labrador commissioned a White Paper on Public Post-Secondary Education, which was endorsed by the provincial government as a basis for university and college collaboration on key provincial issues. The control exercised by provincial governments over community colleges makes such influence very direct. By contrast, universities are autonomous entities, governed by a Board of Regents or Board of Governors, which may be influenced or guided by external advice but are not bound by it. These Boards have community representatives, which have the ultimate say – at a governance level – in setting university priorities.

In the everyday administration of universities and colleges, senior administrators also gain input from external stakeholders, which is advisory, but provides key input to understanding needs and opportunities. Some of the formal mechanisms identified by Atlantic HEIs to gain input on regional priorities include formal advisory boards for

faculties, programs and centres and reports of accreditation bodies for professional programs such as engineering, business, education and nursing. In some circumstances, there are there formal processes such as signed MOU agreements that bind those in the regional engagement relationship at HEIs within Atlantic Canada, but these are not uniformly applied across all institutions or across all circumstances within a given institution. As well, HEIs or their faculty members (in the case of universities) have formal research contracts or intellectual property agreements that govern these engagement relationships. Where incremental resources are gained from government or other funding agencies, contracts require program or project objectives to be met. Increasingly, federally-funded granting councils such as SSHRC emphasize "knowledge mobilization" support, so that research is developed in concert with community stakeholders.

Another formal mechanism to gain input on regional needs is the development of institutional strategic plans, at the level of the university or college, or for specific faculties or programs. Many HEIs reported that strategic plans were developed based on public consultation processes and environmental scans. The Université de Moncton reported the use of internal market studies, analyses of Canadian trends in the post-secondary education sector, analyses of press cuttings, studies of pan-Canadian surveys of post-secondary institutions and analyses of activities of the Department of Post-Secondary Education, Training and Labour. Holland College cited doing environmental scans and strategic planning activities; regular program advisory committee meetings; and ISO procedures for changes to existing programs or development of new programs. Other community colleges reported that college programs are: designed with input from community and industry; there is active research to understand population, demography and occupational trends in the design of system size and programs; environmental scans; labor-market analyses; sectoral program advisory committees; participation in ACCC, APCCC, CAMET, and CMEC; participation on regional economic development committees and agencies; and close contact with industry and labor representative groups.

Universities, which have well-established self-governing mechanisms for program development at the department, faculty and senate levels, also use various centres or institutes to provide university-wide or thematic mechanisms for community input. Memorial University established the Leslie Harris Centre of Regional Policy and Development (The Harris Centre) in 2004 to facilitate and coordinate the University's activities in regional policy and development. Mount Allison University reported that the Rural and Small Towns Institute responds to requests for assistance from groups to undertake research and support, provided sufficient funds are in place to undertake these projects. Other institutions report that a specific administrator or staff member can be tasked with responsibility for gauging community needs in a particular area. The University of New Brunswick reported that *Acadiensis*, a journal that focuses on historical issues in the Atlantic Provinces and the *Canadian Journal of Regional Science*, an interdisciplinary research journal on regional and urban issues provide vehicles to understand and respond to regional needs.

Numerous informal mechanisms were also reported. Executives, deans and directors of HEIs meet frequently with local, provincial and federal government officials. Some HEIs report that large networks of alumni provide a mechanism for gaining input on community needs. The University of Prince Edward Island noted a number of mechanisms: feedback from advisory councils, networks, the co-op programs, diagnosticians and clinician at the Atlantic Veterinary College, and community involvement; liaison with professional associations; regular communication with all stakeholders in the public school system; increasingly frequent meetings with Holland College representatives; and frequent communication (electronic and face-to-face) with the Université de Moncton serve as mechanisms to help the University of Prince Edward Island identify regional and local needs.

Although a number of incentives and initiatives are provided at Atlantic Canadian HEIs to support regional engagement, they are not formalized at all institutions. For instance, regional engagement may be recognized in the tenure and promotion process in some institutions but not at others. In other instances, on a case-by-case basis, internal and external funding, and course relief may be directed at projects with regional, provincial or local significance.

Within Atlantic Canada and within each of the provinces, there are no formal mechanisms to coordinate the activities of HEIs in regional engagement. Instead, there are informal communication processes. These may include, for instance, senior administrators being members of or being affiliated with the AAU, APCCC, MPHEC, CMEC, ACCC and CAP; and general meetings with provincial and federal government departments and agencies and other stakeholders.

On the other hand, there are specific venues through which Atlantic Canada's HEIs cooperate on common interest. For example, Interuniversity Services Inc. (ISI) is a not-for-profit company incorporated in 1984 by four independent Halifax universities. ISI currently provides selected central administrative services to eighteen member institutions in Nova Scotia, New Brunswick, Prince Edward Island, and Newfoundland, thus reducing their overall operating costs, improving services, and providing a framework for cooperation among the universities, while maintaining their independence.

2. Promoting regional dialogue and joint marketing initiatives

Institutions are become increasingly proactive in seeking opportunities for regional engagement. The officials within the institutions have recognized the growing need and included that in the strategic priorities for the institution. Simultaneously, external bodies have recruited institutions to address problems that are important to them. In other cases, the province's objectives and goals for its post-secondary education system have been laid out in a strategic plan, or, as noted in the case of Newfoundland and Labrador, the White Paper on Public Post-Secondary Education.

The mechanisms that exist to promote communication and dialogue between HEIs and regional, provincial, and local stakeholders are consistent with those outlined in Section

7.1 that were identified as enabling HEIs to understand regional and local needs. These include advice from external advisory groups to help connect the university to its stakeholders; community consultation, which may be through surveys or focus groups, when specific input is sought on the institution's strategic plan and other issue of public concern; constant contact with government officials; through the activities of the AAU or the APCCC; events at the university such as research breakfasts, partnership dinners, research fora; and personal networking.

The groups that participate in discussions with the HEIs in terms of regional engagement depend, of course, on both the institution being considered and the province in which the institution is located. Some of the groups that actively participate in discussion with Atlantic Canada's post-secondary institutions on regional engagement are: professional and industry associations, development and planning boards; provincial, municipal and federal officials and politicians; volunteer agencies; school boards; non-governmental organizations; labour and business representatives; and other post-secondary institutions. While these groups are often treated as equal partners in terms of expressing their interests, some groups may not be as strongly represented as others — the voluntary sector's interests may not be as intensely represented as those of industry.

Within their respective provinces, the staff and faculty members of HEIs are extensively represented on public/private bodies. Memberships on boards are normally voluntary and driven by the specific interest of the individual, but the institutions sometimes are requested to provide a representative on specific boards. Given that membership is typically voluntary and, for the most part, not monitored, most institutions do not formally collect data on this activity. Instead, the evidence is primarily anecdotal.

Examples of the bodies on which staff and faculty members participate are: Boards (appeals, advisory, arbitration, review, and others), committees (advisory, standing, standards, planning, coordinating, etc.), Councils (review, advisory), formal and informal gatherings that cover a wide variety of subjects such as: arts (anthropology, culture, English, fine arts, French, history, humanities, languages, military affairs, multimedia, philosophy, politics, psychology , sociology); business (electronic commerce, finance, investment, accounting, banking, entrepreneurship, tourism); computer science; education; health/ wellness; engineering (chemical, civil electrical and computer, forest, geodesy and geomatics, geological, mechanical, transportation); forestry (environmental issues); kinesiology, recreation and sports; law; leadership; nursing; and science (biology, chemistry, geology, mathematics and statistics, physics).

Representation on these bodies is normally to access the expertise, experience and interest of the staff and faculty at HEIs. Reasons why staff and faculty participate include: to contribute to meeting public needs or to make a contribution to the community; to utilize the opportunity to develop professionally; to further one's research agenda or use one's skills and experience; to network and build strong relationships with the external community; and in some cases, to ensure that the institutions are represented.

Student employment is another key mechanism for HEIs to contribute to regional needs. This ranges from summer employment programs supported by the federal and provincial governments, to cooperative education programs involving paid work-terms as part of the required curriculum. Dalhousie University, for instance, reported co-op degree programs in commerce, engineering, computer science, architecture and planning. Approximately 1 in 5 of Dalhousie's undergraduates is in co-op programs, while many other students do practica (e.g., medicine, health professions, law). Memorial University has co-op programs in engineering, business, human kinetics and recreation. Internships and other forms of experiential learning exist in medicine, education, social work, nursing, and pharmacy. Co-operative programs at the University of New Brunswick are offered in the following fields: arts, computer science, business administration, science, engineering, software engineering, software development, and hospitality and tourism management. As well, Professional Experience Programs (PED) at the University of New Brunswick facilitate an internship program that lasts for about eight to 16 months and are offered in computer science and engineering programs, while the Faculties of Nursing and Education, and Renaissance College (Leadership), do require internships/practica.

Similarly, the University of Prince Edward Island provides internships and co-op programs for its students. Co-op programs are in the following areas: business, physics, and computer science. In addition, there are internships for graduate veterinarians in the Veterinary Teaching Hospital (VTH) and residencies for graduate veterinarians in the VTH and Diagnostic Services Laboratories. Acadia University, as well, offers the co-op or internship options to students who meet the eligibility requirements and are registered full-time in one of the following programs: Bachelor of Arts with major in English, French, German, history, music, political science, psychology, sociology, economics, or spanish; Bachelor of Business; Bachelor of Computer Science; Bachelor of Science with major in biology, chemistry, environmental science, geology, mathematics and statistics, nutrition, physics, or psychology; Master of Science in computer science; and Master of Science in mathematics and statistics. At St. Thomas University, co-op program are available to students generally and internships in education and social work programs.

Mount Allison University has a teaching internship and research assistantship, while Mount Saint Vincent University has a number of Bachelor level programs that have mandatory or optional co-op requirements. These include public relations, business and information technology. Saint Mary's University has co-op programs in all faculties.

The Université de Moncton offers co-op opportunities in the following degree programs: forestry (Edmundston), information management (Shippagan), production and operations management and engineering (civil engineering, electrical engineering and mechanical engineering), marketing, nutrition, translation and in science disciplines (biochemistry, biology, chemistry, applied computer science, mathematics and physics). At the graduate levels, the co-operative formula is offered for the post-graduate degree in information technology, the master's degree in business administration and the master's degree in public administration.

The final two universities to consider are Cape Breton University and the NSCAD University. Cape Breton University has internship co-op options in its Bachelor of Business Administration, Bachelor of Arts, Bachelor of Hospitality and Tourism Management, Bachelor of Technology Information, Diploma in Business Technology, Bachelor of Technology (Public Health), Bachelor of Technology (Manufacturing), Bachelor of Technology (Petroleum) and Bachelor of Technology Information (Computer System Development). The NSCAD University has Research Internship in Art History, Fine and Media Arts Internship, Craft Internship, Off-Campus Internship, Practicum in Communication Design and Film Internship

Within the community college system, work experience options are widespread. For example, virtually all programs at Holland College require an internship, lasting from six weeks to several months. However, there are no co-op programs. Nova Scotia Community College students are placed in organizations (mainly local companies) for a five to 10 week work experience placement and co-op options are available to students in some programs, mainly in tourism and hospitality programs. Likewise, in the New Brunswick Community College system most programs now have an industry practicum component of at least several weeks' duration and there are over 800 co-op seats at several campuses. Finally, the College of the North Atlantic offers the co-op option in the following areas: Environmental Technology, Programmer Analyst (Business), Electrical Engineering Technology (Power and Controls); Electronics Engineering Technology (Biomedical), Geomatics Engineering Technology, Industrial Engineering Technology, Mechanical Engineering Technology (Manufacturing) and Software Engineering Technology. In addition, a high percentage of programs have a 2, four or six week work placement requirement.

The HEIs offer various mechanisms to enable employers to find students to meet their needs. Offices for student services provide resources and services to encourage the employment of students through building partnerships and linking employers with students and recent graduates. The services are free to employers and include posting employment opportunities on the website; coordinating employer information sessions; collecting resumes, booking and coordinating interviews (both on- and off- campus), hosting career fairs, advising and providing assistance regarding recruitment procedures.

Local companies are also encouraged to employ students through government student employment programs such as these listed by the University of New Brunswick: the Student Employment and Experience Development (SEED), Summer Career Placements, Federal Student Work Experience Program (F-SWEP), Workability and the Skills Link program which are coordinated through this office. UPEI is a partner and host of the annual Labour Market Expo which brings potential employers and graduates together. The annual Education Job Fair brings together regional graduates and school boards who are actively hiring. The Université de Moncton offers the Service de recherche du travail [job search service] which provides a liaison service with employers to help students find work. The service organizes career fairs and invites employers to present career opportunities, to post job notices and to recruit students.

Cape Breton University reported that it has a long and successful history with student employment. The Cape Breton community has been a long time supporter of CBU and particularly its co-op programs. As a result of co-op work placements, many CBU graduates live and work in the Sydney and surrounding area. In addition, other degree programs at CBU have volunteer work placements as part of their curriculum. These placements often result in full-time hires for graduates.

The New Brunswick Community College reported that Graduate Placement activities are carried out by the Regional Employment Services of Department Post-secondary Education, Training and Labour. A very high percentage (over 80%) of the College network's program offerings carry an industry practicum component, ranging from full traditional coop programs to internships of several weeks' duration. The immediacy of such contact fosters direct employment links for students. In addition, career fairs, as well as participation by industry on curriculum and other advisory bodies, foster better knowledge within local companies of the capabilities and learning of NBCC students.

The College of the North Atlantic reported that there is an emphasis on obtaining local and provincial work experience and employment, with scholarships, posting work terms, job experience through two-week placements, forums for introducing local companies to students and through industry nights and events and by building relations with local industry, networking, and co-op and work placements.

While most HEIs have policies that guide and encourage the employment of students by local companies, only one-half of these institutions have a single point of contact and coordinating structure through which companies can employ current and graduating students. This, of course, can make it more difficult to hire students in those institutions without a single point of contact.

For the most part, the career services and placement services and the technology transfer and industry-sponsored research functions do not work together, as there are really considered to be different functions. Yet, student employment services are available to help fill the student employment needs of researchers and human resource departments coordinate other types of hiring that may be needed for this purpose. At least one institution indicated that while they have not worked together in the past, these departments are currently discussing the possibility of developing a closer working relationship.

In terms of the number of undergraduate and graduate students that the career services and placement function has placed over the last five years, one observed that, although, for the most part, students are responsible for finding their own placements with support provided by our co-op offices, the numbers have generally been increasing on the career services side. Yet, enrollment in co-op and experiential learning programs at some institutions has been relatively stable and, as such, placements in those institutions have not gone up a great deal. On the other hand, the University of New Brunswick reports a 58% increase in students using the student employment services since 2001-02. As well, there has been an increase of 240% from 2001 to 2005 in on campus recruitment by

employers and an increase of 34% in the number of job postings from 2001 to 2005 has provided options for relevant full-time degree-related positions for students approaching graduation and recent graduates. Moreover, participation in the co-op and professional experience placement programs at the University of New Brunswick has increased in the Business administration programs on both campuses and in engineering.

As well, another way that career services and placement have changed is that today's students appear to want more high tech and high touch in their job search — they want extensive online support for preparation, job search and support; but they also want interactive one-on-one advising sessions to assist them. Interest seems to be waning in "employment workshops," where students learn in a group format.

3. Evaluating and mapping the impact of the regional HE system

The economic impacts associated with Atlantic Canadian universities are presented in Table 28 and the corresponding economic impacts for community colleges are provided in Table 29. For smaller universities located in smaller communities, the economic impacts are quite substantial. For example, Acadia University is estimated to generate 43% of the employment and 62% of the income in the community of Wolfville, N.S. Similarly, St. Francis Xavier is credited with 30% of the employment and 75% of the income in Antigonish, N.S. Likewise, the impact of Mount Allison on Sackville, N.B.is substantial — accounting for 15% of the employment and 27% of the income. Even in the larger communities, universities are having an impressing economic impact. For example, Memorial University is associated with 7% of the employment and 6% of the income in St. John's, N.L., while the Halifax, N.S., universities are estimated to generate 2% of the employment and 4% of the income in that city.

Community colleges in Atlantic Canada are estimated to generate nearly 100,000 direct and indirect jobs within Atlantic Canada. In addition, they have an economic output effect of $1.7 billion within Atlantic Canada and have bee responsible for $30 million in R&D expenditures. Finally, it is estimated that the operations of the community colleges yields in excess of $400 million to government.

As indicated by the results presented in Tables 27 and 28, all HEIs in Atlantic Canada have undertaken an audit of their economic impacts on their area of influence. For universities, this consisted of the economic impact study performed by the AAU, while the community colleges were involved in Return on Investment studies coordinated through the ACCC. In addition to these studies, post-secondary education institutions have also performed economic impact analyses periodically in the past.

The results of these impact statements have been distributed and promoted both by individual institutions and by their respective umbrella associations (AAU and APCCC) through institutional communication vehicles, media conferences, and by making the reports available on various websites.

Table 28: Economic Impacts Associated with Atlantic Canadian Universities

Institution	Community Economic Impacts - 2004					
	Population	Population as % of Community	Employment	Employment as % of Community	Income ($ Millions)	Income as % of Community
Atlantic Canada - Combined	112,789		18,493		$2,449.9	
Memorial University	23,040	13.0%	5,439	7.0%	$196.6	6.0%
University of Prince Edward Island	4,793	15.0%	744	5.0%	$44.7	8.5%
Université Sainte Anne	642	7.1%	124	3.2%	$9.0	11.0%
Acadia University	4,817	132.0%	683	43.0%	$37.7	62.0%
Atlantic School of Theology	174	0.1%	26	0.0%	$294.3	4.1%
Cape Breton University	3,910	4.0%	326	1.0%	$23.3	3.0%
Dalhousie University	19,254	5.0%	3,440	2.0%	$294.3	4.0%
University of King's College	1,122	0.3%	61	0.0%	$294.3	4.1%
Mount St. Vincent University	5,227	2.0%	635	0.3%	$294.3	4.0%
Saint Mary's University	13,975	4.0%	2,000	1.0%	$294.3	4.1%
St. Francis Xavier University	5,655	119.0%	580	30.0%	$41.4	75.0%
Nova Scotia Agricultural College	836	2.0%	240	5.0%	$14.3	12.0%
Nova Scotia College of Art & Design	1,142	0.3%	193	0.1%	$294.3	4.1%
Mount Allison University	2,820	53.0%	342	15.0%	$24.4	27.0%
St. Thomas University	3,496	7.0%	262	1.0%	$115.3	12.5%
Université de Moncton	7,705	13.0%	1,305	4.0%	$62.5	7.0%
University of New Brunswick	14,181	13.0%	2,093	4.0%	$115.3	12.5%

Source: AAU Economic Impact Study

In addition to promoting the results of current economic impact analyses, post-secondary institutions attempt to raise awareness of the role of their institution in the region in a variety of ways. These include operating through the MPHEC, AAU and APCCC at a regional level, employing the services of the institution's public relations/marketing arm at the local level and public appearances and speeches by senior administrators.

4. Institutional capacity building for regional involvement

As noted at the start of this chapter, one way to build institutional capacity for enhanced regional involvement is at the level of academic leadership and central management within the institution.

In this regard, Memorial University created the Leslie Harris Centre for Regional Development Studies. According to the university, this is perhaps the most tangible evidence of the central administration's commitment to regional engagement. As well, through its White Paper on Public Post-Secondary Education, government has signaled strongly that it wants the university to take a more prominent role in meeting the needs of

the province. The provincial government has supported calls for greater autonomy by the university's Sir Wilfred Grenfell College campus in Corner Brook, and commissioned a study to consider options. The president of Memorial has been very active in reaching out to all regional stakeholders, and the university has supported initiatives to review opportunities to strengthen its involvement in central Newfoundland and in Labrador.

Table 29: Atlantic Community College Overview and Economic Impact

Area of Focus	Data	Observations
Institutions (#)	4	Data includes APCCC member institutions only (see footnotes for data sources).
Campuses (#)	50*	* does not include learning centers that are established from time to time to serve specific needs in areas where there are no full service campuses.
F/T Students (#)	25,000	
P/T Students (#)	60,000	
Total Students (#)	85,000	
Faculty & Staff (#)	4,522	
Total Jobs (#) (direct and indirect)	96,461	Direct (faculty and staff) and indirect jobs (multiplier effect) in the region explained by activity of institutions.
Local Alumni (#)	n/a*	* Typically, around 90% of college graduates remain in the region after their first year; however, over the next 30 years anywhere from 5% to 35% (depending on the province) are lost to the area through attrition (e.g., retirement, out-migration, or death).
Economic Output (direct and indirect) ($)	$1.7 billion*	* Actual college number may be even higher than stated as data used in source studies is (on average) 5 years outdated; therefore, it does not capture more recent economic contributions of community colleges.
Related Federal & Provincial Revenues* ($)	$422.1 million*	*College data includes only provincial increased tax collections; however, it also includes expenditure savings (i.e., college-attributable reductions in expenditures on crime, welfare, unemployment and health).
R&D ($)	$30 million*	*Estimated research activity ongoing in Atlantic community college projects directly tied to business & industry.

College data based on the aggregate of data from separate socioeconomic benefit studies conducted by CC benefits for Holland College (2004, using 2003 data), College of the North Atlantic (2004, using 2002 data), New Brunswick Community College (2004, using 2002 data) and Nova Scotia Community College (2002, using 2001 data).

Dalhousie University highlights its appointment of the Director of Government Relations and the fact that its senior leadership is encouraged to participate actively. The University of New Brunswick indicates that there have been major shifts made to its administrative structure at the senior level in order to meet local needs. For example, the role of the president has shifted to more external affairs to meet local, regional, national and

international needs and to build greater provincial/regional partnerships with the University. An outgrowth of this has been "Next New Brunswick/Avenir Nouveau-Brunswick" that has been facilitating linkages between the University of New Brunswick community and the people of New Brunswick with the objective of increasing understanding and strengthening public input in policy development. Furthermore, the vice-presidential structure has changed with a new focus on an Academic Vice-President (Fredericton) to match the Academic Vice-President (Saint John) position. Also, the Vice-President (Research) is more heavily engaged in the promotion of partnerships with local, provincial, regional and national agencies as an outcome of planned actions based on the University of New Brunswick Strategic Research Plan and as a means of overcoming the University's relatively small size when securing large R&D funding.

In 2000-01, the University of Prince Edward Island created an office of Vice-President, Research and Development, which has many regional connections. Also, the Vice-President, Academic Development has regional involvements, including as current Chair of MPHEC. There are regional associations of deans of various faculties and residents who collaborate through the AAU.

Acadia University also notes that there is a greater emphasis on regional/provincial/local engagement and that the university has recently hired a Community Relations officer who reports directly to the President. On the other hand, St. Thomas University suggests that the administrative structure has not been altered for this purpose, while the Nova Scotia College of Arts and Design has created a new position in the Office of Advancement (Executive Director Development & Special Projects). This individual works as part of the Office of the President on external relations. Also new is the position of Director of Entrepreneurship and Business Development that links business and students.

For the community colleges, there has not been a dramatic change in administrative structure to achieve an enhanced regional engagement. Rather, it is felt that the role of campus principal has always been to provide both academic leadership in terms of local delivery of programs and local engagement with the community.

Another avenue through which Atlantic Canada's HEIs can increase their contribution to regional engagement is by making it one of the pillars of its strategic plan. In addition to being a very strong component of the university's mission statement and current strategic plan, it has been suggested by the institution that Memorial University's new strategic plan will probably give this issue even more prominence than it currently has. Equally, Dalhousie University's vision statement focuses on regional, provincial and local development needs and their strategy for additional resource support connects to the provision of such activities. In a similar manner, the University of New Brunswick's strategic plan builds upon its mission, which includes a relationship of service to the province of New Brunswick, the Atlantic region and the Nation through the provision of educated graduates, and through the development of applied programs involving the private sector and government agencies. Moreover, the two emerging strategic frameworks on the Fredericton and Saint John campuses as well as the University's Strategic Research Plan recognize both the importance of working with the other

stakeholders and the fact that the University of New Brunswick is fundamentally important to the prosperity and economic development of the province.

Community partnerships and community leadership are at the heart of the University of Prince Edward Island's institutional mission and strategic plan. This is also exemplified in Acadia University's Strategic Plan which states:

> *"Acadia is proud of its long history of collaborating with the community on mutually beneficial projects and initiatives and of working with the community to solve common problems and to take advantage of common opportunities. The University community cherishes these relationships and recognizes the importance of the community in our success as an institution. Building on this strong tradition, Acadia will increase its collaboration with the larger community for the benefit of students, faculty, staff, alumni, local communities, and society as a whole."*

Likewise, the strategic plan adopted by the NSCAD University sets as a priority the forming of a relationship with the Province through public activity which emphasizes the cultural role and value of the institution in the region.

A similar message is given by St. Thomas University's Strategic Plan, which has an objective to make community services an integral part of life at that university. Accordingly, partnerships are being developed with community service agencies. The University also plans to develop closer linkages with high schools. Exploring the feasibility of course offering in the Miramichi Region is another Strategic Plan initiative. Again, this objective is echoed in Mount Allison University's strategic plan. This plan indicates that relationships should focus on the university's ability to meet the social, cultural, and economic needs of the larger community through educational programs, policy analysis, research consultation, creative and artistic endeavours and expertise, student placement, and outreach programs.

In October 2005, the Université de Moncton wrapped up its Excellence Campaign. At that point, it announced that the pledges totalled $48 million. The success of this campaign allowed closer ties to be established with the business community, the academic community and with alumni and friends of the Université de Moncton. This support reflects the attachment that community members have for the Université de Moncton. Although the Excellence Campaign has come to an end, the Université de Moncton identified actions in its strategic plan to maintain the links and to continue to work very closely with New Brunswick communities.

The community colleges are no different than the universities in this regard. Their strategic focus also involves engaging key stakeholders within the province. For instance, one of Holland College's strategic initiatives is to pursue partnerships with private and public sector organizations. The Nova Scotia Community College advanced "Connecting with Communities" as one of eight strategic directions in its 1999 Strategic Plan. Furthermore, extensive consultations with communities have been conducted

recently and will strongly influence emphasis on the needs of the community in the 2006 Strategic Plan. The College of the North Atlantic reports that regional engagement will be included in its next strategic plan. In addition, the New Brunswick Community College system notes that while the strategic directions of the network are currently under review, there is no question that the engagement of stakeholders at all levels will be a key feature of same. Viability can only be ensured by remaining current and relevant, and the institution can only remain current and relevant by nurturing its relationships with all three community levels.

5. Human and financial resource management

Another way of reinforcing or strengthening an institution's commitment to local engagement is through the institution's human resources policy. Human resource policies do not have a regional engagement dimension at any post-secondary institution in Atlantic Canada. While it is generally undertaken nationally/regionally and on the basis of demonstrated experience and expertise, there are no formal human resources policies on this issue. The HEIs are subject to provincial labour codes, human rights legislation, pension regulations, basic health care programs, and so on, and the institutions monitor salary, wage and employment benefits trends locally, provincially and regionally as it relates to their staff. Although faculty and staff are supported in their collaborative efforts with a region, provincial or local focus, this dimension is not consciously recognized in human resources policy in Atlantic Canadian post-secondary institutions. Furthermore, professional development and staff training programs are not differentiated on the basis of the geographic focus of responsibilities. Rather, training is provided on the basis of perceived professional development need.

The funding streams for ongoing operations of HEIs are managed through different approaches at different institutions. Research funds within HEIs also are managed differently by the different post-secondary education institutions. New resources for regional/provincial/local engagement and activity are generated mainly through research and funded from general revenue. Additional sources of funds sometimes come from specific provincial or federal government funding directed at this issue.

A review of new funding streams that are emerging to fund local engagement and how the institution is tapping into these funds reveals a number of innovative approaches to facilitating regional engagement. Memorial University highlighted that the provincial government recently created an IRAP fund that is designed to help institutions with the matching funds often needed as leverage for federal funding programs. The Vice-President (Research) keeps a close watch on the environment for funding opportunities of this type as do individual researchers and entities such as Genesis Group and the Harris Centre. The University also has a director of Major Research Partnerships who is also charged with looking for new opportunities of this sort.

The University of New Brunswick indicates that the federal funding agencies in collaboration with UNB developed research infrastructure funding to support grant applications and proposals and there is ad hoc provincial funding available for targeted

priorities. It calls for proposals for those initiatives that require funding. However, New Brunswick is in the process of establishing a Commission on Post-secondary Education and it is suspected that that Commission may come forward with recommendations on a new model for Post Secondary education funding in the province.

As explained by Acadia University, the provincial and federal governments are looking at ways to engage universities with industry in new and exciting ways, including the Atlantic Innovation Fund. (AIF). As well, the university has invested in a new Dean of Research and Graduate Studies, and Manager of Institutional Projects, to help tap into these resources.

In terms of community colleges, the Nova Scotia Community College reports that the only new funding streams in past five years have been extension of eligibility for applied research funding to colleges by federal granting councils and regional innovation funds. Similarly, the New Brunswick Community College notes that the applied research and innovation programs at both the federal and provincial levels appear to hold the most possibilities. The institution has implemented institutional development roles in order to respond.

6. Creating a new organization culture

One reason why HEIs might not be more fully engaged with the region is that institutional cultures work against this. Post-secondary institutions within Atlantic Canada were asked whether cultural barriers existed within their institution that precluded more comprehensive regional engagement practices being adopted. While all but one institution indicated that institutional culture was not a problem in terms of facilitating or encouraging regional engagement, several colleges and universities did indicate that related factors may play a role. For example, it was pointed out that some disciplines within the institution were more predisposed to regional engagement than others. Moreover, it was noted that faculty members have a tendency to be inwardly focused within the discipline and at times are isolated from the community. As well, inertia also exerts a strong force on the amount of regional engagement undertaken at universities and community colleges within Atlantic Canada. Compounding these issues is the fact that time and resources are in limited supply and this may constrain the abilities of faculty members to be more engaged with the community.

Since one of the constraints working against regional engagement is time, some institutions suggests that they are making efforts to get people together because when people become acquainted and develop trust relationships, it becomes easier to collaborate and requires less time. In addition, in some institutions, senior officials have taken a more personal interest in regional development and this should filter into the greater organization. As well, some institutions have provided funding targeted at enhancing regional engagement. As noted above, university representatives now take part in local government committees, provincial advisory boards and regional research groups.

For most universities and community colleges in Atlantic Canada, regional, provincial, or local engagement has become part of the academic mainstream. While it is balanced by those within the institution that have a national or international focus, it is certainly a priority of the government, senior administration and many faculty members. Whether one focuses on the natural environment, community heritage, the economy, or culture, there are significant substantive connections to the local/provincial context at Atlantic Canadian universities and community colleges. More specifically, it is manifested through teaching and research. This includes course being offered with a local or provincial focus, local field work and the type of research projects being undertaken by faculty members. For students, these field experiences may be in the form of co-operative work terms, internships, a practicum or a professional experience program. They have in common the goal of providing hands-on experience, opportunities to develop leadership skills, and to be mentored by a professional in the field, thereby complementing their university experiences. For faculty members, this may include grants to support teaching and research that are linked with the region/province/ local community.

7. Conclusion – SWOT analysis

Atlantic Canadian HEIs are extensively engaged in regional development on a wide range of fronts. The self-assessment survey indicates the following strengths, weaknesses, opportunities and threats in the area of capacity building for regional cooperation:

Strengths

The HEIs have numerous mechanisms in place to promote regional involvement, ranging from formal means such as advisory boards and strategic plans, to informal mechanisms such as networking and communicating with alumni. Formal funding arrangements, at the institutional level, or in specific industry or funding agency support to individual researchers, can also provide contractual requirements to meet regional needs. Increasingly, funding includes support for dissemination activities and knowledge mobilization.

There are also many examples of institutional champions at the executive, staff or faculty levels, committed to linking the resources of HEI with local or provincial needs. Internships, co-op programs and practica are also providing mechanisms for students to gain experience with regional firms and organizations, while also making valuable contributions.

Atlantic HEIs have also recognized the value of evaluating their impact on their regions and provinces, and Atlantic cooperation has enabled universities and colleges to maximize evaluation efforts through shared methodologies or measurement processes. The results of these impact assessments have clearly demonstrated significant, tangible benefits.

Weaknesses

While numerous formal and informal mechanisms are in place for HEIs to promote dialogue and involvement, few have created institution-wide mechanisms to champion, track and coordinate this effort. While many senior executives place this role high on their priority list, the complexity and demands of running HEIs means that it must be balanced with the countless other responsibilities and pressures they have on a daily basis. Most faculties and departments, especially professional schools, have advisory boards, liaison with professional associations, and student interaction with employers, but these activities operate, for the most part, in silos where relationships may be strong from the faculty or department out to the stakeholders, but institution-wide communications and synergies are lacking.

The absence of formal human resource policies dedicated to supporting regional engagement is clearly a weakness in efforts to encourage and enable more faculty and staff to see this activity as part of their job, and to equip them with the skills and supports to do so. While examples of promotion and tenure policies exist with some (small) weighting given to "service," this seldom specifies regional engagement or service. However, it is unlikely that human resource policies will bring about significant changes. The difficulties lie in interpreting the current policies and collective agreements.

Finally, while the self-assessment survey indicated positive exceptions and movement in the right direction, the culture of universities and colleges – like any institution – is slow to change. Many university faculty identify with their discipline and the universal findings that define excellence in a field. Colleges are much more responsive to regional labour market needs for education and training, but the relative weakness in research limits a major area of engagement.

Opportunities

In regions such as Atlantic Canada, the imperative to create sustainable communities, high productivity industries, environmentally sound management practices, and dynamic and innovative cultures, places enormous expectations on HEIs, but with this comes opportunities for new partnerships, additional outreach, and the resources to make it happen.

Regional cooperation, in initiatives such as this study, and partnerships such as Springboard, can enable relatively small HEIs to leverage their capabilities and benefit by pooling resources.

With increased expectations for engagement and new forms of partnership and collaboration, HEIs will also benefit from increasing examples of faculty, staff and students engaging in regional outreach. Each success will breed new champions, cultures will evolve and a virtuous circle of new opportunities, incremental funding and greater impact could result.

Threats

Changing priorities in government funding, or reduced funding, could severely limit the ability of HEIs to enhance regional cooperation. As noted in Chapter 3, federal funding is increasingly focused on commercialization, which is more difficult where more firms are small and medium-sized. The Atlantic Canada Opportunities Agency has supported many locally- and provincially-oriented HEI innovation initiatives. Reduced funding, or changed mandates, could limit future support.

Meanwhile, provincial funding could be impacted by changing federal-provincial fiscal arrangements. Oil and gas revenues present significant provincial economic capacity for Newfoundland and Labrador over the next decade, at least, but the Maritime provinces do not have such cushions if federal transfers are reduced.

Chapter 8: CONCLUSIONS: MOVING BEYOND THE SELF-EVALUATION

This self-evaluation on the role of HEIs in economic development has been a first in Atlantic Canada. By examining the contributions of universities as well as colleges, the study provides a foundation for future work on higher education as a system and its contribution to economic development.

The complexity of this system, spread across four provinces, in a vast – by European standards - geographic area, presented significant challenges for the research and writing team and the project steering committee. This study has been an exercise in knowledge mobilization. It has put universities and colleges in the unusual, if not inherently contradictory, position of studying themselves, while engaging each other and their stakeholders in the research process.

When conducted by researchers studying community, industry or other external organizations or processes, knowledge mobilization is intended to establish research priorities collectively, share findings during the research process, increase ownership in the research results, and build capacity for all concerned in the process.

This self-evaluation, in conjunction with the other studies and reports that will address Atlantic Canadian opportunities and challenges as part of this OECD initiative, is the start of an Atlantic Canadian dialogue. This dialogue is between colleges and universities - throughout Atlantic Canada, within their respective provinces, and between each HEI and their respective stakeholders.

The European Union concept of subsidiarity is appropriate in considering the conception of "region" and how HEIs contribute to regional development. There are lessons from this study that will inform Atlantic Canadian collaboration. The Steering Committee will consider how best to disseminate the findings from the various reports produced. In addition to this self-assessment reference document, the two OECD reports, one on Atlantic Canada and one on the entire project, will provide valuable independent analysis and guidance for enhancing the role of HEIs in regional development. There will also be two concluding reports by the project team, one on lessons for Atlantic Canada and one synthesizing the results of the OECD study on lessons for Newfoundland and Labrador.

The project team will implement a dissemination program, with an Atlantic Canadian proposed conference to distill lessons, debate options and inform application. Each province will determine how best it can utilize the findings to inform their unique context. Also, each HEI will be able to assess how these studies relate to their mandates, cultures and priorities.

If dissemination and communication are truly successful, external stakeholders – governments, industry associations, community-based organizations, and citizens – will realize the tremendous contributions Atlantic Canadian HEIs are currently making to their communities. They will also gain insights into what new approaches could be tried,

what new partnerships can be forged, and how HEIs are central to the sustainability of communities and the region as a whole. As well, in extending subsidiarity in the other direction, Atlantic Canadian HEIs will continue their engagement with the other 13 regions and 11 countries participating in the OECD initiative. An international dialogue, grounded in research and analysis, committed to greater understanding and education, and linked to local needs and opportunities, is what higher education is all about.

APPENDICES FOR OECD STUDY

Appendix A
Questionnaire for the Educational Institutions Involved in the OECD/HEI Study of the Contribution of Higher Education to Regional Development in Atlantic Canada

Introduction and Project Overview

Society's expectations for higher education institutions (HEIs) in today's knowledge-based economy are evolving. While knowledge generation and knowledge transfer remain core competencies of our universities and community colleges, it is becoming increasingly recognized that HEIs also have a third function — that of regional/provincial/local engagement.

This third role, while less well understood and accepted than the HEI's primary responsibilities for teaching and research, involves the explicit engagement of HEIs with other key stakeholders (governments, businesses, professional organizations, volunteer groups, other special interest groups, and individual citizens) located within the geographic areas (community, province and/or region) in which the institutions operate. In this context, regional/provincial/local engagement is understood to be fully integrated with the institution's teaching and research roles.

In terms of the current OECD study and its application to Atlantic Canadian HEIs, the third task comprises both the formal and informal interactions of the HEIs and individuals within these institutions with other local (community-based)/provincial (province-wide)/regional (Atlantic Canadian) stakeholders for the betterment of the social, economic and cultural well-being of the area encompassed by the institution's direct sphere of influence. This interaction can, of course, be manifested through a variety of forms. Specifically, this can involve:

- cooperation;
- collaboration;
- consultation;
- directed research;
- targeted curriculum development;
- training of local students;
- the sharing of the institution's infrastructure;
- facilitating access to institutional expertise to address local problems and issues;
- the creation of employment directly within the institution;
- the creation of business opportunities through purchases of goods and services from local businesses;
- the development of spin-off enterprises that were incubated within or emanated from the institution; and
- the creation of profit centres within the HEIs to service the region/province/community.

Recognizing the importance of HEIs in regional development and the need to understand the current state of practice and policies associated with this interaction across its member countries, the Organization for Economic Cooperation and Development (OECD)[73] Programme on

[73] The OECD, a Paris-based organization consisting of 30 member countries, including Canada, is an organization through which member countries work together to address the economic, social and governance challenges of globalization. Its research focus covers economic, social and environmental issues and addresses topics that range from macroeconomics to trade, education, development and science and innovation. The OECD provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and co-ordinate domestic and international policies. Additional information on the OECD can be found at **www.oecd.org**.

Institutional Management in Higher Education (IMHE) has undertaken a major international study entitled: *Supporting the Contribution of Higher Education to Regional Development.*[74] This three-year research project, involves 14 regions in 12 countries spread throughout the globe.[75]

The objectives for this research project are:

1. to strengthen the contributions of HEIs to regional/provincial/local development by devising steps to improve the interplay and mutual capacity building between HEIs and regional/provincial/local stakeholders;
2. to raise awareness amongst HEIs and regional/provincial/local stakeholders of the need to evaluate the efficiency and effectiveness of their partnerships;
3. to develop a methodology and evaluation framework for HEIs and regional/provincial/local stakeholders to monitor and compare the activities and achievements in their international context;
4. to create an opportunity for dialogue between HEIs and national and regional and local stakeholders about their contribution to the economic, social and cultural development of their region/province/community (including knowledge exploitation by business, skills enhancement of the population, work with disadvantaged communities, engagement with the arts);
5. to assist government, HEIs and other stakeholders to identify appropriate roles and partnerships within their regions/provinces/communities;
6. to provide policy advice at the national/regional/provincial level on issues that emerge from the analysis (e.g., the impact of special funding initiatives at a regional and institutional level) and to recommend possible new policy and funding interventions;
7. to enable HEIs to articulate their mission, evaluate their contribution and thereby contribute to their viability; and
8. to lay the foundations of an international network for further discussion and exchange of ideas and issues around good practice and self-evaluation techniques in HEIs' regional/provincial/local engagement.

The potential exists for Atlantic Canada to reap significant benefits from participating in this international project.[76] As such, a number of stakeholders within the region have joined together to undertake the research required for this project. The project steering committee for this research project includes: the Atlantic Canada Opportunities Agency (primary funder), the Leslie Harris Centre of Regional Policy and Development, Memorial University (secondary funder), the Atlantic Provinces Economic Council (project coordination and Steering Committee chair), the Association of Atlantic Universities, the Atlantic Provinces Community College Consortium, the Council of Atlantic Premiers, the provincial department responsible for education/higher education from each of the four Atlantic Provinces, and Dr. Wade Locke (principal investigator and regional coordinator). In addition, there are four provincial coordinators – Dr. Stephen

[74] Information on this project can be found at http://**www.oecd.org/document/16/0,2340,en_2649_34525_34406608_1_1_1_1,00.html.**

[75] The regions involved in this study are: the Sunshine-Fraser Coast region (Australia), North Paraná (Brazil), Atlantic Canada (Canada), **Jutland-Funen region** (Denmark), **Øresund region** (Denmark-Sweden), **Jyväskylä Region** (Finland), North East region (England), Valencia and Canary Islands (Spain), **Värmland region** (Sweden), Twente region (the Netherlands), Mid-Norwegian region (Norway), Busan region (Korea), and **Nuevo León** (Mexico).

[76] This research builds upon the economic impact study just released by the Association of Atlantic Universities and the value for money studies recently completed for the community colleges within each of the Atlantic Provinces.

Tomblin (Newfoundland and Labrador), Dr. Frank Strain (Nova Scotia), Dr. Pierre-Marcel Desjardins (New Brunswick) and Dr. Godfrey Baldacchino (Prince Edward Island).

Institutional Questions

The success of this research project depends on the cooperation and participation of institutions such as your own. It is very important that we receive your institution's responses to the questions provided below by **June 14, 2006**. We appreciate that this will require a significant effort on the part of your institution to complete and we thank you very much for your participation and cooperation in advance. As well, some of the questions may not be relevant to the specific circumstances of your institution. In those instances, please indicate that the question is not relevant or does not apply to your institution. This will also be useful information in completing this OECD research project.

To protect the anonymity of the individual respondents as much as possible in the reporting of the results derived from Atlantic Canada, there will be no specific attribution to individuals or institutions of their responses to the questions being asked. Exceptions to this rule are:

- institutional statistics such as student enrollment will be summarized on a provincial basis, which in some cases will be identical to statistics for a single institution; and
- examples used to illustrate a general point or practice such as:
    - Springboard as an example of a collaborative approach to the commercialization of university research as a way of enhancing economic growth and development within the region;
    - ACEnet as an example of a network of Atlantic Canadian universities formed to acquire and operate large-scale high performance computing facilities for research; or
    - the focus of institutes such as the Harris Centre which is tasked with coordinating and facilitating Memorial University 's educational, research and outreach activities in the areas of regional policy and development.

To facilitate your ability to complete and return the attached survey, a rewritable CD has been enclosed. A Microsoft Word version of the survey is provided on the CD and we would appreciate receiving your responses to the questionnaire directly on the attached CD or by an attachment to an email sent to wlocke@mun.ca. However, we are happy to accept your comments and responses in any format that you wish to provide. While institutions have ultimate flexibility in the mechanism they choose to have the questions answered, our preference is to have one questionnaire return per institution, even though the institution may have multiple campuses.

Finally, in answering the questions posed below, **region or regional** should be considered to be synonymous with **Atlantic Canada or Atlantic Canadian**, provincial should be interpreted as the province in which your institution is located or province-wide which refers to the province in which your institution is located and local pertains to the community or communities in which your institution operates.

If you have any questions or concerns about the questionnaire, please feel free to contact Dr. Wade Locke, Memorial University at 709-737-8104 or **wlocke@mun.ca.**

The questions to which we are seeking responses from your institution are provided below and grouped according to general themes.

1.0 Institutional characteristics

1.1 What is the name of your institution? _____

1.2 In which community is your institution's main campus/corporate headquarters? _____

1.3 Do you have more than one campus? _____

1.4 If so, please list their locations.

_____ _____ _____
_____ _____ _____
_____ _____ _____
_____ _____ _____

1.5 How long has your institution been in operation? _____

1.6 What is the specific mandate of your institution? _____
_____
_____
_____
_____

1.7 What is your mission statement? _____
_____
_____
_____
_____

1.8 Is your mission statement available on your website? _____

1.9 Do you have a strategic plan for the institution? _____

1.10 If so, is it available on your website? _____

1.11 If relevant, please list the three top priorities identified in your strategic plan.

a. _____
_____

b. _____
_____

c. _____
_____

1.12 For **universities**, please indicate the enrollment for your institution as a whole by area and level indicated below

	2004/2005			**1999/2000**		
	Bachelor or First Degree	Masters	Ph.D.	Bachelor or First Degree	Masters	Ph.D.
the number of students enrolled in Humanities						
the number of students enrolled in Social Sciences						
the number of students enrolled in Education						
the number of students enrolled in Mathematics and Physical Sciences						
the number of students enrolled in Agriculture and Biological Sciences						
the number of students enrolled in Health Professions and Occupations						
the number of students enrolled in Engineering and Applied Sciences						
The number of students enrolled in Commerce, Management & Admin.						
Other university enrollment						

1.13 For **universities**, please indicate whether your institution has;

	2004/2005	**1999/2000**
Medical school		
Law school		
Pharmacy School		
Dental School		
Veterinary School		

1.14 **For community colleges**, please indicate the enrollment for your institution as a whole by type indicated below:

	2004/2005	**1999/2000**
the level of full-time students enrollment in advanced diplomas programs		
the level of part-time students enrollment in advanced diplomas programs		
the level of full-time students enrollment in two-year diplomas programs		
the level of part-time students enrollment in two-year diplomas programs		
the level of full-time students enrollment in one-year certificate programs		
the level of part-time students enrollment in one-year certificate programs		
the level of full-time students enrollment in apprenticeship programs		
the level of part-time students enrollment in apprenticeship programs		
the level of full-time students enrollment in other community college courses		
the level of part-time students' enrollment in other community college courses.		

1.15 For **community colleges**, please indicate:

	2004/2005	**1999/2000**
the percentage of your student body from within the province		
the percentage of your student body from within the Atlantic Canada		
the level of full-time faculty		

	2004/2005	1999/2000
percentage of full-time faculty which are female		
the level of part-time faculty		
percentage of part-time faculty which are female		
the level of full-time staff		
percentage of full-time staff which are female		
the level of part-time staff		
percentage of part-time staff which are female		

1.16 For **community colleges**, please indicate:

	2004/2005	1999/2000
the size of the institution's annual budget (including professional schools)		
funding for your institution that comes from - tuition		
funding for your institution that comes from – government grants		
funding for your institution that comes from – contract research		
funding for your institution that comes from - gifts		
funding for your institution that comes from - other		
funding for research that comes from - granting councils		
funding for research that comes from – federal regional grants, such as AIF		
funding for research that comes from - contracts		
funding for research that comes from – other please specify		
funding to cover indirect costs of research		

1.19 For **community colleges**, please indicate the proportion of your annual budget absorbed by;

	2004/2005	1999/2000
Labour		
Goods & Services		
Scholarships and bursaries		
Other, please specify		

1.17 For **universities**, please indicate the proportion of the research funds which to each of the following departments/faculties or areas of the universities:

	2004/2005	1999/2000
Humanities		
Social Sciences		
Education		
Mathematics and Physical Sciences		
Agriculture and Biological Sciences		
Health Professions and Occupations		
Engineering and Applied Sciences		
Commerce, Management & Admin.		
Other		

1.18 For **universities**, please indicate the number of Canada Research Chairs that existed within your institution in 2004/05 _____ .

1.19 For **universities**, please indicate the number of endowed research chairs (other than Canada Research Chairs) that existed within your institution in 2004/05 _____ and 1999/2000 _____.

1.20 For both **universities and community colleges**, please indicate the proportion of the goods and services that were purchased from local companies in 2004/05 _____ and 1999/2000 _____.

1.21 For both **universities and community colleges**, on average, what is the balance between teaching and research in your institution?
_____% Research, _____% Teaching, _____% Other (please specify)

2.0 Motivation for regional engagement

In answering the following questions, regional/provincial/local engagement pertains to the HEI's interaction with governments, businesses, professional organizations, volunteer groups, other special interest groups, and individual citizens and encompasses:

- *cooperation;*
- *collaboration;*
- *consultation;*
- *directed research,*
- *targeted curriculum development;*
- *training of local students;*
- *the sharing of the institution's infrastructure;*
- *facilitating access to institutional expertise to address local problems and issues;*
- *the creation of employment directly within the institution;*
- *the creation of business opportunities through purchases of goods and services from local businesses;*
- *the development of spin-off enterprises that were incubated within or emanated from the institution; and*
- *the creation of profit centres within the HEIs to service the region/province/community.*

2.1 Is regional/provincial/local engagement part of the focus of your institution?

Local Engagement:	Yes ____	No ____
Provincial Engagement:	Yes ____	No ____
Regional Engagement:	Yes ____	No ____

2.2 If yes to more than one in 2.1, is it focused primarily on

Local Engagement:	____
Provincial Engagement:	____
Regional Engagement:	____

2.3 Has this focus changed over time? Yes ____ No ____

2.4 If yes to 2.3, please explain._____
_____
_____
_____

2.5 Is regional/provincial/local engagement imposed on your institution by government as a formal requirement? Yes ____ No ____

2.6 If you answered no to 2.5, do you feel that there is an expectation by government that your institution be involved in regional/provincial/local engagement?
Yes ____ No ____

2.7 If you answered yes to 2.6, please explain._____
_____
_____

2.8 Does an emphasis upon a regional/provincial/local role for HEIs involve any policy tensions within your institution? For example, is there a conflict between regional/provincial/local commitments and the need to strive for quality and international competitiveness in higher education? If so, how are these resolved? _____
_____
_____
_____

2.9 How has the involvement of your institution with region/province/community stakeholders evolved over time? This would include in general terms how these links were established and maintained. _____
_____
_____
_____

3.0 ***<u>Responding to regional needs and demands</u>***

3.1 Does research policy at your institution have a regional local dimension? Please explain.
_____
_____
_____

3.2 Does research policy at your institution have a provincial dimension? Please explain.
_____
_____
_____

3.3 Does research policy at your institution have a local dimension? Please explain.
_____
_____
_____

3.4 To what extent does your institution draw upon the characteristics of your region/province/community to develop research activity? Please explain and provide illustrative examples of each where relevant. _____
_____
_____
_____

3.5 What other regional/provincial/local stakeholders are drawn into this process of determining the regional/provincial/local research focus of your institution? _____
_____
_____
_____

3.6 How have such research links been established? _____
_____
_____
_____

3.7 Does your institution have a technology transfer office or equivalent? Yes ____ No ____

3.8 If your institution does not have a technology transfer office, do you have access to a regional or provincial office that serves this function? (Please explain) _____
_____
_____
_____

3.9 If your institution does have a technology transfer office, does the technology transfer office have a specific role to play in transferring your technology to the regional market? Please explain. _____
_____
_____
_____

3.10 If your institution does have a technology transfer office, does the technology transfer office have a specific role to play in transferring your technology to the provincial market? Please explain. _____
_____
_____
_____

3.11 If your institution does have a technology transfer office, does the technology transfer office have a specific role to play in transferring your technology to the local market? Please explain. _____
_____
_____
_____

3.12 How is provision made to meet specific regional/provincial/local technology and innovation needs and demands, such as those from small and medium-sized enterprises (SMEs)? Please explain. _____
_____
_____
_____

3.13 Is such provision undertaken in collaboration with other regional/provincial/local innovation and technology stakeholders such as public labs and research institutes? Please explain. _____
_____
_____

3.14 In your institution, what mechanisms exist to reward and acknowledge regionally/provincially/locally-based research which has been traditionally outside of peer review processes such as academic journals? This would include, for example, the application of the established knowledge for the local/provincial/regional community as opposed to the generation of "basic" knowledge for the national/international academic community. Please explain._____
_____
_____
_____

3.15 List and describe any institutional policies that guide and encourage graduate education and industry research partnerships. _____
_____
_____
_____

3.16 Does your institution have a single point of contact and/or coordinating structure through which companies can explore potential research relationships? Yes ____ No _____

3.17 Does your institution maintain a database of faculty interests and competencies to help companies find faculty members that match their needs? Yes ____ No _____

3.18 Is this database web accessible and searchable on the Internet? Yes ____ No _____

3.19 Does your institution make efforts to simplify contract language and develop simplified partnership agreement forms? Yes ____ No _____

3.20 Describe how the percentage of hiring of nationally prominent scientists (including endowed research chairs) with industry and/or entrepreneurial backgrounds has changed over the last five years. _____
_____
_____

3.21 Describe how the number and type of industry-research partnerships has changed over the last five years. _____
_____
_____
_____

3.22 List any existing or planned research parks contiguous to your institution, and describe how they foster ongoing relationships between local companies and faculty researchers.
_____
_____
_____
_____

3.23 Within your institution, approximately how much is spent annually on industry research partnership activities? _____ dollars.

4.0 <u>Framework conditions for promoting research and innovation</u>

4.1 Who owns intellectual property rights to inventions and innovations created by individuals working in your institution? _____

4.2 Does the national legal framework (e.g. intellectual property law) support the role of HEIs, in general, and your institution, in particular, in research and innovation (including research and innovation partnerships with industry)? Yes ____ No ____
Please explain._____
_____
_____

4.3 What are the incentives and barriers in HEI-industry relationships, both for HEIs and for industry? _____
_____
_____
_____

4.4 Describe the ways in which HEIs, in general and your institution, in particular help to stimulate innovation and knowledge transfer between researchers and industry (both larger enterprises and SMEs). _____
_____
_____
_____

4.5 List the programme(s) which exist in Canada or in the province that your institution is involved with that encourage co-operative research between HEIs and industry.
_____
_____
_____
_____

4.6 List the programme(s) which exist in Canada or in the province that your institution is involved with that encourage the exchange of research staff between HEIs and industry.
_____
_____
_____
_____

4.7 Within your institution, list and describe any institutional policies that guide and encourage external partnering and involvement in regional/provincial/community economic development. _____
_____
_____
_____

4.8 How are these policies linked to tenure and promotion? If they are not, are there currently any efforts to develop these linkages? Please explain. _____
_____
_____
_____

4.9 List and describe any informal cultural practices and activities that guide and encourage external partnering (e.g., formal awards or acknowledgements of faculty inventors, entrepreneurs, and industry partners; media efforts that extol partnering successes, etc.)?
_____
_____
_____
_____

4.10 Approximately how much money is spent annually in your institution on this activity? _____ dollars

4.11 How has the percentage of senior institutional officials with industry and entrepreneurial experience changed over the last five years? _____

5.0 <u>Interfaces facilitating knowledge exploitation and transfer</u>

5.1 At your institution, what mechanisms have been developed to commercialize the research base and to promote technology transfer between your institution and regional/provincial/local stakeholders? Please include the following:

- research contracts Yes ____ No ____
- collaboration Yes ____ No ____
- consultancy Yes ____ No ____
- intellectual property (IP) transactions Yes ____ No ____
- promotion of spin-offs Yes ____ No ____
- incubators Yes ____ No ____
- science parks Yes ____ No ____
- clusters Yes ____ No ____
- teaching/training Yes ____ No ____
- labour exchanges Yes ____ No ____

5.2 How have your institution and other regional/provincial/local stakeholders been promoting the mechanisms noted above? _____
_____
_____
_____

5.3 Do you know how HEIs, in general and other regional/provincial/local stakeholders have been promoting the mechanisms noted above? Please explain. _____
_____
_____
_____

5.4 What are the respective roles of the federal government, federal regional development agency, provincial government, HEIs, regional research institutes, and businesses in creating mechanisms to commercialize the research base of HEIs and to promote technology transfer between HEIs and regional/provincial/local stakeholders?
_____
_____
_____
_____

5.5 Are there any specific mechanisms to commercialize the research base and to promote technology transfer between your institution and regional/provincial/local stakeholders that have been created within your institution or between your institution and other HEIs? Please explain. _____
_____
_____
_____

5.6 Are there structures in place in the region or province that enable your institution and other HEIs to more widely disseminate its R&D and innovation initiatives beyond its contractual industry partners? (i.e., exhibitions, competitions, regular demonstrations, media, regional web page entry points, etc). Please explain. _____
_____
_____
_____

5.7 List and describe any institution policies that guide and encourage potential faculty entrepreneurs. _____
_____
_____
_____

5.8 Does your institution have a single point of contact and coordinating structure through which faculty can explore potential technology transfer relationships? Yes ___ No ___

5.9 Does your institution offer seed or proof-of-concept funding for the development of research-based innovations (i.e., financial support at the very early stages of research commercializing for things such as feasibility studies, testing of prototype development, market research, business plans, etc., which are designed to bring research to the point where its commercial usefulness can be demonstrated)? Yes ____ No ____

5.10 Briefly describe how your institution measures technology transfer.
_____
_____
_____

5.11 Describe how the extent of technological transfer from your institution has changed over the last five years. _____
_____
_____
_____

5.12 Describe the working relationship and physical location between the technology transfer and industry-sponsored research functions. Are these done by the same individuals/office? Are they located in the same building? _____
_____
_____
_____

5.13 Approximately how much is spent annually by your institution on technology transfer activities? _____ dollars

6.0 Localizing the learning process

6.1 How does your institution draw upon the specific characteristics of your region/province/community to aid learning and teaching? _____
_____
_____
_____

6.2 Are there any courses which cater to regional/provincial/local needs? Please describe briefly. _____
_____
_____
_____

6.3 In what ways are learning programs tied to reflecting and finding creative solutions on regional/provincial/local issues over the medium to long term?
_____
_____
_____
_____

6.4 Are there learning programs within your institution that enhance the capacity of students to be entrepreneurial by taking advantage of regional/provincial/local issues and opportunities? Please explain. _____
_____
_____
_____

6.5 How are students from your institution integrated in the region/province/community, in terms of course placements, co-op programs, accommodation, volunteering activities?
_____
_____
_____

6.6 Within your institution, what mechanisms exist to monitor/accredit extra-curricular activities? _____
_____
_____
_____

6.7 Within your institution, to what extent is postgraduate activity geared towards meeting regional/provincial/local needs? Please explain. _____
_____
_____
_____

6.8 Does your institution facilitate voluntary associations and coalitions of regional/provincial/local expertise and knowledge around key regional/provincial/local strategic priorities? Please explain. _____
_____
_____
_____

7.0 ***<u>Student recruitment and regional employment</u>***

7.1 What are your institution's policies concerning regional/provincial/local recruitment?
_____
_____
_____
_____

7.2 What mechanisms are in place in your institution to increase regional/provincial/local recruitment? _____
_____
_____

7.3 Are there any collaborative partnerships or quota arrangements among regional/provincial/local HEIs to manage regional recruitment? Please explain.
_____
_____
_____
_____

7.4 To what extent does your institution recognize itself as part of a regional or provincial education supply chain? Where relevant, please provide specific examples.
_____
_____
_____
_____

7.5 What mechanism exists to create pathways between regional HEIs and regional/provincial/local firms, especially SMEs? _____
_____
_____
_____

7.6 To what extent is labour market information gathered by your institution to monitor the flow of graduates into the labour market? _____
_____
_____
_____

7.7 Does this process involve other regional/provincial/local stakeholders? Please explain.
_____
_____
_____
_____

7.8 Through your institution, are there any specific initiatives or practices to support graduate enterprise in an effort to retain graduates in the region/province/community and recruit alumni to return to the region/province/community? Please explain. _____
_____
_____
_____

7.9 What has been the experience of your institution with the Millennium Fund in terms of enhancing access to post secondary education in your province? Please explain.
_____
_____
_____

7.10 How have scholarships at your institution change over the past five years?
_____
_____
_____

7.11 How has student employment at your institution change over the past five years?
_____
_____
_____

8.0 <u>Promoting lifelong learning, continuing professional development and training</u>

8.1 How are continuing education and continuing professional development activities organized within your institution? (e.g., adult liberal education; tailored and specialist continuing professional development). Please explain. _____
_____
_____
_____

8.2 Have external or independent enterprises (e.g., separate and independently-run business school) been established within HEIs to extend professional education provision to the region/province/community? Yes ____ No ____

8.3 Is such provision undertaken in collaboration with other regional/provincial/local stakeholders? Yes ____ No ____

8.4 Which regional/provincial/local partners are involved in meeting regional/provincial/local training needs? _____
_____
_____
_____

8.5 Does your institution have mechanisms in place to increase access for learners in the region/province/community who have been traditionally under-represented in higher education? (i.e., ethnic minorities, returning adult learners, aboriginal peoples, and individuals with disabilities). Please explain. _____
_____
_____
_____

9.0 ***<u>Changing forms of educational provision</u>***

9.1 What mechanisms exist within your institution for promoting flexible education provision such as satellite campuses, accreditation networks, on-line courses and outreach centres?
_____
_____
_____
_____

9.2 How do HEIs maintain institutional coherence in the light of this multi-territorial educational provision? _____
_____
_____
_____

9.3 Is your institution drawing upon new forms of ICT-based course delivery to enhance educational opportunities to a wider group? Please explain. _____
_____
_____
_____

9.4 Are there barriers to your institution in developing distance education? Please explain.
_____
_____
_____

9.5 Within your institution, are there tensions between place-based and virtual forms of education provision? If so, what are they? _____
_____
_____
_____

10.0 <u>Enhancing the regional learning system (post secondary education system)</u>

10.1 To what extent is there a coherent vision of an education system existing at the provincial level? Please explain. _____
_____
_____
_____

10.2 Is there a need to develop education on a provincial basis? Please explain. _____
_____
_____
_____

10.3 To what extent is there a coherent vision of an education system existing at the Atlantic Canada (regional) level? Please explain. _____
_____
_____
_____

10.4 Is there a need to develop education programs on an Atlantic Canada (regional) basis? Please explain. _____
_____
_____
_____

10.5 What data analysis has been performed at your institution or elsewhere to establish the demand and supply of different types of higher education 'product' within the region/province? _____
_____
_____
_____

10.6 Are procedures in place to support regional/provincial collaboration between HEIs in this respect? Please explain. _____
_____
_____
_____

10.7 Is there a single or common application process for post-secondary education institution within your province? Yes ____ No ____

10.8 Is there a credit transfer system between education institutions? Yes ____ No _____

10.9 If yes, what links exist between the university and non-university higher education sector within the province or region? Please explain.
_____
_____
_____

10.10 What measures exist to promote gender equity in participation in higher education participation in the region or province? Please explain. _____
_____
_____
_____

10.11 List and describe any education or training programs that address the needs of key provincial industries. _____
_____
_____
_____

10.12 Does your institution have a single point of contact and/or coordinating structure through which companies can explore potential industry/education training partnerships?
Yes ____ No ____

10.13 List and describe any formal needs assessments that inform the design of education and training programs. _____
_____
_____
_____

10.14 Describe the extent to which your institution engages in the provincial-wide/region-wide delivery of extension courses. _____
_____
_____
_____

10.15 Describe how the number of education/training partnerships with which your institution is associated has changed over the last five years.
_____
_____
_____

10.16 Approximately how much money is spent by your institutional annually on industry education/training partnership activities? _____ dollars

11.0 <u>Social Development</u>

11.1 Does your institution provide community access to facilities for services such as health and medical, welfare advisory, cultural exchange, indigenous support, religious institutions? Yes ____ No ____

11.2 Does your institution provide community access to expertise support for services such as health and medical, welfare advisory, cultural exchange, indigenous support, religious institutions? Yes ____ No ____

11.3 Does your institution engage in partnership with the community in the provision of social services? Yes ____ No ____

12.0 <u>Cultural Development</u>

12.1 Does your institution provide facilities, expertise or learning program support for cultural groups? Please explain. _____
_____
_____
_____

12.2 Does your institution encourage sports development? Please explain. _____
_____
_____
_____

12.3 Does your institution support the arts through its infrastructure, programs and services? Please explain. _____
_____
_____
_____

12.4 Has your institution established mechanisms through which their stock of cultural facilities can be jointly managed and marketed to the regional/provincial/local community? Please explain. _____
_____
_____
_____

13.0 <u>Environmental Sustainability</u>

13.1 Would you consider your institution to be a practical demonstration of best practice to address environmental issues of concern to the regional/provincial/local community? Please explain. _____
_____
_____

13.2 Are there joint initiatives between your institution, the regional/provincial/local community and others to demonstrate environmental sustainability possibilities for the region/province/community? Please explain. _____
_____
_____

14.0 <u>Mechanisms to promote HEI-regional involvement</u>

14.1 Within your institution , what formal and informal mechanisms exist to identify regional/provincial/local needs? _____
_____
_____

14.2 Has the catalyst for regional/provincial/local engagement been internal or external to your institution? Please explain. _____
_____
_____

14.3 Within your institution, are there formal processes such as signed agreements that bind those in the engagement relationship? Please explain. _____
_____
_____
_____

14.4 What incentives and support are provided to support regional/provincial/local engagement of your institution and to whom are they provided?
_____
_____
_____

14.5 What processes are in place within your institution to regularly review current engagement arrangements between your institution and the region/province/community?
_____
_____
_____

14.6 Are you aware of whether government has identified any good practices in respect of regional/provincial/local engagement of HEIs and if so, how has this been disseminated to your institution and to other institutions within your province? _____
_____
_____
_____

14.7 What formal and informal mechanisms exist to coordinate the activities of HEIs in regional/provincial/local engagement both within the higher education sector and with those of other participants? _____
_____
_____
_____

14.8 Does your institution make use of existing regional/provincial/local community infrastructure for its operation? Yes ____ No ____

14.9 Does the community access your institution's infrastructure for its day-to-day needs? (e.g., testing laboratories, libraries, sporting and cultural facilities, transport, accommodation for students, etc) Yes ____ No ____

15.0 <u>Promoting regional dialogue & Joint marketing initiatives</u>

15.1 What mechanisms exist to promote communication and dialogue between your institution, in particular and HEIs, in general and regional/provincial/local stakeholders?
_____
_____
_____
_____

15.2 What groups participate with your institution in terms of the dialogue on regional/provincial/local engagement of your institution with other regional/provincial/local stakeholders? _____
_____
_____
_____

15.3 How are the regional/provincial/local interests of various sectors of interest, such as the higher education sector, industry, and the private, public and voluntary sectors, represented in this communication/dialogue designed to promote the regional/provincial/local engagement of your institution? _____
_____
_____
_____

15.4 What is the extent and nature of your institution's staff representation on public/private bodies in the region/province/community? _____
_____
_____
_____

15.5 What are the reasons for such representation and what is their role? Is such representation monitored? _____
_____
_____
_____

15.6 What roles do external bodies play in decision making within your institution? Please explain. _____
_____
_____
_____

15.7 Are there joint HEI and regional/provincial/local promotion and marketing initiatives within the HEIs in the region? Yes ____ No ____

15.8 Does your institution have a 'buy local' purchasing program targeted at local, provincial or regional businesses? Yes ____ No ____

15.9 List and describe any policies that guide and encourage the employment of students by local companies. _____
_____
_____
_____

15.10 Does your institution have a single point of contact and coordinating structure through which companies can employ current and graduating students? Yes ____ No ____

15.11 List and describe any internships and co-op programs that exist within your institution? _____
_____

15.12 Describe the working relationship between the career services and placement, and technology transfer and industry-sponsored research functions. _____
_____
_____
_____

15.13 Describe how the number of undergraduate and graduate students the career services and placement function has placed over the last five years has changed. _____
_____
_____

15.14 Approximately how much is spent annually by your institution on career services and placement activities? _____ dollars.

16.0 <u>Evaluating and mapping the impact of the regional HE system</u>

16.1 Has your institution undertaken an audit of its impacts on and links with the region/province/community? (i.e., direct economic impact of the institution; contributions to local economic development; or social and cultural impact). Please explain. _____
_____
_____

16.2 How are such impact statements used and distributed to the region/province/community and further a field to promote the HEIs and the region/province/community? _____
_____
_____
_____

16.3 Do mechanisms exist to raise awareness of the role of your institution and HEIs in the region/provincial/community? Please explain. _____
_____
_____

16.4 What is known about the contribution that your institution makes to the region/province/community? Please explain. _____
_____
_____
_____

17.0 <u>Institutional capacity building for regional involvement</u>

17.1 Within your institution, to what extent has academic leadership and central management been altered to engage with regional/provincial/local needs? Please explain. _____
_____
_____
_____

17.2 Does your institution's strategic plan include its relationship with the regional/provincial/local community as a key strategy for enhancing viability? Please explain. _____
_____
_____
_____

17.3 What are the main channels of communication between regional/provincial/local stakeholders and your institution (senior managers, committees, etc) and who is responsible for regional/provincial/local decisions in the institution? _____
_____
_____
_____

17.4 Within your institution, what internal mechanisms exist for coordinating regional/provincial/local activities within the institution especially in relation to funding issues? _____
_____
_____
_____

17.5 What new posts/offices have been created within your institution with an explicitly regional/provincial/local remit? _____
_____
_____
_____

17.6 Does your institution use adjunct appointments to add expertise to its capacity?
Yes ____ No ____

17.7 In what ways is your institution responding to regional/provincial ICT infrastructure and is it adopting new technologies to restructure its own management structures? Please explain. _____
_____
_____
_____

18.0 <u>Human and financial resources management</u>

18.1 How is the regional/provincial/local dimension incorporated into the human resources policy of your institution? Please explain. _____
_____
_____
_____

18.2 In your institution, what training is given to staff with regional/provincial/local responsibilities? _____
_____
_____
_____

18.3 If training is given to staff with regional/provincial/local responsibilities, how is staff rewarded for regional/provincial/local engagement?

_____
_____
_____
_____

18.4 How are regional/provincial and national funding streams for ongoing operations of HEIs managed? _____
_____
_____
_____

18.5 How are regional/provincial and national funding streams for research within HEIs managed? _____
_____
_____
_____

18.6 What are the possibilities of financial decentralization of ongoing operations funding and research funding within the institution? _____
_____
_____
_____

18.7 How does the institution embed newly devolved financial responsibilities into academic life? _____
_____
_____
_____

18.8 How are new resources for regional/provincial/local engagement and activity generated? Who pays for the regional/provincial/local role of the institution? _____
_____
_____
_____

18.9 What new regional/provincial/local funding streams are emerging which the institution can tap into? What mechanisms are being established to tap into these sources?

_____
_____
_____

19.0 <u>Creating a new organization culture</u>

19.1 Are there any significant cultural obstacles to adopting greater regional/provincial/local engagement within your institution? Please explain. _____
_____
_____
_____

19.2 What efforts have been done to overcome these obstacles? _____
_____
_____
_____

19.3 Has regional/provincial/local engagement become part of the academic mainstream of your institution? Please explain. _____
_____
_____
_____

19.4 If so, how far has this influenced mainstream teaching and research?
_____
_____
_____
_____

Appendix B
The Contribution of Higher Education Institutions to Regional Economic Development
An OECD Study
Questions for <u>Other Stakeholders</u>

<u>Governance Structure</u>

1.11 hat is the structure of central, regional and local government in the region? Specifically, who is responsible for the following:
- resourcing public services (balance between local, regional and national taxation)
- economic development
- education (primary, secondary, tertiary, vocational)
- health and welfare
- cultural provision

1.12 What powers are available to local and regional authorities in relation to economic and social development? Please include the following: (1) acquisition of land and property; (2) financial inducements to business; and (3) provision of vocational education.

1.13 What influence, if any, do local and regional authorities have over the provision of tertiary level education and research and development?

1.14 What influence, if any, do local and regional authorities have over national policy with regard to tertiary level teaching and research?

1.15 What are the principal drivers in relation to national territorial development policy as these impact on the region and what place does higher education have in these policy developments?

<u>Overview of the National system of higher education</u>

1.16 What are the dominant characteristics of the provincial higher education system? Please include the following:
b) What data analysis has been performed at the provincial level to establish the demand and supply of different types of higher education 'product'?
c) Outline the basic governance of and regulatory framework for the higher education system (i.e., funding mechanism and institutional autonomy) including the major legislation that applies to it.
d) Describe briefly the major provincial agencies responsible for developing tertiary education policy, for financing the system, and for assuring its quality, and their mandates.
e) Outline how provincial higher education policies are developed.
- What characterizes inter-institutional (between universities and between universities and community colleges) relationships – cooperation, competition, market-led?

1.17 To what extent is there dialogue between government ministries concerned with regional development, science & technology and those sponsoring higher education? What mechanisms exist to coordinate and attune the policies and measures taken by the different ministries?

1.18 To what extent does provincial higher education policy have an Atlantic Canadian focus and to what extent has it had a sub-provincial focus? In answering this, the following questions could be taken into consideration:

- Have regional development (economic, social, cultural) considerations played a prominent role in decisions on where to locate and build up new institutions?
- Have funding arrangements been altered to reward institutions for regional engagement or to make this engagement possible?
- Is regional engagement imposed on institutions by government as a formal requirement?
- What policy initiatives have been taken by various actors (e.g. central governments in different policy domains, regional authorities etc) to foster the regional role of HEIs and to stimulate regional collaboration between HEIs, industry, government and civil society?

1.19 To what extent do these considerations have a differential impact upon different types of higher education institutions? (i.e. universities vs. non-university HEIs)

1.20 To what extent does the financing and management of HEIs occur at a Atlantic Canadian or Maritime Provinces level?

1.21 Are there regional organizations that have strategic responsibility over funding and management of HEIs? Please explain.

Suggested Questions for Chapter 3: CONTRIBUTION OF RESEARCH TO REGIONAL INNOVATION

Framework conditions for promoting research and innovation

1.22 Does the national legal framework (e.g. Intellectual property law) support the role of HEIs in research and innovation (including research and innovation partnerships with industry)? What are the incentives and barriers in HEI-industry relationships both for HEIs and for industry?

Interfaces facilitating knowledge exploitation and transfer

1.23 At the provincial or Atlantic Canada level, what mechanisms have been developed to commercialize the research base of the HE sector and to promote technology transfer between the HEI and regional stakeholders? Please include the following:

- research contracts, collaboration and consultancy
- intellectual property (IP) transactions
- promotion of spin-offs, incubators, science parks; and clusters
- teaching/ training and labour mobility

1.24 Are you aware of how have HEIs and other regional stakeholders been promoting these mechanisms described above? If so, please explain.

- What are the respective roles of the federal government, the provincial government, regional authorities, HEIs, regional research institutes, and businesses in creating such mechanisms?
- Are there any specific mechanisms that have been created within or between higher education institutions?

1.25 Are you aware of whether there are structures in place in the region that enable the HEIs to more widely disseminate its R&D and innovation initiatives beyond its contractual

industry partners? (i.e., exhibitions, competitions, regular demonstrations, media, regional web page entry points, etc)

Suggested Questions for Chapter 4: CONTRIBUTION OF TEACHING & LEARNING TO LABOUR MARKET AND SKILLS

Student recruitment and regional employment

1.26 Are you aware of whether there any specific initiatives or practice to support graduate enterprise (i.e. the Cambridge MIT initiative in the UK) in an effort to retain graduates in the region and recruit alumni to return to the region?

Enhancing the regional learning system

1.27 To what extent is there a coherent vision of an education system existing at the Atlantic Canada level? Do HEIs acknowledge the need to develop education on an Atlantic Canadian basis?

1.28 What data analysis has been performed to establish the demand and supply of different types of higher education 'product' within Atlantic Canada?

1.29 To what extent is there a coherent vision of an education system existing at the provincial level? Do HEIs acknowledge the need to develop education on a provincial basis?

1.30 What data analysis has been performed to establish the demand and supply of different types of higher education 'product' within the province?

Mechanisms to promote HEI-regional involvement

1.29 What formal and informal mechanisms exist to identify Atlantic Canadian/provincial/local needs? Has the catalyst for regional/provincial/local engagement been internal or external to HEIs?

- Are their formal processes such as signed agreements that bind those in the engagement relationship?

1.30 Have government and/or regional authorities undertaken an audit of the knowledge resources of the region in terms of: (1) the expertise, skills and experience of people in the regional population; (2) the research places and spaces; and (3) the accessibility of research and learning infrastructure for new innovative knowledge generating and dissemination initiatives?

1.31 Does the province's strategic plan(s) include the role of the HEIs as a key element?

1.32 What resources are made available to HEIs by government and others to support regional/provincial/local engagement? How are these distributed? What incentives and support are provided to support regional/provincial/local engagement of HEIs?

1.33 What processes are in place to regularly review current engagement arrangements between the HEIs and the region/province/community so as to build an element of ongoing improvement into the relationship?

- How do government and/or regional authorities evaluate the success of HEIs in regional/provincial/local engagement? Have government and/or regional authorities identified any good practice in respect of regional/provincial/local engagement of HEIs and if so how has this been disseminated?

1.34 What formal and informal mechanisms exist to coordinate the activities of HEIs in regional/provincial/local engagement both within HE sector and with those of other participants?

1.35 Do the HEIs make use of existing regional community infrastructure for its operation? Also, does the community access HEI infrastructure for its day to day needs? (i.e., testing laboratories, libraries, sporting and cultural facilities, transport, accommodation for students, etc)

Promoting regional dialogue & Joint marketing initiatives

1.36 What mechanisms exist to promote communication and dialogue between HEIs and regional/provincial/local stakeholders?

1.37 What groups are part of the dialogue of regional/provincial/local engagement? How are the regional interests of various sectors of interest such as HE, industry, and the private, public and voluntary sectors represented?

1.38 Are there joint HEI/ regional promotion and marketing initiatives or a 'buy local' purchasing program within the HEIs in the region/province?

Appendix C

NL – Focus and Gov Questions
Dr. Stephen Tomblin

This international project provides an opportunity to investigate how governance structures and decision-making processes shape or influence ideas, patterns of communication in the area of regional economic development. Sustainability and innovation for any community (province or otherwise) depends on having a foundation or system of knowledge construction, problem definition, research, and teaching where diverse interests can come together, debate issues, agree on strategies, and then build the capacity to implement these.

My role as provincial coordinator was to coordinate and report on perceived challenges, problems, internal and external influences, based on the perspectives of decision-makers, researchers, civil society stakeholders within the province. The report employed a qualitative approach (interviews/focus groups) to better understand the cultural, institutional, and interest-based barriers and facilitators to promoting or enhancing the contribution of universities to community development.

Emphasis was placed on understanding the cultural, economic, political inhibitors and constraints that influenced efforts to increase the contribution of Higher Education Institutions (HEI's) to regional economic development. Another purpose was to better understand the conditions required for building more integrated and sustainable governance structures and processes. Without new forms of knowledge and patterns of integration/interaction, getting a consensus on development problems and developing a common mental map required for innovation will remain a political challenge for Newfoundland and Labrador.

From the start, it is important to recognize that there has never been an academic or political consensus on the causes of underdevelopment in Canada.[77] Nor has there been a political or academic consensus in Newfoundland and Labrador about industrialization, modernization, Atlantic integration, and whether rural outports are essential for social cohesion or are themselves responsible for poor economic performance and lack of innovation. Over the decades these different battles over regional development policy have produced a multitude of strategies and national, provincial, sub-provincial structures which have further complicated the task of working across silos, whether policy fields, disciplines, or jurisdictions. The lack of consensus on regional development coupled with the plural, fragmented nature of state-society relations and knowledge construction in Newfoundland and Labrador has complicated the quest to turn the ship around based on a common mental map. On the other hand, there have been clear attempts to increase the role of universities and colleges in economic development in recent years. Knowing more about how best to bring together governance structures and processes *within* the economic development field, as well as adjacent governance structures and processes that

[77] Donald J. Savoie, *Regional Economic Development in Canada: Canada's Search for Solutions*, 2nd edition, (Toronto: University of Toronto Press, 1992), 228-229

shape or influence the capacity to work together would be beneficial.

Sub-Project Design: Comparative Case-study Design

In consultation with a steering committee, a questionnaire was developed for the purpose of highlighting key themes to be explored in interviews and focus group discussions. The focus group discussions took place on July 4, 2006 and 24 people attended. The participants included a range of public decision-makers, researchers, and civil society representatives. The interviews with key decision-makers took place the week of July 10, 2006.

Newfoundland and Labrador Insights

The questions for each interview/focus group offered an opportunity to not only identify common problems across the Atlantic provinces but also to highlight special cultural, historical, and institutional challenges. Newfoundland and Labrador, like other provinces, would like to see more collaboration across silos. Yet much more study is required to generate critical insights on the best strategy for encouraging HEIs, decision-makers, and community groups to work together in pooling resources, strengthening social cohesion, while promoting economic development. Participants in the study strongly emphasized that the unique NL historical, cultural, and institutional context needs to carefully examined before deciding on any new strategies or models for creating new synergies between HEI's, decision-makers, and communities.

Every country and province wrestles with the problem of promoting a common identity, and these feelings are often connected with acceptable levels of dependence and self-reliance. Newfoundland and Labrador only joined Canada in 1949, and there has always been an uneasy tension over experts (especially modernization theorists), and the quest for integration, homogenization, policy coordination, knowledge creation, and innovation. Different rural-urban ideas, interests, institutions, and objectives have complicated the search for common perceptions. These urban-rural divisions have been reflected in public debates and help to explain the variety of competing programs and strategies (silos) that have evolved over the years.

For example, during the days of Moores and Peckford, much focus was placed on strengthening rural development, and increasing support for rural development associations. At the same time, the political decision was made to attack the notion of Pan-Atlantic Canadianism, and strengthen province-building. It was a time when the province focused on rural problems. Memorial University established the Institute of Social and Economic Research and the intent was to revisit industrialization and contest the work of modernization boosters on campus as well as outside the province. Memorial also helped rural areas define their own realities through Extension services. These institutional divisions within the University were established to help stimulate rural ideas, interests, and provide a defensive strategy against further homogenization based on modernization theory and Smallwood's approach to implementing a new economic vision.

To further complicate matters, this was a period when the federal government under DREE promoted the idea of "growth centres." Even though this fit Smallwood's needs and priorities, the provincial Conservatives and other critics in the rural movement provided counter-arguments and took over power. In the 1990's, the province-centred, rural approach took another turn under Clyde Wells, and he went back into the Atlantic Canadian orbit, cut funding for the Rural development associations, and constructed another political vision for the province. Put simply, these embedded memories and institutions have added to the challenge of renewing governance based on a common vision or set of objectives.

Knowledge Mobilization and Research Commercialization: Assessing Links between HEIs and their Respective Communities

How well are Universities and Colleges doing in linking knowledge to communities?

Understanding the governance structures within the university itself is a challenge for communities, and while most agreed that the University has highly qualified staff that have the capacity and knowledge for advancing economic development in the province, it is often a struggle finding out what expertise is available, who to contact, and so on. It was suggested that the Harris Centre, Gateway, Genesis Centre, and other agencies have been doing a better job connecting researchers, decision-makers, and civil society stake-holders in recent times.

There were concerns raised about biases in knowledge construction, dissemination, and the kinds of partnerships that already exist between the university, government and the private sector. There were some concerns raised that knowledge construction and dissemination strategies based on commercialization preferences may undermine other types of research that benefit non-profit or public interests. Universities were never designed for commercial purposes only, and while certain academic divisions dealt more with market strategies and partnerships, some critics felt that multiple needs and priorities needed to be considered before embracing any new commercialization strategy. Concerns were raised that the university is already too closely connected with big business, and the real gap was for small business and rural communities.

There was much discussion about the role of colleges versus university. For the most part, the university seems to be the place people look for specialized forms of knowledge or information, and the colleges were described as being more practical. For example, regional development boards have worked very closely with colleges and they received much practical advice. The biggest challenge with the university for outsiders is its complexity and the fact it is not a monolith. Some academic divisions see themselves as part of society and they go out of their way to form partnership with decision-makers and various civil society actors (Engineering, Business, Medicine). Others are more insular.

Colleges in urban areas were said to be less community active, while rural colleges provide a place to help people define and resolve practical issues. Viewed this way, the

role of colleges and universities are quite different in the province. The defenders of community colleges tended to be critical of the role of universities and how they either ignored or did not understand rural issues and problems. The defenders of the university system, on the other hand, raised concerns about lack of resources and capacity required to construct and broker new forms of knowledge required for success in the new urban, service-based economy. It was suggested that unless new resources were made available, it was unlikely that any new reforms could be implemented.

There was an extended debate over maintenance and recruitment. It appears that everyone in the province is dealing with the problem and it was argued that not enough has been done to conceptualize the problem, discuss strategies and make sure people are not working at cross-purposes. The medical school has been doing an excellent recently in recruiting and maintaining doctors in rural areas of the province and it was suggested that recruiting students from rural areas did influence these outcomes. There was also much discussion about how co-op programs at the university have improved the situation while facilitating the movement of knowledge from the university to the private or public sector. Finally, programs like the Atlantic Regional Training Centre, which offers graduate degrees in health services in the four Atlantic provinces (Dalhousie, Memorial, UPEI, and University of New Brunswick) provides a model for working across silos and building new research-teaching partnerships that benefit everyone.

It was suggested there was an appetite to bring together small and medium size businesses, government, Harris Centre, and the medical school to deal with the problem of maintenance and recruitment. It was suggested that such an initiative would bode well for the university and enhanced its reputation.

What mechanisms assist or impede meeting your knowledge needs?

Effecting change in industry, government, and academia in a common direction has proven difficult. Much discussion ensued over challenge of integrating academic, market, and political processes and mechanisms. Each has its own silo, and institutional traditions, and the province lacks the corporatist traditions required to created new forms of integration among political parties, interest groups, and external political actors. The province is both blessed and cursed by diversity and pluralism.

Politics is often driven by crisis or external pressure. Complicating matters is the fact that academia itself is pluralistic, internally divided on the role of commercialization, the state, or any other topic. These internal divisions are also the product of external battles among competitors. Hence, the federal government may have a research agenda that is quiet different from a particular provincial premier, and this may be supported by a federal department or other funding agency. As a result, when communities or decision-makers are seeking new definitions or answers, they are bound to find different perspectives and this may not meet their particular knowledge needs. In addition, the dynamics of the commercial/market sector are different again. Linking market, state, community, and academic systems together in a way that is cohesive and integrated is a very difficult task. There was much discussion about the fact that each of these systems

(market, state, university) is very complex and promoting new forms of integration and interaction is not an easy task.

Knowledge generators must have an audience for their research and they may not. The audience may be too small or marginal and that may impact on the capacity to find investors. Unless ways can be found to generate data and knowledge that is applicable to both the province (or rural areas) and elsewhere, it would be a gamble to invest too much academic capital in such ventures. In small provinces, there are bound to be challenges associated with doing the kind of research that may be required locally, but also meets the needs of academics or commercial interests. The fact that most research in the country is funding nationally adds to the challenge of creating the incentives/opportunities to construct knowledge based on local needs. For the most part, big issues and problems get researched and this may not help local needs. However, they get researched because they meet the needs and interests of academics and market players.

At the academic level, there is little incentive to do research that is useful for community development or deals with a local problem. Promotion and tenure tend to be based more on publishing and influencing agendas elsewhere. Besides, academics are free and independent actors. Because they enjoy academic freedom, they cannot be forced to address pertinent local economic issues or problems.

Despite these challenges, there have been various examples of efforts to create new linkages, incentives and partnerships. Genesis, the Harris Centre, C-Core, NSERC, Centre for Fisheries Innovation, RED boards, Extension service, rise of projects such as Coasts Under Stress, have all created important new forms of integration and interaction. It was suggested that these examples demonstrate that if there is balance, resources and capacity, we can break down silos, work together and pool resources.

Conclusion

A number of critical insights on governance structure, higher education, human resource knowledge and strategies came out of the focus group discussion. First, there is much diversity within the university, government, and civil society and creating new forms of integration and interaction has always been a challenge.

Part of the problem is due to the fact that knowledge tends to be dominated by urban, industrial interests. As a result, partnerships involving the university and civil society tend to appear in areas where there is capacity and an understanding of the benefits of working together. These partnerships tend to be influenced by universal frameworks (industrialization) which closely reflect urban values, interests and institutions. For those involved (academics, investors, government) there is much to be gained by working together, conceptualizing problems and producing data and systems of implementation. Academics, for example, can increase both their income and reputation by becoming involved with issues and projects that matter in other urban societies. It was clear from the focus group discussions that more powerful interests were better connected with government and academia, and this was reflected in discussions about engineering/

medicine, Business, NRC, medical school, Genesis, and so on. As one would expect, more powerful interests are in a better position to create the conditions required to facilitate partnership building or developing strategies for maintenance and recruitment. As predicted by pluralist theory, the most powerful interests in society have the capacity and opportunity to construct new knowledge and ways for defining problems and solving them.

In a era of globalization and a knowledge-based economy it is a good thing that these activities are taking place. It would not be beneficial to renew the system of knowledge creation based entirely on the need to create a better balance for rural areas. However, there was recognition that more could be done to build or encourage the building of other systems of knowledge production and brokering. For the most part, there was a sense that community colleges (especially in rural areas) were not well equipped for knowledge construction and they tended to provide a place for practical advice. There was some criticism of the role and performance of the community college system, but the defenders of these institutions felt they were not well represented in the room. Much of this suggests that there may be a need to differentiate the role of rural community colleges from the knowledge construction activities of the urban-centred university. Since it is unlikely that rural community colleges will ever have the knowledge generation capacity of universities some critics suggested it would not make sense to drain essential resources to create something that is unlikely to be achieved. Rather, new ways need to be found to bring rural and urban experiences and knowledge together, rather than working at cross-purposes.

There were suggestions about examples of attempts to promote new understandings and linkages between urban-rural ideas, interests, and institutions. In the past, during times of crisis, reports, commissioned studies, extension services, help to facilitate communication and debate among diverse communities and interests. A major challenge with having research funded nationally is that the themes may not reflect the realities or problems of provincial governments or communities themselves. More recently, there have been larger, interdisciplinary, cross-jurisdictional examples of partnering, knowledge construction, and two-way communication that offers a way to bring together diverse groups and interests.

In the end, the focus group suggested that there are lots of challenges ahead but these kind of meeting are essential and there is much more that could be done to break down silos. First, we have to know what we have built, the different values, processes, and outcomes achieved. The medical school, for example, would be open to sharing the strategies they have employed to maintain and recruit doctors in rural areas of the province. Second, we have to find ways to come together, to ensure there is balance, develop a cohesive vision that diverse interests can buy into and does not pose a threat their interests.

Appendix D
Prince Edward Island – FOCUS

The Contribution of Higher Education Institutions to Regional Economic Development

Charlottetown Focus Group

Date & Time: Thursday, July 6 2006, 9.30 am to 12.20 pm.

Venue: Student Union Board Room, Student Union Building, University of Prince Edward Island, Charlottetown, PEI.

In attendance:

Elizabeth Beale, President & CEO, Atlantic Provinces Economic Council (APEC) – elizabeth.beale@apec-econ.ca (as session Chair)
Rory Francis, Executive Director, PEI BioAlliance – rory@peibioalliance.com
Ron Keefe, President & CEO, Biovectra – DCL – rkeefe@biovectra.com
Mike Clow – Department of Education, PEI Provincial Government – gmclow@edu.pe.ca
Allan Smith – CEO, Technology PEI & PEI Business Development Inc. – absmith@gov.pe.ca
Dawna Noonan – Holland College (HC) – dnoonan@hollandc.pe.ca
Mike O'Grady – Holland College (HC) – mogrady@hollandc.pe.ca
Colleen MacQuarrie – Psychology Department, University of Prince Edward Island (UPEI) – cmacquarrie@upei.ca
Godfrey Baldacchino – Canada Research Chair (Island Studies), UPEI – gbaldacchino@upei.ca (as session Rapporteur)

Following brief introductions, Dr Beale opened the session by welcoming everyone and by explaining the purpose of this focus group in the context of a global, comparative study commissioned by the Organization of Economic Cooperation & Development on the relationship between higher education institutions (HEIs) and regional economic development (RED). A key focus is the interaction of HEIs with the communities that they purportedly serve, within the challenges posed by an overall transition towards a knowledge economy. Atlantic Canada is one of 14 regions in 12 countries taking part in this study.

Dr Beale referred the focus group members to a proposed set of "questions for discussion" which had been circulated in advance; nevertheless, the focus group members were encouraged to decide for themselves what was important and relevant and not to feel unduly constrained by the suggested questions.

What follows below is a *thematic summary* of the key issues discussed, organized as a series of distinct (though inter-related) bullets.

1. HEI on PEI is a diverse and multi-locational sector: Higher education institutions in Prince Edward Island would include UPEI, HC, La Société Educative (Francophone Community College) and 17 private training schools – the latter would graduate approximately 500 students annually in such areas as: information technology, accounting, vet assistants, interior decorating, health assistants, respite care workers. HC is a multi-campus institution with 12 sites across the province, bring education to local communities which may have a relative unwillingness, or inability, to travel. (While PEI youth is increasingly mobile, others may be left behind. Older workers may be relatively under-educated. It is critical to try and upscale the level of the people who do not go away. There are also qualified candidates who do not manage to get access to specialized training because of excess demand. Many parents still think of HC as a "vocational school" to which their kids would get automatic entry.) Six of HC's 15 sites have well-defined programs (e.g. automotive training in Summerside); others would consider running courses on demand, subject to availability of staffing and financing.

2. HEIs can both help and challenge small, rural communities by empowering their members: One example of this was the 14-month practical nursing course offered by HC in Tignish, a community of some 800 people around 100 miles NW of Charlottetown, following persistent local demand. It took a whole year to find 2 qualified instructors willing and able to teach in Tignish. 14 students graduated from this course in May 2006.[78] The entire community became somehow engaged in their learning. Two of thee students are planning to work in Ontario. Rural communities are victims of urbanization and loss of population. Education (along with churches and voluntary organizations) could be one of the "last bastions" for maintaining and sustaining communities; even though it could also equip students with the credentials and confidence to leave.

3. There exist powerful cultural and economic icons connected to PEI's character which however do not represent the 'new economy': Farming, fishing, forestry, tourism are industries that have traditionally employed a fair number of islanders. But job opportunities in these sectors are declining in percentage terms. PEI needs "new legs" to shore up its economy; however, the island and its people remain connected psychologically to the resource-based sectors. They comprise a very powerful mind-set that cannot easily be dislodged. Some PEI youth don't even see the jobs in growth sectors that are available, and instead lament the lack of jobs in the declining sectors. (Students at UPEI often feel that, unless they get a job with government, then they have to depart.) New products and services need to be brought on the market and add value; PEI and its HEIs need to support and encourage the brain power needed to contribute to such new, wealth-creating initiatives: that would be 'real' economic development.

4. The Bioscience Initiative on PEI is an example of successful partnership between supply and demand over time: HC is responding to anticipated response by the growing 'cluster' with a 2-year training program. Demand for such courses is typically higher than

[78] www.hollandc.pe.ca/NewsReleases/news.php?mode=item&id=287&year=2006

can be accommodated; and so various applicants are not accepted. There is a remarkable development of graduates continuing their training at the college, in order to "hone their skills". HC, industry and the BioAlliance have a mutually beneficial relationship and need to continue to cooperate in this way; the take-up of such courses is in itself an indication of the reputation that HC already enjoys in the community and of how its certificates are seen as translatable into jobs. There is a future in the bioscience sector for UPEI's B.Sc. graduates, many of whom currently may end up accepting jobs which are typically not related to their degree and for which they may be over-qualified. News about the Bioscience Initiative is filtering down slowly but surely to the island community.

5. Quality Higher Education may be destined to facilitate the export of brain and skill from PEI: HC enjoys local and international demand for its specialized programs. 96% of students from all HC programs are employed within 1 year of their graduation. Some of the programs – especially those which are trade-related – are in particularly high demand: these include welding, plumbing, electrical, carpentry and diving. For example, the welding school in Georgetown produces a labour pool that is "highly sought-after" in places like Alberta, Louisiana and Florida. 50% of first-year welding students at HC intend going to Western Canada after graduation. Some students are offered generous signing bonuses and lifetime employment opportunities by international firms, even before they finish their programs. It appears that PEI is on the verge of a "major western migration". Skilled labour may be on its way to becoming PEI's No. 1 export commodity. However, the 'threat of emigration' is no excuse for not providing quality higher education for human and professional development. Training should be done to international standards, irrespective of the outcome. Quality training gives people choices. People should not be 'under-trained' to discourage them from emigrating.

6. A pattern of 'brain rotation' may be emerging, linking human export/mobility to sustainable communities: Clearly, PEI youth in the 20-25 age cohort are extremely mobile and want portable qualifications. However, the nature of their employment 'away' is not necessarily one of permanence. There is a "camp life style" in places like Fort McMurray AB, meaning that some young workers go there with the intent of stashing the dollars for a few years, rather than with a view to settle there; and certain employers will fly employees to/from work for time slots, enabling them to enjoy good and well-paying jobs while maintaining ongoing links with families and local communities in places like PEI. A new phenomenon is that of going away (for work or education), then coming back, then perhaps leaving again, and returning again … a circulation or rotation of brains that is very different from the more static 'brain drain / brain gain' model. With a 'brain rotation' model, youth export and mobility could coexist with sustainable local communities, although such youth will be increasingly 'glocal' in outlook and behaviour. (More research may be called for in this area.)

7. A new partnership in training provision may be called for: The growing need for training qualifications creates opportunities to bring people to the province. Places like HC and UPEI could encourage inward migration. Atlantic Canada is renowned for the quality and ethic of its workforce. Demands for accreditation and benchmarking in the

industry create a need for specialized training, which can best be fulfilled by HEIs. Upgrading and upskilling one's existing workforce is also a task that is perhaps best handled by HEIs. However, all this is expensive: who should pay for workplace-based training? (For example, it currently costs around $15,000 a year to train a tradesperson.) If it is employers in Western Canada or the USA who benefit largely from the human investment, then should they at least 'partner' by co-investing in PEI's training infrastructure, finance chairs and/or provide scholarships and bursaries? However, at the same time, if workers are attending training, they would be still in receipt of their wages and salaries: that too is a significant cost to business. Who are the intended beneficiaries of investment in education/training? – Is it a local/ national/ regional/ international labour market? Is it individuals, households, communities, the province, the country, local employers or multi-national corporations? Insights on this could help answer the question as to who should be paying to support this investment. (There is a 'co-management agreement' for training provision in the province, with some $27million available; however, because of the Labour Market Development Agreement [LMDA] conditions, training programs need to be adapted to fit the criteria, rather than the other way round.)

8. Does PEI have what it takes to attract and retain specialists 'from away'?: Meanwhile, there is a need to source specific skills from away: they cannot be locally available; and the demographics clearly indicate that we have a changing local labour market and the local labour supply will become more scarce in the medium-term. The question here is whether local employers would be keen to recruit non-islanders, and would non-islanders feel PEI society to be sufficiently welcoming and the job opportunities particularly attractive and challenging for them to want to stay and work here? Various newcomers have expressed concern in a recent settler study[79] about the shortage of specialized, careerist, all-year-round jobs on PEI. Relatively large, export-driven, internationally-oriented firms are better suited to attract and retain off-island labour.

9. Does PEI have what it takes to attract islanders back?: Many employers express an interest in employing islanders; but for the latter to leave jobs which typically pay better than most of what the island has to offer, there needs to be "evidence of opportunity": PEI has to be holistically attractive, culturally and economically. (A *Specialized Labour Tax Credit* is available, intended to help kick-start new business growth by providing an incentive for workers from away with specialized expertise or skills to accept employment on PEI – where that knowledge or skill is not yet available in the PEI labour market. The 17% tax rebate applies to the personal income tax payable, for up to 3 years, on eligible income earned by the eligible individual.[80])

10. Not all higher education options are available at UPEI; nor is there a strong business mandate: A HEI like UPEI simply cannot offer the full slate of courses that one would find in a larger university. It is primarily an undergraduate institution, with a key focus on teaching rather than research. Anyone wishing to graduate in law, medicine,

[79] G. Baldacchino (2006) *Recent Settlers to PEI: Stories & Voices,* www.islandstudies.ca/Settlers_to_PEI/
[80] www.gov.pe.ca/photos/original/ptrp_sltc.pdf

engineering or architecture, along with most graduate options, cannot do so at UPEI and so has to study off island. This, in combination with the shortage of perceived suitable employment opportunities, means that some 40% of islanders who do *not* study at UPEI, do *not* even stay in *the Atlantic region* once they graduate. Moreover, UPEI does not 'spawn' business 'from within'. Is there an 'innovation pipeline' at UPEI that is developing potentially commercializable products and services? Other than the Canada Research Chair (CRC) and Canada Fund for Innovation (CFI) programs, UPEI professors are (by and large) still developing the disposition and the right 'connecting tissue' to partner with industry. Many remain 'petrified' of the business world, proprietary rights, marketing issues, etc. Current HC policy dictates that the College owns all IP created at the College. The issue of intellectual property rights at UPEI has been resolved in the negotiations to the latest (2006) collective agreement. (Perhaps the University of New Brunswick model provides a useful template here?)

11. Successful examples of industry-academia collaboration exist: Fish health expertise at UPEI partnering with Novartis is one successful example of academia-business partnering. This has led to the development of fish vaccines. The research was supported by the Industrial Research Assistance Program (IRAP) Other successful 'hands-on' projects involving UPEI include National Research Council (NRC) collaboration or AIF (Atlantic Innovation Fund) supported projects. Perhaps the AIF initiative – which support college-based *and* university-based, academic research in the post secondary sector – is the most supportive in helping to translate post-secondary academic research into commercializable opportunities. (Canada is not as supportive of such academia-business relationships as the USA.) HC has had success in such collaborative ventures with marine-related training, the police cadet program offered by the Atlantic Police Academy, and an on-line justice training program as part of the Justice Knowledge Network (another AIF project), involving a coast-to-coast audience, and with students ending up in jobs locally and nationally.

There is some tangible evidence of the impact of investment in research at HEI's: such as publications, patents, licenses, royalty streams. Investment in research can also buy excellent science, new knowledge, trained people, forming the basis for the next wave of inventions. The effort now being put into research at UPEI is a direct result of a strategic intent to establish new knowledge economy legs under PEI's economic platform. The evidence is clear around the world that centres of academic and research excellence are essential elements of successful industry clusters in the new economy. One can identify several examples already in the very brief life of the bioscience sector in PEI (less than 5 years) where UPEI's research base has been directly responsible for or enabled new business development.

13. More synergy and a suitable interface between higher education and industry are needed: HEIs (and community colleges in particular) are becoming quite adaptive to new opportunities, either driven by changes off island, or by demands from local communities. However, there are also systemic rigidities (such as political pressure, or reluctance to implement a semester system). HC and UPEI have had different experiences in the way that they engage industry and individual employers in, for

example, program development and change, and problem-driven applied research opportunities. There are also opportunities for greater collaboration between UPEI and HC in equipping university grads with the skills and competencies required of today's knowledge worker.

Science graduates at UPEI (some 175 annually) need more "education for industry": many graduates need to be trained intensively 'in-house' (especially 'process training') once recruited. There are attempts to set up more 'business-friendly' programs at UPEI (e.g. introducing business units in a science degree; introducing science units in a business degree; and/or an MBA due to start in 2007, with the option to study biotechnology and management). And, for those firms already in production, they need to be guided beyond commodity manufacture and onto a Research & Development (R&D) platform, in order to boost or maintain their competitiveness and long-term viability. Perhaps connecting industry to the researcher is easier and can be done better on a small jurisdiction like PEI. However, some governments departments may not to be talking to each other. So many possibilities of collaboration just *don't* happen. One needs people at the interface who understand what the researcher is doing, what the market needs and whether a new or existing company can exploit the opportunity. UPEI does not appear to have developed the institutional capacity for handling that interface. But then, *is it* a university's role to do so?

14. HEIs go beyond commercialization, including tackling functional illiteracy and training the seasonally employed: UPEI and other HEIs have other obligations in supporting development generally. Higher education feeds into public health, literacy, quality of civil infrastructure, good governance – all of which have an impact on economic development. Some work is required to bring the quality of the K-12 educational system on PEI up to scratch. Literacy is a key social and economic issue, and it is not yet perceived to be a big problem. Many islanders continue to operate at a level of literacy that is below the minimum proficiency required to function in a knowledge economy. Moreover, PEI has the highest levels of seasonal employment across Canadian provinces. Providing training to seasonal employees presents its own challenges, as does the distortion where training is only offered to the unemployed who are eligible for Employment Insurance, although this may be changing.

15. There is a role for HEIs as change agents, even in a mainstream society: PEI is a largely mainstream society where novelty may be embraced but change is difficult to sell. PEI is a society that offers high-risks to change agents. Still, there has been a dramatic increase in recent years in the contribution of UPEI professors to public policy and debate. An independent platform for critical observation is very important, especially in a small society like PEI where practically everyone has, and is known to have, party political baggage. Moreover, 'communities of interest' which straddle borders may fuel changes in the context of professional cooperation. An ongoing relationship between HC and various Caribbean island states in the sphere of police training is a good example which exposes the power of "the commonality of island cultures" which cut across geographical or political divides.

16. What is regional economic development in the current scenario?: With industries being mobile in their sourcing and operational strategies; with workers developing mobile and 'rotational' employment strategies; with HEIs developing a keen interest in recruiting students 'from away' to their specialized programs and thus also generating revenue streams (e.g. UPEI's Vet College placements for fee-paying US students), while educating the locals 'for export'… with this going on, one wonders: what is 'regional' in regional economic development? Does it make any sense in narrowing down the focus of analysis beyond 'the big picture'? Clearly, the whole Atlantic 'region' (and not just PEI) is increasingly plugged into a much wider context for the purpose of economic development.

17. The risks at stake, and the road ahead: PEI is already on its way to a radical transition in its economic structure, as traditional and seasonal industries (fishing, farming, tourism) 'sunset' as job creators, while employment in new economic sectors (hopefully) emerge. There are high risks associated with investing in HEIs to support knowledge economy growth in a small place such as PEI. (The whole region, let alone PEI, may lack the scale to sustain a proper cluster.)

Investing in research at UPEI is absolutely critical to the province's long term success in building a knowledge economy. More facilities, more highly qualified personnel, more research investment in HEI's, are required if PEI is going to compete successfully. These investments *need* to be made, even though there are no guarantors of success. Moreover, such research development and infrastructure funding may only be sustained in the long run if one can point to tangible outcomes of success (e.g. so many jobs of a certain kind? So many less people unemployed? So many patents secured from HEI initiatives? So many $$ of research funding to HEIs from the private sector? etc.). Should we ask ourselves what are the results that need to be achieved, and by when, in order for these investments to be deemed successful? Unless 'results' happen, in a tangible manner and within a decent timeframe, it may be prove hard to find, and maintain, the political commitment to sustain expensive R&D funding on PEI.

Appendix E
Contribution of Higher Education Institutions to Regional Economic Development

Focus Group

August 3, 2006, 12:00 – 3:00 p.m.
Atlantic Provinces Economic Council Office
5121 Sackville Street, Suite 500, Halifax, N.S.

The focus group held in Halifax on August 3, 2006, generated a spirited discussion about the role of Higher Education Institutions (HEIs) in regional economic development in Nova Scotia. Over the three hours, participants covered most of the major issues. Consensus was not the order of the day, with sector representatives/stakeholders simultaneously reaching agreement on the major issues while disagreeing on the solutions.

The participants included representatives from a variety of stakeholders/sectors, as follows.

Universities:

- Deborah Carver, Executive Director of Development, NSCAD University
- Leigh Huestis, Director, Technology Transfer and Innovation, Acadia University
- Terry Murphy, Vice-President, Academic and Research, Saint Mary's University
- Gillian Wood, Director of Government Relations, Dalhousie University

Community College:

- Joan McArthur-Blair, President, Nova Scotia Community College

Government:

- Wade AuCoin, Senior Policy Analyst, Atlantic Canada Opportunities Agency, Government of Canada
- Greg Ells, Director, Universities and Colleges, Department of Education, Government of Nova Scotia
- Paul LaFleche, Clerk of the Executive Council, Government of Nova Scotia (former Vice-President, Nova Scotia Community College)

Business Community:

- John Manning, Vice-President, Sales and Business Development, GenieKnows
- Fred Morley, Senior Vice-President and Chief Economist, Greater Halifax Partnership
- Valerie Payn, President, Halifax Chamber of Commerce
- Jane Smith, President, CFO and Compliance Officer, Beacon Securities (former Chair of Board of Governors, Mount Saint Vincent University)

Elizabeth Beale, President and CEO, Atlantic Provinces Economic Council (APEC), chaired the session and Frank Strain, Economics, Mount Allison University, acted as

session rapporteur. Prior to the session, Elizabeth Beale sent participants a list of questions (Appendix A) as an agenda-setting strategy. However, the focus group session was not strictly organized around these questions, allowing participants to engage in a more open discussion of the relationship between HEIs and regional development in Nova Scotia.

This document was prepared by Dr. Strain and includes not only a summary of the discussion, but also additional material that provides relevant empirical data. The additional material will appear as in text boxes, tables or in the Appendices. The document focuses on the general discussion of HEIs and regional development, and provides examples of HEIs' contributions to regional development offered by participants.

1. General Discussion

Agreement was reached on four major points. First, all agreed that HEIs are involved in a production process in which inputs (students, facilities, faculty and existing knowledge) are transformed into outputs (highly productive graduates, new knowledge and community service). To make the maximum contribution to economic development, HEIs must have high quality inputs, organize the production process to be as inexpensive as possible and produce high quality outputs relevant to the needs of Nova Scotia. Second, all agreed that Nova Scotia has historically lagged behind other areas and that, despite continuous progress, continues to lag in a significant way. As a corollary, all agreed that the idea of leapfrogging (jumping ahead of the leaders) as a development strategy is a very attractive one. The concept of leapfrogging was illustrated with a simple example: China does not need a wired telecommunication system and can (and has) immediately jump into a wireless world. Third, Nova Scotia faces a particular industrial structure involving a large number of small enterprises, a few large enterprises, and most importantly, relatively few medium-sized enterprises. Because the economy is dominated by small enterprises, interaction between HEIs and business is limited in nature. Finally, all recognized that the HEI sector involves a relatively large number of small universities, most of which offer a traditional liberal arts and science education, and a community college system that relatively recently evolved from a largely vocational high school system (1989) to an expanding post-secondary institution.

1.A. Students as Inputs and Outputs

Students were identified as both the most important input and output of the HEIs in Nova Scotia. Economic development, as a measurable phenomenon, involves human beings transforming their world to create a higher standard of living, typically defined as higher incomes, for all. Technical skills, entrepreneurial orientation, adaptability in the face of change, and the ability to innovate and act as agents of change were identified as particularly important characteristics a graduate of an HEI should possess if they are to make a significant contribution to economic development.

Some concern was expressed about the quality of students as inputs (with failure rates in some first-year university courses as high as 55%). The OECD Programme for International Student Assessment (PISA) exam results suggest that Nova Scotia secondary school students perform relatively poorly, especially relative to students in Alberta (Appendix B).

Concern was also expressed over the fact that a large number of students entering Nova Scotia universities are from outside the province. (Some facts: Nova Scotia faces a net inflow of about 5,000 students; out-of province students account for 38% of all students at Nova Scotia universities; and at some universities, out-of-province students account for over 50% of enrolments, as per the table below.) If these students return home after graduation, they will not have an impact on economic development in Nova Scotia, yet while they are in Nova Scotia, they may increase the costs of education. [81]

2004-05 MPHEC Enrolment Estimates Using Statistics Canada's Enhanced Student Information System				
University	**Total**	**Out of Province**	**Nova Scotia**	**NS as a % of Total**
Acadia University	4,257	2,219	2,038	47.87%
Atlantic School of Theology	119	39	80	67.23%
Dalhousie University	15,274	7,844	7,430	48.64%
Mount Saint Vincent University	4,336	621	3,715	85.68%
Nova Scotia Agricultural College	749	226	523	69.83%
NSCAD University	1,006	478	528	52.49%
Saint Mary's University	8,177	1,718	6,459	78.99%
St. Francis Xavier University	5,364	2,110	3,254	60.66%
Université Sainte-Anne	1,046	535	511	48.85%
Cape Breton University	3,418	547	2,871	84.00%
University of King's College	1,106	657	449	40.60%
Total	44,852	16,994	27,858	62.11%

Participants also identified the out-migration of Nova Scotian graduates who leave in search of employment elsewhere as a major issue. The investment made in their education does not contribute to economic development and any chance to recoup some of the expenditure on their education through the progressive tax system is lost. Moreover, several participants noted that the size of the student-aged cohort is declining and is expected to decline further in the future. Businesses will not survive without highly-skilled workers.

This may not be as significant an issue as some have feared. It was pointed out that out-migration can be associated with return migration at some point in the future. Returning

[81] In the short run, an increase in student numbers does not necessarily increase either costs to taxpayers or the HEIs since in the short term, government grants involve block funding and the marginal cost of educating an additional student can be zero. In the long run, however, there will be a cost, as HEIs adjust facilities and faculty size to that appropriate for the student body and, perhaps, to taxpayers if the government adjusts the funding formula to reflect changes in enrolments.

Nova Scotians are often armed with specialized skills, networks and capital, which equip them to make a substantial contribution to economic development.

Quick Fact: The Maritime Provinces Higher Education Commission (MPHEC) conducts occasional surveys of graduates of Nova Scotia, New Brunswick and Prince Edward Island universities two years following graduation. Analysis of the survey of 1999 graduates reveals that 73% of students who claimed Nova Scotia residency prior to enrolling remained in Nova Scotia two years after graduation. Moreover, Nova Scotia is a destination for graduates from the other Maritime provinces and 20% of graduates of Nova Scotia universities originally from outside the Maritime provinces stay in Nova Scotia. Indeed, the ratio of students graduating from Nova Scotia universities to the number of graduates of Maritime universities resident in Nova Scotia two years following graduation is almost 88%. Given Nova Scotian students who left the region to attend university sometimes return, and given graduates from universities outside the Maritimes come to Nova Scotia to work, the so-called "brain drain" problem may be exaggerated.
Source: Maritime Provinces Higher Education Commission (2006), *Five Years On: A Survey of the Class of 1999 Maritime University Graduates*, (Fredericton: MPHEC).

It was also noted that surveys of Nova Scotia Community College (NSCC) graduates indicate the almost 80% of graduates remain in the province and that most of these remain in their local community.

The "brain drain" issue is a subtle one and still deserves the attention given to it by the focus group. The MPHEC surveys indicate that out-migration rates have changed over time and that rates differ by field of study. Thirty-nine percent of engineering and applied science graduates left the region, as did 38% of information technology graduates. However, only 16% of education graduates were outside the region two years following graduation. The proportion of graduates (Class of 1999) of universities in the Maritimes originally from the region and remaining two years after graduation was down by nine percentage points from the estimate for the Class of 1996.

The large numbers of students from outside the province push university participation rates (university enrolments/18-21 cohort size) to 36.4% (almost twice the national average of 19.7%). If the out-of-province students are removed from the participation rate, one finds that Nova Scotia rate is 22.6%, still above the national average. On the other hand, the college participation rate in Nova Scotia was only 6.7%, less than half the 14.3% figure for Canada as a whole. The low participation rate in the community college system was identified as a major issue by several participants in the focus group. It should also be noted that the community college participation rate increased by 4.1 percentage points between 1990-91 and 2002-03, significantly more than the national average increase of two percentage points during the same period.[82]

[82] Canadian Millennium Scholarship Foundation.

Concerns were also raised about the type of education students were receiving. In part, this was motivated by the imbalance between university and community college relative to the national average. It may be the case that there are too many university graduates and too few community college graduates. Also, there was a concern that too many students were graduating with liberal arts and science degrees that offer little job-related training and too few with applied and professional degrees.

Putting the types of education on the table provoked a heated discussion. Advocates of a liberal arts and science education argued that this approach to higher education creates a graduate who has the skills required to learn on the job, to adjust to changing circumstances and to provide leadership. Advocates of a liberal education also noted that this type of education prepares graduates for independent life-long learning. Interestingly, life-long learning was also identified by the community college representative as a critical part of their skills-oriented programs. Technical skills required on-the-job-change as rapidly as technology, and the community college recognizes this by providing new training opportunities to people wishing to update skills. Programs are designed, often with very specific input from employers needing new skills, as part of a life-long commitment to students.

It was also noted that expert forecasts of future specific skill requirements (manpower planning) has had a dismal history and that designing education programs around forecasts of specific skills can be a dangerous approach. Students, who are the people who must weigh alternative programs and who bear the cost of any mistakes, may be the best judges of education options.

Participants in the focus group also argued that more attention should be focused on education for leadership and entrepreneurship. It was noted that some progress was being made on this front. For example, NSCAD University has officially recognized that most of its graduates will be entrepreneurs and is starting to develop programs involving entrepreneurial education. The career centre in business at Saint Mary's University now includes a self-employment program and the NSCC is experimenting with programs that allow students to work on a co-op basis to the journeyman level in a trade and then receive training on setting up their own business.

1.B. Institutions

Nova Scotia universities were also subjected to critical scrutiny. Concerns were expressed about duplication and waste that result as a consequence of having many relatively small universities. Some argued that economies of scale can be realized through amalgamation of some functions (a centralized admissions process similar to that used in Ontario was used as a concrete example of a cost-saving measure) and perhaps complete amalgamation with multiple campuses similar to the NSCC. Moreover, some believed that significant benefits could accrue from more specialization. Why should most universities in Nova Scotia offer Bachelor of Arts degrees in English when this role could be assumed by one university where the English Faculty could be larger, the range of course offerings could be wider, and students could have more opportunity for

productive interaction with others with similar interests. However, others argued that economies of scale are very hard to identify and that specialization would involve a loss of diversity in the education process. Moreover, small competing institutions may well perform better than a single institution. It was also noted that having diverse institutions can be an advantage in the process of competing for investment. For example, potential investors are impressed when they are told that they can recruit managers from one of three Halifax university business programs, each with their own educational philosophy and unique program characteristics.

The amalgamation debate – which has a long history in Nova Scotia – was not going to be settled at this focus group meeting.

Concerns were also expressed about the adaptability of universities in the face of change. Decision-making processes seem slow, especially compared with those in the business sector, and change seems to be resisted. Moreover, it was argued that universities and the business community seemed to follow a silo approach with very little contact. This was attributed in part to a lack of effort by the universities, and in part to the small size of typical Nova Scotia businesses who lack the staff time to devote to interaction and who see little payoff to the interaction. The recent development of industry liaison offices at universities was seen as a step in the right direction.

One of the goals of the NSCC is to become increasingly adaptable and responsive to the changing needs of Nova Scotia. For example, if a community identifies a need for 20 skilled workers, the community college would like to be in a position to respond by creating the training opportunity without putting in place a program producing 20 graduates per year.

1.C. Research

University research, in general, was also a topic of concern. Although university-based research has increased significantly in recent years, Nova Scotia still lags. Moreover, little university-based research is linked to the economic development needs of Nova Scotia. Again, the existence of many small universities, most with a concentration on the liberal arts and sciences, was cited as a factor in the poor performance of universities as a source of relevant research. Research in philosophy, English, classics and others generates very little knowledge with commercial application and/or direct impact on local incomes.

One participant noted that the Nova Scotia Agricultural College is an exception and has a strong record of research, strong connections to the community when setting priorities, and a very aggressive attitude. It is an especially interesting example given it is the only HEI in Nova Scotia which is not run by an independent board (it is run from a government department and employees are civil servants). Other participants noted that specialization in a narrow applied area rather than the governance structure is the most likely source of the "culture of connections" and the strong track record in relevant applied research.

Commercialization of research was also an important concern. Linking basic researchers in the higher education sector with businesses that might incorporate the research results to produce marketable products was considered critical by many (specific examples are provided in Section 2 of this document). However, it was noted that the links among basic research, product development and product production can be weak in nature. Basic research can be completed in one place, the product can be developed to the marketable stage at another location and final production can occur at still another location. Thus, the links between basic research and local economic development are not necessarily strong ones. On the other hand, business success in an economy where technical knowledge is critical requires technically sophisticated workers who are abreast of technical trends and who can adapt new knowledge to their particular circumstances. The potential role of HEIs in the diffusion of technology has received little attention from government, business or the HEIs themselves. It was also noted that the NSCC has become increasingly active in applied research in recent years and plans to pursue more research partnerships.

The discussion of research produced several examples of successful collaboration. Faculty and students at Dalhousie University and the NSCC are currently collaborating on a project involving brain injuries and stem cell research. In this example, diploma students in technology at the NSCC complement medical research by developing new technology to deliver treatments to people with brain injuries. Another example was provided by one of the participants at the focus group. IT Interactive Services Inc., a privately held, Canadian Internet technology incorporation based in Halifax, N.S., is a leading developer and provider of performance-based marketing services for the Internet. GenieKnows, one of IT Interactive Services' main products, offers "an extensive suite of search tools that are proven to be highly effective marketing products and services on the Internet."

As a participant in a highly competitive market, where products must simultaneously be powerful and easy to use, and where rewards go to the "most powerful," continuous research and development is a necessity. A number of linkages with universities have been established to allow the company to stay at the frontier. First, the company has connections with individual computer scientists at Dalhousie University who are engaged in complementary research. Second, the company hires computer science graduates. Classes for graduate students have been held at the company offices and connections with faculty allow the company to better identify the most talented prospective employees. Finally, IT Interactive Services is involved in MITACS (The Mathematics of Information Technology and Complex Systems). This research network was developed as part of the federal government's Network of Centres of Excellence (NCE) program. The only NCE for the mathematical sciences, MITACS currently includes 305 scientists, 611 students and 169 partner organizations working on 32 ongoing projects involving 48 Canadian universities.

The relationship between IT Interactive Services and the universities has been a very productive for the company. Interestingly, the relationship is a very personal one. Rather than being a relationship built on institutions (a business and a university) the relationship is between individuals, that is, individual faculty members and individual employees at IT Interactive Services. This feature was considered extremely important and it was argued that the relationship would not have been as successful if it had been engineered at the institutional level.

1.D. General Contribution

Participants in the focus group recognized that the presence of HEIs in a community can make that community attractive to businesses searching for a location. Halifax, for example, has one of the liveliest downtowns (pubs, restaurants, entertainment and so on), thanks to the large number of young people drawn to the downtown by the presence of HEIs in the city. The HEIs also offer cultural amenities and intellectual opportunities that enhance the quality of life and attract both labour and capital.

1.E. HEIs and Leapfrogging

Overall, the focus group participants felt that HEIs in Nova Scotia are very strong and no concrete proposals emerged to enhance the role of HEIs in regional development. However, all agreed that government, business and community groups, and the HEIs themselves must continuously ask the question: How can HEIs do more? Moreover, the silos must be broken down. Currently, there is very little discussion of the role of HEIs in regional development among and across the various stakeholder groups, and the resulting lack of knowledge is a major impediment to leapfrogging.

Incentives (and rewards) for success and penalties for failures were identified as important tools available to governments in dealings with HEIs in general. "Great Leaps Forward" should be celebrated and rewarded. It was also argued that research should be more targeted in nature. Quebec takes a very active role in the research funding process and vetoes applications to the Canadian Foundation for Innovation (CFI) from university researchers if they do not fit within the Quebec government's strategic plan. Perhaps Nova Scotia should take a similar approach and decide that some things are not going to be done in Nova Scotia. Including representatives from outside the academic world on granting agencies such as the Nova Scotia Innovation Trust Fund was proposed by one participant as a measure that would link research agendas and the community.

Finally, one participant argued that the local business community needs to change deeply ingrained attitudes. Companies coming to Nova Scotia from elsewhere know they must invest in both people and research. Homegrown Nova Scotian companies do not seem, on average, to be as willing to invest in people or research. Other participants noted that this observed difference in attitude may be not be a result of some unique Nova Scotian characteristic but instead might be a result of industrial structure. (Nova Scotian firms are generally small while firms moving to Nova Scotia from outside are generally larger.)

Appendix E1

The Contribution of Higher Education Institutions (HEIs) to Regional Economic Development

Halifax Focus Group
August 3, 2006
12:00 to 3:00 p.m.

Atlantic Provinces Economic Council
5121 Sackville Street, Ste. 500
Halifax, N.S.

Questions for Discussion

1. What are the key manifestations of regional/provincial/local engagement for HEIs in Atlantic Canada?
    a. How has the relationship between HEIs and the province/community stakeholders evolved over time?
    b. Is there a coherent vision for the role of HEIs in the provincial/regional economy? Is that vision clearly understood by all stakeholders?
    c. What are the greatest obstacles to greater connection between HEIs and the community?
2. Does research at HEIs have a regional/provincial or local dimension?
    a. What is the engagement of stakeholders in determining HEI research directions/activities?
    b. What role do HEIs play in assisting small and medium-sized companies in Nova Scotia to develop or acquire new technologies or innovations?
    c. What types of initiatives have been most successful in generating effective research/industry partnerships?
3. How is the learning process for HEIs localized in Nova Scotia?
    a. To what extent do programs/courses cater to regional/provincial/local needs?
    b. Do teaching and learning activities match provincial/local priorities?
    c. What is the pathway between HEIs and local firms?
    d. What partnerships exist among HEIs to meet regional/provincial needs?
    e. How has the delivery of post-secondary education programs changed in response to new technologies (i.e., distance education, web-based courses)?
4. What role do HEIs play in the cultural and social life in Nova Scotia?

Appendix E2

OECD Programme for International Student Assessment (PISA) Tests

Conducted by the Organization for Economic Co-operation and Development (OECD), PISA assesses the international achievement of 15-year-old students in reading, mathematics and science. Administered every three years, PISA focuses on a different subject each time. In 2000, the largest portion of the test and major area of focus was reading.

I. Reading

Country and Province	Average Score (Intl. av. of 500)	Confidence Interval (+ or -)
Alberta	**550**	**6.5**
Finland	546	5.1
British Columbia	538	5.7
Quebec	536	6
CANADA	534	3.1
Ontario	533	6.5
Manitoba	529	7
Saskatchewan	529	5.3
New Zealand	529	5.5
Australia	528	7
Ireland	527	6.4
Korea	525	4.8
United Kingdom	523	5.1
Japan	522	10.4
Nova Scotia	***521***	4.5
Prince Edward Island	517	4.8
Newfoundland	517	5.6
Sweden	516	4.4
Austria	507	4.8

Belgium	507	7.1
Iceland	507	2.9
Norway	505	5.6
France	505	5.4
United States	504	14
New Brunswick	501	3.5
Denmark	497	4.7
Switzerland	494	8.4
Spain	493	5.4
Czech Republic	492	4.7
Italy	487	5.8
Germany	484	4.9
Liechtenstein	483	8.2
Hungary	480	7.9
Poland	479	8.9
Greece	474	9.9
Portugal	470	9
Russian Federation	462	8.3
Latvia	458	10.3
Luxembourg	441	3.2
Mexico	422	6.6
Brazil	396	6.2

Mathematics

Country and Province	Average Score (Intl. av. of 500)	Confidence Interval (+ or -)
Japan	557	10.9
Quebec	550	5.4
Alberta	**547**	**6.6**
Korea	547	5.5
New Zealand	537	6.3
Finland	536	4.3
British Columbia	534	5.6
Australia	533	6.9
Manitoba	533	7.3
CANADA	533	2.8
Switzerland	529	8.7
United Kingdom	529	5
Saskatchewan	525	5.8
Ontario	524	5.8
Belgium	520	7.8
France	517	5.4
Austria	515	5
Denmark	514	4.9
Iceland	514	4.5
Liechtenstein	514	13.9
Nova Scotia	***513***	5.6
Prince Edward Island	512	7.4
Sweden	510	4.9
Newfoundland	509	5.9

New Brunswick	506	4.4
Ireland	503	5.4
Norway	499	5.5
Czech Republic	498	5.5
United States	493	15.2
Germany	490	5
Hungary	488	8
Russian Federation	478	10.9
Spain	476	6.2
Poland	470	10.9
Latvia	463	8.7
Italy	457	5.8
Portugal	454	8.1
Greece	447	11.1
Luxembourg	446	4
Mexico	387	6.7
Brazil	334	7.4

Science

Country and Province	Average Score (Intl. av. of 500)	Confidence Interval (+ or -)
Korea	552	5.4
Japan	550	10.9
Alberta	**546**	**6.9**
Quebec	541	6.7
Finland	538	4.9
British Columbia	533	6.4
United Kingdom	532	5.3
CANADA	529	3.1
New Zealand	528	4.8
Australia	528	6.9
Manitoba	527	7.1
Ontario	522	6.8
Saskatchewan	522	5.9
Austria	519	5.1
Newfoundland	516	6.7
Nova Scotia	***516***	6
Ireland	513	6.3
Sweden	512	5
Czech Republic	511	4.8
Prince Edward Island	508	5.4
France	500	6.3
Norway	500	5.5
United States	499	14.6
New Brunswick	497	4.5

Hungary	496	8.3
Iceland	496	4.3
Belgium	496	8.5
Switzerland	496	8.8
Spain	491	5.9
Germany	487	4.8
Poland	483	10.2
Denmark	481	5.6
Italy	478	6.1
Liechtenstein	476	14.1
Greece	461	9.7
Russian Federation	460	9.4
Latvia	460	11
Portugal	459	8
Luxembourg	443	4.6
Mexico	422	6.3
Brazil	375	6.5

Appendix F
New Brunswick Focus Group
Moncton, NB
Assumption Vie Conference Room
August 3, 2006

(Pierre-Marcel Desjardins, Secretary)

List of Attendees	
Bouchard-Michaud, France	Medes
Bourgeois, Andreea	Senior Policy Analyst, Canadian Federation of Independent Business
Bourgeois, Daniel	Executive Director, CIRPPPA
Cormier, Adélard	Chair, Beauséjour Health Authority
Cormier, René	Director, FCCF/AAAPNB
Courville, Maryse	Senior Research Consultant, Bristol Group
Dallaire, Catherine	Assistant Manager, City of Moncton
Desjardins, Léandre	Former Academic Vice-President, UdeM
Desjardins, Pierre-Marcel	Meeting Secretary
Doucet, Carole	Professor, NB Community College
Grandmaison, Valdo	President and CEO, Frederick Group
Landry, Aldéa	Meeting Chair
Landry, Béatrice	Director, Strategic Policy Development, ACOA
Losier, Denis	President and CEO, Assumption Life
Losier, Gaston	President, Losier Consultant
Martin, André	Member, Fédération des jeunes francophones du N.-B.
McKee-Allain, Isabelle	Dean, Faculty of Arts and Social Sciences, Université de Moncton
Ouellette, Dr. Rodney	Chief Executive Officer, Atlantic Cancer Research Institute
Paulin, Bernard	President, Regional Development Corporation
Rioux, Jean-Guy	President, Fédération des communautés francophones et acadiennes
Schofield, Dr. Aurel	Director of the NB medical training centre, Université de Moncton, and Associate Dean, Faculty of Medecine, Université de Sherbrooke

Context: Most of the discussion (with the notable exception of question 3) focused on the reality of New Brunswick's Acadians. The notes presented here do not necessarily represent the opinion of all or even a majority of participants, but are rather a synthesis of opinions expressed. The discussion took place in French and the present is a translation. Five questions were presented to participants to generate discussion.

1. **<u>Economic Development</u>: Some talk of the "*Acadian Miracle*": would such growth have been possible without French post secondary institutions (PSI)?**

- OVERALL SYNTHESIS: Although there was no consensus on the existence of an *Acadian economic miracle*, there was a consensus that the economic development experienced by the Acadian community would not have been possible without its PSI. Quantifying or demonstrating the causality is, on the other hand, rather difficult.
- The 1960's, with the creation of l'Université de Moncton followed by that of community colleges, was a watershed period for New Brunswick's community. It represented a democratisation of post secondary education. Louis J. Robichaud was then New Brunswick's first elected Acadian Premier. The civil service was being restructured. PSI – especially l'Université de Moncton – became a cultural hotbed and a centre for debate and generating new ideas.
- The creation of l'Université de Moncton – even with three campuses – became a unifying force for New Brunswick's Acadians. It generated a great sense of pride: the community had its own university, something the Anglophone community had for years. The Anglophone community always had community leaders which were university graduates, from Acadians, this had not been the case. Religious colleges had been present, but the impact was not equivalent to the impact of a university. Furthermore, the number of Acadian college graduate was not very important. With the creation of the Université de Moncton and the democratisation of accessibility to post secondary education, the number of University gradates generated a critical mass of community leaders.
- PSI are present in all of New Brunswick's Acadian regions
- There always existed an Acadian entrepreneurship, but the creation of new francophone PSI increased the number and the training of entrepreneurs, a reality which was only available to Anglophones before. It has also contributed to the development of managers. This is not only true for university graduates, but also of community college graduates, where many graduates become entrepreneurs in their relevant fields.
- Impact on public policy development. For example, the person who prepared the analysis which lead to the creation of ACOA is a graduate – and now professor – of the Université de Moncton
- PSI have lead to an increase in human capital in the Acadian community
- This increase in human capital has allowed development through innovation
- PSI have contributed to the development of women, for example by fostering the development of women entrepreneurs.
- The presence of the Université de Moncton (with its 3 campuses) and of community colleges, including through Institutes and various chairs, has contributed to the acquisition and transfer of knowledge, as well as research in – and with – the community.
- We should not underestimate non-formal PSI such as hospitals, which through special agreements allowed students studying at medical schools in Québec to do internships in New Brunswick, thus helping with the recruitment and retention of doctors.

- The presence of PSI attracts immigrants – professors and students – which has the beneficial impact of diversifying the community, "importing" knowledge from abroad, and contributing to help solve the demographic challenge.
- The creation of the Université de Moncton represented a break from a religious education to a non-religious education. Entrepreneurship and profits became "acceptable"
- Economic development is more successful when PSI and the community work together, which is the case in regions like the Acadian Peninsula and Madawaska. Furthermore, community leaders are most often graduates of the PSI. In the Acadian Peninsula, we not only have close links between the PSI and the community, but also between the UdeM Shippagan campus and the Acadian Peninsula Community College (even is some had wished that the links would be even closer when the APCC was created).
- The significant growth in the Moncton region would not have been possible without the presence of the Université de Moncton. Note that Moncton does not have an Anglophone university (excluding the Atlantic Baptist University).
- Even if great progress was achieved, the challenge remains.

2. **<u>Global Community Development:</u> What role have PSI played and will continue to play with respect to social, cultural, health and wellness, governance, leadership, etc.?**
    - OVERALL SYNTHESIS: PSI in general, and the Université de Moncton in particular, contributed to the overall development of the Acadian community. An important factor was the development of pride and self confidence acquired by individuals who became leaders in their own ways and contributed to the development of Acadian society in various forms.
    - An example of the impact of the Université de Moncton is the 1968 manifestation when students made a presentation at Moncton's city council to ask for French services. A few decades later, Moncton became the first large bilingual city in Canada and bilingualism is now a cornerstone of Moncton's dynamic economy.
    - L'Université de Moncton offers a much more comprehensive curriculum than the previous religious colleges, thus contributing more comprehensively to the Acadian community.
    - PSI are an important component of the response to the demographic challenge. PSI can attract and retain population. They can metamorphosis a region. The demographic challenge for Acadians is extremely important. In fact, it is two-tiered. First, there is the usual demographic challenge. Second, there is the linguistic balance, i.e. the weight (regional, provincial, etc.) of Francophones.
    - There is a concern that access to PSI is getting more difficult as a result of increasing cost. This is also true for international students which represent an important component (quantitatively and qualitatively) for Acadians PSI.
    - PSI graduate occupy leadership positions in the Acadian community (e.g. Directors of schools, hospitals, community organisations, trade unions, etc.)

- Impacts of the Université de Moncton:
    - A lighthouse, an ambassador, for the Acadian community
    - Impact for the cultural sector… during the initial stages of the development of the cultural sector, was often the promoter, financier, etc. of cultural events, infrastructure…
    - Indirect in many sectors, through the training of students
- Some argue that the honeymoon is over and that the Université de Moncton has to ask itself if it is good because it is good, of if it is good because it is located in the community. Some argued that the U de M will have to make hard choice and decide to focus on niches and excel in those, rather than remain more generalist.
- The impact of PSI is often not very visible in the sense that it helped develop "small leaders" who often contribute, thanks in part to the contribution of PSI in their own development, in the development of their own communities.
- U de M's professors and researchers contribute to the development of Acadian society through their reflections, their research and their community involvement.
- Francophone community colleges have developed several partnerships abroad, namely in Africa, contributing to the reputation of Acadian society.
- PSI graduates became innovators (e.g. theatre, *Jeux de l'Acadie* (summer games), etc.)
- Is the presence of the main campus of l'Université de Moncton – in Moncton – contributing to the exodus from northern rural Acadian regions of New Brunswick?
- PSI must continue to support the development of Acadian communities which face ever changing challenges. PSI must be flexible and innovative in order to positively contribute to meeting these challenges.

3. **<u>Atlantic Canada's Francophone Community:</u> Have PSI had – and still have – an influence on the economic development of Acadians in Atlantic Canada's four provinces?**
    - OVERALL SYNTHESIS: The impact of PSI on Acadians in the three other provinces has not been the same as in New Brunswick. While New Brunswick's Acadians have achieve a level of development where they are legally – and in the mind of many if not most of them – equal to the Anglophone community, it does not seem to be the same elsewhere. This reality and the lack of a critical mass (organisations, institutions, etc.) has meant that the impact of PSI on communities in the other provinces is different.
    - L'Université Sainte-Anne, being in a rural community in Church Point, NS, does not seem to have the same kind of impact as the Université de Moncton, located in an urban setting.
    - L'Université de Moncton does not have a huge reputation amongst Anglophones outside New Brunswick

- Challenges are very different for Acadians in Atlantic Canada's three other provinces. There, we very often have an absence of the critical mass present in New Brunswick.
- Acadians tend not to think in the context of Atlantic Canada, but rather in a provincial context.
- Mobility of individuals going or having gone at PSI in New Brunswick then going to other provinces.

4. **<u>Interaction and interdependence:</u> For some, there is a perception that Acadians have stronger links than Anglophones with their PSI. Is it the case? If so, what are the explanations?**
    - OVERALL SYNTHESIS: We must consider that – especially for l'Université de Moncton – there is no alternative and thus the community develops a sense of ownership
    - In Acadian regions, it is expected that PSI will be at the table when development is discussed. The same cannot be said of Anglophone regions.
    - Although some reservations were expressed with respect to the Maclean's university ranking, it was noted that repeatedly, l'Université de Moncton tops the chart with respect to alumni support
    - Many "francophone" businesses and organisations work in French and hence turn to francophone PSI for new employees, Summer students, co-op students, etc.
    - New Brunswick's Acadian community is relatively small and networks are very important… and there is an absence of competition from other PSI
    - In the eyes of the Acadian community, a university is a relatively new phenomenon, and may thus have a "higher status" than for the Anglophone community whose universities are much older. This may not be the case for the "new generation."
    - Acadian PSI are located in all regions (3 U de M campuses, 6 francophone community colleges), contributing to strong links with the community.
    - PSI must pursue excellence if they want to maintain strong links, especially with the "new generation."

5. **<u>Duality:</u> What importance does duality with respect to PSI have in a context where Francophones are numerically a minority?**
    - OVERALL SYNTHESIS: The concept of duality of institutions has been included, for New Brunswick's two linguistic communities, in the Canadian constitution. This means that Acadians are entitled to manage their own institutions.
    - Very important… the survival of the French language requires it.
    - Duality is taken for granted by Acadians
    - It slows down assimilation
    - Allows to better identify needs and to respond to it more quickly. An example is the new medical school which will open this Fall and where Acadians were much quicker and the Anglophone community is now trying to catch up.

- The reality is much different in Atlantic Canada's other provinces
- The Anglophone community is starting to see more and more the economic benefits of bilingualism
- There is a need to be flexible in the implementation of duality, amongst other things to be most efficient in the delivery of services
- This has an impact on PSI: Acadian PSI are francophone and not bilingual. This issue is often raised in Moncton, which does not have an Anglophone university.

Appendix G
Programmes that encourage co-operative research between HEIs and Industry in Atlantic Canada

The programme(s) reported by institution are:

- **Memorial University** - Canada Foundation for Innovation; Various tri-council industry programs (e.g. NSERC I2I); Atlantic Innovation Fund; and IRIF (Newfoundland and Labrador)
- **Dalhousie University** - IRAP, CIHR proof of principle, NSERC I2I awards, AIF funding, NSERC CRD and strategic grants, Springboard funding.
- **University of New Brunswick** - New Brunswick Innovative fund (NBIF), Natural Sciences and Engineering Research Council's Collaborative Research and Development grants, Strategic grants, Idea to Innovation (I2I) grants, Atlantic Canada Opportunities Agency, National Research Council's Industrial Research Assistance Program and support groups for collaborative research. In addition, the programmes by campus are:
- FREDERICTON CAMPUS
    - Artificial Intelligence Laboratory
    - Automated Reasoning Group
    - Centre for Resource & Environmental Information Studies
    - Computer Information Security
    - Energy Conversion Engineering Group
    - Garnet Strong Laboratory (computer applications in forestry)
    - Geodesy Group
    - Geodetic Research Laboratory
    - Geographic Information System (GIS) Laboratory
    - Groundwater Studies Group
    - Human-Computer Interaction
    - Labour Training Research Network
    - Language Technology
    - Materials Group
    - Multimedia Laboratory
    - New Brunswick Center for Education Administration
    - New Brunswick Cooperative Fish and Wildlife Research Unit
    - Ocean Mapping Group
    - Parallel/Distributed Processing Group
    - Resource Information Management Group
    - Transportation Group
- SAINT JOHN CAMPUS
    - Aquaculture Economics
    - Alternative Species in Aquaculture
    - Irish Moss Harvesting
    - Noise Effects in Aquaculture
    - Shoreline Oil Spill Contamination and Waste Management
    - Forest Regeneration and Biodiversity Conservation

- Bioactive Compounds from Fungi
- Effects of Ritalin

- **University of Prince Edward Island** - NRC-IRAP, NSERC - Collaborative, CIHR-POP.
- **Acadia University** - NSERC CRD; NSERC Strategic Initiatives; NSERC RPA; ACOA; Office of Economic Development Proof of Concept; IRAP
- **Mount Saint Vincent University** - Industrial Liaison Officer shared with another university
- **Cape Breton University** - SSHRC – Various; NSERC – While the following programs exist they are not all accessed by CBU: Collaborative Research and Development (CRD) Grants; Idea to Innovation (I2I) Program; Intellectual Property Mobilization (IPM) Program; NSERC/The Canada Council for the Arts New Media Initiative; Research Partnership Agreements (RPA); Strategic Network Grants (SNG); Strategic Project Grants (SPG); Industrial Research Chairs (IRC); Chairs in Design Engineering (CDE)Various; IRAP – Various; Atlantic Canada Opportunities Agency – Business Development Program, Atlantic Innovation Fund; Enterprise Cape Breton Corporation – Various;
- **NSCAD** - Atlantic Innovation Fund; Canada Foundation for Innovation; SSHRC Research/Creation
- **Saint Mary's University** - ACOA, Innovacorp, NSERC, OED, IRAP
- **Mount Allison University** - New Brunswick Innovation Foundation, Industry Canada's IRAP (Industrial Research Assistance Program), CIHR Research Partnerships Program, NSERC Collaborative Research Development Grants.
- **Holland College** - Atlantic Innovation Fund (regional), Tech PEI Research & Development Initiative (provincial), PreCarn (national), NSERC (national)
- **Nova Scotia Community College** - Minimal possibilities for colleges. Nova Scotia Community College: An important role of our campus principals is as an important leader/partner with their local communities to support involvement in local level community development. Nova Scotia Community College: Part of the role accountability for principals. No formal linkages to promotion or other performance incentives for principals.
- **New Brunswick Community College –-** Province – New Brunswick Innovation Foundation.
- **College of the North Atlantic** - NRC-IRAP, ACOA, INTRD, CFI,

The institutional policies that guide and encourage external partnering and involvement in regional/provincial/community economic development for each institution were listed as:

- Memorial University - The Harris Centre for Policy is the formal conduit and mostly informal arrangements otherwise;
- Dalhousie University - Office of Industry Liaison outreach programs, support for Atlantic Innovation Fund applications, and creation of entrepreneurship programs in several Faculties.
- University of New Brunswick - The Next Five Years: The President's Perspectives; Campus Academic Planning Advisory Committee Report: A

Framework for UNB Planning; UNBSJ Academic Planning: A Framework for Strategy and Action; UNBF Setting and Pursuing Academic Priorities for the 2005-06 Planning and Budgeting process. The UNB Research Plan, Canada Research Chairs Strategic Research Summary Plan, President's UNB: Pieces of the Puzzle: External Engagements, April 2006; Renewal Directions: 2000 and Beyond; One of the pillars of academic life is "service". This can include involvement by faculty in bodies external to the university. Specifically, UNB encourages, particularly by the Vice Presidents on both campuses, to become involved in local Chambers of Commerce, representation in Knowledge Parks, Team Fredericton, Saint John Board of Trade, Enterprise Fredericton and membership on company and community boards, review committees, etc.

- University of Prince Edward Island - Contract Research Policy.
- Acadia University - Collective Agreement; Guide to the Administration of Research Contracts; Acadia's IP Policy;
- St. Thomas University - Our strategic research plan includes a focus on partnerships
- Cape Breton University - Guide: Research Ethics Board and the Animal Care Committee – all research projects involving human or animal subjects must be approved by these bodies. These committees don't specifically encourage external partnering and involvement – they have to approve the project if it involves human or animal subjects.
- Holland College: None
- Nova Scotia Community College: An important role of our campus principals is as an important leader/partner with their local communities to support involvement in local level community development.
- New Brunswick Community College – NBCC/CCNB does not have a specific policy on this item at this time. This is left at the discretion of each campus, on an individual basis.
- College of the North Atlantic: College Policy FA 305 Partnership agreement/contracts.

Appendix H
Education or training programs that address the needs of key provincial industries

- Memorial University: The Marine Institute offers training for the fisheries and marine sector in province. The Centre for Management Development offers courses to various industries in the province. The Division of Life-Long Learning has provided training for the Federal Government and the Iron Ore Company of Canada.
- Dalhousie University: Architecture; Planning; Engineering; Dentistry and Dental Hygiene; wide range of Health Professions; Medicine; Law; Computer Science; Business; Public Administration; Music; Theatre; Marine Science; various Arts and Sciences.
- University of New Brunswick: Business Administration programs, including entrepreneurship and financial investment programs, Electronic Commerce and many of the programs in the professional faculties such as Chemical Engineering, Forestry and Environmental Management, Chairs in a number of areas, for example in Nuclear Engineering and Power Plant engineering (*see list below), programs put on by several companies and government departments including the Atomic Energy of Canada Ltd (AECL), Xylaur Enterprises, NB Department of Fisheries and Aquaculture, NB Power, Health Safety and Environment-NIL (UK), Environmental Science and Technology Alliance Canada (ESTAC,) Noranda, Irving, Praxair, Tembee Inc, UNB College of Extended Learning Programs

---

*RESEARCH CHAIRS AND PROFESSORSHIPS THAT INCLUDE EDUCATION /TRAINING AND ADDRESS THE NEEDS OF KEY PROVINCIAL INDUSTRIES

UNB - Fredericton Campus

The D.C. Campbell Chair in Highway Construction and Pavement Research – strongly links graduate level education and research in the areas of education and research in the highway and pavement engineering fields.

The M. Patrick Gillin Chair in Construction Engineering and Management -- establishes liaison with industry and encourages technology transfer.

The J. Herbert Smith/ACOA Chair in Technology Management and Entrepreneurship –involved in examining the impact of technology on systems, organizations, and people

NB Power Chair in Power Plant Engineering - develops and teaches specialized courses in power plant engineering at UNB

Chair in Ocean Mapping- expands the research capabilities in the development of innovative methods to manage, process, depict and interpret ocean mapping data.

NSERC/CWS Research Chair in Wildlife Ecology - is part of the Atlantic Cooperative Wildlife Ecology Research Network and represents ACWERN's presence at UNB..

NSERC/Monenco AGRA/Elsag Bailey Chair in Advanced Instrumentation and Control - advances industrially-oriented research and education in real-time instrumentation and control of processes and equipment.

NSERC/NB Power/AECL Chair in Nuclear Engineering- takes a leading role in the training of personnel and the development of nuclear technology.

NSERC/REPAP Chair in Pulp & Paper Engineering - encourages education and research in areas of interest to the pulp and paper industry, cooperates with industry on research and development projects, and gives courses to on-site mill engineers.

NSERC Chair in Environmental Design Engineering - develops broad-based collaborations with industry and other institutions, conducts high quality R&D in innovative and environmentally friendly products and technologies, and provides interdisciplinary expertise, training and service in the areas of environmental design engineering.

Vaughan Chair in Regional Economics- serves as a catalyst for faculty members and graduate student to conduct research pertaining to the economic, political and historical characteristics of Atlantic Canada.

Meighen/Molson Professorship in Atlantic Salmon Research -

NB DNRE/Cloverleaf Professorship in Recreational Fisheries-provides needed scientific support for the management and sustainability of the socio-economically significant recreational fishing industry of Atlantic Canada.

(Source: Research Chairs and Research Professorships: <http://www.unb.ca/research/chairs.html>

- University of Prince Edward Island: Degrees in Education, Nursing, and Veterinary Studies are directly concerned with employment preparation. Degrees such as Business Administration, Computer Science, and Journalism also have outcomes addressing the needs of provincial industries. The Certificate in Public Administration and a wide range of non-credit courses and programs aim at addressing training needs of government and other employers.
- Acadia University: Institutions work regularly with provincial industries on their needs.
- Université de Moncton: the very nature of the university makes most programs fall in this category.
- Mount Allison University: Life Sciences is listed as a key strategic area in the New Brunswick Innovation Agenda. Mount Allison University is providing exceptional research training to undergraduate students in the Life Sciences within our departments of Biology, Chemistry and Environmental Science

- Cape Breton University: Bachelor of Hospitality and Tourism Management, Bachelor of Technology Information, Biotechnology and Pharmaceutical Technology Certificate Program, Bachelor of Technology (Environmental Studies, Emergency Management, Manufacturing & Petroleum), Bachelor of Science (Agriculture), Environmental Engineering, Petroleum Engineering Technology.
- Holland College: Tourism and Hospitality Management, Culinary Arts, all of the construction trades, aerospace, Health Related programs, Bioscience – as a community college our starting point is local industry – so there is a good argument that all programs are developed to meet the specific needs of local industries – that they also meet the needs of other regions. Our programs train to Occupational Profiles not fields of knowledge.
- Nova Scotia Community College: In addition to ensuring that relevant certificate and diploma programs are delivered locally to enhance the local pool of skilled adults available to key industries in the province, there are a number of training partnerships that have been designed specifically to meet a need for a large employer. Examples include programming designed for MARLANT (civilian workforce for military operations), skills training for recent military recruits, workplace training initiatives with Michelin and Sobeys. The College is also working with the provincial Aerospace industry association and individual employers in this sector to participate in the recruitment and development of skilled employees. Another example is the creation of a specialized institute with a major Civil Engineering and Construction firm that recruits and trains students for employment with the company (Dexter Institute).
- New Brunswick Community College – All college programs. College programs are designed with industry needs in mind.
- College of the North Atlantic: The majority or programs address needs including Industrial Trades, Engineering, Tourism and Natural Resources, Early childhood Education, Health Sciences, and Business.

Appendix I
Steering Committee Members

Steering Committee members included:

- Elizabeth Beale, Atlantic Provinces Economic Council, (Chair)* ;
- Cyril Farrell, Atlantic Provinces Community College Consortium;
- Peter Halpin, Association of Atlantic Universities;
- Wade Aucoin, Atlantic Canada Opportunities Agency;
- Rhéal Poirier, Council of Atlantic Premiers;
- Robert Greenwood, The Leslie Harris Centre of Regional Policy and Development, Memorial University*;
- Wade Locke, Memorial University of Newfoundland*;
- Brenda McCavour and Charles Ayles, Government of New Brunswick;
- Rachelle Cochrane, Government of Newfoundland and Labrador;
- Wayne Doggett and Greg Ells, Government of Nova Scotia; and
- Mike Clow, Government of Prince Edward Island.

* These members also served as the Management Committee

THE LESLIE HARRIS CENTRE OF REGIONAL POLICY AND DEVELOPMENT
1st Floor Spencer Hall, St. John's, NL Canada A1C 5S7
Tel: 709 737 6170 Fax: 709 737 3734 www.mun.ca/harriscentre

THE HARRIS CENTRE
Memorial University