Entrepreneurship in University Environments

L'Environnement universitaire de l'entrepreneurship

Entrepreneurship in Atlantic Canadian University Environments

The Variables That Promote and Hinder Entrepreneurship Development

3

ENTREPRENEURSHIP IN ATLANTIC CANADIAN UNIVERSITY ENVIRONMENTS

PART III
The Variables That Promote and Hinder Entrepreneurship Development

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EXECUTIVE SUMMARY

The Executive Summary has been designed to specifically answer each of the research questions outlined in the Introduction to this report. More detail can be found in the Key Findings and the Detailed Analysis sections of the report.

1. **Is the structure and culture of Atlantic Canadian universities conducive to the implementation of entrepreneurship programming?**

   The common structure and culture of Atlantic Canadian universities appears to be a barrier to implementing entrepreneurship programming due to decentralized decision-making, an interdependence of departments relative to course offerings - meaning changes in curriculum of one department may affect many others, peer governance, and the autonomy of faculty. These institutional factors slow the change process and create the need to garner support from various departments even when the change is concentrated in one department or discipline.

2. **Are the attitudes toward entrepreneurship within Atlantic Canadian universities negative or positive and what variables contribute to these attitudes?**

   While the results were varied among the respondent groups, overall, senior administration and alumni possessed a more positive attitude than students, faculty, and academic administration toward entrepreneurs and entrepreneurship as a career option. The variables that were found to contribute to a more positive attitude were: possessing a broad definition of the term entrepreneurship, students being exposed to entrepreneurship as a career option during university, and academic administration and faculty being responsible to generate revenue for a Faculty/department (earned income philosophy).

3. **What is the level of interest among university students, academic administration, and faculty in the implementation of entrepreneurship programming?**

   The level of interest among students, academic administration, and faculty, in the implementation of entrepreneurship development across all disciplines/programs was somewhat low. The majority of respondents within all groups possessed a business oriented perception of the concept of entrepreneurship and indicated it pertains to the creation and operation of a for-profit business. However, those who possess a broad perception of entrepreneurship (acting on opportunities that may improve the quality of life for others) also have a more positive attitude toward the implementation of entrepreneurship across all disciplines. Therefore, influencing and expanding the perception of entrepreneurship to include the broader applications of entrepreneurship may promote the positive implementation of entrepreneurship across all disciplines.

4. **Do students attending Atlantic Canadian universities possess entrepreneurial characteristics/skills?**

   Results showed students possess a variety of entrepreneurial characteristics and skills yet the majority of students do not possess those characteristics related to alumni entrepreneurs. The students with a strong predisposition toward entrepreneurship more strongly possess characteristics and skills related to alumni entrepreneurs and further, have a higher likelihood of future entrepreneurship. Therefore, the variable that appears to promote entrepreneurial characteristics and skills in students is predisposition.

5. **Are students provided the opportunity to develop entrepreneurial characteristics/skills and what factors increase or decrease this opportunity?**

   It is apparent that students do have the opportunity to develop several entrepreneurial characteristics and skills; however, they tend to have a higher level of opportunity to develop those characteristics deemed important by academic administration and faculty as opposed to those most strongly related to being an

entrepreneur. It appears that faculty opinion/perception is a variable that can promote or hinder the development of entrepreneurial characteristics and skills in students.

6. **To what extent are future graduates from all disciplines prepared to embrace entrepreneurial opportunities?**

It is evident that Atlantic Canadian university students, on average, are somewhat unlikely to undertake one of the three types of entrepreneurship defined in this study even though 62.33% indicated they have had an idea for a small business. Of the students who have a high likelihood to undertake entrepreneurship, males tend to be more likely than females to engage in business entrepreneurship and inventing/innovating and females tend to be more likely than males to engage in social entrepreneurship. It appears that students studying certain disciplines also have a higher likelihood to engage in particular types of entrepreneurship. Additionally, acquiring the knowledge to start a business seems to positively influence students' likelihood to start a business.

Increasing students' predisposition, providing the knowledge to start a business/venture, and focusing on the development of characteristics related to alumni entrepreneurs, should increase students' likelihood to engage in entrepreneurship.

7. **Do students intend to stay in Atlantic Canada after graduation and if not, why?**

A total of 58.57% of students said they intended to stay in Atlantic Canada after graduation. Of the group who indicated they would leave (37.26%), the most common reasons cited were few career/job opportunities, uncompetitive salaries, the need to broaden their horizons, and the desired graduate programs are unavailable in Atlantic Canada. These reasons were similar to the reasons cited by alumni who left the region.

The literature available on the phenomenon of entrepreneurship is predominantly focused on business creation and operation so it appears that entrepreneurship and business are seen as synonymous. The results of this study show that the majority of people working and studying in Atlantic Canadian universities believe entrepreneurship is creating and operating a business. Given this, it is understandable why they do not think it is appropriate and relevant to every program. This is supported by the fact that the majority viewed entrepreneurs as valuable contributors to society, yet as a whole they reacted fairly negatively to the concept of entrepreneurship development in every degree program.

Additionally, while entrepreneurship related courses and programs can be found in numerous disciplines, they relate to business entrepreneurship such as small business management, new venture creation, and family business. The inherent problem with linking the concept of entrepreneurship in universities to one form of entrepreneurship only (business), rests in the overall mandates of Atlantic Canadian universities. The typical business mandates of maximizing profits for the benefit of shareholders do not entirely align with the primary mandates of Atlantic Canadian universities of research, teaching, and service for the benefit of society. This may be the foremost contributing factor to the resistance toward entrepreneurship in universities and to the belief that it is not relevant to students outside of business disciplines.

There is evidence that entrepreneurship is not only undertaken within the realm of business. Entrepreneurial behaviors often result in the creation of a venture or business but there is increasing literature demonstrating the use of entrepreneurial characteristics in carrying out socially oriented mandates and addressing challenges in the education and health services sectors. These broader applications of entrepreneurship, including but not limited to business entrepreneurship, may be more relevant to the primary university mandates and to the various disciplines within these institutions.

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PROJECT OVERVIEW

A consortium of Atlantic Canadian university-based business development centres, university entrepreneurship chairs, and other university-based partners joined forces in 2001 to undertake a major research initiative. The overall goal of the project was to identify needs and developmental opportunities regarding gaps in entrepreneurship education, awareness, and advocacy at the university level in Atlantic Canada. This information was used to develop a model to increase entrepreneurial behaviours and activities in students and graduates, specifically:

- expose all students to entrepreneurship;
- provide the information to support the creation of an entrepreneurial learning environment;
- develop entrepreneurial characteristics/traits in students;
- create awareness of venture creation as a viable career option; and
- increase the likelihood of venture creation among students and graduates.

The project, funded by the Atlantic Canada Opportunities Agency (ACOA), was broken down into six steps as follows:

Step 1 – Literature and Model Review - The purpose of the literature review was to better understand past work and facilitate effective survey design for primary research. The model review provided insight into what is currently being done within the worldwide university community in regards to Entrepreneurship Education.

Step 2 – Inventory of Entrepreneurship Courses and Resources - This step involved creating a database of entrepreneurship courses and resources currently in existence in Atlantic Canadian universities.

Step 3 – Review of the University Infrastructure - The purpose of this step was to provide a better understanding of the structure and culture within Atlantic Canadian universities to determine what approach for implementation might be used.

<u>Step 4 – Attitudinal Surveys</u> – Five survey instruments were designed to assess attitudes and perceptions of entrepreneurship among those working and studying in Atlantic Canadian universities and to identify the variables that promote or hinder entrepreneurship development.

<u>Step 5 – Model Development</u> – The analysis of the primary research conducted in Step 4 was used to develop the model.

<u>Step 6 – Implementation Strategy</u> – This step involved the development of a general implementation strategy that Atlantic Canadian universities can utilize to implement the model. The strategy encompasses insight gained through the analysis of Atlantic Canadian universities' culture and structure gathered in Step 3 and the attitudinal surveys to ensure the strategy was conducive to these environments.

In total, this project took over three years to complete with the majority of time being spent designing the questionnaires, analyzing and interpreting the data and writing the reports. The results can be found in a four part series of documents entitled Entrepreneurship in Atlantic Canadian Universities: Part I "Understanding Entrepreneurs: An Examination of the Literature; Part II "An Examination of Models, Best Practices, and Program Development"- results of steps 1 and 2; Part III "The Variables That Promote and Hinder Entrepreneurship Development in Atlantic Canadian Universities"- results of steps 3 and 4; and Part IV "A Model and Strategy for Entrepreneurship Development Among Students in Atlantic Canadian Universities" – results of steps 5 and 6.

The consortium is comprised of Université de Moncton, Centre for Women in Business at Mount Saint Vincent University, Saint Mary's University Business Development Centre, Centre Jodrey at Université Sainte-Anne, St. Francis Xavier Enterprise Development Centre, Chair in Youth-Focused Technological Entrepreneurship at Memorial University of Newfoundland, The John Dobson Micro-Enterprise Centre at Mount Allison University, the School of Business at University of Prince Edward Island, Dr. J. Herbert Smith Centre at University of New Brunswick, Dalhousie University, University of Kings College, Atlantic School of Theology, Nova Scotia Agricultural College, University College of Cape Breton, St. Thomas University, Atlantic Baptist University, Nova Scotia College of Art and Design, and the Acadia Centre for Small Business & Entrepreneurship at Acadia University.


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INTRODUCTION

The presence of entrepreneurship related courses within university curriculum has been increasing over the past number of years and entrepreneurship is gradually gaining acceptance as a field of study as more academic research is conducted on the topic (Vesper & Gartner, 1997). Elements of entrepreneurship can be found in the literature dating back as far as the 14th century, however; the largest portion of the literature available concerning entrepreneurship is only approximately 50 years old. The majority of entrepreneurship research pertains to small business creation and operation yet studies on social entrepreneurship (Emerson & Twersky, 1996; Kent & Anderson, 2003; Kourilsky & Hentschke, 2003), academic entrepreneurship (Louis Blumenthal, Gluck & Stoto, 1989), intrapreneurship (Miner, 1997; Sheffield, 1987) and educational entrepreneurship (Kourilsky & Hentschke, 2003) are beginning to emerge, demonstrating the multidisciplinary nature of the concept.

The literature review revealed evidence that "entrepreneurship education is increasingly in demand" (Dunn & Short, 2001; Gallup, 1994). Blais (1997) as cited in Menzies and Gasse (1999) contends entrepreneurship education "…adds a practical base to theoretic knowledge and it focuses attention on student talent and skills. It also motivates students to become more creative, innovative and improves a student's ability to work with others in team initiatives" (p. 6). As Fleming (1996) states, "Entrepreneurship education promotes an awareness of self-employment as a career option and motivates young people to begin equipping themselves with the skills, knowledge and experience required for effective business ownership" (p. 94).

However, many barriers to implementing entrepreneurship education within a university may exist including: faculty resistance (Bird & Allen, 1989; Desruisseaux, 1999; Finkin, 1998; Hills, 1988), financial restrictions (Kozeracki, 1998; Neal, 1998), existing attitudes

and perceptions (Hills, 1988; Kozeracki, 1998), and external influences (Allen, 2000; Bygrave & Minniti, 2000; Desruisseaux, 1999; Neal, 1998). These barriers must be understood and addressed in order to allow for successful acceptance and implementation of entrepreneurship programming.

Currently, little primary research exists on the status of entrepreneurship within Atlantic Canadian universities. The aim of this exploratory study was to provide insight into university environments in Atlantic Canada to determine how entrepreneurship could be increased so that more university students and graduates are equipped to act on opportunities. It builds on the research of Gasse and D'Amour (1998), previous research concerning characteristics and skills of entrepreneurs, and past work conducted on entrepreneurship education.

RESEARCH OBJECTIVE:

The primary research objective was to identify variables that can promote or hinder entrepreneurship development within universities in Atlantic Canada. In order to accomplish this objective the following research questions were devised:

1. Is the structure and culture of Atlantic Canadian universities conducive to the implementation of entrepreneurship programming?
2. Are the attitudes toward entrepreneurship within Atlantic Canadian universities negative or positive and what variables contribute to these attitudes?
3. What is the level of interest among university students, academic administration, and faculty in the implementation of entrepreneurship programming?
4. Do students attending Atlantic Canadian universities possess entrepreneurial characteristics/skills?
5. Are students provided the opportunity to develop entrepreneurial characteristics/skills and what factors increase or decrease this opportunity?
6. To what extent are future graduates from all disciplines prepared to embrace entrepreneurial opportunities?
7. Do students intend to stay in Atlantic Canada after graduation and if not, why?

In order to gain insight and answer the research questions, university presidents, academic administrators, faculty, students, and alumni from Atlantic Canadian universities were surveyed using qualitative and quantitative methods. The population of university presidents, representing senior administration, completed a questionnaire and were personally interviewed. In two instances, academic vice-presidents participated in the study on behalf of the president of the university. The purpose of the questionnaire was to gather their views concerning the university structure and culture. The purpose of the interview was to identify the mandates of Atlantic Canadian universities in order ascertain whether entrepreneurship development aligns with the mandates. All 18 Atlantic Canadian universities participated in this study.

The population of all Atlantic Canadian academic administrators (deans, directors, department heads), faculty, and students were surveyed to discover attitudes toward entrepreneurship and implementation of entrepreneurship programming, perceptions of entrepreneurship, the level of importance placed on the development of entrepreneurial characteristics/skills, and whether students possess entrepreneurial characteristics. A combination of on-line and mail delivery was used to collect the data. Academic administration returned 140 surveys of which 128 were useable, faculty returned 841 of which 803 were usable and students returned 11,786 with 11,747 being included in the analysis. For more complete details concerning methodologies see the section entitled Research Methodology and Descriptive Statistics.

A sample of Atlantic university alumni, who graduated between 5 and 10 years ago, were surveyed by mail to measure the level of entrepreneurial activity among Atlantic university alumni, attitudes toward and perceptions of entrepreneurship, the characteristics/skills alumni entrepreneurs possess, and whether their university experience contributed to their desire to pursue entrepreneurship. The alumni respondents totaled 1,664 and 511 surveys were removed since the alumni had graduated

more than 10 years prior, leaving a sample size of 1,153. The section entitled Research Methodology and Descriptive Statistics provides details of population sizes, response rates and sample sizes.

Three different types of entrepreneurship were examined in this study; Business Entrepreneurship (ownership and/or operation of a business), Social Entrepreneurship (directing/managing a not-for-profit organization), and Inventing/Innovating (inventing or improving a product, process or service). Additionally, entrepreneurship was not specifically defined by the researchers so it was possible to ascertain whether respondents' possess a business oriented or broad perception of the concept. This was accomplished by providing respondents with two definitions of entrepreneurship: one which specifically related to the creation and operation of a business (business oriented), and the other which related to initiating change and improvement within society (broad).

This report is structured to meet the needs of various readers. It contains the Executive Summary which provides an overview of the research results and briefly answers each of the research questions; Key Findings which summarize the significant results; Conclusions includes limitations of the study and areas of future research; Research Methods and Descriptive Statistics which provides the details of data collection procedures, descriptions of the respondent groups, and biases of the study; and the Detailed Data Analysis which contains the detailed qualitative and quantitative analysis and corresponding tables for each respondent group. Appendices referred to throughout the report can be found at the back of this report.


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KEY FINDINGS

University Structure and Culture

A traditional university structure according to Neal (1998) and Mintzberg (1993) is configured with the Board of Governors and Senate at the top level of the organization, the next level being the President and then Vice-Presidents (can include academic, finance, administration, research, planning). Faculties (such as arts, science, music, medicine, agriculture, etc.) may fall under the Academic or Administrative Vice-President. Within each Faculty are deans, department heads and faculty (professionals). The majority of universities in Atlantic Canada operate within a traditional university structure, described by Mintzberg (1993) as a professional bureaucracy. This structural configuration utilizes decentralized decision-making and peer governance, is highly dependent upon faculty (professionals) to carry out the organizational mandate, and supports a collegial culture.

Bird and Allen (1989) describe a traditional university culture as featuring "teaching, basic research and governance by peers" (p. 584). This is supported by Desruisseaux (1999). The collegial culture of traditional university environments is clearly evident in Atlantic Canadian universities as a whole as demonstrated by the existence of senates, curriculum development and review committees, faculty councils, and tenure and promotion review committees, providing faculty with a voice in decisions which affect them. Additionally, teaching and research are seen as very important within Atlantic Canadian universities; however; the results showed an equal emphasis on basic/fundamental research and applied research as opposed to a concentration on basic research only.

Tenure is an element of the culture which has long been present within universities. Finkin (1998) indicates that:

> "tenure is a means to certain ends; specifically: 1) freedom of teaching and research and of extra-mural activities, and 2) a sufficient degree of economic security to make the profession attractive to men and women of ability. Upon freedom and economic security, and hence upon tenure, depends the success of an institution in fulfilling its obligations to its students and to society" (p.21).

All universities in Atlantic Canada provide the opportunity for faculty to acquire tenure and only a small percentage require an individual to have a Ph.D. before achieving tenure.

The collegial nature of the structure appears to affect the speed of change since faculty have a voice in decision making, especially decisions that directly affect them. This slows the decision making process yet ensures standards are being met (Mintzberg, 1993). The results of this study support this in that change within Atlantic Canadian universities is only moderately difficult yet tends to take place relatively slowly. **See Table 1.**

Peter Drucker says university organizations "function on the basis of budgets rather than results, they are forced to satisfy a multitude of constituencies and they tend to see their mission in moral or ethical terms rather than in economic ones" (Keast 1995 as cited in Kozeracki, 1998, p.3). Desruisseaux (1999) describes the core of universities' missions as "teaching, research, and community service" (Desruisseaux, 1999, p3). All university presidents described their visions in terms of providing high quality education, preserving high academic performance, and aspiring to increase research activity which reflect traditional philosophies. Equally, many presidents spoke of adopting a specialized focus, servicing market niches or internationalizing the university which indicates transition, at least among some Atlantic Canadian universities.

The mission statements also support traditional views of teaching, research, and development of the whole person. These statements reflect the moral and ethical mandates of developing broad-based thinkers who contribute positively to society and benefiting society through research and teaching. However, some university missions also incorporate servicing particular industry sectors or targeting segments of the population, again indicating possible transition.

Although entrepreneurship was not specifically mentioned in the vision and mission statements of Atlantic Canadian universities, the number of entrepreneurship related courses offered within these institutions provides evidence that entrepreneurship is supported within selective disciplines. In 2001, there were approximately 150 entrepreneurship courses with the majority offered through business, commerce and management disciplines. However, courses were also identified in the arts and humanities, computer science, education, engineering, health profession, science, and theology disciplines. Titles of these courses are largely in the genre of: studies in small business, the nature of entrepreneurship, family business, and entrepreneurship in software systems. Even though there is evidence of entrepreneurship courses in certain disciplines, they tend to focus on business entrepreneurship only, rather than on the application of entrepreneurial behaviors in various sectors of society.

Perception of Entrepreneurship

Perception of entrepreneurship was measured by asking respondents to choose a definition, of the two provided, that most closely matched their own definition of the term. One definition was business oriented and stated: "Entrepreneurship is a process whereby a combination of resources, characteristics and knowledge are utilized to create and operate a profit-oriented business". The second definition was broad and stated: "Entrepreneurship is a process whereby a combination of resources, characteristics and knowledge are utilized to recognize and act on opportunities that may improve the quality of life for others".

The majority of faculty, students, and alumni chose the business oriented definition; however, academic administrators were more evenly divided with only a very slight majority favoring the business-oriented definition. This indicates that, overall, respondents believe entrepreneurship pertains to creating and operating a for-profit business. **See Table 2.**

Attitude toward Entrepreneurship

While the attitudes toward entrepreneurship varied among the respondent groups, the attitudes were generally positive towards entrepreneurs' contributions to society; however, they were more negative toward entrepreneurship as a career option. Presidents, followed by alumni, demonstrated the most positive attitudes both towards entrepreneurs and careers in entrepreneurship. Academic administration, faculty, and students have a relatively positive attitude toward entrepreneurs but only somewhat agree that entrepreneurship is a good career option. **See Table 3.**

The variable found to affect attitudes among academic administration was having financial responsibility for Faculties and departments within the university (earned income philosophy). Those academic administrators who are responsible for revenue generation and fundraising for their respective Faculties and departments have a significantly more positive attitude toward entrepreneurs.

The variable found to affect the attitudes of faculty was perception of entrepreneurship. The perception of entrepreneurship among faculty is generally business oriented with the majority of respondents choosing the business-oriented definition over the broad definition. Faculty who chose the broad definition of the concept of entrepreneurship had a significantly more positive attitude toward entrepreneurs and a career in entrepreneurship.

The variables which affect student attitudes were perception of entrepreneurship and exposure to entrepreneurship as a career option. While the majority of student respondents chose the narrow (business) definition of entrepreneurship, those who chose the broad definition had a significantly more positive attitude toward entrepreneurs and entrepreneurship as a career option. Additionally, those students exposed to entrepreneurship as a career option during university had a significantly more positive attitude towards entrepreneurs and becoming an entrepreneur.

Interest in the Implementation of Entrepreneurial Programming

The results indicate that some groups may see entrepreneurship development as relevant to certain programs but overall, respondents do not believe it is relevant to every degree program. Alumni agreed that universities should invest resources in the development of entrepreneurship and students and presidents somewhat agreed; however, both faculty and academic administrators tended to be indifferent. Attitudes toward the implementation of entrepreneurship programming across all disciplines were somewhat negative among all groups. Alumni slightly agreed that entrepreneurship should be a part of every degree program yet presidents, faculty, academic administrators, and students all somewhat disagreed. **See Table 3.**

The variable contributing to faculty's level of interest in entrepreneurship development appear to be perception of entrepreneurship. Faculty who possess a broad definition showed a significantly more positive attitude toward universities investing resources in entrepreneurship development and toward its relevance to all programs.

The variables that appear to be affecting students' interest in entrepreneurship development are perception of entrepreneurship and exposure to entrepreneurship as a career option. Students who chose the broad definition have a significantly more positive attitude toward universities investing resources in the development of entrepreneurship.

Those students who have been exposed to entrepreneurship as a career option during university have a significantly more positive attitude both toward universities investing resources in the development of entrepreneurship and toward its implementation across all disciplines.

Entrepreneurial Characteristics and Skills

Characteristics related to entrepreneurs identified in the past work of Gasse and D'Amours (2000) were used in this study to determine if students possess these characteristics, which characteristics are seen as important from the perspective of academic administrators and faculty, and which characteristics students have the opportunity to develop.

Entrepreneurial Characteristics in Students

It is evident that students possess certain entrepreneurial characteristics/skills based on how frequently they exercise them. The characteristics/skills the majority of students possess include: curiosity, desire to complete a project from beginning to end, and need to achieve. They rarely prefer that others take responsibility for a project indicating they like to take on responsibility and generally have some desire to control their own destiny since they tend to believe their success is not dependent upon chance.

The characteristics the majority of students do not possess include: creative thinking/innovation, overall responsibility/accountability, opportunistic characteristics, risk taking ability, and need for power. Many of these characteristics were strongly related to alumni entrepreneurs.

Entrepreneurial characteristics were also measured among the alumni group and specifically those alumni who indicated they are business entrepreneurs, social entrepreneurs and inventors/innovators. A statistically significant relationship was found between business entrepreneurs and opportunistic characteristics and intuition. Social

entrepreneurs were found to have a strong need for power (influence) and sense of overall responsibility/accountability and inventors/innovators possess opportunistic characteristics and intuition; however, they also have adaptability characteristics in that they like change and adapt easily to it.

The results showed that overall, students do not possess many of the characteristics significantly related to the entrepreneurs identified in this study; in particular, opportunistic characteristics, overall responsibility/accountability, need of power (influence), intuition, and desire for constant change.

The students with a strong predisposition (being prone) toward entrepreneurship more strongly possess characteristics and skills related to alumni entrepreneurs and further, have a higher likelihood of future entrepreneurship. Therefore, the variable that appears to promote entrepreneurial characteristics and skills in students is predisposition.

Opportunity to Develop Characteristics

On average, students are being provided the opportunity to develop certain entrepreneurial characteristics and skills through university. The characteristics students had the highest level of opportunity to develop included: specific responsibility/accountability, need to achieve, desire to complete a project from beginning to end, communication skills, desire for independence, and ability to learn from mistakes. Interestingly, the majority of the characteristics rated on the high end of the scale by students were those considered important for student development by academic administrators and for student success by faculty. **See Table 4.**

The characteristics/skills students indicated they have the least opportunity to develop were: need for power, risk taking ability, desire for constant change, ability to maximize the potential of others, and intuition. Again, many of these characteristics/skills were identified by academic administrators as least important for student development and as least important for student success by faculty. **See Table 4.**

Results indicated the variables that may be affecting the level of opportunity students have to develop entrepreneurial characteristics/skills include: faculty's opinions/perception concerning the relevance of characteristics/skills to successfully mastering a course, academic administrator's opinions/perception concerning the relevance of characteristics/skills to student development, and teaching methods utilized.

Relevance of Entrepreneurial Characteristics

It appears that faculty's opinions/perception concerning the relevance of an entrepreneurial characteristic/skill to the mastery of a course, impacts students' opportunity to develop that characteristic or skill. The results suggest that the characteristics/skills faculty believe are important that students develop in order to achieve the objectives of a course are the ones students have the highest level of opportunity to develop. Conversely, the characteristics/skills faculty identified as least important to student success in their courses are included in the group of characteristics/skills students indicated they have the least opportunity to develop.

Additionally, academic administrators' opinions/perception concerning the relevance of an entrepreneurial characteristic/skill to student development appears to impact students' opportunity to develop that characteristic or skills. The majority of characteristics/skills identified by academic administrators as important to student development were among those students indicated they have the highest level of opportunity to develop and those identified as least important were among the characteristics/skills students indicated they have the least opportunity to develop.

Teaching Methods Utilized

Teaching methods utilized appear to be a variable contributing to students' opportunity to develop entrepreneurial characteristics/skills. According to Tompson and Dass (2000) traditional university methods include lectures, case studies, supporting textbooks, and practical exercises which are useful in developing basic business skills, communication skills and technical expertise. Experiential teaching methods include: guest speakers, real-world projects, simulations and field trips and are beneficial in developing, self-

efficacy, strategic thinking, business planning, goal-setting and decision making along with certain personal characteristics. Lectures were rated on average by students as almost always being used, followed by classroom discussion, and independent study. The methods used the least on average were field trips, simulations/role plays, guest speakers, and community-based, real world projects. The results showed that certain teaching methods provide more opportunity to develop certain entrepreneurial characteristics. See Detailed Analysis Section, Students, Teaching Methods Used by Faculty.

The results also suggest an association between experiential teaching methods and the use of external networks. Overall, faculty rated their use of external networks to support their teaching relatively low; however, the faculty who utilize experiential teaching method more than average also use external networks significantly more than average.

Students' Interest in and Likelihood of Engaging in Entrepreneurship

On average, students said they are somewhat unlikely to undertake business entrepreneurship even though the majority indicated they have had an idea for a small business. Equally, they are somewhat unlikely to undertake social entrepreneurship or inventing/innovating in the future.

Students studying Business, Dentistry, Forestry and Environmental Studies, and Computer Science returned higher ratings to engage in business entrepreneurship in the future more frequently than other students. Students in the disciplines of Theology, Forestry and Environment Studies, Architecture and Urban/Rural Planning, and Arts and Humanities/Social Sciences indicated a stronger likelihood toward Social Entrepreneurship and students studying Engineering indicated the highest likelihood for inventing/innovating. Students studying Computer Science, Forestry and Environmental Studies, and Business also have a relatively high likelihood for inventing/innovating.

Additionally, male students are significantly more likely than females to start a business and invent/innovate and females are significantly more likely than males to manage/direct a not-for-profit organization.

The variables found to be impacting students' interest in and likelihood of entrepreneurship include: possessing entrepreneurial characteristics, students' career aspirations, the career attributes influencing their career choice, their predisposition toward entrepreneurship, and acquiring the knowledge to start a business.

Possessing Entrepreneurial Characteristics

Students who possess strong entrepreneurial characteristics also have a very high likelihood of future entrepreneurship. Specifically, students who possess the characteristics strongly related to business entrepreneurs identified in this study (opportunistic characteristics and intuition) have a very high likelihood of business entrepreneurship. Students who possess the characteristics strongly related to social entrepreneurs (need for power, overall responsibility/accountability, ability to handle pressure) have a very high likelihood of social entrepreneurship and students who possess characteristics strongly related to inventors/innovators (desire for constant change, capacity to adapt to change, opportunistic characteristics, intuition) indicated a very high likelihood of inventing/innovating.

Career Aspirations

Generally, students do not want to become entrepreneurs. Their career intentions upon graduation relate to pursuing further education, followed by working for the government, or working for a large business/organization as opposed to entrepreneurial endeavors.

A slight majority of students said they had not been exposed to entrepreneurship as a career option during university. However, it appears over the past 10-15 years exposure has been increasing since a fairly large majority of alumni indicated they had not been exposed during their university experience.

Students tend to make their career decisions based on their level of personal interest in a field combined with the potential for employment. Alumni also reported personal interests as the strongest influence on their career choice followed by employment prospects. Both groups indicated the least influential factor was sports activities and additionally, school teachers and professors were less of an influence than parents.

Desired Attributes

The attributes that most significantly influence students' career decisions are financial security, opportunity for intellectual challenge, and opportunity to be creative and original. It is worth noting that the attributes that are provided through entrepreneurship (ability to be creative and original, the possibility to take on responsibility, and freedom from close supervision) were chosen fairly frequently indicating that some students desire the attributes in their careers that entrepreneurship can offer.

Predisposition toward Entrepreneurship

Predisposition or being prone to entrepreneurship was measured using nine factors, the majority of which cannot be influenced during university; however there are some which can be influenced. The factors that cannot be influenced include: having a parent who owns or has owned a business, having a close friend who owns business, being the eldest child in the family, being an immigrant or having parents who are immigrants, and earning spending money as a child. The factors that can be influenced include: being involved in initiating student activities during university, working in a small or medium-sized business/organization, being aware of any resources or organizations that support the creation of a business/venture, and having ideas for a small business/venture. A statistically significant relationship was found between predisposition toward entrepreneurship and likelihood of future entrepreneurship; therefore, students with a stronger predisposition toward entrepreneurship also have a higher likelihood of future entrepreneurship.

Knowledge to Start a Business

Students who have acquired the knowledge to start a business also have a significantly higher likelihood to undertake one of the three types of entrepreneurship (business, social, inventing/innovating).

Out-migration of University Graduates

The results suggest that a perceived lack of career/job opportunities in the region is the primary reason for the out-migration of graduates from Atlantic Canadian universities. Approximately a third of students said they intended to leave Atlantic Canada after graduation with a very small portion being undecided. Of the group who indicated they would leave, the most common reason cited was few career/job opportunities followed by the desire to broaden their horizons. The third most common reason for leaving was the lack of desired graduate programs in Atlantic Canada.

A little less than a third of the alumni sample currently reside outside of Atlantic Canada. Of the group who left the region, the most common reason for leaving was employment or financial opportunities, followed by family reasons; they left due to a spouse or to be closer to family and friends, or left to return home. A smaller percentage left to broaden their horizons and travel or for further education.

Key Findings Tables

Table 1
Comparison of Respondent Groups
Difficulty and Speed of Change

	Senior Admin. Mean	Acad. Admin Mean	Faculty Mean
Difficulty of Change (Scale: 1=very easy, 5=very hard)	3.29	3.16	3.19
Speed of Change (Scale: 1=very slow, 5=very fast)	2.96	2.74	2.68

Table 2
Comparison of Respondent Groups
Perception of Entrepreneurship

Definition	Acad. Admin %	Faculty %	Students %	Alumni %
Business Oriented	54.84	69.82	67.98	78.39
Broad	45.16	30.18	32.02	21.61

Table 3
Comparison of Respondent Groups
Attitudes Toward Entrepreneurship
(Scale: 1=strongly disagree, 5=strongly agree)

	Presidents	Academic Admin	Faculty	Students	Alumni
Entrepreneurs make a positive contribution to society.	4.33	4.14	3.97	4.17	4.25
Entrepreneurs are admired within society.	3.81	3.58	3.60	3.68	3.76
Entrepreneurship is a good career option.	3.91	3.61	3.38	3.58	3.70
Universities should invest resources in the development of entrepreneurship.	3.75	3.33	3.20	3.79	3.90
Entrepreneurship should be part of every degree program.	2.62	2.61	2.52	2.83	3.24

Table 4

Comparison -Importance of Characteristics and Opportunity to Develop Characteristics in University

(Scale: 1=low opportunity, 5=high opportunity)

Characteristic	Importance		Opportunity
	Acad. Adm	Faculty	Students
	(Mean)	(Mean)	(Mean)
Risk Taking Ability	3.42	2.72	3.17
Self-confidence	4.33	3.75	3.89
Need to Achieve	4.01	3.83	4.20
Desire for Independence	3.65	3.34	4.12
Need for Power	2.23	1.92	3.09
Intuition	3.33	3.04	3.45
Responsibility/Accountability	4.50	4.18	4.33
Self-esteem	4.27	3.53	3.83
Desire - Control one's destiny	3.80	3.25	4.00
Optimism	4.00	3.43	3.70
Perseverance	4.52	4.30	3.98
Desire for constant change	2.82	2.61	3.29
Competitiveness	3.03	2.73	3.57
Curiosity	4.53	4.34	3.95
Enthusiasm	4.52	4.27	3.83
Initiative/Active Involvement	4.41	4.24	3.74
Desire to complete a project	4.37	4.25	4.16
Empathy	3.76	3.11	3.63
Perfectionism	2.94	3.04	3.66
Creative Thinking/Innov	4.31	4.00	3.90
Communication skills	4.65	4.25	4.15
Identify an opportunity	4.00	3.48	3.88
Ability to find info	4.42	4.22	4.05
Ability to acquire expertise	4.18	4.00	3.88
Capacity to adapt to change	4.14	3.56	3.92
Ability to handle pressure	4.19	3.75	4.08
Maximize potential of others	3.62	2.83	3.41
Leadership ability	3.68	2.97	3.70
Ability to process feedback	4.14	3.81	3.74
Resourcefulness	4.32	3.92	3.92
Ability to learn from mistakes	4.50	4.23	4.11
Use/apply new technology	3.77	3.33	3.82
Theory into practice	4.13	4.12	3.74

Characteristics rated as more important for student success by academic administrators and faculty

Characteristics rated as less important for student success by academic administrators and faculty


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CONCLUSIONS

Major Findings:

- Results suggest that the structures and cultures common within Atlantic Canadian universities may be a barrier to entrepreneurship development.
- Attitudes toward entrepreneurship are generally positive with regard to its role in society; however, attitudes have a tendency to become increasingly negative when the concept refers to change within the university environment.
- A broad definition of entrepreneurship appears to positively influence the attitudes toward entrepreneurship.
- When students are exposed to entrepreneurship as a career option, their attitudes toward becoming an entrepreneur are more positive.
- The results indicate that overall, respondents do not believe entrepreneurship programming is relevant to all disciplines.
- Generally, Atlantic Canadian university students possess certain entrepreneurial characteristics/skills; however, they do not possess many of the characteristics/skills related to business and social entrepreneurs and inventor/innovators identified in this study.
- Students are provided the opportunity to develop certain entrepreneurial characteristics/skills but not the majority of those found to be important for business and social entrepreneurship and inventing/innovating.
- Teaching methods utilized within Atlantic Canadian universities can have a significant impact on the development of entrepreneurial characteristics in students.
- The majority of students do not want to become business entrepreneurs, social entrepreneurs, or inventors/innovators. It appears students do not believe entrepreneurship can provide the career attributes that are most important to

them - financial security, opportunity for intellectual challenge, and opportunity to be creative and original.

- Students tend to make their career decisions based on their level of personal interest in a field combined with the potential for employment.
- The out-migration from the Atlantic Region of graduates from Atlantic Canadian universities is primarily due to a perceived lack of career opportunities, uncompetitive salaries, the need to broaden their horizons, and the desired graduate programs are unavailable.

Limitations:

- These results are limited to the population of Atlantic Canadian universities therefore we cannot evaluate our results against those universities in other regions of the country.
- The whole population of Atlantic Canadian university faculty, academic administrators, and students were surveyed; however, the whole populations may not have been reached due to limited or no access to internal mail and email.
- The data collection process was somewhat lengthy as it took over three months to collect data from all 18 universities. It is possible respondents developed a bias by communicating with one another about survey questions.

Future Research:

- This study has helped identify factors that increase one's likelihood to undertake entrepreneurship; however, it does not explore the factors that trigger engaging in entrepreneurship. Further research should aim to identify the triggers that move an individual who has a high likelihood of engaging in entrepreneurship to actually undertaking entrepreneurship.
- This study provides a profile of students studying within Atlantic Canadian universities. Further research concentrating on the profiles of students studying in universities in other geographic regions would shed light on whether or not regional differences exist and, if so, what factors are contributing to any differences.

Research Methods and Descriptive Statistics

METHODOLOGY

Five surveys were designed targeted toward presidents, academic administration (deans, directors, department heads, chairs), faculty, students, and alumni from all 18 Atlantic Canadian universities.

The majority of questions were formulated based on the past work (obtained through the literature review conducted in Step 1 of the research project) and adjusted to meet the specific goals of this study. Additionally, certain questions were designed to provide new insight and knowledge to further contribute to the existing body of entrepreneurship literature. The student and alumni surveys were each pre-tested on ten individuals and the faculty and academic administration surveys were pre-tested on five individuals. Some modifications were made to the instruments based on the pre-testing.

All research findings have been reported globally to ensure confidentiality and to provide an Atlantic Canadian perspective. Surveys were delivered in both official languages (English and French).

Senior Administration

Methodology

Two methods were used to collect data from senior administration (presidents and academic vice-presidents) within all Atlantic Canadian universities. Qualitative data was gathered through interviews which focused on the visions, missions, and future directions of these universities as well as the challenges they face. Quantitative data was collected through a survey which focused on attitudes toward and perceptions of entrepreneurship, the culture and structure of the university, and the unique characteristics of each university. *Refer to Appendix A for a copy of the senior administration survey.*

Descriptive Statistics

Sixteen university presidents and two academic vice-presidents were interviewed and surveyed, representing all 18 universities in the region. All university statistics reported are from the 2002-2003 academic year.

Academic Administration

Methodology

The deans, directors, department heads, and chairs were surveyed between November 2002 and February, 2003 using two methods:

1. A blanket email message was sent to academic administrators within 17 universities of the 18 universities. One university was not able to distribute through email, therefore, a hard copy was distributed through internal mail. The email message contained an invitation to participate and a link to the applicable survey hosted on a server. A reminder email request was sent 4 weeks after the mail surveys. *Refer to Appendix B for a copy of email messages and letter.*

2. Hard copies of the surveys were sent to academic administrators within 17 universities 6-8 weeks after the first email request in order to accommodate those who preferred not to complete the survey on-line Surveys were distributed and collected through internal mail and subsequently forwarded to the principal investigators. *Refer to Appendix B for a copy of the academic administrator survey.*

Descriptive Statistics

Of the total population of 730 academic administrators within the 18 Atlantic Canadian universities, 140 respondents returned either an email or mail survey representing a total response rate of 19.18%. A total of 128 surveys were useable.

The average age of this group was 51.93 years and 70.40% were male. Their average academic experience, or years since they completed their highest level of education, was 19.71 years and on average their years of work experience outside the university environment was 6.09 years. With respect to experience in their current academic administrative position, the mean was 4.35 years. This result is reasonable since academic administrators normally complete 1-2 terms in administrative roles; each term approximately 5 years in length.

Department heads/chairs comprised 51.18% of the sample followed by deans (22.83%), directors of schools and programs (7.87%), and finally associate deans (6.30%). **Table 5** provides the descriptive statistics of Academic Administration.

The educational backgrounds of academic administrators were as one might expect. Those holding a Ph.D. or equivalent represented 74.02% of the sample, 20.47% indicated they hold a Master degree, and a very small percentage (3.15%) reported they do not possess a graduate degree. The majority of respondents were from the Arts and Humanities/Social Sciences (33.33%), followed by Science (19.84%), with Business/Commerce and Education both making up 7.14%. The smallest percentages of the sample were from Theology, Public Relations and Computer Science, each comprising 0.79%.

Faculty

Methodology

Faculty was surveyed during the period of November 2002 – February 2003 using two methods:

1. A blanket email message was sent to all faculty within 17 universities of the 18 universities. One university was not able to distribute through email, therefore, a hard copy was distributed through internal mail. The email message contained an invitation to participate and a link to the applicable survey hosted on a server. A reminder email request was sent 4 weeks after the mail surveys. *Refer to Appendix C for a copy of email messages and letter.*

2. Hard copies of the surveys were sent to faculty 6-8 weeks after the first email request in order to accommodate those who preferred not to complete the survey on-line. Surveys were distributed and collected through internal mail and subsequently forwarded to the principal investigators. *Refer to Appendix C for a copy of the faculty survey.*

Limitations

Web/email was chosen as the first method of delivery for faculty as the population is large and geographically disbursed. It was recognized that emails would not reach the entire population therefore a mail survey was designed to follow. Limitations recognized include:

- Representative Sample: The representativeness of responses by university and by discipline was examined and it was found to be uniform (less than 5% variance) across 17 of 18 universities. One university had a survey response that was 7.35% lower than reported population figures. Information on university demographics was obtained through the Maritime Provinces Higher Education Commission (ESIS 2003-2003), Memorial University (Fact Book 2003), and senior administration.

Descriptive Statistics

Of the total population of 5,999 faculty within all Atlantic Canadian Universities, 841 respondents returned either an email or mail survey representing a total response rate of 14.02%. A total of 803 surveys were useable.

The average age of respondents was 48.47 years, 61.03% were males, and 89.04% indicated they were full-time faculty. The average years of academic experience (number of years in academic life since completing their highest degree) was 13.96 years with the average years of teaching experience being 14.25.

The five categories of academic rank used in this study were fairly evenly represented in this sample. Adjunct Professors represented 1.38%, Lecturers represented 14.88%, 26.26% of the sample was comprised of Assistant Professors, 29% were Associate Professors, and 28.5% represented Full Professors. **Table 6** shows the descriptive statistics for faculty respondents.

When reviewing the educational backgrounds of faculty, again the results were as one might expect. Those holding a Ph.D. or equivalent represented 69.55% of the sample and 25.19% indicated they hold a Master degree. Faculty members who do not possess a graduate degree comprised a very small percentage of the total (3.76%). Similar to the results of academic administration, the majority of respondents came from disciplines in Arts and Humanities/Social Sciences (34%), followed by Science (19.57%) and Business/Commerce (12.30%). The disciplines related to specialized programs such as Public Relations (0.13%), Architecture (0.25%), and Theology (1.51%) comprised the smallest portion of the sample.

Alumni

Methodology

Alumni who graduated from university between 5 and 10 years ago were targeted for this study since secondary research indicated that the majority of young entrepreneurs start their business after the age of 25 (Atlantic Canada Opportunities Agency, 2001). It was also important that respondents had career experience and were able to easily recollect their university experience.

1. Alumni surveys were distributed through university alumni offices to ensure protection of privacy. Each office created a random list of 700 graduates who had graduated during the period 1993-1997 using the researchers' criteria. The whole population was targeted if universities had alumni lists of less than 700. Completed surveys were submitted via return mail. *Refer to Appendix D for a copy of the alumni letter and survey.*

Limitations

Each Atlantic Canadian university developed their list of alumni respondents based on the graduation year criteria. All alumni lists were randomly selected and each university verified that a random selection was used to create the mailing list.

Descriptive Statistics

Of the 10,890 alumni surveys distributed, 807 surveys (7.4%) were returned undeliverable. The total number of surveys received was 1664 creating a response rate of 15.28%. Of those returned, 1153 were usable based on the graduation year criteria.

The descriptive statistics regarding the alumni respondents are detailed in **Table 7**. The average age was 34.86 years, males comprised 30.09% of the sample, the majority

(85.83%) were Anglophone, and 72.78% were currently residing in Atlantic Canada. The distribution among the years of graduation was relatively uniform.

Concerning the educational backgrounds of Alumni, 75% have a Bachelor Degree followed by almost 14% with a Master Degree and less than 2% possess a Ph.D. The breakdown by disciplines showed the following: Arts and Humanities/Social Sciences (29.44%), Engineering (17.77%), Business/Commerce (17.25%) or Science (10.19%) with the minority coming from Architecture and Urban/Rural Planning (0.26%), Dentistry (0.52%) and Public Relations (0.61%).

Students

Methodology

Student surveys were primarily conducted using email systems which allowed quick, real-time response from a large population and minimized data entry. The whole student populations were targeted using two methods:

1. A blanket email message was sent to students within 17 of the 18 universities. The email message contained an invitation to participate in the Student Survey and contained a link to the survey hosted on a server at Saint Mary's University. Three subsequent reminder emails were sent in two week intervals. *Refer to Appendix E for a copy of email messages.*

2. Mail surveys were sent to the whole student population at one university since email distribution was not possible. Surveys were distributed and returned through internal mail. *Refer to Appendix E for a copy of the student survey.*

To encourage participation, bursary incentives were created - one $500 bursary and two $250 bursaries and winners were chosen at random. Students provided their name and contact number only if they wished to be entered into the draw and this information was removed prior to analysis.

Limitations

Web/email was chosen as the primary method of delivery for students as the population is large and geographically disbursed. It was recognized that emails would not reach all Atlantic Canadian universities; therefore the mail survey method was also required.

To increase response rates, email messages were sent by individuals within each university and were not sent during busy academic periods such as mid-term and final examinations. Invalid addresses were not tracked due to the 3rd party delivery of emails. Verification of delivery was provided by the universities upon distribution of each email message.

Limitations:

- Representative Sample: The representativeness of responses by university was examined and it was found to be uniform (less than 5% variance) across 14 of 18 universities. Of the four that were found not to be uniform, one university had a survey response that was 6.19% higher than reported population figures; one university had a response rate that was 14.48% lower than the reported population, one university had a response rate 5.45% lower than the reported population; and one university had a response rate 5.48% lower than the reported population.

- The representativeness of responses by discipline was examined and it was found to be uniform (less than 5% variance) across 15 of 18 universities. Of the three that were found not to be uniform, Architecture and Urban/Rural

Planning had a survey response that was 5.73% higher than reported figures and Arts and Humanities/Social Sciences had a response rate that was 8.69% higher than the reported figures.

Information on university demographics was obtained through the Maritime Provinces Higher Education Commission (ESIS 2002-2003), Memorial University (Fact Book 2003), and senior administration (2002-2003).

Descriptive Statistics

Of the total student population of 86,831 *(refer to Appendix E for student population table)* the percentage of students reached by email and paper survey was 82.63% of the total population (71,746 students). Of this convenience sample, the student email and paper surveys received were 11,786 creating a response rate of 13.57% of the total student population. A total of 11,747 surveys were useable.

Table 8 shows the descriptive statistics of the student sample. The average age of the respondents was 23.58 years, 31.50% were males and 93.31% were full-time students. The majority of respondents were English speaking (87.19%) while 8.18% were Francophone. A large majority, 78.96%, were Atlantic Canadian and a very small percentage, 6.5%, were international students.

The majority of responses came from students studying in the Arts and Humanities (30.22%), with the next highest percentage from Science (17.64%), followed closely by Business/Commerce (16.01%). The smallest percentage of responses represented Theology (0.54%), Dentistry (0.56%) and Medicine (1.04%). These results are consistent with responses from academic administration, faculty, and alumni and proportionate with the educational pursuits of the Atlantic Canadian university student population.

The vast majority, 86.47%, of students were pursuing a Bachelor degree. Smaller percentages were pursuing a Master degree (8.23%), a Certificate (2.66%) or a Ph.D. (1.84%). Full-time students represented 93.31% of the sample and the representation regarding year of study was fairly evenly distributed from 1st year through to 4th year, with a slight majority being 1st year students. A very small percentage of students were in their 5th, 6th, or 7th year of a particular program. See **Table 9.**

Methodology Tables – Academic Administration

Table 5
Descriptive Statistics
Academic Administration

Variables	Mean	Median
Age (in years) (n=123)	51.93	52.00
Academic Experience (years since completing highest degree) (n=125)	19.71	20.00
Administrative Experience (in years) (n=126)	4.35	3.00
Years Teaching (n=128)	20.16	20.00
Years of work experience outside the university (n=118)	6.09	5.00

Variables	Number	Percentage
Male (n = 125)	88	70.40
Rank: (n=127)		
Dean	29	22.83
Associate Dean	8	6.30
Department Head/Chair	65	51.18
Director of School	10	7.87
Director of Program	10	7.87
Other	5	3.94

Methodology Tables – Faculty

Table 6
Descriptive Statistics
Faculty

Variables	Mean	Median
Age (in years) (n=775)	48.47	49.00
Professional Age (years since completing highest degree) (n=787)	13.96	12.00
Years Teaching (n=794)	14.25	13.00
Years of work experience outside the university (n=791)	7.71	5.00

Variables	Number	Percentage
Male (n = 793)	484	61.03
Full-time (n=794)	707	89.04
Rank: (n=800)		
Lecturer	119	14.88
Assistant Professor	210	26.25
Associate Professor	232	29.00
Full Professor	228	28.50
Adjunct/Invited Professor	11	1.38

Methodology Tables – Alumni

Table 7
Descriptive Statistics
Alumni

Variables	Mean	Median
Age (in years) (n=1114)	34.86	31.00
Variables	**Number**	**Percentage**
Male (n = 1 140)	343	30.09
First Language English (n = 1150)	987	85.83
First Language French (n =1150)	140	12.17
Reside in Atlantic Canada (n = 1150)	837	72.78
Year of graduation (n=1153) :		
• 1993	195	16.91
• 1994	231	20.03
• 1995	229	19.86
• 1996	238	20.64
• 1997	260	22.55

Methodology Tables – Students

Table 8
Descriptive Statistics
Students

Variables	Mean	Median
Age (in years) (n=11,655)	23.58	22.00
Variables	**Number**	**Percentage**
Male (n =11,627)	3663	31.50
First Language English (n = 11,627)	10,137	87.19
First Language French	951	8.18
Canadian Citizen (n=11,540)	10,790	93.50
Atlantic Canadian (n = 11,597)	9,157	78.96

Table 9
Educational Pursuits
Students

Variables	Number	Percentage
Level of academic education being pursued (n=11,704)		
• Certificate	311	2.66
• Bachelor	10,121	86.47
• Master	963	8.23
• Ph.D. or equivalent	215	1.84
• Other	94	0.80
Full-time student (n=11,679)	10,898	93.31
Year of study in present program (n=11,725)		
1st year	3,491	29.77
2nd year	3,236	27.60
3rd Year	2,525	21.54
4th Year	1,971	16.81
5th Year	418	3.57
6th Year	56	0.48
7th Year or more	28	0.24


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ENTREPRENEURSHIP PROGAMS/COURSES

In 2001 an inventory of entrepreneurship courses and programs was developed by the St. Francis Xavier Enterprise Development Centre which provides a snapshot of entrepreneurship content within the curriculum of Atlantic Canadian universities. This inventory exists in database form to allow for updates.

Courses and Programs

At that time there were 151 courses relating to entrepreneurship offered within Atlantic Canadian universities. The majority of these courses are offered through business, commerce and management disciplines. Courses were also identified in the arts and humanities, computer science, education, engineering, health profession, science, and theology disciplines. Titles of these courses are largely in the genre of: studies in small business, the nature of entrepreneurship, family business, and entrepreneurship in software systems.

A small percentage of senior administration reported that their universities offer a degree program in entrepreneurship, although the large majority (85%) offer one or more entrepreneurship courses. This indicates that universities have begun to incorporate entrepreneurship courses into the curriculum thus creating a foundation to help promote entrepreneurship.

Business Development Centres

There are 10 university business development/entrepreneurship centers throughout Atlantic Canada. These centers exist to further entrepreneurship and are located within the following universities: Acadia University, Memorial University of Newfoundland, Mount Allison University, Mount Saint Vincent University, Nova Scotia Agricultural College, Saint Mary's University, St. Francis Xavier University, Université de Moncton, Université Sainte-Anne, and University of New Brunswick.

The Database

The database includes courses and programs currently in existence in Canadian universities and has been designed to allow for expansion to include additional entrepreneurship resources. It has the potential to become a robust resource containing program and project ideas, research, and curriculum which can prove very useful to those involved in entrepreneurship development in an educational environment. It is anticipated this information will be available through a web-site created and maintained by the Consortium.


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UNIVERSITY STRUCTURE & CULTURE

A review of existing structures and cultures within Atlantic Canadian universities was undertaken to provide insight into the purpose and operation of these academic institutions. The results of this review may help researchers determine how an entrepreneurship development model might best be developed to work effectively within these environments. The understanding of mandates, structures and common cultures, combined with a sense of the challenges and the barriers, will serve well in properly designing the model for entrepreneurship development which is respectful of the cultures, aligned with the mandates and conducive to the structures. It is important to note that the purpose was not to identify how to change the structure and culture but rather how to work in conjunction with it.

Information was gathered by way of studying organizational charts and calendars for each Atlantic Canadian university, interviewing presidents, and through a series of questions asked on the president, academic administration, faculty and student surveys.

A traditional university structure according to Neal (1998) and Mintzberg (1993) is configured with the Board of Governors and Senate at the top level of the organization, the next level being the President and then Vice-Presidents (can include academic, finance, administration, research, planning). Faculties (such as arts, science, music, medicine, agriculture, etc.) may fall under the Academic or Administrative Vice-President and within each Faculty are deans, department heads and faculty (professionals).

This traditional structure is described as a professional bureaucracy with a highly decentralized formation. The majority of power lies with the professionals with the role of administration being the handling of disturbances in the structure, defining the

boundaries of the organization, and delineating the boundaries between faculty, business, and industry. In the professional bureaucracy, senior administration directly affects the relationship between faculty, business and industry (Mintzberg, 1993). The majority of universities in Atlantic Canada operate within a traditional university structure according to senior administration and judging by their organizational charts.

Bird and Allen (1989) describe a traditional university culture as featuring "teaching, basic research and governance by peers" (p. 584). The collegial nature of the professional bureaucracy is clearly evident in Atlantic Canadian universities as a whole as demonstrated by the existence of senates, curriculum development and review committees, faculty councils, and tenure and promotion review committees. Additionally, teaching and research are seen as very important within Atlantic Canadian universities; however; the results showed an equal emphasis on basic/fundamental research and applied research as opposed to a concentration on basic research only.

Tenure of faculty is an element of the culture which has long been present with universities. Finkin (1998) indicates that:

> "tenure is a means to certain ends; specifically: 1) freedom of teaching and research and of extra-mural activities, and 2) a sufficient degree of economic security to make the profession attractive to men and women of ability. Upon freedom and economic security, and hence upon tenure, depends the success of an institution in fulfilling its obligations to its students and to society" (p.21).

All universities in Atlantic Canada provide the opportunity to acquire tenure and the levels of academic rank (lecturer to full professor) are similar among them. Interestingly, only 38% of Atlantic Canadian universities require an individual to have a Ph.D. before achieving tenure and almost 89% have full-time faculty without a Ph.D. Additionally, the large majority (83.3%) have a faculty union.

Mandates:

Peter Drucker says university organizations "function on the basis of budgets rather than results, and they tend to see their mission in moral or ethical terms rather than in economic ones" (Keast, 1995 as cited in Kozeracki, 1998, p.3). Desruisseaux (1999) desribes the core of universities' missions as "teaching, research, and community service" (p. 3).

Vision and Mission

When asked about the visions of their universities, 82% of presidents spoke about continuously improving their distinctiveness and high quality education; maintaining current high academic performance; and aspiring to the 2nd tier of research, reflecting traditional philosophies of universities (Bird & Allen, 1989). However, many presidents also spoke of a specialized focus, specifically, 50% indicated servicing market niches or adopting an international focus indicating transition.

All universities within Atlantic Canada have university mission statements that encompass teaching, research, and the development of the whole person. Their missions reflect a moral and ethical mandate (Keast, 1995 as cited in Kozeracki, 1998) and a philosophy of developing broad-based thinkers who positively contribute to society. Comments from presidents centered around "learning through teaching and research in a way that is personally and socially constructive", "holistic approaches to education", "undertaking high caliber research", and "a focus on teaching and research". The mandates are broad and reflect benefits to society as a whole and the local community and economy as well. However, almost half of senior administration (39%) linked the mission of the university to developing a specific segment of the population or concentrating on a particular industry sector/specialty area, again indicating transition at least among some Atlantic Canadian universities.

When asked what important contribution(s) their university makes to society, the majority mentioned student development (50%) and community development (56%). Specifically, "educating people who will bring a civilizing and liberalizing impact to the world, social development of our community, research and outreach to the community and community groups". These contributions further support the moral and ethical nature of their mandates but again there is evidence of specific geographic or sector related contributions. A small percentage of senior administration included economic development, regional development, and linking contributions to specific sectors or industries when discussing their contributions.

Universities, in general, service a number of constituents within society as a whole (Keast, 1995 as cited in Kozeracki, 1998). This was supported in the results of this study as senior administration reported students, small enterprises, faculty, staff, alumni, the community, government, donors, the international community and the church community as stakeholders who benefit from university services and programs. This confirms that, overall, Atlantic Canadian universities do service multiple constituents with differing needs and requirements.

Long-term Objectives and Challenges

Most of the long-term objectives articulated by senior administration were closely related to their visions and missions and appear to address the challenges facing them. The most significant challenge, according to 82% of senior administration, is attaining financial stability in order to remain competitive.

A sound financial base is required to prepare for the following challenges – to increase faculty recruitment and retention (53%); to repair existing facilities and acquire new infrastructure (29%); to increase student enrollment and retention (24%); and to increase

research resources (18%). The expected demographic decline in the youth population in the next 10 years combined with ensuring accessibility with rising costs are exacerbating the problem and complicating the challenge.

Revenue Sources

Senior administration was asked if there are significant strategies used to generate revenue over and above government funding and student tuition. Ninety-four percent of respondents answered this question and all indicated additional strategies are being employed. The majority (82%) of universities included capital campaigns, endowment funds, fundraising events, and alumni gifts as their primary sources of raising funds. However, 71% of respondents included private sector funding, cost-sharing strategies with industry, special events, and renting physical infrastructure in describing their revenue generating strategies.

In addition, 41% of respondents have "challenged faculties to become much more active in terms of producing revenue" such as developing new premium priced programs, undertaking contract research, forming academic and corporate partnerships, and co-operating with other universities on projects. In this study, the strategy of passing responsibility for generating revenue and managing expenses over to Faculties and departments has been termed an earned income philosophy. An earned income strategy promotes entrepreneurial behaviors (Clark, 1998) and affects organizational performance in a positive manner (Emerson & Twersky, 1996). Comments from senior administration regarding an earned income strategy show that the philosophy of earned income does exist among some Atlantic Canadian universities yet is not widely utilized. This strategy may promote innovation and build external relationships with the community.

The information reported above was gathered through interviews with Senior Administration and secondary sources. The following information was gathered using quantitative methods by surveying senior administrators, faculty, students, and academic

administrators. A series of questions were designed to provide information on how universities respond to change, if there is support for innovation, whether research activities are seen as important, and whether there is agreement among the respondent groups as to the general culture of universities and departments. In order to compare the results of all respondent groups, the results (mean only) of senior administration were converted from a 7 point scale to a 5 point scale.

Difficulty and Speed of Change

Change is normally slow to occur within universities due to the collegial nature of the structure meaning faculty have a voice in decision making, especially decisions that directly affect them. This form of decision making ensures standards are being met and explains the existence of departmental councils, curriculum committees and university senates. (Mintzberg, 1993). In this study, change relates to introducing new programs and modifying or eliminating existing courses. **See Table 10.**

Senior Administration

Senior administration was asked to rank difficulty and speed of major change within their university. On average they ranked difficulty 3.29 using a 5 point scale (1=very easy, 5=very difficult) and speed 2.96 using a 5 point scale (1=very slow, 5=very fast).

Academic Administration

Academic Administration generally believes it is only moderately difficult to introduce new programs or modify and eliminate existing courses within their department or Faculty. They were given a 5 point scale (1=very easy, 5=very difficult) and the mean response was 3.16. The speed of change may occur more slowly judging by the average rating of 2.74 using a 5 point scale (1 = very slow, 5=very fast).

Faculty

With regard to the difficulty and speed of change within their Faculty, respondents indicated change is only moderately difficult given the mean of 3.19 using a 5 point scale

(1=very difficult, 5=very easy) which is in line with that of academic administrators. The speed of change again seems to be more of a challenge given the average rating of 2.68 on a 5 point scale (1=very slow, 5=very fast).

These results were more positive than expected given the nature of university structures. The results indicate that change is not an extremely difficult task but tends to take place relatively slowly. Implementation of entrepreneurship programming should adhere to those procedures to increase acceptance and sustainability. This approach is supported by Desruiseaux (1999) wherein Bill Graham, President of the University of Toronto Faculty Association acknowledges the need for entrepreneurship inclusion in universities and suggests respecting the structure is a key to acceptance. In this case, it can be assumed that change is not a barrier to entrepreneurship development but rather a challenge that can be addressed by upholding the academic standards, proceeding through the established change process, and ensuring transparency and accountability.

Research

Given the fact that research is core to university mandates, it was of interest to determine whether interdisciplinary research is occurring, whether the focus of research is basic or applied, and whether there is evidence of outreach to the community.

Senior Administration

Results showed that 83% of senior administrators encourage interdisciplinary exchange between Faculties, and they describe their university's relationship with business and community as somewhat weak with regard to research. The mean ranking was 2.5 on a 5 point scale (1=very weak, 5=very strong).

Academic Administration

It is evident that research within Atlantic Canadian universities is seen as important among academic administrators. Again a 5 point scale was provided (1=very low, 5=very high) and on average, the respondents placed a slightly higher level of importance on basic research (3.71) than applied research (3.59); however the T-TEST procedure resulted in no significant difference.

This group indicated financial resources available for research within their respective universities is somewhat less than adequate according to the mean answer of 2.59 using a 5 point scale (1=very low, 5=very high). However, the majority, 66.93%, believe a critical mass of researchers exist within their Faculties/Departments to initiate and conduct research initiatives.

Academic administrators were asked the extent to which they believe faculty participate in inter-university research networks. Using a 5 point scale (1=never, 5=always) the mean rating of 2.91 indicated they believe faculty sometimes participate. Additionally, it is their opinion that faculty have a moderate relationship with business, industry, and government in conducting research projects, according to the mean answer of 2.90 on a 5 point scale (1=very weak, 5=very strong).. **Table 11** provides the full results.

Faculty

Faculty in Atlantic Canadian universities have a high interest in research according to the mean answer of 4.08 using a 5 point scale (1=very low interest, 5=very high interest). This result is further supported by the majority (78.43%) of faculty being actively involved in research. Those involved are undertaking just slightly more applied research (50.49) than basic/fundamental research (49.14%) and are actively publishing as well with the average number of juried publications in the past three years being 5.14.

This group indicated financial resources available for research within their respective universities is less than adequate according to the mean answer of 2.45 using a 5 point scale (1=very low, 5=very high); consistent with the mean answer of academic

administration of 2.59. However, only a slight majority (54.70%) believe a critical mass of researchers exists within their Faculties/Departments to initiate and conduct research initiatives as opposed to academic administration where 66.93% indicated a critical mass exists in their Faculties/Departments.

Faculty indicated they sometimes participate in inter-university research networks according to their mean rating of 2.69 using a 5 point scale (1=never, 5=always). This result was close to that of academic administrators' opinion concerning faculty's participation rates (2.91). Additionally, faculty rated their relationship with business, industry, and government in conducting research projects as moderately weak, judging by the mean of 2.52 on a 5 point scale (1=very weak, 5=very strong). This result was lower than that of academic administrators (2.90). See **Table 12**.

Innovation

According to Peters and Waterman (1982) as cited in Louis, Blumenthal, Cluck and Stoto (1989) and Hatten and Ruhland (1995) there is a strong connection between entrepreneurship, innovation and invention, therefore, it was desirable to determine if innovative activities among faculty and students are supported and encouraged within Atlantic Canadian universities. Additionally, innovation is normally slow to occur in a decentralized structure because it does not facilitate cooperation and acceptance of new ideas across specialties (Mintzberg, 1993).

Senior Administration

The majority of senior administrators (83%) recognize innovation, new initiatives, and new venture brought forth by faculty and by students, and 61% believe their university's existing culture fosters the development of entrepreneurship in faculty and students. Awards and public recognition were cited as the most common means used to encourage innovative behavior among faculty; however, it is also encouraged through the curriculum development process. Innovation among students is encouraged through financial incentives (scholarships/bursaries) and awards.

Academic Administration

Academic administrators were asked what level of support they place on innovation and new initiatives brought forth by faculty and by students using a 5 point scale (1 = very low, 5 = very high). According to the respondents' average ranking of 4.01, faculty innovation is highly supported and the average ranking of 3.78 indicates student innovation is also supported yet slightly less so. Refer to **Table 13**.

Faculty

It was important to gauge whether faculty believe their university supports and encourages innovative activities among both faculty and students in order to compare faculty's views to those of senior and academic administration.

The results showed that faculty believe support for faculty driven innovation is only moderate (2.95) and slightly less so for student innovation (2.45) using a 5 point scale (1=very low, 5=very high). These results were lower than those of academic administration who indicated that support for faculty innovation (4.01) and student innovation (3.78) is relatively high.

Students

Students were also asked if their university supports innovation and new initiatives brought forth by students. The mean answer was 3.26 indicating they believe this type of support is moderate.

Commercialization

The level of commercialization of research results in Atlantic Canadian universities was not addressed specifically in this study; however, it was of interest to determine whether support for commercialization is available and whether academics take steps toward commercialization (ie. registering a patent).

Senior Administration

The majority (72%) of Atlantic Canadian universities support the commercialization of research results according to senior administration. This support is largely provided through a department designated to research and development or technology transfer and staffed with individuals who possess expertise in these areas. Some universities that do not have these resources available on site have established partnerships with universities that do in order to provide faculty with access to this expertise.

Faculty

When asked about support for the commercialization of faculty research, 40.53% agreed that their university provides financial, advisory or structural support, 9.66% disagreed, and almost 50% said they did not know whether their university supports commercialization. **Table 14** provides the results.

The disciplines where the majority of respondents indicated their university does support commercialization were Computer Science (66.67%), Engineering (57.50%), Forestry and Environmental Studies (64.71%), Law (71.43%), Medicine (65.52%), and Science (55.58%). The disciplines where the majority indicated they did not know whether their university supported commercialization were Arts and Humanities/Social Sciences (59.40%), Business (51.58%), Dentistry (57.14%), Education (66.67%), Health Profession (55.36%), and Other (83.33%). Theology was the only discipline from which respondents indicated either their university does not support commercialization (50%) or they did not know (50%).

Further analysis showed some differences with regard to research activity among those who have commercialization support, those who do not have support, and those who are unaware of any support. Those who do not have commercialization support are more actively involved in applied research than those who either have support or are unaware of support and the difference was significant. However, those who have

commercialization support had a significantly higher number of juried publications in the past three years and indicated a significantly stronger relationship with business, industry, and government in conducting research projects. Refer to **Table 15** below.

Regarding inventing/innovating activities among faculty, there was a significant difference found between those who are unaware of support and the other two groups. A significantly higher percentage have not invented or improved a product, process, or service; however, no differences were found between those with support and those without support. This indicates that commercialization activity and support may be more relevant to certain disciplines than others but moreover, the fact that no differences were found in inventing/innovating activity between those who have support and those who do not is interesting. While the results of this study do not address this issue specifically, results do indicate there are differences among inventors'/innovators' motivations and purpose for inventing/innovating. Some may desire to invent/innovate for commercial purposes while others wish to invent/innovate for academic purposes. This is also supported by the result that over half (55.65%) of the faculty who indicated they have invented or improved a product, process, or service did not register their invention and further a very small percentage of faculty have held equity in a company with products based on their research results (7.80%).

Earned Income Philosophy

According to senior administration, Atlantic Canadian universities are faced with financial challenges such as having the financial capacity to stay competitive in terms of attracting faculty, providing research funding, acquiring new infrastructure, and maintaining current facilities. One method being used by certain Canadian universities is encouraging an earned income philosophy among academic administration and faculty, meaning they are passing responsibility for revenue generation and expenses over to Faculties and departments. It was of interest to determine whether this philosophy is present within Atlantic Canadian universities.

Senior Administration

Senior administrators, overall, believe an earned income philosophy is only moderately present within their university culture given a mean of 2.86 on a 5 point scale (1=definitely not, 5=definitely).

Academic Administration

Slightly more than 36% of academic administrators indicated they are frequently involved in fundraising or revenue generation for their Faculties/departments. While it may not be an entrenched philosophy, there is evidence some universities are adopting an earned income philosophy, at least among the academic administration sector. The results showed that those involved in fundraising or revenue generation for their Faculty/department are administering departments in disciplines such as Engineering, Business, Dentistry, Law, Medicine, and Public Relations.

Faculty

Only 22.82% of faculty said they are involved in fundraising or revenue generating activities for their departments, indicating the majority of faculty do not possess an earned income philosophy.

University Structure and Culture Tables

Table 10
Comparison of Respondent Groups
Difficulty and Speed of Change

	Senior Admin. Mean	Acad. Admin Mean	Faculty Mean
Difficulty of Change (Scale: 1=very easy, 5=very hard)	3.29	3.16	3.19
Speed of Change (Scale: 1=very slow, 5=very fast)	2.96	2.74	2.68

Table 11
Research within Faculty/Department
Academic Administration
(n between 121 and 128)

Variables	Mean	Median
Importance of Applied Research (Scale: 1=very low, 5=very high)	3.59	4.00
Importance of Basic Research (Scale: 1=very low, 5=very high)	3.71	4.00
Faculty members participate in inter-university research networks (Scale: 1=never, 5=always)	2.91	3.00
Faculty members use of external relationships in conducting research (Scale: 1=very low, 5=very high)	2.90	3.00
Financial resources available (Scale: 1=very low, 5-very high)	2.59	3.00

Variables	Number	Percentage
Critical mass exists within department	85	66.93

Table 12
Research Activities
Faculty

Variables	Mean	Median
Interest in research (n=796) (Scale: 1=very low, 5=very high)	4.08	4.00
Participates in inter-university research networks (n=628) (Scale:1=never, 5=Always)	2.69	3.00
Financial resources available (n=777) (Scale: 1=very low, 5=very high)	2.45	3.00
Relationship with business, industry, government in conducting research projects (n=622) (Scale: 1=very weak, 5=very strong)	2.52	2.00

Variables	Number	Percentage
Have held a Research Chair (n=791)	27	3.41
Critical mass exists within department (n=788)	431	54.70
Actively involved in research (n=788)	618	78.43

Variables	Mean	Median
• Percentage of Applied research (n=585)	50.49	50.00
• Percentage of Basic research (n=582)	49.14	50.00
• Number of juried publications in last 3 years (n=588)	5.14	3.00

Table 13
Comparison of Respondent Groups
Support for Innovation
(Scale: 1=very low, 5=very high)

Variable	Academic Admin. Mean	Faculty Mean	Students Mean
Support for Faculty Innovation	4.01	2.95	n/a
Support for Student Innovation	3.78	2.45	3.26

Table 14
Support for Commercialization
Faculty
(n=787)

Variables	Number	Percentage
Support for commercialization of faculty research:		
Yes	319	40.53
No	76	9.66
Don't know	392	49.81

Table 15
Support for Commercialization
and Research Activity
Faculty

	% of Applied Research	# of Juried/Reviewed Publications	Strength of Relationship with Bus, Ind., Gov. (Scale 1-5, 5 =very strong)	Externally Funded Research ($)	Privately Funded Research ($)
	Mean	Mean	Mean	Mean	Mean
University Supports Commercialization	50.63 B	6.10 A	2.85 A	$341,240 A	$71,058 A
University does not Support Commercialization	61.97 A	4.05 B	2.48 AB	$141,841 A	$37,091 A
Not Aware of Support	47.29 B	4.51 B	2.23 B	$109,105 A	$10,075 A

Means with the same letter are not significantly different

ATTITUDES AND ACTIVITY

SENIOR ADMINISTRATION

Attitude Toward Entrepreneurship

Five statements were designed to measure general and specific attitudes toward entrepreneurship. Each respondent group was given a 5 point scale (1=strongly disagree, 5=strongly agree) and were asked to rate their level of agreement with each of the statements. The first three (3) statements measured attitudes toward entrepreneurship: Entrepreneurs make a positive contribution to society; Entrepreneurs are admired within society; and Entrepreneurship is a good career option and the last two (2) statements were more specific to attitudes toward implementing entrepreneurship within universities: Universities should invest resources in the development of entrepreneurship; and Entrepreneurship should be a part of every degree program.

Senior administration was provided a 7 point scale (1=strongly disagree, 7=strongly agree) to measure attitudes; however, the mean results have been converted to a 5 point scale for comparison purposes with the other respondent groups (1=strongly disagree, 5=strongly agree)

When asked if entrepreneurs make a positive contribution to society, the average response was 4.3 indicating senior administrators believe that entrepreneurs make positive contributions. They also agreed that entrepreneurs are respected, admired and have a high level of social status (3.81). When asked if being an entrepreneur is a good career option, the average response was 3.91 signifying their agreement and they tended to agree that universities should invest time and/or money to promote the development of entrepreneurship (3.75).

When asked if entrepreneurship should be part of every student's degree program the response dropped to 2.62 indicating they somewhat disagreed with the implementation of entrepreneurship development across all disciplines. Senior administration was also asked if entrepreneurship should be part of every course within university and the average response was 1.29 signifying their strong disagreement with this statement.

ACADEMIC ADMINISTRATION

Attitude Toward Entrepreneurship

Academic administrators generally agreed that entrepreneurs make a positive contribution to society judging by the mean or average answer of 4.14. They somewhat agreed that entrepreneurs are admired within society (3.58) and that entrepreneurship is a good career option (3.61) but only marginally agreed that universities should invest resources in the development of entrepreneurship (3.33). They somewhat disagreed with the statement that entrepreneurship should be part of every degree program (2.61). The results are detailed in **Table 16**.

This group was also asked their opinion concerning the general attitude toward entrepreneurship within their Faculty/department. The average answer was 3.11, this time using a 7 point scale (1=very negative, 7=very positive), indicating they believe the attitude is somewhat negative among faculty members.

Further analysis showed that possessing an earned income philosophy may impact a more positive attitude toward entrepreneurship. The T-TEST procedure was used to compare the mean answers of the attitudinal questions of those with an earned income philosophy against those without an earned income philosophy. A statistically significant difference in the mean responses resulted in three of the five attitudinal statements. The three included, "entrepreneurs make a positive contribution to society", "universities should invest resources in entrepreneurship development", and "entrepreneurship should be part

of every degree program". In each case, those with an earned income philosophy rated these three attitudinal questions significantly more positively than those without an earned income philosophy.

Perception of Entrepreneurship

To gain insight into the perception of entrepreneurship of academic administrators they were asked to choose between two definitions, selecting the one which most closely matched their own definition of the term. One definition was business oriented and stated: "Entrepreneurship is a process whereby a combination of resources, characteristics and knowledge are utilized to create and operate a profit-oriented business". The second definition was broad and stated: "Entrepreneurship is a process whereby a combination of resources, characteristics and knowledge are utilized to recognize and act on opportunities that may improve the quality of life for others".

A slight majority (54.84%) chose the business oriented definition, while 45.16% chose the broad definition, indicating many academic administrators think entrepreneurship can be applied to many aspects of life, including, but not limited to initiating a for-profit business. See **Table 17**.

In order to determine whether perception of entrepreneurship impacts attitude toward entrepreneurship among academic administration, a T-TEST procedure was used to compare the mean responses of the attitudinal questions of the two groups. Group one was comprised of those who chose the business oriented definition and group two included those who chose the broad definition. There was no statistically significant difference found between the means of each group, indicating their perception of entrepreneurship does not necessarily affect their attitude toward it. See **Table 18**.

Importance of Entrepreneurial Characteristics/Skills in Students

It was important to determine which entrepreneurial characteristics/skills are seen as important for student development from the perspective of academic administration. This group was provided 33 characteristics/skills and asked to rank their importance on a 5 point scale (1=very low, 5=very high).

The characteristics/skills that were identified as being most important were communication skills (4.65), curiosity (4.53), perseverance and enthusiasm (4.52), ability to learn from mistakes (4.50), and responsibility/accountability (4.50). Self confidence and creative thinking/innovativeness were also identified as important characteristics with means of 4.33 and 4.31 respectively. In each case, the median was very close to the mean answer indicating low variability in the responses. The need for power (2.23), desire for constant change (2.82), and perfectionism (2.94) were seen as the least important. See **Table 19.**

Teaching Resources and Support

Academic administrators were asked if there are one or more entrepreneurship courses offered within their Faculty/department. Almost 27% indicated there are entrepreneurship courses offered and just over 5.5% indicated they did not know.

Both Eekles (1987) and Vawdrey (1987) agree that experiential learning is a key component of entrepreneurship education and many opportunities exist to link students with community organizations and business owners. Through these interactions, students will develop an appreciation for entrepreneurship that may not be possible through lectures, and these business and community leaders serve as role models for future entrepreneurs.

In order to better understand if academic administrators believe these external contacts are being utilized by faculty, they were asked to describe their faculty members' use of external business, community, and government networks to augment teaching. The

average answer was 2.87 using a 5 point scale (1=very low, 5=very high) indicating they believe faculty's use of these networks is slightly low. Additionally, they were asked to rate the availability of financial resources for teaching activities within their respective universities using the same 5 point scale. The average response was 2.45, signifying that financial resources are somewhat low or relatively scarce which may be a deterring factor in faculty's ability to utilize external resources. **See Table 20.**

Research Activities

Despite this respondent group's administrative responsibilities, they have a high interest in research according to the mean answer of 4.14 using a 5 point scale (1 = very low, 5 = very high). The majority (79.53%) are activity researching and publishing with the average number of juried publications in the past three years being 5.31. What is more interesting, is those who are actively researching indicated a higher percentage of their research is applied research (57.47%) versus basic/fundamental research (43.40%) even though as a group they placed slightly less importance on applied research.

Entrepreneurial Activity

The bank of questions related to entrepreneurial activity were designed to determine if academic administrators engage in entrepreneurship or have past experience with entrepreneurial endeavours. Entrepreneurial activity was broken down into three entrepreneurship types: business entrepreneurship, social entrepreneurship, and inventing/innovating. Just over 21% said they have owned a business, almost 33% indicated they have managed/directed a not-for-profit organization, and 27% said they have invented or improved a product, service or process. Of the 34 individuals who indicated they were inventors/innovators, 19 of them did not register their product or process which represents almost 56%. Of those who did register their invention, the majority obtained copyright (20.59%), followed by patent (14.71%), industrial design (5.88%), and trademarks (2.94%). See **Table 21** for the complete results.

Entrepreneurship and Demographics

It was of interest to identify if those who indicated they are involved in one of the three types of entrepreneurship differ from those who indicated they are not with respect to their academic experience, level of education, age, experience outside the academic environment, and administrative rank.

The comparison resulted in no statistically significant difference between those who have owned a business and those who have not with regard to the variables listed above.

With respect to social entrepreneurs, there were no statistically significant differences based on academic experience, level of education, experience outside the university environment, and academic rank yet there was a significant difference in the mean age of the social entrepreneurs and non-entrepreneurs. Social entrepreneurs tend to be younger (50.31) than the non-entrepreneurs (52.77).

Comparisons of the inventors/innovators with non-inventors/innovators resulted in no statistically significant differences with regard to academic experience, level of education, experience outside of the university environment, and academic rank. There were significant differences in age; the inventors/innovators being younger (49.55 years) than the non-inventors/non-innovators (52.8 years).

Entrepreneurship and Research

Further analysis showed no statistical difference between inventors/innovators and non-inventors/innovators with regard to being actively involved in research and no statistical difference was detected between inventor/innovators and non-inventors/innovators with regard to holding a research chair. However, a T-TEST conducted on the mean responses of inventors/innovators and non-inventors/innovators showed a statistically significant difference in the type of research undertaken. Inventors/innovators conduct significantly more applied research than basic/fundamental research.

Entrepreneurship and Earned Income Philosophy

Additionally, it was of interest to determine if differences exist between those who are involved in revenue generation for their departments (earned income philosophy) and those who are not with regard to entrepreneurial activity. A higher percentage of those who are involved in revenue generation are also involved in one of the three types of entrepreneurship (business entrepreneurship, social entrepreneurship, inventing/innovating) and the difference was found to be statistically significant.

Attitudes – Academic Administration Tables

Table 16
Attitude Toward Entrepreneurship
Academic Administration
(n-127)

Variables	Mean	Median
Attitudes toward entrepreneurs (scale 1=strongly disagree, 5=strongly agree)		
• Entrepreneurs make a positive contribution to society.	4.14	4.00
• Entrepreneurs are admired within society.	3.58	4.00
• Entrepreneurship is a good career option.	3.61	4.00
• Universities should invest resources in entrepreneurship.	3.33	3.00
• Entrepreneurship should be part of every degree program.	2.61	3.00

Table 17
Perception of Entrepreneurship
Academic Administration
(n=124)

Variables	Number	Percentage
Definition of entrepreneurship:		
• Business oriented – Entrepreneurship is a process whereby a combination of resources, characteristics, and knowledge are utilized to create and operate a for profit business.	68	54.84
• Broad – Entrepreneurship is a process whereby a combination of resources, characteristics, and knowledge are utilized to recognize and act on opportunities that may improve the quality of life for others.	56	45.16

Table 18
Comparison of Means
Perception of Entrepreneurship and Attitude Toward Entrepreneurship
Academic Administration

Attitude	Perception - Business oriented Definition Mean	Perception - Broad Definition Mean
Entrepreneurs make a positive contribution to society	3.81	4.04
Entrepreneurs are Admired within society	3.31	3.34
Becoming an entrepreneur is a good career option	3.34	3.36
Universities should invest resources in the development of entrepreneurship	2.90	3.26
Entrepreneurship should be part of every student's degree program	2.11	2.54

**** - statistical significance to p<0.05***

Table 19
Importance of Entrepreneurial Characteristics in Students
Academic Administration
(n=between 122 and 126)

Variables (Scale: 1=very low, 5=very high)	**Mean**	**Median**
Communication skills	4.65	5.00
Curiosity	4.53	5.00
Perseverance	4.52	5.00
Enthusiasm	4.52	5.00
Responsibility/Accountability	4.50	5.00
Ability to learn from mistakes	4.50	5.00
Ability to find required information	4.42	4.00
Initiative/Active involvement	4.41	4.00
Desire to complete a project from start to finish	4.37	4.00
Self-confidence	4.33	4.00
Resourcefulness	4.32	4.00
Creative thinking/innovativeness	4.31	4.00
Self-esteem	4.27	4.00
Ability to handle pressure	4.19	4.00
Ability to acquire expertise	4.18	4.00
Capacity to adapt to changes	4.14	4.00
Ability to process feedback	4.14	4.00
Ability to put theory into practice	4.13	4.00
Need to achieve	4.01	4.00
Optimism	4.00	4.00
Ability to identify an opportunity to improve a situation	4.00	4.00
Desire to control one's destiny	3.80	4.00
Ability to use and apply new technology	3.77	4.00
Empathy	3.76	4.00
Leadership abilities	3.68	4.00
Desire for independence	3.65	4.00
Ability to maximize the potential of others	3.62	4.00
Risk taking ability	3.42	3.00
Intuition	3.33	3.00
Competitiveness	3.03	3.00
Perfectionism	2.94	3.00
Desire for constant change	2.82	3.00
Need for power	2.23	2.00

Table 20
Entrepreneurship Courses and Teaching Activity
Academic Administration

Variables	Number	Percentage
One or more entrepreneurship courses within Faculty (n=126)	34	26.98
Unaware of entrepreneurship courses within Faculty (n=126)	7	5.56

Variables (Scale: 1=very low, 5=very high)	Mean	Median
Faculty members use of external networks for teaching (n=126)	2.87	3.00
Personal Interest in teaching (n=128)	4.60	5.00
Availability of financial resources for teaching (n=125)	2.45	2.00

Table 21
Entrepreneurial Activity
Academic Administration

Variables	Number	Percentage
Business entrepreneur (n=127)	27	21.26
Social entrepreneur (n=128)	42	32.81
Inventor (n=127) – invented or improved product/process	34	26.77
• Not registered	19	55.88
• Patent	5	14.71
• Copyright	7	20.59
• Trademarks	1	2.94
• Industrial design	2	5.88
• Integrated circuit topography	0	0
Held Equity in a company based on their research results (n=115)	11	9.57

Variables	Mean	Median
Likelihood for business entrepreneurship (n=122) (Scale 1=very unlikely, 5=very likely)	2.56	2.00

FACULTY

Attitude Toward Entrepreneurship

Jackson and Rodkey (1994), supported by Gibb (1987), argue that:

> "The presence of entrepreneurial attitudes among a population may be an important indicator of the pool of potential entrepreneurs. Areas with a larger proportion of people who are willing to take financial risks or who think it might be easy to start a successful business, may display higher rates of firm creation simply because the region contains more people who are likely to start a business" (Jackson & Rodkey, 1994, p.360).

Applying this theory to the university population, one could assume that a positive attitude toward entrepreneurship in faculty would influence the number of student entrepreneurs in that population. Faculty were provided the same five statements as academic administration and asked to rate their level of agreement with each statement using a 5 point scale (1=strong disagree, 5=strongly agree).

While faculty's attitude toward entrepreneurship in general was fairly positive, their attitude toward entrepreneurship development within universities was somewhat negative. They agreed with the statement that entrepreneurs make a positive contribution to society, given the average answer of 3.97 and they somewhat agreed that entrepreneurs are admired within society (3.60). They were less agreeable to entrepreneurship being a good career option (3.38) and were close to being indifferent with regard to whether universities should invest resources in the development of entrepreneurship (3.20). The statement related to entrepreneurship being part of every degree program evoked a fairly negative average response of 2.51 signifying they somewhat disagreed. These results demonstrate that, in general, faculty believe entrepreneurship is valuable to society yet may not think it is applicable to every degree program. **Table 22** provides the results.

In order to determine whether possessing an earned income philosophy impacts a more positive attitude toward entrepreneurship among the faculty respondent group, the T-TEST procedure was used to compare the means of the attitudinal statements of those with an earned income philosophy against those without an earned income. No statistically significant differences in the mean responses resulted in any of the five attitudinal statements indicating an earned income philosophy does not necessarily impact a more positive attitude among faculty. These results are not consistent with academic administration where possessing an earned income philosophy did result in a more positive attitude toward entrepreneurship.

Perception of Entrepreneurship

In relation to their perception of entrepreneurship, 69.82% of faculty chose the business oriented definition of the term over the broad definition, indicating the majority believe entrepreneurship is related to the creation and operation of a for-profit business. This may help explain why faculty do not agree that entrepreneurship should be part of every degree program. See **Table 23**.

To provide further insight as to whether perception of entrepreneurship has an impact on attitude towards it, the mean response to the five attitudinal statements of the group who chose the business oriented definition was compared to the group who chose the broad definition. The T-TEST revealed differences in the means and statistical significance was detected in four of the five statements. The only statement that did not result in a statistically significant difference was "entrepreneurs are admired within society". **Table 24** provides the results of the mean comparison.

Those disciplines with the highest percentage of respondents who chose the business oriented definition included: Arts and Humanities/Social Sciences, Business, Computer Science, Dentistry, Engineering, Forestry and Environmental Science, Law, Medicine and Science. Those disciplines with equal or more even distribution between the percentage of respondents that chose the business oriented definition and those who chose the broad definition included: Theology, Education, Health Profession, and Other.

Importance of Entrepreneurial Characteristics in Students

Faculty were asked to rank the same 33 characteristics as academic administrators using the same 5 point scale (1=very low, 5=very high) from the perspective of their importance relative to student success in their courses. The results are detailed in **Table 25**.

The most important characteristics identified included curiosity, enthusiasm, and perseverance with means in the 4.27 to 4.30 range. Communication skills (4.25), ability to learn from mistakes (4.23), and ability to find required information (4.22) were also ranked as important to very important. These results are consistent with those of academic administrators. Additionally, creative thinking, with a mean of 4 was identified as important along with self-confidence with a mean of 3.75.

The characteristics that were seen as less important or unimportant for students' success in their courses included need for power (1.92), desire for constant change (2.61), risk taking ability (2.72), and leadership ability (2.97). Again, these results are consistent with those of academic administration.

Teaching Methods and Resources

In order to better understand if experiential approaches to teaching are being used on a regular basis, faculty were asked to indicate the frequency they use various teaching methods, both traditional and experiential. According to Tompson and Dass (2000) traditional university methods include lectures, case studies, supporting textbooks, and practical exercises. Basic business skills, communication skills and technical expertise

can be taught successfully using traditional methods; however, this is not the case concerning self-efficacy, strategic thinking, business planning, goal-setting and decision making along with certain personal characteristics. These are best developed using experiential methods (Tompson & Dass, 2000).

Lecture was rated on average as almost always being used (3.90) followed by classroom discussions (3.74), and independent study (3.41); these methods are considered more traditional (Tompson & Dass, 2000). The methods used the least on average were field trips (1.95), simulations/role plays (2.17), guest speakers (2.33) and community-based, real world projects (2.53); these methods are considered experiential methods (Ibid). The results show that, in general, faculty use more traditional teaching methods and do not regularly incorporate experiential learning techniques into their courses. **See Table 26.**

Faculty were then asked to rate their use of external business, community and government networks to augment teaching. Again, using a 5 point scale (1=very low, 5=very high) the average rating of 2.33 indicates that generally their use of these external networks is somewhat low. This result might further explain why the use of mentoring, guest speakers, and community-based projects is also somewhat low. Additionally, financial resources available for teaching are relatively scarce (2.35) yet their interest in teaching is very high (4.43) so it may not be financially feasible to incorporate experiential learning techniques or to utilize external networks.

While these results provide a general overview of the teaching methods most widely used, it does not account for the use of different methods in different disciplines. In order to account for these differences, methods most commonly used were matched to disciplines to see if there was significant deviation from the norm. This would indicate whether certain faculty move outside of the traditional boundaries and explore new ways of teaching.

The results indicate that faculty in different disciplines do use different teaching methods. Further analysis was done to identify the characteristics of those who use enactive mastery experiences (hands-on activities) and vicarious experience (speaker series, guest instructors) more so than traditional teaching methods such as lectures, classroom discussions and case studies (Tompson & Dass, 2000).

Mentoring

Results showed that those who ranked the use of mentoring higher than the mean with a statistically significant difference also have a significantly higher than average use of external networks to enhance teaching. They are significantly less experienced relative to academic experience (years since attaining their highest level of education) and they use the lecture method significantly less than average. Mentoring is used more frequently than average in Architecture and Urban/Rural Planning, Medicine, and Public Relations. It is used less frequently than average in Arts and Humanities/Social Sciences, Business, Computer Science, Engineering, Forestry and Environment Science, Law, Science, and Other.

Field Trips/Site Visits

Those who ranked the use of field trips/site visits significantly higher than average, use external networks more than average and are significantly older. Field Trips/Site Visits are used more frequently in Architecture and Urban/Rural Planning, Forestry and Environment Science, Education, Health Profession, Engineering, Science, and Other and less frequently than average in Computer Science and Law.

Community-based Real World Projects

The group that indicated they use this teaching method more often than average use external networks to enhance teaching more often than any other group, the mean difference being largest and statistically significant. Their academic experience is slightly less than average, they are slightly older and they too use the lecture method less often than average. Those who use this method more often come from: Architecture and

Urban/Rural Planning, Business, Education, Health Profession, Public Relations, and Other and those who use this method less frequently than average come from: Science, Law, and Dentistry.

Guest Speakers

Those using guest speakers more often than average also have a statistically significant higher use of external networks to enhance teaching. The result is understandable since guest speakers tend to use the lecture method. The difference may lie in the content of the talk so the two are quite similar. Those who use this method more often than average come from Forestry and Environmental Science, Health Profession, Theology, and Education. Those who use this method less often than average come from Computer Science, Dentistry, and Public Relations.

Simulations/Role Plays

The respondents who ranked this method as one they use more frequently than average also indicated significantly higher use of external networks and contacts to enhance teaching. They have less academic experience but are not younger. Similar to faculty who use various experiential teaching methods, those who utilize simulations and role plays also use the lecture method significantly less than average. The faculty that employ this method more often than average come from Education, Public Relations, and Other and those who use it less often come from Computer Science, Engineering, Law, Science, and Theology.

It is important to note that some teaching methods are simply more appropriate and effective than others depending on the circumstances. Class size, availability of external resources, and content of the course may all impact the method chosen. For example, utilizing real-world projects with a class size of 300 may simply be difficult to coordinate, monitor, and grade. Likewise, utilizing group work with a class size of 5 may not be the best method for maximum learning. Therefore, circumstances beyond the control of the instructor may have more influence on teaching methods most commonly used than the desire or ability to use the methods.

Entrepreneurial Activity

There was the desire to gauge the entrepreneurial activity of faculty relative to the three types of entrepreneurship being researched in this study; business entrepreneurship, social entrepreneurship and inventing/innovating. See **Table 27**.

Interestingly, 25.97% of faculty said they have owned a business and 31.82% have directed or managed a not-for-profit organization, excluding their university activities. With regard to inventing/innovating activities, 28.64% indicated they had invented or improved a product, service or process. This result was not unusual given one focus of universities is to create new knowledge through research.

When comparing those who engage in entrepreneurship against those who do not by discipline, interesting patterns emerged. Those disciplines where a large percentage of respondents indicated they are business entrepreneurs included: Business (51.02%), Other (50%), Engineering (42.50%), and Computer Science (40%). Those disciplines with the highest percentage of social entrepreneurs included: Theology (50%), Other (50%), Business (48.98%), and Engineering (42.50%). Finally, the disciplines with the highest percentage of inventors/innovators were: Engineering (65%), Forestry and Environment Science (52.94%), Computer Science (50%), and Law (42.86%).

Entrepreneurship and Demographics

It was of interest to identify if those involved in one of the three types of entrepreneurship differ from those who are not with respect to their academic experience, level of education, age, academic rank, and experience outside the university environment.

The results showed a statistically significant difference between business entrepreneurs and non-business entrepreneurs with regard to level of education, age, academic rank, and experience outside the university. A significantly higher percentage of those who have owned a business indicated their highest level of education was a Masters degree, they tend to be older (49.45 years) than non-business entrepreneurs (48.03), the highest

percentage fall into the Lecturer category of academic rank, and they have significantly more years of experience outside of the university setting (11.03 years) than those who have not owned a business (6.52 years). No statistical significance was found with regard to academic experience.

The results also showed significant differences between social entrepreneurs and non-entrepreneurs. Social entrepreneurs have significantly more academic experience (15.48 years) than non-entrepreneurs (13.27 years), are older (51.27 years) than non-entrepreneurs (47.18 years), and have more years of experience outside the university setting (10.05 years) than non-entrepreneurs (6.56 years). There was no significant difference with regard to level of education and academic rank.

Comparisons of the inventors/innovators with non-inventors/innovators resulted in statistically significant differences with regard to academic experience, academic rank, and experience outside the university setting, yet no statistically significant differences in level of education and age. Inventors/innovators have significantly more academic experience (15.49 years) than non-inventors/non-innovators (13.37 years), tend to be at the top of the academic rank scale (Full Professor) and have significantly more years of experience outside the university setting (8.73 years) than non-inventors/innovators (7.27 years).

Entrepreneurship and Research

Further analysis showed no statistical difference between inventors/innovators and being actively involved in research; however, a statistically significant difference was detected regarding the type of research conducted. A significantly higher percentage of applied research is undertaken by inventors/innovators. This result is consistent with academic administrators who are inventors/innovators regarding their level of applied research versus basic/fundamental.

Entrepreneurship and Earned Income Philosophy

The results showed no statistically significant differences among those who possess an earned income philosophy and those who do not, regarding their involvement in the three types of entrepreneurship (business, social entrepreneurship and inventing/innovating). This result conflicts with the results of academic administration relative to this cross tabulation where a statistical difference was detected.

Business Entrepreneurship Potential

Lastly, a measurement of faculty's business entrepreneurial potential was taken to determine if the desire for entrepreneurial activity was present but being underutilized. They were asked to rate the likelihood they would apply their knowledge to create a new business or improve an existing business in the private sector. Using a 5 point scale (1=very unlikely, 5=very likely) the average answer was 2.63, indicating that becoming an entrepreneur is not necessarily a high priority among faculty. See **Table 27**.

Academic Entrepreneurship

To further understand the attitudes toward entrepreneurship among faculty and determine whether their actions match their opinions, the level of academic entrepreneurship activity was measured. Academic entrepreneurship, as defined by Louis et al. (1989), is "the attempt to increase individual or institutional profit, influence, or prestige through the development and marketing of research ideas or research-based products" (p. 110) and five types of academic entrepreneurship are identified. **Table 28** provides the five types and the results obtained through this research. Since each of these variables is considered a form of academic entrepreneurship they have been analyzed separately.

1. Large Scale Grantmanship

Individual involvement in large-scale research was measured by the amount of externally funded research for which the respondent was the principal investigator during the period 1997-2002. The average dollar amount was $226,105 and the median answer was $45,000; however the standard deviation was $709,931 indicating considerable variation in this type of entrepreneurship. In order to compare these results with that of Louis et al.

(1989) the median response was used. In their study, the median response was $195,000 which was seen as being enough to fund a modest laboratory with a small staff of technicians and a few doctoral students. In this study the median response was $45,000, much lower than Louis et al. results.

2. Earning Supplemental Income

The second type of academic entrepreneurship relates to earning supplemental income. Respondents were asked to rate the level at which they engage in activities to earn supplemental income externally using a 5 point scale (1=never, 5=always). The mean answer of 2.35 with a median of 2 indicated that faculty occasionally engage in these types of activities and therefore it is likely this income does not represent a major portion of their overall earnings. In the Louis et al. (1989) study, supplemental income represented about 10% of base salary for over 50% of faculty respondents. The purpose of this question was to see if faculty, in general, maintain connections with the external community yet still focus primarily on their academic pursuits and these results support this notion.

3. Dollar Amount of Industry/Privately Funded Research

The third type deals with the amount of industry or privately funded research conducted. Privately funded research, while becoming more prominent in university environments, is a deviation from the traditional federal funding route supporting pure or basic research. On one hand, this method of obtaining research funds is seen by some as controversial in that the research questions tend to be chosen based on the commercial potential (Blumenthal et al., 1986 as cited in Louis et al., 1989). On the other hand, private research funds tend to be more easily accessible and available and are not normally based upon the applicant's past productivity as are federal funds. This may make industry funded research more attractive to younger scholars striving to build their Curriculum Vitae (Liebert, 1977 as cited in Louis et al., 1989).

In this study, 55% answered the question and the mean was $42,751 generated from private sources in the past 5 years while the standard deviation was $237,000. Again, there was a large variation in responses. On average, applied research accounts for 50.49% of research activity while basic/fundamental research accounts for 49.14% which suggests faculty do engage in applied, privately funded research in general.

4. Patenting and Generating Trade Secrets

The fourth type of academic entrepreneurship is connected with commercializing research results and was measured by asking those 230 respondents who had invented or improved a product, process, or service if they had obtained a patent. Of the 102 individuals who did register their invention, 13.48% obtained patents. It is interesting to note that of the 230 respondents who indicated they had invented something, 128 did not register their invention which represents 55.65%.

In order to compare these results to the Louis et al. (1989) study the total number of faculty who registered a patent was used. In this study, 31 faculty registered a patent which represented 3.8% of the sample. This result was lower than the 19% who registered a patent in the Louis et al. study. In order to help gauge whether this form of academic entrepreneurship is comparatively low, further analysis was required to identify the discipline of these faculty. The Louis et al. study was made up of Life Science faculty whose fields and research activity may be more conducive to patenting. In this sample, the highest percentage of registered patents were among faculty in Science (37.84%), Engineering (27.03%) and Medicine (13.51%) rather than just Life Science disciplines, therefore, it is difficult to draw a conclusive comparison. See **Table 29**.

5. Direct Commercial Involvement

The final type, direct commercial involvement, pertains to faculty member's involvement in private firms whose products are based on their research results. This form of entrepreneurship seems to be most controversial according to the literature, largely due to the potential use of university facilities and graduate students to meet the firm's commercial goals. Respondents were asked if they currently hold or have ever held

equity in a company with products based on their research results. Only 7.8% of respondents answered positively to this question which matched the results from the Louis et al. (1989) study almost exactly (7%). It appears this may be the least common form of entrepreneurship among academics. **See Table 28.**

Faculty Tables

Table 22
Attitude Toward Entrepreneurship
Faculty
(n = between 793 and 798)

Variables	Mean	Median
Attitudes toward entrepreneurs (scale 1=strongly disagree, 5=strongly agree)		
• Entrepreneurs make a positive contribution to society	3.97	4.00
• Entrepreneurs are admired	3.60	4.00
• Entrepreneurship is a good career option	3.38	3.00
• Universities should invest resources in entrepreneurship	3.20	3.00
• Entrepreneurship part of every degree program	2.51	2.00

Table 23
Perception of Entrepreneurship
Faculty
(n = 772)

Variables	Number	Percentage
Definition of entrepreneurship:		
• Business oriented – Entrepreneurship is a process whereby a combination of resources, characteristics, and knowledge are utilized to create and operate a for profit business.	539	69.82
• Broad – Entrepreneurship is a process whereby a combination of resources, characteristics, and knowledge are utilized to recognize and act on opportunities that may improve the quality of life for others.	233	30.18

Table 24
Comparison of Means
Perception of Entrepreneurship and Attitude Toward Entrepreneurship
Faculty

Attitude	Perception - Business oriented Definition Mean	Perception - Broad Definition Mean
Entrepreneurs make a positive contribution to society.	3.88	4.23*
Entrepreneurs are admired within society.	3.58	3.67
Becoming an entrepreneur is a good career option.	3.26	3.66*
Universities should invest resources in the development of entrepreneurship.	3.01	3.65*
Entrepreneurship should be part of every student's degree program.	2.30	3.05*

**** - statistical significance to p< 0.05***

Table 25
Importance of Entrepreneurial Characteristics in Students
Faculty
(n = between 780 and 795)

Variables (Scale: 1=very low, 5=very high)	**Mean**	**Median**
Curiosity	4.34	4.00
Perseverance	4.30	4.00
Enthusiasm	4.27	4.00
Desire to complete a project from start to finish	4.25	4.00
Communication skills	4.25	4.00
Initiative/Active involvement	4.24	4.00
Ability to learn from mistakes	4.23	4.00
Ability to find required information	4.22	4.00
Responsibility/Accountability	4.18	4.00
Ability to put theory into practice	4.12	4.00
Creative thinking/innovativeness	4.00	4.00
Ability to acquire expertise	4.00	4.00
Resourcefulness	3.92	4.00
Need to achieve	3.83	4.00
Ability to process feedback	3.81	4.00
Self-confidence	3.75	4.00
Ability to handle pressure	3.75	4.00
Capacity to adapt to changes	3.56	4.00
Self-esteem	3.53	4.00
Ability to identify an opportunity to improve a situation	3.48	4.00
Optimism	3.43	4.00
Desire for independence	3.34	3.00
Ability to use and apply new technology	3.33	3.00
Desire to control one's destiny	3.25	3.00
Empathy	3.11	3.00
Intuition	3.04	3.00
Perfectionism	3.04	3.00
Leadership abilities	2.97	3.00
Ability to maximize the potential of others	2.83	3.00
Competitiveness	2.73	3.00
Risk taking ability	2.72	3.00
Desire for constant change	2.61	3.00
Need for power	1.92	2.00

Table 26
Comparison of Means
Teaching Methods Used by Discipline
Faculty
(Scale: 1=never, 5=always)

Method	Mean	Arch	Art	Busi	Comp	Dent	Educ.	Eng.	Forest	Law	Med.	H.P.	PR	Sci	Theol	O
Lecture	**3.66**	3.00	3.89	3.89	4.31	2.58	2.85	4.58	4.00	4.57	3.63	3.74	4.00	4.33	3.83	2.18
Case	**3.33**	4.00	2.47	3.36	2.31	3.17	3.05	2.68	3.18	3.67	3.52	3.44	4.00	2.37	2.67	2.90
Mentors*	**3.17**	5.00	2.76	2.66	2.86	3.18	3.03	2.37	2.87	2.14	3.36	3.17	4.00	2.52	3.17	3.10
Discussions	**3.50**	4.00	4.01	4.19	3.25	2.82	4.23	3.13	3.88	3.57	3.41	4.04	4.00	3.05	4.83	4.27
Field Trips*	**1.60**	3.50	1.73	1.66	1.07	2.30	2.68	2.15	3.12	1.57	1.77	2.51	2.00	2.06	1.83	2.20
Labs	**2.83**	1.50	1.93	1.65	3.06	2.91	2.20	3.58	3.24	1.43	2.40	2.71	2.00	3.60	1.17	1.55
Projects*	**2.17**	4.00	2.26	3.07	2.27	2.00	3.63	2.55	2.94	2.00	2.50	3.51	5.00	1.92	2.50	3.64
Speakers*	**2.17**	2.50	2.33	2.42	1.60	1.80	2.65	2.21	2.94	2.43	2.25	2.89	1.00	2.03	2.83	2.45
Role Plays*	**3.0**	2.00	2.07	2.57	1.33	2.30	3.03	1.84	2.59	1.86	2.26	2.69	4.00	1.67	1.83	3.00
Independent Study	**3.33**	5.00	3.48	3.37	3.13	3.10	3.89	2.73	3.41	2.86	3.59	3.50	4.00	3.27	4.17	3.64
Group Work	**2.67**	4.00	3.24	3.94	3.13	2.82	4.18	3.10	3.88	2.57	2.98	3.59	4.00	2.93	4.00	3.82
Other	**4.0**	5.00	3.93	3.63	1.00	-	4.00	2.00	3.76	-	4.67	3.75	-	2.69	4.00	4.33

Note: Other methods cited include: computer/multi-media, audio visual/video, presentations and seminars

Evident in the model programs, those judged best by Vesper , Gartner, Menzies and Gasse use "enactive mastery experiences" (hands-on activities) and vicarious experience (speaker series/practitioners as teachers) as essential Entrepreneurial Education tools.

Legend:

Arch=Architecture and Urban/Rural Planning
Art=Arts and Humanities/Social Sciences
Busi=Business/Commerce/Management
Comp=Computer Science
Dent=Dentistry
Educ=Education
Eng=Engineering
Forest=Forestry and Environmental Studies
Law=Law
Med=Medicine
H.P.=Health Profession
P.R.=Public Relations
Sci.= Science
Theol=Theology
Other=Recreation Mgmt, Agriculture

Table 27
Entrepreneurial Activity
Faculty

Variables	Number	Percentage
Business entrepreneur (n=797)	207	25.97
Social entrepreneur (n=795)	253	31.82
Inventor	230	28.86
Held Equity in a company based on your research results (n=718)	56	7.80
Variables	**Mean**	**Median**
Likelihood for business entrepreneurship (n=767) Scale: 1=very unlikely: 5=very likely	2.63	3.00

Table 28
Academic Entrepreneurship
Faculty

Variables	Mean	Median
• Large scale grantmanship (n=477)	$226,108	$45,000
• Earn supplemental income (n=795) (Scale: 1=never, 5=always)	2.35	2.00
• Privately funded research (n=446)	$42,751	0.00
Variables	**Number**	**Percentage**
• Invented/improved product/process (n=230)		
- Patenting	31	13.48
• Commercial involvement (n=718)		
- Holds/held equity in company with products based on their research	56	7.80

Table 29
Registration of an Invention/Innovation
Faculty

Variables	Number	Percentage
Innovator (n=797) – invented or improved product/process	230	28.86
• Not registered	128	55.65
• Patent	31	13.48
• Copyright	50	21.74
• Trademarks	12	5.22
• Industrial design	8	3.48
• Integrated circuit topography	1	0.43

ALUMNI

Attitude Toward Entrepreneurship

The identical set of statements used to measure the attitudes of academic administration and faculty were used with alumni. Generally, alumni have a relatively positive attitude towards entrepreneurs and the development of entrepreneurship within universities. When asked whether they agree or disagree with the statement "entrepreneurs make a positive contribution to society" the average rating was 4.25 on a 5 point scale (1=strongly disagree, 5=strongly agree). They tended to agree that entrepreneurs are admired within society (3.76) and that becoming an entrepreneur is a good career option (3.70).

In response to whether universities should invest resources in the development of entrepreneurship, the average answer was 3.90 signifying their agreement with this statement; however, the mean was much lower (3.24) when they were asked if entrepreneurship should be part of every student's degree program within university. This indicates they marginally agree or are close to being indifferent to integrating entrepreneurship into every program; however, the alumni were more positive toward this idea than all other respondent groups. See **Table 30.**

Perception of Entrepreneurship

In order to gauge whether alumni believe that entrepreneurship relates only to the creation and operation of a for-profit business or whether their definition is broader and applies to various activities and endeavours, the same two definitions used with the other respondent groups were provided. Alumni were asked to choose the definition which most closely represented their understanding of the term entrepreneurship and the vast majority (78.39%) chose the business oriented definition. This is not surprising given entrepreneurship normally manifests itself in the creation and/or growth of a business (Morris & Jones, 1999). However, over the past number of years, the emergence of

social, educational, and personal entrepreneurship has given way to a broader definition of entrepreneurship and these broader views are gaining acceptance (Kent & Anderson, 2003; Kourilsky & Hentschke, 2003). These results support this view in that one fifth of respondents believe in the broader definition. Refer to **Table 31**.

Theology was the only discipline where the majority chose the broad definition over the business oriented definition (53.33%) but only by a small margin. All other disciplines had large discrepancies between the two in favour of the business oriented definition.

An examination of whether perception of entrepreneurship has any impact on attitudes toward entrepreneurship was carried out on the alumni group. A comparison of means, using the T-TEST procedure, was conducted to determine if there was a difference between the group that chose the business oriented definition and their average rating of the attitude questions and those who chose the broad definition. In this case there were no statistically significant differences found between the attitudes of the two groups, indicating their perception of entrepreneurship does not necessarily impact their attitude toward it. See **Table 32**.

Career Choice and Influences

Respondents were asked to rate various factors that have influenced their career choice using a 5 point scale (1=very weak, 5=very strong). **Table 33** provides the factors used and the mean response. Personal interests had the strongest influence with an average rating of 4.34, followed by employment prospects (3.78) and education choices available (3.56). The least influential factor was sports activities with an average rating of 1.71 and alumni indicated overall that school teachers (2.59) and professors (2.44) were less of an influence than parents (3.29).

Entrepreneurial Activity

Business Entrepreneurship

A little over 17.5% of the alumni sample currently own or operate a business. Within this group, 37% started the business themselves, 38% are self-employed professionals, and 13.5% acquired their business through family succession. A small percentage, 6%, purchased an existing business, 1% purchased a franchise and there were no franchisors. See **Table 34.**

The majority of businesses are small in terms of number of employees, ranging between 1 and 3, with a small percentage reporting a staff of between 10-20. A few respondents indicated an employee compliment of 12,000–13,000 which increased the mean to 136.58; however, the median of 1 provides further support that the vast majority have less than 3 employees. The size relative to gross annual revenue provided additional support to the majority of businesses falling into the small category. As much as 61% indicated their gross annual revenues are less than $99,000, followed by 12.5% with annual revenues of between $100,000-$249,999 and only 5.7% indicated revenues between $250,000-$499,999. Just 6.2% have revenues above $500,000 but less than $4,999,999 and a very small percentage (3.1%) have revenues exceeding $100,000,000 per year.

When asked how long they have been operating the business the average answer was 4.87 years with the median being 4 years. The majority of responses fell in the range of 1-9 years which is reasonable given the sample is comprised of graduates who finished their degrees between 5 and 10 years ago. Additionally, statistically significant differences were found between the business entrepreneurs and non-entrepreneurs with regard to age and gender. Entrepreneurs tend to be older (36 years) than the non-entrepreneurs (34.5 years) and a higher percentage of business entrepreneurs are male. No statistically significant difference was found in relation to language (English, French and Other).

Social Entrepreneurship

A total of 14.59% of alumni indicated they are currently, or have been, a manager/director of a not-for-profit organization. Again, the organizations operated by these alumni fall into the small category with an average operating budget of $949,771. While the budgets ranged from $2,000 to $40,000,000, the vast majority indicated an operating budget of between $35,000 and $750,000. A very small percentage operating with a $40,000,000 budget increased the mean response yet the median of $100,000 indicates most operate with budgets in the lower range.

It is more challenging to gauge the size of these organizations based on number of employees since many not-for-profit organizations depend largely on volunteers to carry out their mandates and the figures gathered in this study do not include volunteer employees. However, based on the number of salaried employees, the majority of not-for-profit organizations in this study are relatively small in size with the average number of salaried employees (full-time equivalent) being 8.92. Answers ranged from 0.5 to 310 with the majority falling to the 0.5-11 range.

The social entrepreneurs tend to be older with a mean age of 38.5 versus a mean age of 34.2 for non-entrepreneurs and the difference was found to be statistically significant. There were no significant differences detected relative to language or gender. Refer to **Table 35**.

Inventors/Innovators

When asked about activities related to invention and innovation, 27.04% indicated they had invented or improved a product, process or service; however, few of them obtained a registration. As high as 89.94% did not register their invention and of those who did, 3.90% registered a trademark, followed by 2.60% who registered a copyright. Only 1.60% registered an industrial design, 1.30% obtained a patent, and just 0.65% registered an integrated circuit topography. This is an interesting finding given the strong focus in

Canada on innovation and commercialization and while the results of this study cannot provide insight into why this is the case, it does provide the potential for further study. See **Table 36.**

A similar pattern was found in the inventor/innovator group with regard to age as was found with the business and social entrepreneurs. They too were slightly older than the non-inventor/non-innovator group with a mean age of 35.6 years versus 34.5 and the difference was statistically significant. There was a significantly higher percentage of inventors/innovators who identified their first language as other than English or French and a significantly higher percentage were male.

Predisposition to Entrepreneurship

To build upon the work of Gasse and D'Amours (2000) with respect to predisposition or being prone to entrepreneurship, alumni were asked to respond to a bank of questions to measure their predisposition. **Table 37** provides the complete results. A high percentage of alumni, 82.50%, said they have worked in a small/medium-sized business, 73.01% said they had a means of earning spending money as a child, and 71.57% indicated they have had an idea for a small business. Additionally, 41.22% come from a family where one parent has owned a business and a large percentage (44.70%) are the eldest child in the family.

In order to discern whether or not a difference exists between those engaged in one of the three types of entrepreneurship and those who are not with regard to predisposition toward entrepreneurship, the bank of questions to measure predisposition (see **Table 38**) were analyzed based on the number of predisposition indicators chosen. There were nine (9) questions in all and the higher the mean the more indicators chosen. The mean response of entrepreneurs was then compared to that of non-entrepreneurs using the T-TEST procedure.

The results showed that those engaged in entrepreneurship also have a stronger predisposition toward entrepreneurship. The difference in the mean responses of business entrepreneurs (5.40) was higher than non-entrepreneurs (4.62) and the difference was statistically significant. There was also a statistically significant difference detected between social entrepreneurs (5.16) and non-entrepreneurs (4.70) and between inventors/innovators (5.15) and non-inventors/innovators (4.61).

Exposure to Entrepreneurship During University

Most of the alumni respondents, 72.54%, were not exposed to entrepreneurship as a career option while in university. Of the 20.18% who said they were exposed, 70.54% of them took specialized classes or courses in entrepreneurship, 10.71% indicated their exposure occurred through their involvement in group projects, competitions or work experience, and 9.82% cited extra curricular activities such as student societies and clubs as the primary method of exposure. Career fairs and workshops only accounted for 4.91%.

The disciplines where over 25% said they had been exposed to entrepreneurship as a career option included: Business (45.13%), Forestry and Environment Studies (38.46%), Dentistry (33.33%), and Law (26.92%). The disciplines where over 75% were not exposed included: Theology (87.10%), Education (83.74%), Science (80.34%), Health Profession (80.28%), and Arts and Humanities (79.04%).

When asked if they had acquired the knowledge to start a business (ie. identifying opportunities and developing a business plan) through their university studies 19.91% indicated they had. Furthermore, 56.89% of this group indicated they had also been exposed to entrepreneurship as a career option. The most interesting result is that 43.11% said they acquired the knowledge to start a business through their university studies yet indicated either they were not exposed to entrepreneurship as a career option or they did not know whether they had been exposed.

Alumni were also asked if they had taken any business courses during their degree program and 42.79% said they had. Of this group, 34.30% indicated being exposed to entrepreneurship as a career option while attending university. It is also interesting to note that 65.70% indicated they had taken business courses but had not been exposed to entrepreneurship as a career option through these courses. See **Table 38**.

Exposure and Attitude toward Entrepreneurship

It was of interest to determine if there is a difference between those who were exposed to entrepreneurship as a career option during university and those who were not with regard to attitude toward entrepreneurship. While the group who had been exposed rated each of the attitudinal statements more positively than the other two groups, statistically significant differences were only found in 2 of the 5 statements; "entrepreneurs make a positive contribution to society" and "universities should invest resources in the development of entrepreneurship". The difference was between those exposed and those who did not know if they had been exposed. **Table 39** provides those results.

Exposure to Entrepreneurship and Entrepreneurship Activity

To determine if exposure to entrepreneurship during university had any affect on entrepreneurship activity, the frequency procedure was used to compare entrepreneurs who were exposed during university to non-entrepreneurs exposed during university. The results indicated there was a difference as 28% of those exposed during university are now business entrepreneurs compared to 18.54% who are not currently business entrepreneurs and the difference was statistically significant. Social entrepreneurs who were exposed to entrepreneurship represented 27.11% and non-entrepreneurs who were exposed represented 19.03%. Again, a statistically significant difference was found. However, there was no statistically significant difference found between inventors/innovators (23.28%) and non-inventors/innovators (19.18%) exposed during university.

Based on these results, it appears that exposure to entrepreneurship as a career option during university is associated with business and social entrepreneurship but may not be associated with inventing/innovation activities.

Business start-up Knowledge and Entrepreneurship Activity

It was also of interest to determine whether having the knowledge to start a business affects entrepreneurship activity. The frequency procedure was used to compare entrepreneurs and non-entrepreneurs relative to whether they had acquired business start-up knowledge during university. The results indicates a difference as 26.28% of those who acquired the knowledge to start a business are now business entrepreneurs compared to 18.60% who are not and this difference was statistically significant. Social entrepreneurs represented 26.99% versus non-entrepreneurs who represented 18.76% and the difference between the groups was also statistically significant. However, no statistically significant difference was detected between inventors/innovators (22.22%) and non-inventors/innovators (19.20%).

Similar to exposure to entrepreneurship as a career option, it appears that acquiring the knowledge to start a business during university is associated with business and social entrepreneurship but not necessarily inventing/innovating.

Entrepreneurial Characteristics/Skills

Alumni were given a set of 35 questions related to characteristics and skills and were asked to rate the extent to which they utilize the skills and/or exercise the characteristics using a 5 point scale (1=never, 5=always). Two contrasting types of questions were used to measure the extent to which alumni exercise these characteristics: one type measured the characteristics/skills based on the frequency of use and the second type measured the characteristics/skills relative to the infrequency of use.

Overall, alumni are regularly curious (4.18), possess responsibility (4.18), and have a high need to achieve (4.12). In contrast, alumni do not strongly believe their success depends on chance (2.38) indicating they have some desire to control their destiny, do not

have a strong need for affiliation (2.41) suggesting they somewhat desire independence, and do not prefer that others take overall responsibility for a project (2.66), signifying they tend to like to take on responsibility. **Table 40** provides the full results.

While it was deemed important to identify the characteristics that alumni possess in general, it was of greater interest, for purposes of the model, to determine the characteristics/skills possessed by the three types of entrepreneurs within the alumni sample. There were 35 characteristics/skills in total; therefore, a factor analysis was employed to establish groupings to simplify the regression procedure by reducing the number of independent variables. A regression was then conducted to examine the relationship between entrepreneurs (business, social, inventors) as the dependent variable and the factors as the independent variables. The results are detailed below for each type of entrepreneur.

Business Entrepreneurs

A strong relationship was found between business entrepreneurs and Factor 6 – Opportunist/Intuitive and the relationship was statistically significant.

Exposure to entrepreneurship as a career option, acquiring the knowledge to start a business during university studies, and taking business courses at university were also used as independent variables to identify if they are related to business entrepreneurship. No statistically significant relationship resulted, indicating that these variables may not contribute to undertaking business entrepreneurship.

Social Entrepreneurs

Relationships were found between social entrepreneurs and Factor 4 – need for power (influence), responsibility/accountability, and initiative; Factor 6 – opportunistic and intuition; and Factor 7 – perseverance. It is interesting to report that statistically significant negative relationships were detected between social entrepreneurs and Factor 2 – need for recognition and need for independence, and Factor 9 – ability to process feedback to evaluate their success.

Social entrepreneurship tends to focus on solving social problems and providing socially important products therefore, being admired and achieving social status may not be as important to the social entrepreneur as achieving social change (Kent & Anderson, 2003). As well, social entrepreneurs would use persuasive techniques to garner support for their organizations since many are not-for-profits and depend on volunteers to execute the mission. This might explain why a negative relationship was observed with Factor 2.

In the same sense, a negative relationship was observed between social entrepreneurs and Factor 9. The ability to process feedback to evaluate their success was measured by asking respondents if they need to see the results of their efforts to evaluate success. Entrepreneurs tend to judge their performance and subsequently self-evaluate. The negative relationship found between Factor 9 and social entrepreneurs may be explained by the fact that it is difficult to translate the resulting social benefits into pure economic terms and social objectives are difficult to measure. "They are often intangible, hard to quantify, difficult to attribute to a specific organization, best evaluated in the future, and open to dispute" (Dees & Anderson, 2003, p.7). Therefore, social entrepreneurs must measure success in incremental terms and on progress toward the objective rather than results.

No significant relationships resulted between social entrepreneurship and exposure to entrepreneurship as a career option, acquiring the knowledge to start a business during university, and taking business courses during university. These results indicate that these variables may not contribute to undertaking social entrepreneurship.

Inventors/Innovators

With regard to inventors/innovators, statistically significant relationships were observed between Factor 1 – adaptability; Factor 4 – need for power (influence), responsibility/accountability, initiative; and Factor 6 – opportunistic and intuition.

No significant relationships were found between inventors/innovators and being exposed to entrepreneurship as a career option during university, acquiring the knowledge to start a business, and taking business courses during university. These results are similar to those of business and social entrepreneurs in that these variables may not contribute to undertaking inventing/innovating activities.

According to this study, there are similarities and differences with regard to characteristics among the three types of entrepreneurs. All three types have a strong positive relationship with Factor 6 which equates to possessing opportunistic characteristics (thinking about or looking for business opportunities) and intuition or acting on one's instincts. Both social entrepreneurs and inventors/innovators have strong relationships with Factor 4 which equates to a need for power by influencing and persuading others and assuming responsibility for a wide variety of circumstances. **Table 41** details the results.

To further support that there are similarities and differences in characteristics/skills between the three types, a comparison of means using a T-TEST procedure was conducted on each of the three types of entrepreneurs compared to the non-entrepreneurs.

Business Entrepreneurs vs Non-entrepreneurs

There were statistically significant differences found between business entrepreneurs and non-entrepreneurs relative to their mean ratings of the characteristics questions. Business entrepreneurs like taking risks more often, possess stronger opportunistic characteristics (think about or look for business opportunities), are more intuitive (act on instincts), are more resourceful (creative in solving day-to-day problems), and more curious than non-business entrepreneurs. Of interest are also the differences in ratings for self-confidence and competitiveness. Business entrepreneurs are significantly more competitive and more self-confident.

Social Entrepreneurs vs Non-entrepreneurs

The mean comparison of social entrepreneurs and non-entrepreneurs also resulted in statistically significant differences. Social entrepreneurs have a stronger need to achieve, a stronger ability to influence others, are more optimistic, and have stronger leadership ability than non-social entrepreneurs. Social entrepreneurs are more persistent with difficult situations (perseverance), are more resourceful (creative in solving day-to-day problems), and maximize the potential of others more than non-social entrepreneurs.

Inventors/Innovators vs Non-inventors/innovators

There were a number of notable differences in the mean ratings between inventors/innovators and non-inventors/innovators as well. Inventors/innovators have a stronger need to achieve, are more persistent (perseverance), like taking risks more often, are more adaptable, and have more opportunistic characteristics than non-inventors/innovators. There were also significant differences in the mean rating concerning their ability to learn from mistakes, resourcefulness, leadership ability, and creativity (consider themselves trendsetters). See **Table 42**.

Comparison of the three Entrepreneur types

In analyzing the mean comparisons, patterns began to emerge in the characteristics among the three types of entrepreneurs. There are a number of characteristics shared by all three types and yet others that are only shared between two types. **Table 43** provides the results.

The characteristics/skills common to all three entrepreneur types in this study are similar to those identified in the past work. The ability to identify an opportunity is one such characteristic. The entrepreneurs in this study think about and look for business opportunities and act on their instincts more often than those who are not entrepreneurs and this is supported by both the regression and comparison of means procedures. They are persistent and creative in solving problems and like to take risks. Additionally, they like to assume a leadership role and enjoy being challenged.

It is interesting to note the differences between the types of entrepreneurs as well, especially between the business and social entrepreneurs. Outside of the characteristics/skills common to all three, there are no common characteristics between these two. There are more similarities between the business entrepreneurs and inventors/innovators than social entrepreneurs and inventors, possibly due to the nature of their mandates. These results support the theory that while entrepreneurs share common characteristics and skills, there will also be differences in their characteristics and skills depending on the type of venture they operate since different businesses and organizations in various sectors will demand different skill sets.

Entrepreneurial Potential

In order to gauge the entrepreneurial potential of alumni and gain insight into whether there is a strong desire to become an entrepreneur in the future, respondents were asked to rate the likelihood they would start a business, direct/manage a not-for-profit organization, or invent/improve a product or process in the future. This time, the scale was a 7 point scale; however, results (the means only) have been converted to a 5 point scale (1=very unlikely, 5=very likely) for comparison purposes. Alumni are somewhat unlikely to start a business or invent/improve a product or process in the future with the average ratings being 2.28 and 2.32 respectively. They are even more unlikely to manage or direct a not-for-profit organization given the average rating of 2.02. These results further support the need to target efforts related to encouraging and supporting entrepreneurship and innovation.

In order to identify any differences between males and females with regard to future entrepreneurial activity, the mean answers for each group were compared. There was a statistically significant difference between the means indicating males are more likely than females to start a business in the future. This pattern held true for inventors/innovators as well but there was no significant difference between males and females when comparing likelihood of social entrepreneurship, indicating females among alumni are just as likely as males to become a manager/director of a not-for-profit organization. **See Table 44**.

Out-Migration of University Graduates

Atlantic Canada has long suffered economically from the out-migration of young, educated individuals to other parts of Canada and even the United States. Respondents were asked if they currently reside in Atlantic Canada and almost 73% of alumni indicated they do. Those who do not currently reside in Atlantic Canada (27%) were asked why they left after graduation. The most common reason (55.74%) for leaving was for employment or financial opportunities, followed by family reasons; almost 13% said they left due to a spouse or to be closer to family and friends and 9.5% left to return home. A smaller percentage (5.25%) left to broaden their horizons and travel or to further their education (4.92%).

When the same group was asked if they were intending to move back to Atlantic Canada in the future, almost 55% said yes and on average would do so in eight to nine years. Sixty percent (60%) of respondents cited career opportunities as the most important variable that would bring them back sooner. The second most important variable was competitive salaries (12.17%) followed by family reasons (11.30%). The political environment or a growing economy does not seem to play a significant role in their decision to return sooner as evidenced by the small percentage (1.74%) who chose these variables. However, given the connection between a growing economy and career opportunities these results seem to conflict.

Alumni Tables

Table 30
Attitude Toward Entrepreneurship
Alumni
(n = between 1139 and 1141)

Variables	Mean	Median
Attitudes toward entrepreneurs (scale 1=strongly disagree, 5=strongly agree)		
• Entrepreneurs make a positive contribution to society.	4.25	4.00
• Entrepreneurs are admired within society.	3.76	4.00
• Becoming an entrepreneurship is a good career option.	3.70	4.00
• Universities should invest resources in the development of entrepreneurship.	3.90	4.00
• Entrepreneurship should be part of every student's degree program.	3.24	3.00

Table 31
Perception of Entrepreneurship
Alumni
(n = 1143)

Variables	Number	Percentage
Definition of entrepreneurship:		
• Business oriented – Entrepreneurship is a process whereby a combination of resources, characteristics, and knowledge are utilized to create and operate a for profit business	896	78.39
• Broad – Entrepreneurship is a process whereby a combination of resources, characteristics, and knowledge are utilized to recognize and act on opportunities that may improve the quality of life for others.	247	21.61

Table 32
Comparison of Means
Perception of Entrepreneurship and Attitude Toward Entrepreneurship
Alumni

Attitude	Perception Business oriented Definition Mean	Perception Broad Definition Mean
Entrepreneurs make a positive contribution to society.	4.24	4.29
Entrepreneurs are admired within society.	3.77	3.72
Becoming an entrepreneur is a good career option.	3.69	3.68
Universities should invest resources in the development of entrepreneurship.	3.89	3.93
Entrepreneurship should be part of every student's degree program.	3.22	3.34

**** - statistical significance to p<0.05***

Table 33
Career Influences
Alumni
(n = between 1138 and 1145)

Variables	Mean	Median
Influencers on career choice:		
• Parents	3.29	3.00
• Extended family	2.39	2.00
• Friends	2.85	3.00
• Education choices available	3.56	4.00
• Employment prospects	3.78	4.00
• Sports activities	1.71	1.00
• Professors	2.44	2.00
• Previous work experience	3.31	4.00
• Personal interests	4.34	5.00
• Extra curricular activities during university	2.07	2.00
• School teachers	2.59	3.00
• Other (n=115)	4.53	5.00

Table 34
Business Entrepreneurs
Alumni
(n = 1138)

Variables	Number	Percentage
Currently own or operate a business	200	17.57
How acquired (n = 199):		
• Self-employed professional	76	38.19
• Started the business	74	37.19
• Family succession – inherited the business	27	13.57
• Purchased existing business	12	6.03
• Other	8	4.02
• Franchisee	2	1.01
• Franchisor	0	0
Gross annual revenue level (n = 191):		
• Less than $ 99,000	117	61.26
• Between $ 100,000 and $ 249,999	24	12.57
• Between $ 250,000 and $ 499,999	11	5.76
• Between $ 500,000 and $ 999,999	12	6.28
• Between $ 1,000,000 and $ 4,999,999	10	5.24
• Between $ 5,000,000 and $ 9,999,999	3	1.57
• Between $ 10,000,000 and $ 49,999,999	6	3.14
• Between $ 50,000,000 and $ 99,999,999	2	1.05
• Over $ 100,000,000	6	3.14

Variables	Mean	Median
Years operating the business (n = 197)	4.87	4.00
Number of employees (n = 191)	136.58	1.00

Table 35
Social Entrepreneurs
Alumni
(n = 1138)

Variables	Number	Percentage
Managed/directed a Not-for-Profit	166	14.59

Variables	Mean	Median
Number of employees (n=145)	8.92	2.00
Annual operating budget (n=131)	$949,771	$100,000

Table 36
Inventors/Innovators
Alumni
(n=1139)

Variables	Number	Percentage
Invented, improved a product/process	308	27.04
If yes, is it registered and how (n =308)		
• Patent	4	1.30
• Copyright	8	2.60
• Trademarks	12	3.90
• Industrial design	5	1.62
• Integrated circuit topography	2	0.65
• Not registered	277	89.94

Table 37
Predisposition to Entrepreneurship
Alumni
(n = between 1141 and 1145)

Variables	Number	Percentage
• One parent owned a business	472	41.22
• A closed friend is a small business owner	644	56.39
• Eldest child in the family	510	44.70
• Immigrants	114	9.97
• Earned spending money as a child	836	73.01
• Involved in initiating student activities at university	407	35.61
• Worked in a small/medium business	943	82.50
• Know of resources that support business start-up in area	841	73.51
• Had an idea for small business	818	71.57

Table 38
Exposure to Entrepreneurship in University
Alumni

Variables	Number	Percentage
Exposed to entrepreneurship career option (n = 1140):		
• Yes	230	20.18
• No	827	72.54
• Don't know	83	7.28
Exposure occurred through (n = 224)		
• Specialized classes – courses in entrepreneurship	158	70.54
• Hands on experience – group projects, competition, jobs	24	10.71
• Guest speakers – career fairs, workshops, banquets	11	4.91
• Extra curricular activities – student societies, clubs	22	9.82
• Other	9	4.02
University studies provided knowledge to start a business (n = 1135):	226	19.91
• Exposed to entrepreneurship	128	56.89
Taken business courses (n=1138)	487	42.79
• Exposed to entrepreneurship	166	34.30

Table 39
Comparison of Means
Exposure to Entrepreneurship and Attitude Toward Entrepreneurship
Alumni

Attitude	Entrepreneurs makes a positive contribution to society	Entrepreneurs are admired within society	Becoming an entrepreneur is a good career option	Universities should invest resources in the development of entrepreneurship	Entrepreneurship should be a part of every student's degree program
Exposed to Entrepreneurship	4.36A	3.85A	3.79A	4.01A	3.33A
Not Exposed to Entrepreneurship	4.25AB	3.78A	3.68A	3.89AB	3.22A
Don't Know	4.04B	3.73A	3.64A	3.72B	3.13A

Those with the same letter are not statistically different.

Table 40
Entrepreneurial Characteristics/Skills
Alumni
(n = between 1145 and 1152)

Variables	Mean	Median
Are you curious? (Curiosity)	4.18	4.00
Do you see things through to completion? (Desire to complete a project)	4.18	4.00
Do you strive to exceed your expectations? (Need to Achieve)	4.12	4.00
Do you believe-failures are opportunities to learn? (Ability to learn from mistakes)	4.07	4.00
Do you perform tasks with great effort and energy? (Need to Achieve)	4.04	4.00
Do you know how to get information to make decisions? (Ability to acquire information)	3.98	4.00
Do you try to help others achieve their potential? (Ability to maximize potential)	3.96	4.00
Do you look for new challenges? (Need to Achieve)	3.92	4.00
Are you persistent in difficult situations? (Perseverance)	3.86	4.00
Are you creative in day to day problems? (Resourcefulness)	3.86	4.00
Do you put yourself in the place of others to feel what they feel? (Empathy)	3.82	4.00
Do you use knowledge and skills of others effectively? (Ability to acquire expertise)	3.78	4.00
Do you like to be admired by others? (Need for Power-Recognition)	3.76	4.00
Are you self-confident? (Self-confidence)	3.75	4.00
Do you like to take a leadership role? (Leadership abilities)	3.70	4.00
Do you adapt easily to change? (Capacity to adapt to change)	3.68	4.00
Do you act on your instincts? (Intuition)	3.63	4.00
Is reputation and status important? (Need for Power-Recognition)	3.60	4.00
Does competition increase your performance? (Competitiveness)	3.60	4.00
Are you quick to take action? (Initiative/active involvement)	3.60	4.00
Do you have a positive attitude regardless of the situation? (Optimism)	3.57	4.00
Do you need results to evaluate your success? (Ability to use feedback to evaluate)	3.55	4.00
Do you seek approval from others around you? (Desire for Independence)	3.54	4.00
Are you competitive and love to win? (Competitiveness)	3.51	4.00
Do you like change? (Desire for constant change)	3.48	4.00
Does persuading/influencing others come naturally? (Need for Power-Influence)	3.42	4.00
Does uncertainty cause you stress? (Ability to handle pressure)	3.42	3.00
Do you have a tendency to be responsible for everything & everyone? (Resp/Acct)	3.28	3.00
Do you like taking risks? (Risk taking ability)	3.18	3.00
Do you think about or look for business opportunities? (Opportunistic)	3.02	3.00
Do you consider yourself a trendsetter? (Creative thinking/innovativeness)	2.83	3.00
Does the difficulty and complexity of situations scare you? (Perseverance)	2.71	3.00
Do you prefer others take overall responsibility on a project? (Resp./Accountability)	2.66	3.00
Do you prefer to work with friends than with experts? (Desire for Independence)	2.41	2.00
Does your success depend on chance? (Desire to control one's destiny)	2.38	2.00

Table 41
Regression – Logistic Procedure
Alumni

Factor Name	Dominant Question	Likelihood Estimate		
		Business	**Social**	**Inventor**
Factor 1 – Adaptability & Ability to learn from mistakes	- Do you like change? - Do you adapt easily to change? - Do you believe failures are opportunities to learn?	-0.00712	0.0709	0.2855*
Factor 2 – Need for Power-Recognition & Desire for Independence	- Do you like to be admired by others? - Is reputation and status important? - Do you seek the approval of those around you?	0.0268	-0.2084*	-0.0409
Factor 3 – Need to Achieve	- Do you perform tasks with great effort and energy? - Do you strive to exceed your expectations? - Do you look for new challenges?	-0.00073	0.1608	0.0293
Factor 4 – Need for Power-Influence, Responsibility/ Accountability, and Initiative	- Does persuading others or influencing their actions come naturally? - Do you have a tendency to find yourself solely responsible for everyone and everything? - Are you quick to take action?	0.0874	0.3238*	0.3006*
Factor 5 – Ability to Acquire Expertise and Ability to Acquire Information	- Do you use the knowledge and skills of others effectively? - Do you know how to get the information you need to make decisions?	0.0487	0.1374	0.0304
Factor 6 – Opportunistic and Intuition	- Do you think about or look for business opportunities? - Do you act on your instincts?	0.7980*	0.1775*	0.4354*
Factor 7 – Perseverance and Desire to control destiny	- Does the difficulty and complexity of situations scare you? - Do you prefer that others take overall responsibility for a project? - Does your success depend on chance?	-0.0951	-0.2188*	-0.1161
Factor 8 – Empathy	- Do you put yourself in the place of others to feel what they feel?	-0.0662	0.0799	0.0502
Factor 9 – Ability to process feedback to evaluate success	- Do you need to see the results of your efforts to evaluate your success?	0.1292	-0.1952*	0.0539
Question 10	Exposed to Entrepreneurship as a career option during university	-0.2682	-0.1798	0.00767
Question 12	Acquired the knowledge to start a business through university studies	-0.0990	-0.3934	0.2114
Question 13	Took business courses in university	0.1418	0.0894	-0.2945

**** statistically significant to p<0.05***

Note: The sign (-/+) may not represent the relationship since some questions would evoke a negative response from entrepreneurs.

Table 42
Comparison of Means
Entrepreneurial Characteristics of Entrepreneurs and Non-Entrepreneurs
Alumni

	Business Entrepreneur (Mean)	Non-entrepreneur (Mean)	Social Entrepreneur (Mean)	Non-entrepreneur (Mean)	Inventor (Mean)	Non-inventor (Mean)
Perform tasks with great effort/energy	4.07	4.03	4.09	4.03	4.07	4.02
Looks for new challenges	4.05*	3.89	4.14*	3.88	4.10*	3.85
Strive to exceed expectations	4.21	4.11	4.22	4.10	4.25*	4.07
Persuading/influencing others comes naturally	3.52	3.41	3.72*	3.37	3.57*	3.36
Like to be admired by others	3.80	3.75	3.64	3.78	3.76	3.76
Importance of Reputation/Status	3.65	3.59	3.57	3.60	3.70*	3.56
Competitive/love to win	3.69*	3.47	3.48	3.52	3.60	3.48
Seek approval of others	3.44	3.56	3.36*	3.57	3.45	3.57
Prefer to work with less knowledgeable friends than with experts they do not know	2.25*	2.44	2.39	2.41	2.30*	2.45
Self-confident	3.90*	3.72	3.87	3.73	3.78	3.74
Positive attitude regardless of situation	3.61	3.56	3.83*	3.52	3.62	3.55
Persistent with difficult situations	3.97*	3.85	4.05*	3.83	4.01*	3.81
Tendency to be responsible for everyone and everything	3.37	3.26	3.34	3.27	3.29	3.27
Uncertainty causes them stress	3.46	3.40	3.34	3.42	3.33	3.44
Like taking risks	3.44*	3.12	3.31*	3.15	3.39*	3.10
Failures are opportunities to learn	4.20*	4.04	4.13	4.05	4.24*	4.00
Like change	3.54	3.47	3.63*	3.45	3.67*	3.42
Competition increases performance	3.77*	3.56	3.63	3.59	3.70*	3.57
Success depends on chance	2.40	2.37	2.21*	2.40	2.37	2.38
Curious/enjoy discovering new things	4.30*	4.16	4.20	4.18	4.34*	4.13
Creative solving daily problems	4.04*	3.82	4.04*	3.82	4.09*	3.77
Consider themselves trendsetters	2.98*	2.79	3.02*	2.80	3.08*	2.73
Quick to take action	3.60	3.61	3.69	3.59	3.68	3.57
See things through to completion	4.16	4.19	4.20	4.18	4.17	4.19
Prefer others take overall responsibility for projects	2.53*	2.69	2.57	2.68	2.50*	2.73
Empathize with others	3.73	3.84	3.85	3.81	3.84	3.80
Difficult/complex situations scare them	2.59	2.73	2.55*	2.74	2.58*	2.76
Adapt easily to change	3.71	3.68	3.80	3.66	3.84*	3.62
Like to take a leadership role	3.84*	3.67	4.02*	3.64	3.93*	3.61
Help others achieve their potential	4.08*	3.94	4.14*	3.93	4.07*	3.92
Know how to get information needed to make a decision	4.10*	3.96	4.06	3.97	4.08*	3.94
Use knowledge/skills of others effectively	3.76	3.78	3.80	3.77	3.82	3.75
Need results to evaluate success	3.69*	3.52	3.48	3.56	3.52	3.55
Think about/look for business opportunities	3.78*	2.86	3.29*	2.97	3.39*	2.89
Acts on instincts	3.89*	3.57	3.73	3.61	3.67*	3.58

- Statistical Significance to p<0.05

Table 43
Characteristics
Similarities and Differences Among Three Types of Entrepreneurs
Alumni

Characteristic	Business		Social		Inventor	
	Mean	PValue	Mean	PValue	Mean	PValue
Looks for new challenges	4.05	0.0129	4.14	0.0001	4.10	0.0001
Persistent with difficult situations	3.97	0.0369	4.05	0.0006	4.01	0.0001
Like taking risks	3.44	0.0001	3.31	0.0338	3.39	0.0001
Creative solving day to day problems	4.04	0.0003	4.04	0.0008	4.09	0.0001
Consider themselves trendsetters	2.98	0.0123	3.02	0.0058	3.08	0.0001
Like to take a leadership role	3.84	0.0191	4.02	0.0001	3.93	0.0001
Help others achieve their potential	3.97	0.0256	4.14	0.0011	4.07	0.0028
Think about/look for business opportunities	3.78	0.0001	3.29	0.0013	3.39	0.0001
Prefer to work with less knowledgeable friends than with experts they don't know	2.25	0.0149			2.30	0.0283
Failures are opportunities to learn	4.20	0.0114			4.24	0.0001
Competition increases performance	3.77	0.0069			3.70	0.0314
Curious/enjoy discovering new things	4.30	0.0197			4.34	0.0001
Prefer others take overall responsibility for projects	2.53	0.0497			2.50	0.0009
Know how to get information needed to make a decision	4.10	0.0104			4.08	0.0021
Acts on instincts	3.89	0.0001			3.67	0.0005
Persuading/influencing others comes naturally			3.72	0.0001	3.57	0.0015
Like change			3.63	0.0186	3.67	0.0001
Difficult/complex situations scare them			2.55	0.0199	2.58	0.0068

Table 44
Entrepreneurship Potential
Comparison of Males and Females
Alumni

Variables	Sampe	Males	Females
	Mean	Mean	Mean
Likelihood to start or buy a business in future (n = 1017)	2.29	2.64*	2.14
Likelihood of managing/directing a not-for-profit (n = 1068)	2.02	2.06	2.01
Likelihood of inventing something (n = 1138)	2.32	2.71*	2.15

- Statistical Significance to p<0.05

STUDENTS

Attitude toward Entrepreneurship

Students were provided the same five statements as the other respondent groups to reflect their attitudes toward entrepreneurship and overall, their attitudes are relatively positive. Using a 5 point scale (1=strongly disagree, 5=strongly agree), they agree that entrepreneurs make a positive contribution to society (4.17) and somewhat agree that entrepreneurs are admired within society (3.68). When asked if entrepreneurship is a good career option, the average answer was 3.58 indicating they only somewhat agree with this statement.

The response was favourable when they were asked if universities should invest resources in the development of entrepreneurship (3.79) which supports the notion there is demand from students for entrepreneurship education (Dunn & Short, 2001; Gallup, 1994); however, they somewhat disagree that entrepreneurship should be a part of every degree program (2.83). Refer to **Table 45.**

Perception of Entrepreneurship

Perception was measured using the same two definitions provided to the other three respondent groups and students were asked to choose the one which most closely matched their own definition of entrepreneurship. The majority (67.98%) chose the business oriented definition; however, a little over 32% chose the broad definition demonstrating that some students believe entrepreneurship can be applied to various disciplines and pursuits other than business. **Table 46** provides definitions used and the results.

To examine whether there was a difference in attitude between the students who chose the business oriented definition and those who chose the broad definition, a T-TEST procedure was used to compare the mean answers of the attitude statements of both groups. The group that chose the broad definition had a more positive attitude toward entrepreneurship than those who chose the business oriented definition and a statistically significant difference resulted in four of the five statements provided to measure attitude. The only statement that did not result in a statically significant difference was statement 5 – "entrepreneurship should be part of every degree program". Even though those with a broad perception of entrepreneurship tend to believe it may pertain to various disciplines and endeavours, their reaction to entrepreneurship being part of every degree program was no more positive than those who believe it pertains to business creation and operation. See **Table 47.**

Career Interests and Influences

Students were asked three (3) questions related to their career aspirations in order to gain insight into their intentions upon graduation and what factors most influence their career choice and career related decisions. The first question dealt with their intention upon graduation. They were asked to rate, using a 5 point scale (1=very low, 5=very high), a number of possible career paths based on their aspirations. The highest average rating was given to pursuing further education (3.82), followed by working for the government (3.34), and then working for a large business/organization (3.16). The options with lower ratings included inheriting or buying an existing business (1.97), running their own business while working elsewhere (2.14), and starting their own business (2.52).

On average, students seem to favour further education and employment with large organizations; however, given the large size of this respondent group (11,594+) there appears to be interest in starting a business judging by the mean answer of 2.52. See **Table 48**.

Further analysis was conducted to determine if differences existed between full-time and part-time students with regard to career aspirations. The T-TEST procedure was used to compare the mean responses of full and part-time students and statistically significant differences were found. Part-time students are significantly more interested in working for a not-for-profit organization and working for the government than full-time students. They are significantly less interested in working for a large business/organization, inheriting or buying an existing business, and less interested in pursuing further education than full-time students. No significant difference was found with respect to starting a business and running a business while working full-time elsewhere, between full-time and part-time students.

The second question allowed students to rate the factors that have influenced their career interests. Personal interests were rated on average as the strongest influencer (4.61) using a 5 point scale (1=very weak, 5=very strong), followed by prospect for employment (3.99), and education choices available (3.79). Therefore, students in general tend to make their career decisions based on their level of personal interest in a field combined with the level of potential for employment. It is also very likely they aspire to professional positions judging by the high average rating for further education. See **Table 49**.

Finally students were asked to identify, from a list of ten attributes, the top three that will most significantly influence their career decision. A significant majority (60.42%) chose financial security as one of the top three, followed by a career that provides intellectual challenge (46.86%), and thirdly, the opportunity to be creative and original (41.74%). Working in a dynamic and collaborative workplace was also chosen as a significant factor (36.82%). The opportunity to manage, opportunity for training, and prospects for promotion were chosen much less frequently as one of the top three attributes. **Table 50** provides the detailed results.

It is worth noting that the attributes that are provided through entrepreneurship - opportunity to be creative and original (41.74%), opportunity to take responsibility (27.44%), and freedom from close supervision (18.29%) were chosen fairly frequently indicating that some students desire the attributes in their careers that entrepreneurship can offer.

Predisposition to Entrepreneurship

Students were asked to respond to the same bank of questions used with alumni to measure predisposition (being prone) to entrepreneurship. **Table 51** provides the complete results. A high percentage, 79.49%, said they have worked in a small/medium sized business, 69.29% said they had a means of earning spending money as a child, and 62.33% indicated they have had an idea for a small business. A little over 40% come from a family where one parent has owned a business and almost 46% are the eldest child in the family.

A comparison of means using the T-TEST procedure was conducted to determine if those students who possess the predisposition factors related to their backgrounds had a more positive attitude toward entrepreneurship. The factors tested included: 1. one parent owns/owned a business, 2. a close friend is a small business owner, 3. they are the eldest child in their family, 4. they are from an immigrant family, and 5. they had a means of earning spending money as a child. Those students who either have one parent who owns/owned a business, or have a friend who owns a small business, or are the eldest in their family, or come from an immigrant family, or had a means of earning spending money as children, had a significantly more positive attitude toward entrepreneurs. Those students who either have one parent who owns/owned a business, or have a friend who owns a small business, or are the eldest in their family, or had a means of earning spending money as children, had a significantly more positive attitude toward entrepreneurship as a career option.

Exposure to Entrepreneurship and New Information Technology in University

Students were asked if they have been exposed to entrepreneurship as a career option during their university experience and the majority said no (56.20%) or indicated they don't know whether they were exposed (13.41%). A comparison was then conducted to determine if those exposed to entrepreneurship have a more positive attitude toward entrepreneurship than those who were not. The results indicated exposure to entrepreneurship positively affects attitude. The mean responses to the questions used to measure attitude of the group exposed were higher, or more positive, than those who were not exposed and a statistically significant difference resulted using both the Scheffe Test and the Tukey Test. **Table 52** provides the mean comparisons.

When asked if they are being provided with the knowledge to work with new information technology, 52.29% indicated yes; however, their interest in new information technology is not particularly high with a mean response of 3.40 using a 5 point scale (1=very low, 5=very high). Just over 27% said they have had the opportunity to acquire the knowledge to start a business and 37.73% said they are taking business courses or have taken business courses during university. See **Table 53**.

Further analysis was conducted to determine if being exposed to entrepreneurship as a career option, acquiring the knowledge to start a business, and taking business courses are related to attitude. The Regression procedure was used resulting in a significant relationship between possessing a positive attitude toward entrepreneurs' contributions to society and both being exposed to entrepreneurship and taking business courses. A significant relationship resulted between believing entrepreneurs are admired within society and both being exposed to entrepreneurship and taking business courses. Additionally, a significant relationship resulted between possessing a positive attitude toward entrepreneurship as a career option and being exposed to entrepreneurship, acquiring the knowledge to start a business, and taking business courses. These results indicate that exposure, acquiring start-up knowledge, and business knowledge all have a positive impact on attitudes toward entrepreneurs and careers in entrepreneurship.

Entrepreneurial Potential

In order to better understand if students have the desire to pursue entrepreneurship as a career option, they were asked to rate the likelihood they would buy or start a business, manage or direct a not-for-profit, and invent or improve a product, process, or service in the future. In each case the mean response was slightly below 3 using a 5 point scale (1=very unlikely, 5=very likely). The mean likelihood of business entrepreneurship was 2.68, the mean for social entrepreneurship was 2.82 and the mean likelihood for inventing/innovating was 2.64.

It appears that, in general, students are somewhat unlikely to undertake one of these entrepreneurial activities in the future. See **Table 54**. It is interesting to note, however, the majority (62.33%) have had a business idea yet they do not wish to pursue their idea. Additionally, the majority believe entrepreneurship is synonymous with business, therefore is it quite possible they believe that if they are not interested in starting a business then entrepreneurship education and development is not relevant to them.

Predisposition toward Entrepreneurship and Likelihood of Entrepreneurship

The Regression procedure was used to identify if a relationship exists between predisposition toward entrepreneurship and likelihood of engaging in entrepreneurship. The results indicated there are significant positive relationships between predisposition toward entrepreneurship and likelihood to engage in business entrepreneurship, social entrepreneurship, and inventing/innovating. The relationships were slightly stronger with likelihood to undertake business entrepreneurship and inventing/innovating than with social entrepreneurship however.

Likelihood of Entrepreneurship and Business Knowledge

In order to examine if having the knowledge to start a business increases the likelihood for future entrepreneurship, the ANOVA procedure was used to compare the mean likelihood of those who are acquiring this knowledge against those who are not. In each of the three entrepreneurship categories, those who indicated they are acquiring the knowledge to start a business through their university studies indicated a higher

likelihood to undertake entrepreneurial activity in the future. A statistically significant difference in the mean responses was detected using both the Scheffe and Tukey Tests. Refer to **Table 55.** Further, those students who have a high likelihood for entrepreneurship also have a significantly higher interest in new information technology.

Additionally, the Regression procedure resulted in a significant relationship between taking business courses and the likelihood to undertake business entrepreneurship and inventing/innovating. However, there was no significant relationship between taking business courses and the likelihood to undertake social entrepreneurship. These results indicate that taking business courses may have a positive impact on increasing the likelihood that students undertake some forms of entrepreneurship.

Likelihood of Entrepreneurship and Discipline

It was beneficial to determine if those respondents with above average likelihood of future entrepreneurship come from particular disciplines. The ANOVA procedure was used to conduct a mean comparison and the Tukey test identified statistically significant differences among the disciplines with regard to business entrepreneurship. Students studying Business, Dentistry, Forestry and Environmental Studies, and Computer Science have the strongest likelihood of business entrepreneurship and significantly stronger than Law, Arts and Humanities/Social Sciences, Health Profession, Science, Education and Theology. Theology demonstrated the weakest likelihood of business entrepreneurship. See **Table 56**.

Statistically significant differences were also detected among the disciplines when testing the mean responses of those with a higher than average likelihood of social entrepreneurship. Students studying Theology, Forestry and Environment Studies, Architecture and Urban/Rural Planning, and Arts and Humanities/Social Sciences have the strongest likelihood of social entrepreneurship and significantly stronger than students studying Computer Science, Engineering and Dentistry. See **Table 57**.

When testing the likelihood for inventing/innovating by discipline, the results showed students studying Engineering have the strongest likelihood for inventing/innovating and it is significantly stronger than all other disciplines. Students studying Computer Science, Forestry and Environmental Studies, and Business also have a strong likelihood and Theology students demonstrated the weakest likelihood of inventing/innovating. See **Table 58**.

Likelihood of Entrepreneurship and Gender

Finally, it was of interest to see if there were differences between males and females with regard to likelihood for future entrepreneurship. A comparison of means using the T-TEST procedure resulted in a statistically significant difference in the mean responses of males and females relative to their likelihood to start a business and their likelihood to invent/innovate. In each case, the mean response of males was significantly higher than females; however, the mean response of females relative to their likelihood to manage/direct a not-for-profit organization was significantly higher than that of males.

These results indicate that males tend to be more likely than females to start a business and invent/innovate in the future, and females tend to be more likely than males to manage/direct a not-for-profit organization in the future. See **Table 59**.

Likelihood of Entrepreneurship and Attitude Toward Entrepreneurship

The Regression procedure was used to identify if one's attitude impacts their likelihood to undertake entrepreneurship. Firstly, a significant relationship was detected between likelihood to undertake business entrepreneurship and a more positive attitude toward entrepreneurs and entrepreneurship as a career option. Secondly, a significant relationship was detected between likelihood to undertake social entrepreneurship and a more positive attitude toward entrepreneurship as a career option. Thirdly, there was a significant relationship found between likelihood to undertake inventing/innovating and a more positive attitude toward entrepreneurs and entrepreneurship as a career option. These results indicate that, generally, possessing a more positive attitude toward entrepreneurship increases the likelihood to engage in entrepreneurship.

Entrepreneurial Characteristics/Skills

Students were given the same series of characteristics/skills as academic administration and faculty and were asked to rate the level of opportunity they have to develop these during university. Of the 33 variables, the top answers on average using a 5 point scale (1=very low, 5=very high) were responsibility/accountability (4.33), need to achieve (4.20), desire to complete a project from beginning to end (4.16), followed by communication skills (4.15). The variables that students indicated they have the least opportunity to develop on average were need for power (3.09), risk taking ability (3.17), and desire for constant change (3.29). **Table 60** provides the full results.

While it was desirable to gain insight into whether students have opportunities to develop entrepreneurial characteristics/skills during university, it was equally important to understand if they exercise these characteristics. Students were provided with the same series of 35 questions as alumni and were asked to rank each based on how frequently they utilize these characteristics/skills using a 5 point scale (1=never, 5=always). In the majority of questions, a high ranking signified possession of the characteristic; however, there were questions where a low ranking signified possession of the characteristic and hence are explained.

The characteristics/skills students indicated they exercise most frequently were curiosity (4.18), desire to complete a project (4.07), and need to achieve (4.04 and 3.91). They exercise responsibility/accountability relatively often given they rarely prefer that others take overall responsibility for a project (2.39) and have some desire to control their own destiny given the lower rating (2.48) when asked if their success depends on chance.
In general, students are not particularly opportunistic since they only sometimes think about or look for business opportunities (3.21) and sometimes like taking risks (3.35). **Table 61** provides the full results.

To further analyze the entrepreneurial characteristics/skills of students a T-TEST procedure was used to compare the mean responses of those with a higher likelihood of future entrepreneurship against those with a lower likelihood to see if there were differences in the characteristics/skills they possess. Refer to **Table 62.**

Overall, students with a high likelihood of future entrepreneurship exercise the majority of entrepreneurial characteristics/skills significantly more than those with a low likelihood of future entrepreneurship; in particular, they like taking risks more often, like taking a leadership role more often, and they use creativity more regularly. Further, students with a high likelihood of business entrepreneurship are more opportunistic, competitive, and have a stronger need for power. Student with a high likelihood of social entrepreneurship help others achieve their potential more, empathize more, and are more resourceful than students with a low likelihood. Those with a high likelihood of inventing/innovating like change significantly more than those who do not have a high likelihood for inventing/innovating, look for new challenges more, and are more opportunistic.

Teaching Methods Used by Faculty

In order to determine if students are exposed to experiential teaching methods or if more traditional methods are used more commonly, they were asked to rate the frequency their professors use various teaching methods. **Table 63** provides the full list of methods and corresponding average rankings.

Overall, the most common teaching method used according to students is lecture with an average ranking of 4.43 on a 5 point scale (1=Never and 5=Always). The second most common method is group work followed by classroom discussion. The least common methods included field trips (1.79), simulations/role plays (2.16) and community-based

projects (2.34). Among those respondents who chose the Other category and provided an explanation, the methods identified were presentations, seminars, audiovisual, and computer/multi-media.

Teaching Methods and Characteristic Development

When examining relationships between teaching methods and characteristics/skills that students have the opportunity to develop, a number of statistically significant relationships resulted. The Regression procedure was used to analyze the relationships between the two sets of variables with the goal being to discover whether certain teaching methods provide more opportunity to develop certain characteristics.

Generally, mentoring, class discussions, independent study, real-world community projects, group work, and lecture provide the highest opportunity respectively to develop all 33 entrepreneurial characteristics and skills. However, the methods which provide the highest opportunity to develop the characteristics/skills significantly related to entrepreneurs, using the Regression procedure as well as those identified as common to all three types using a comparison of means, are detailed below.

Opportunistic

Mentoring, class discussions, labs, real-world community projects, role plays, and independent study, all provide the highest opportunity to develop the ability to identify an opportunity to improve a situation.

Intuition

Lecture, mentoring, class discussions, labs, real-world community projects, independent study, and group work provide opportunity to develop intuition.

Need to Achieve

To develop the need for achievement, lecture, mentoring, class discussions, labs, guest speakers, and independent study should be employed.

Perseverance

Utilizing mentors, class discussions, real-world community projects, independent study, and group work provide high opportunity to develop perseverance.

Risk Taking

In order to provide opportunity for students to develop their risk taking ability, methods such as lecture, mentoring, class discussions, labs, real-world community projects, independent study, and group work should be used.

Resourcefulness

Teaching methods that provide opportunity to develop resourcefulness include lecture, case studies, mentoring, labs, independent study, and group work.

Creative thinking/Innovativeness

To provide opportunity to develop creative thinking and innovativeness teaching methods such as lecture, mentoring, class discussions, labs, real-world community projects, and independent study should be used.

Leadership

The methods that provide the highest opportunity to develop leadership ability include: lecture, mentoring, class discussions, real-world community projects, guest speakers, role plays, and group work.

Ability to maximize potential of others

The ability to maximize the potential of others can be developed using mentoring, class discussions, real-world community projects, guest speakers, independent study, and group work.

Out-Migration of University Graduates

Students were asked if they intend to stay in Atlantic Canada after graduation and a total of 58.57% said yes. Of the group who indicated they would leave, the most common reason cited was few career/job opportunities (38.12%). They indicated that not only are there few job opportunities in the region but salaries are generally uncompetitive. The next most common reason given related to broadening their horizons (16.66%) and this group have the desire to travel and explore other countries and cultures before pursuing their career aspirations. The third most common reason was to further their education (8.53%) and they indicated the graduate programs of interest are not available in Atlantic Canada.

Student Tables

Table 45
Attitude Toward Entrepreneurship
Students
(n = between 11,675 and 11,694)

Variables	Mean	Median
Attitudes toward entrepreneurs (scale 1=strongly disagree, 5=strongly agree):		
• Entrepreneurs make a positive contribution to society	4.17	4.00
• Entrepreneurs are admired	3.68	4.00
• Entrepreneurship is a good career option	3.58	4.00
• Universities should invest resources in entrepreneurship	3.79	4.00
• Entrepreneurship part of every degree program	2.83	3.00

Table 46
Perception of Entrepreneurship
Students

Variables	Number	Percentage
Definition of entrepreneurship:		
• Business oriented – Entrepreneurship is a process whereby a combination of resources, characteristics, and knowledge are utilized to create and operate a for- profit business.	7,932	67.98
• Broad – Entrepreneurship is a process whereby a combination of resources, characteristics, and knowledge are utilized to recognize and act on opportunities that may improve the quality of life for others.	3,736	32.02

Table 47
Comparison of Means
Perception of Entrepreneurship
and Attitude Toward Entrepreneurship
Students

Definition	Entrepreneurs make a positive contribution to society	Entrepreneurs are admired within society	Entrepreneurship is a good career option	Universities should invest resources in entrepreneurship	Entrepreneurship should be part of every degree program
Business - oriented	4.13	3.64	3.49	3.69	2.66
Broad	4.27*	3.75*	3.77*	3.98*	3.18

- statistically significant to p<0.05.

Table 48
Career Interests
Students
(n between 11,594 and 11,656)

Variables	Mean	Median
Interest upon graduation: (Scale 1=very low, 5=very high)		
• Further education	3.82	4.00
• Work for government	3.33	4.00
• Work for a large business/organization	3.16	3.00
• Self-employed professional	2.85	3.00
• Other – no analysis	2.69	1.00
• Work for a not-for-profit organization	2.64	3.00
• Work for a small business/organization	2.60	3.00
• Start own business	2.52	2.00
• Run own business while working full-time elsewhere	2.14	2.00
• Inherit or buy an existing business	1.97	2.00

Table 49
Career Influences
Students
(n=11,664 and 11,702)

Variables	Mean	Median
Influencers on career choice: (Scale: 1=very weak, 5=very strong)		
• Personal interests	4.61	5.00
• Employment prospects	3.99	4.00
• Education choices available	3.79	4.00
• Parents	3.45	4.00
• Previous work experience	3.37	4.00
• School teachers	2.97	3.00
• Professors	2.90	3.00
• Friends	2.87	3.00
• Other	2.82	3.00
• Extra curricular activities during university	2.44	2.00
• Extended family	2.42	2.00
• Sports activities	2.08	2.00

Table 50
Top Three Career Attributes
Students
(n = 11,747)

Top three factors that will most significantly influence career choice	Number	Percentage
• Financial security	7,098	60.42
• Provides intellectual challenge	5,505	46.86
• Opportunity to be creative and original	4,903	41.74
• Dynamic and collaborative workplace	4,325	36.82
• Opportunity to take responsibility	3,223	27.44
• High starting salary	2,354	20.04
• Freedom from close supervision	2,148	18.29
• Prospect for promotion	1,667	14.19
• Opportunity for training	1,448	12.33
• Other	1,216	10.35
• Opportunity to manage	1,110	9.45

Table 51
Predisposition Toward Entrepreneurship
Students
(n = between 11,659 and 11,700)

Variables	Number	Percentage
• One parent owns/owned a business	4,707	40.23
• A close friend is a small business owner	3,891	33.29
• Eldest child in the family	5,368	45.95
• Immigrants	1,180	10.12
• Earned spending money as a child	8,101	69.29
• Involved in initiating student activities at university	3,550	30.36
• Worked in a small/medium-sized business	9,291	79.49
• Know of resources that support business startup in area	6,553	56.12
• Had an idea for small business	7,282	62.33

Table 52
Comparison of Means
Exposure to Entrepreneurship
and Attitude Toward Entrepreneurship
Students

Attitude	Entrepreneurs make a positive contribution to society	Entrepreneurs are admired within society	Becoming an entrepreneur is a good career option	Universities should invest resources in the development of entrepreneurship	Entrepreneurship should be a part of every student's degree program
Exposed to Entrepreneurship	4.31A	3.80A	3.73A	3.95A	3.05A
Not Exposed to Entrepreneurship	4.13B	3.63B	3.54B	3.71B	2.74B
Don't Know	4.07C	3.61B	3.51B	3.71B	2.73B

Those with the same letter are not statistically different.

Table 53
Exposure to Entrepreneurship and New Information
Technology in University
Students

Variables	Number	Percentage
Exposed to entrepreneurship as a career option (n = 11,684):		
• Yes	3,551	30.09
• No	6,566	56.20
• Don't know	1,567	13.41
University providing opportunity to acquire knowledge to start a business (n=11,670)	3,160	27.08
Have taken or are now taking business courses (n=11,656)	4,398	37.73
Studies provide knowledge to work with new info technology (n=11,657)	6,096	52.29

Variables	Mean	Median
Interest in new info technology (n=11,497) (Scale 1=very low, 5=very high)	3.40	3.00

Table 54
Entrepreneurship Potential
Students
(Scale 1=very unlikely, 5=very likely)

Variables –	Mean	Median
Likelihood to start or buy a business in future (n = 11,673)	2.68	3.00
Likelihood of managing/directing a not-for-profit (n = 11,669)	2.82	3.00
Likelihood of inventing something (n = 11,646)	2.64	3.00

Table 55
Likelihood of Future Entrepreneurship and Acquiring Business Start-up Knowledge
Students

	Likelihood to start or buy a business (Mean)	Likelihood of managing/directing a not-for-profit (Mean)	Likelihood of inventing or improving a product, process or service (Mean)
Acquiring the knowledge to start a business.	3.24A	2.98A	2.96A
Not acquiring the knowledge to start a business.	2.47B	2.77B	2.51C
Do not know if they are acquiring this knowledge.	2.53B	2.78B	2.64B

Those with the same letter are not statistically significant

Table 56
Likelihood to Start a Business by Discipline
Students

Discipline	Sample Mean	Mean by Discipline
Business/Commerce/Management	2.68	3.41 A
Dentistry	2.68	3.40 A
Forestry and Environmental Studies	2.68	3.13 AB
Computer Science	2.68	3.04 ABC
Engineering	2.68	2.90 BCD
Architecture and Urban/Rural Planning	2.68	2.79 BCDE
Medicine	2.68	2.66 CDEF
Public Relations	2.68	2.63 CDEF
Law	2.68	2.58 DEF
Arts and Humanities/Social Sciences	2.68	2.50 DEF
Health Profession	2.68	2.43 EF
Science	2.68	2.42 EF
Education	2.68	2.34 F
Theology	2.68	1.73 G

Those with the same letter(s) are not statistically significant

Table 57
Likelihood to Manage/Direct a Not-for-Profit Organization by Discipline
Students

Discipline	Sample Mean	Mean by Discipline
Theology	2.82	3.13 A
Forestry and Environment Studies	2.82	2.99 AB
Architecture and Urban/Rural Planning	2.82	2.97 AB
Arts and Humanities/Social Sciences	2.82	2.97 AB
Law	2.82	2.91 ABC
Business/Commerce/Management	2.82	2.90 ABC
Public Relations	2.82	2.89 ABC
Health Profession	2.82	2.80 ABCD
Education	2.82	2.72 ABCD
Science	2.82	2.67 BCD
Medicine	2.82	2.63 BCD
Computer Science	2.82	2.55 CDE
Engineering	2.82	2.39 DE
Dentistry	2.82	2.18 E

Those with the same letter(s) are not statistically significant

Table 58
Likelihood of Inventing/Innovating by Discipline
Students

Discipline	Sample Mean	Mean by Discipline
Engineering	2.64	4.01 A
Computer Science	2.64	3.35 B
Forestry and Environmental Studies	2.64	3.09 BC
Business/Commerce/Management	2.64	2.95 BCD
Architecture and Urban/Rural Planning	2.64	2.72 CDE
Science	2.64	2.57 DEFG
Dentistry	2.64	2.49 EFG
Public Relations	2.64	2.49 EFG
Health Profession	2.64	2.46 EFG
Arts and Humanities/Social Sciences	2.64	2.38 EFGH
Medicine	2.64	2.38 EFGH
Education	2.64	2.27 FGH
Law	2.64	2.16 GH
Theology	2.64	2.05 H

Those with the same letter(s) are not statistically significant

Table 59
Likelihood of Future Entrepreneurship by Gender
Students

Variables Scale: (1=very unlikely, 5=very likely)	**Mean Males**	**Mean Females**
Likelihood to start a business in the future (n=11,587)	3.04*	2.52
Likelihood to manage/direct a not-for-profit in the future (n=11, 583)	2.64	2.94*
Likelihood to invent something in the future (n=11,560)	3.08*	2.44

****- Statistical Significance to p<0.05***

Table 60
Opportunity to Develop Entrepreneurial Skills at University Students
(n=between 11,662 and 11,726)

Variables (Scale: 1=very low, 5=very high)	**Mean**	**Median**
Responsibility/accountability	4.33	4.00
Need to achieve	4.20	4.00
Desire to complete a project from beginning to end	4.16	4.00
Communication skills	4.15	4.00
Desire for independence	4.12	4.00
Ability to learn from mistakes	4.11	4.00
Ability to handle pressure	4.08	4.00
Ability to find required information	4.05	4.00
Desire to control one's destiny	4.00	4.00
Perseverance	3.98	4.00
Curiosity	3.95	4.00
Capacity to adapt to changes	3.92	4.00
Resourcefulness	3.92	4.00
Creative thinking/innovativeness	3.90	4.00
Self-confidence	3.89	4.00
Ability to identify an opportunity to improve a situation	3.88	4.00
Ability to acquire expertise	3.88	4.00
Self-esteem	3.83	4.00
Enthusiasm	3.83	4.00
Ability to use and apply new technology	3.82	4.00
Initiative/active involvement	3.74	4.00
Ability to process feedback	3.74	4.00
Ability to put theory into practice	3.74	4.00
Optimism	3.70	4.00
Leadership abilities	3.70	4.00
Perfectionism	3.66	4.00
Empathy	3.63	4.00
Competitiveness	3.57	4.00
Intuition	3.45	4.00
Ability to maximize the potential of others	3.41	3.00
Desire for constant change	3.29	3.00
Risk taking ability	3.17	3.00
Need for power	3.09	3.00

Table 61
Application of Entrepreneurial Characteristics
Students
(n = between 11,653 and 11,705)

Variables (Scale: 1=never, 5=always	**Mean**	**Median**
Are you curious and do you like discovering new things? (Curiosity)	4.18	4.00
Do you see things through to completion? (Desire to complete projects)	4.07	4.00
Do you strive to exceed your expectations? (Need to Achieve)	4.04	4.00
Do you think failure is opportunity to learn? (Ability to learn from mistakes)	3.99	4.00
Do you look for new challenges? (Need to Achieve)	3.91	4.00
Do you like to be admired? (Need for Power)	3.88	4.00
Do you know how to get information to make decisions? (Ability to find information)	3.86	4.00
Do you perform tasks with great effort and energy? (Need to Achieve)	3.84	4.00
Do you try to help others achieve their potential? (Ability to maximize potential)	3.78	4.00
Are you persistent in difficult situations? (Perseverance)	3.77	4.00
Are you creative in day-to-day problems? (Resourcefulness)	3.76	4.00
Are you self-confident? (Self-confidence)	3.74	4.00
Do you put yourself in the place of others to feel what they feel? (Empathy)	3.73	4.00
Do you use knowledge and skills of others effectively? (Ability to acquire expertise)	3.72	4.00
Do you need results to evaluate success? (Ability to process feedback)	3.72	4.00
Does competition increase your performance? (Competitiveness)	3.70	4.00
Do you adapt easily to change? (Capacity to adapt to change)	3.67	4.00
Do you like to take a leadership role? (Leadership abilities)	3.67	4.00
Are you competitive and love to win? (Need for Power)	3.59	4.00
Do you seek approval from others? (Desire for independence)	3.59	4.00
Do you like change? (Desire for constant change)	3.59	4.00
Do you act on your instincts? (Intuition)	3.59	4.00
Are you quick to take action? (Initiative/active involvement)	3.56	4.00
Do you always have a positive attitude? (Optimism)	3.55	4.00
Does uncertainty cause you stress? (Ability to handle pressure)	3.52	4.00
Does persuading/influencing others come naturally? (Need for Power)	3.51	4.00
Is reputation and status important? (Need for Power)	3.46	4.00
Do you like taking risks? (Risk taking ability)	3.35	3.00
Do you think about or look for business opportunities? (Opportunistic)	3.21	3.00
Is your tendency to be responsible for everything & everyone? (Resp/Acct)	3.17	3.00
Are you a trendsetter? (Creative thinking/innovativeness)	2.90	3.00
Does the difficulty and complexity of situations scare you? (Perseverance)	2.83	3.00
Do you prefer to work with friends than with experts? (Desire for Independence)	2.67	3.00
Does your success depend on chance? (Desire to control one's destiny)	2.48	2.00
Do you prefer others take overall responsibility on a project? (Responsibility/Acct)	2.39	2.00

Table 62
Comparison of Means
Application of Characteristics and Likelihood of Future Entrepreneurship Students

	High Business Likelihood (Mean)	Low Business Likelihood (Mean)	High Social Likelihood (Mean)	Low Social Likelihood (Mean)	High Inventor Likelihood (Mean)	Low Inventor Likelihood (Mean)
Perform tasks with great effort/energy	4.00*	3.83	4.01*	3.80	4.05*	3.80
Look for new challenges	4.22*	3.77	4.24*	3.77	4.27*	3.72
Strive to exceed expectations	4.25*	3.99	4.26*	3.96	4.25*	3.94
Persuading/influencing others comes naturally	3.85*	3.30	3.81*	3.40	3.88*	3.31
Like to be admired by others	4.01*	3.77	3.99*	3.89	4.03*	3.79
Importance of Reputation/Status	3.66*	3.30	3.51	4.49	3.67*	3.34
Competitive/love to win	3.90*	3.33	3.61	3.63	3.91*	3.36
Seek approval of others	3.58	3.59	3.58	3.58	3.58	3.58
Prefer to work with less knowledgeable friends than with experts they don't know	2.65	2.66	2.51*	2.68	2.65	2.69
Self-confident	4.03*	3.61	3.96*	3.70	4.07*	3.60
Positive attitude regardless of situation	3.86*	3.43	3.80*	3.41	3.88*	3.42
Persistent with difficult situations	4.06*	3.69	4.04*	3.70	4.14*	3.63
Tendency to be responsible for everyone and everything	3.40*	3.07	3.41*	3.05	3.39*	3.07
Uncertainty causes them stress	3.40*	3.61	3.41*	3.56	3.38*	3.64
Like taking risks	3.76*	3.09	3.63*	3.21	3.75*	3.10
Failures are opportunities to learn	4.26*	3.86	4.23*	3.81	4.25*	3.84
Like change	3.87*	3.42	3.86*	3.44	3.96*	3.39
Competition increases performance	3.98*	3.47	3.76*	3.67	3.96*	3.50
Success depends on chance	2.55	2.40*	2.44	2.48	2.51	2.39*
Curious/enjoy discovering new things	4.40*	4.10	4.43*	4.11	4.53*	4.04
Creative solving daily problems	4.10*	3.60	4.08*	3.64	4.20*	3.50
Consider themselves trendsetters	3.11*	2.59	3.24*	2.73	3.38*	2.56
Quick to take action	3.83*	3.43	3.81*	3.45	3.89*	3.40
See things through to completion	4.13	4.09	4.22*	4.06	4.21*	4.04
Prefer others take overall responsibility for projects	2.31*	2.39	2.29*	2.43	2.35	2.35
Empathize with others	3.80	3.74	4.05*	3.53	3.84*	3.71
Difficult/complex situations scare them	2.64*	2.91	2.71*	2.83	2.58*	2.94
Adapt easily to change	3.91*	3.54	3.92*	3.58	4.03*	3.50
Like to take a leadership role	4.07*	3.44	4.06*	3.50	4.06*	3.44
Help others achieve their potential	4.04*	3.68	4.13*	3.53	4.09*	3.65
Know how to get information needed to make a decision	4.05*	3.84	4.14*	3.83	4.14*	3.81
Use knowledge/skills of others effectively	3.91*	3.66	3.91*	3.64	3.98*	3.64
Need results to evaluate success	3.75	3.73	3.72	3.78	3.79	3.72
Think about/look for business opportunities	4.16*	2.61	3.50*	3.01	3.86*	2.78
Acts on instincts	3.86*	3.48	3.81*	3.52	3.86*	3.47

**** - Statistical Significance to p<0.05***

Table 63
Teaching Methods and Resources Used by Professors
Students

Variables	Mean	Median
Teaching Method: (Scale: 1=never, 5=always)		
Lecture (n=11,702)	4.43	5.00
Group Work (n=11,674)	3.58	4.00
Classroom Discussions (n=11,658)	3.55	4.00
Independent Study (n=11,676)	3.38	4.00
Case Studies (n=11,657)	2.98	3.00
Labs (n=11,633)	2.72	3.00
Guest Speakers (n=11,669)	2.61	3.00
Mentoring (n=11,606)	2.37	2.00
Community-based, Real World Projects (n=11,667)	2.34	2.00
Simulations/Role Plays (n=11,682)	2.16	2.00
Field Trips (n=11,667)	1.79	1.00
Other (n=2,813)	2.43	2.00

Other Teaching Methods Used
(n=2,813)

Variables	Mean	Median
Teaching Methods		
Group Work	3.55	4.00
Computer/Multi media	3.17	3.00
Audio Visual/videos	3.35	3.00
Presentations	3.99	4.00
Seminars	3.60	4.00


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APPENDIX A - Senior Administration

SENIOR ADMINISTRATION INTERVIEW

Introduction

Good morning/afternoon _____, my name is _____. I am here today on behalf of the consortium of universities (18) in Atlantic Canada who are working together to increase the knowledge of characteristics and skills that can promote or hinder entrepreneurship development in Atlantic Canadian Universities. I believe you are aware of this project through _____, who sits on the Steering Committee for this Atlantic universities research project.

If no, go through the goals – give handout-outlining project.

This morning, I'd like to ask you a series of questions. The interview will take about 40 minutes to complete? Is this time frame acceptable?

If no, make adjustments

May I tape our conversation, as it will make note taking easier?

If no, take notes.

Questions

1. What is the mission of your university?

2. What is the vision of your university for the future?

3. What are the most important objectives of your university in the next 5-10 years?

4. What challenges exist in your effort to achieve these objectives?

5. What do you believe makes your university unique?

6. As a university, are there significant strategies you use to generate additional revenue over and above government funding and student tuition?

   □ Yes □ No

   If yes, could you describe some of these strategies?

7. What important contribution (s) does your university make to society?

8. Which stakeholder (s) benefit most from the services and programs provided by your university?

9. What is your definition of entrepreneurship?

Interviewer, please collect written questions and the university statistics sheet that was sent in advance of the interview.

SENIOR ADMINISTRATION SURVEY

Written Section to be filled out by President with collaboration of Vice-Presidents if required.

1. Does your university encourage inter-disciplinary exchange between faculties?

   □ Yes □ No

   If yes, how?

2. Does your university recognize innovation, new initiatives and new ventures brought forth by its faculty?

   □ Yes □ No

   If yes, how?

3. Does your university recognize innovation, new initiatives and new ventures brought forth by its students?

   □ Yes □ No

   If yes, how?

4. In your opinion, does an earned income philosophy exist within your university? (i.e. course/programs maintained based on revenue generation, creative approaches to fundraising such as selling floor tiles to acknowledge financial contributors, naming buildings after beneficiaries, etc).

   Definitely not 1 2 3 4 5 6 7 Definitely yes

   If yes, can you provide some recent examples?

5. In your opinion, please rate the difficulty and speed of major structural change within your university (i.e. merging two faculties, closing a department, moving a department from one faculty to another).

Difficulty	Very easy 1 2 3 4 5 6 7 Very hard

Why?

Speed	Very slow 1 2 3 4 5 6 7 Very fast

Why?

6. In your opinion, rate the cooperation between the various faculties, schools and departments within your university?

   Very weak 1 2 3 4 5 6 7 Very strong

   Please explain response

7. Rate the degree to which your university allows faculty to engage in activities to earn supplemental income outside the university?

   Very low 1 2 3 4 5 6 7 Very high

8. How would you describe the relationship of your university with business and industry in regards to research?

   Very weak 1 2 3 4 5 6 7 Very strong

   Please explain response

9. How would you describe the relationship of your university with business and industry in regards to teaching?

   Very weak 1 2 3 4 5 6 7 Very strong

   Please explain response

10. What level of importance do you place on research within your university?

Very low 1 2 3 4 5 6 7 Very high

11. What level of importance do you place on teaching within your university?

Very low 1 2 3 4 5 6 7 Very high

12. What level of importance does your university place on applied research?

Very low 1 2 3 4 5 6 7 Very high

13. What level of importance does your university place on fundamental research?

Very low 1 2 3 4 5 6 7 Very high

14. Does your university support the commercialization of research results?

☐ Yes ☐ No

If no, go to question # 17

15. What resources exist to support commercialization?

Please explain.

16. What barriers might exist to discourages commercialization of research results?

Please explain.

17. Please indicate your level of agreement with the following statements.

	Strongly disagree 1 2 3 4 5 6 7 Strongly agree
Entrepreneurs make a positive contribution to society.	1 2 3 4 5 6 7
Entrepreneurs are respected, admired and have a high level of social status.	1 2 3 4 5 6 7
Becoming an entrepreneur is a good career option.	1 2 3 4 5 6 7
Universities should invest time and/or money to	

promote the development of entrepreneurship.	1 2 3 4 5 6 7
Entrepreneurship should be part of every student's degree program within university.	1 2 3 4 5 6 7
Entrepreneurship should be part of every course within university.	1 2 3 4 5 6 7

18. Does your university's existing culture foster the development of entrepreneurship in its faculty and students?

    □ Yes □ No

    Please explain.

    _____

    _____

    _____

19. Are you aware of any research being conducted within your university in the area of entrepreneurship?

    □ Yes □ No

    If yes, in what department(s)?

    _____

20. What is your perception of entrepreneurship?

    Very negative 1 2 3 4 5 6 7 Very positive

21. Select **one** of the four definitions that most closely reflect your definition of entrepreneurship?

    □ The term "entrepreneurship" refers to a form of innovation. It is the successful implementation of creative ideas to produce a new business, or a new initiative within an existing business.

    □ The term "entrepreneurship" refers to the process of identifying, developing, and bringing a vision to life. The vision may be an innovative idea, an opportunity, or simply a better way to do something.

    □ The term "entrepreneurship" refers to the effort of translating a vision into a business enterprise.

    □ The term "entrepreneurship" refers to a process that can occur in organizations of all sizes and types. It refers to the process of creating value and bringing together a unique combination of resources to exploit an opportunity.

"Entrepreneurship Development In Atlantic Canada Universities"
University Statistics

Please complete and fax to:
Saint Mary's University Business Development Centre at 902-429-0330

1) How many students are currently enrolled in these programs within your university?

	Bachelor	Master	Doctoral	Other
Part-time				
Full-time				

2) a) How many full-time university employees do you currently have (includes all employees)?
_____

b) What is the number of full-time faculty?
_____

c) What is the number of full-time administration staff?
_____

3) Approximately what percentage of courses do part-time instructors teach? _____%

4) To obtain tenure, does one need to have a Ph.D.?

□ Yes □ No

5) a) Do you have full-time faculty positions without Ph.D. requirements?

□ Yes □ No

b) If yes, what percentage of faculty does this represent? _____ %

6) Is there a faculty union within your university?

□ Yes □ No

7) a) What is the total amount of your university budget including special funds?
_____

b) What amount of the total university budget in (question 7a) is allocated to research projects?
_____

8) Please rank the following research funding sources in importance for your university? When ranking, 1 is most important, 2 is next important, etc.

___Federal government
___Provincial government
___Corporate
___Foundation
___Other _____

9) a) Does your university offer a degree program in entrepreneurship?

□ Yes □ No

b) If no, does your university offer one or more entrepreneurship courses?

□ Yes □ No

APPENDIX B - Academic Administration

Entrepreneurship in University Environments

L'Environnement universitaire de l'entrepreneurship

ACADEMIC ADMINISTRATION SURVEY

General Instructions

For each question, either check, circle or indicate the number which corresponds to your answer.

Leave blank

1. At which university are you currently employed?

□ Acadia University
□ Atlantic Baptist University
□ Atlantic School of Theology
□ Dalhousie University
□ Mount Allison University
□ Mount Saint Vincent University
□ Memorial University of Newfoundland
□ Nova Scotia Agricultural College
□ Nova Scotia College of Art and Design
□ St. Francis Xavier University
□ Saint Mary's University
□ St. Thomas University
□ University College of Cape Breton
□ University of King's College
□ University of New Brunswick
□ Université de Moncton
□ Université Sainte-Anne
□ University of Prince Edward Island
□ Other, specify _____

2. Under which department do you primarily belong?

□ Architecture and Urban/Rural Planning
□ Arts and Humanities / Social Sciences
□ Business / Commerce / Management
□ Computer Science
□ Dentistry
□ Education
□ Engineering
□ Forestry and Environmental Studies
□ Law
□ Medicine
□ Health Profession
□ Public Relations
□ Science
□ Theology
□ Other, specify _____

3. What is the highest level of academic education you have achieved?

□ Bachelor □ Master □ Ph.D. or equivalent □ Other, specify_____

4. How long ago did you receive your highest level of academic degree?
_____ year(s) (If less than 1 year, enter 0 years)

5. What is your administrative rank?
□ Dean
□ Associate Dean
□ Department Head / Chair
□ Director of School
□ Director of Program
□ Other, specify _____

6. How many full-time and part-time faculty members are you responsible for?
_____ full-time _____ part-time
b) How many tenured and tenure track faculty are you responsible for?
_____

Leave blank

7. Overall, please rate the level of importance each of the following characteristics/skills have in relation to student development?

	Very low	1	2	3	4	5	*Very high*	
Risk taking ability								
Self-confidence								
Need to achieve								
Desire for independence								
Need for power								
Intuition (gut feeling)								
Responsibility/Accountability								
Self-esteem								
Desire to control one's own destiny								
Optimism								
Perseverance								
Desire for constant change								
Competitiveness								
Curiosity								
Enthusiasm								
Initiative/Active Involvement								
Desire to complete a project from beginning to end								
Empathy (ability to feel what others feel)								
Perfectionism								
Creative thinking/Innovativeness								
Communication Skills								
Ability to identify an opportunity to improve a situation								
Ability to find required information								
Ability to acquire expertise								
Capacity to adapt to changes								
Ability to handle pressure								
Ability to maximize the potential of others								
Leadership abilities								
Ability to process feedback								
Resourcefulness								
Ability to learn from mistakes								
Ability to use and apply new technology								
Ability to put theory into practice								

8. Do you have one or more entrepreneurship courses in your Faculty/department?

□ Yes □ No □ Don't know

Leave blank

9. How would you describe your Faculty/department members' use of the external business, community and government networks to augment teaching?

Very low 1 2 3 4 5 Very high ⌟

10. Are you frequently engaged in fundraising or revenue generation for your Faculty?

□ Yes □ No □ Don't know ⌟

11. Please rate the availability of financial resources for teaching activities within your university.

Very low 1 2 3 4 5 Very high ⌟

12. In your opinion, please rate the degree your faculty members engage in activities to earn supplemental income outside the university.

Never 1 2 3 4 5 Always ⌟

13. Please rate the level of difficulty and speed of change within your Faculty/department (i.e., modifying existing programs, introducing new courses and eliminating courses).

Difficulty: Very easy 1 2 3 4 5 Very hard ⌟

Speed: Very slow 1 2 3 4 5 Very fast ⌟

14. What level of support do you place on innovation and new initiatives brought forth by faculty?

Very low 1 2 3 4 5 Very high ⌟

15. What level of support do you place on innovation and new initiatives brought forth by students?

Very low 1 2 3 4 5 Very high ⌟

16. a) Please rate your level of personal interest in teaching activities?

Very low 1 2 3 4 5 Very high ⌟

b)Please rate your level of personal interest in research activities?

Very low 1 2 3 4 5 Very high ⌟

17. Please rate the availability of financial resources for research activities within your university.

Very low 1 2 3 4 5 Very high ⌟

18. In your opinion, does your Faculty/department have a critical mass of researchers to initiate and conduct research initiatives?

□ Yes □ No □ Don't know ⌟

19. a) Are you actively involved in research? If no, go to question #20.

□ Yes □ No ⌟

Leave blank

b) Please indicate the percentage of your research that is:

Applied	_____%
Basic/fundamental	_____%
Total	100%

c) Approximately, how many juried or reviewed publications have you had in the last three years?

_____

20. a) Please indicate the dollar amount of externally funded research for which you were the principal investigator in the last five years.

_____ dollars

b) Of the amount mention above, what dollar value came from private industry?

_____ dollars

21. Have you ever held a research chair?

□ Yes □ No

22. In general, do your faculty/department members participate in inter-university research networks?

Never 1 2 3 4 5 Always

23. In your administrative role, please rate the importance you place on applied research within your Faculty/department.

Very low 1 2 3 4 5 Very high

24. In your administrative role, please rate the importance you place on basic/fundamental research within your Faculty/department.

Very low 1 2 3 4 5 Very high

25. In your administrative role, please rate your Faculty/department members' relationship with business, industry and government in regards to conducting research projects?

Very weak 1 2 3 4 5 Very strong

26. Have you ever been an owner of a business?

□ Yes □ No

27. Have you ever been a manager/director of a not-for-profit, humanitarian or charitable organization? (excluding university activities).

□ Yes □ No

28. a) Have you ever invented or improved a product, service or process?

□ Yes □ No

If no, go to part C.

b) If yes, did you ever obtain/register any of the following (please check all those that apply):

□ Patent
□ Copyright
□ Trademarks
□ Industrial Design
□ Integrated Circuit Topography

Leave blank

c) Have you ever held equity in a company with products and services based on your own research?

□ Yes □ No

29. What is the likelihood that you could apply your knowledge to create a new business or improve an existing business in the private sector?

Very unlikely 1 2 3 4 5 Very likely

Note: It is important to answer the next two questions (#31 and #32) spontaneously and base responses on your perceptions.

30. Please indicate your level of agreement with the following statements.

	Strongly disagree	1	2	3	4	5	*Strongly agree*
Entrepreneurs make a positive contribution to society.		____	____	____	____	____	
Entrepreneurs are admired within society.		____	____	____	____	____	
Becoming an entrepreneur is a good career option.		____	____	____	____	____	
Universities should invest resources in the development of entrepreneurship.		____	____	____	____	____	
Entrepreneurship should be part of every student's degree program within university.		____	____	____	____	____	

31. Which of the following statements more closely reflects your understanding of the term entrepreneurship? (Select one by checking the appropriate box)

□ Entrepreneurship is a process whereby a combination of resources, characteristics and knowledge are utilized to create and operate a profit-oriented business.

□ Entrepreneurship is a process whereby a combination of resources, characteristics and knowledge are utilized to recognize and act on opportunities that may improve the quality of life for others.

32. In your opinion, what do you believe the perception of entrepreneurship is within your Faculty/department?

Very negative 1 2 3 4 5 6 7 Very positive

33. a) How long have you been working in your current administrative position? (If less than 1 year, enter 0 years)
_____ year(s)

b) How long have you been teaching in the university environment? (If less than 1 year, enter 0 years)
_____ year(s)

34. How many years of work experience do you have outside the university setting?
_____ year(s)

35. In what year were you born? _____

35. What is your gender? □ Male □ Female

The survey is complete. Thank you for your assistance and co-operation.

Academic Administrator Emails

Message #1

Attention Line: Academic Administrator Questionnaire

Hello,

We are a team of researchers from Atlantic Canadian Universities and we are seeking your assistance in conducting a study. Our study is designed to identify needs and developmental opportunities regarding entrepreneurship education, awareness and advocacy within all Atlantic Canadian universities. Your experience, combined with the global perspective you have relative to your Faculty/Department could help us discover variables that can promote or hinder entrepreneurship development within university environments.

Our data collection involves surveying academic administrators (deans, department heads), faculty, students, and alumni as well as conducting interviews with university presidents. The research project has been approved by all Atlantic University Research Ethics Boards. **To participate in the survey, simply click on the URL below.** This will take you to the research consent form. Once you give your consent, the survey will appear on the screen and **will take about 15 minutes to complete.** We would greatly appreciate your valuable cooperation.

Please click here to begin the survey: http://www.stmarys.ca/adminsurvey

With thanks,

Sylvie Berthelot, Ph.D.
Faculté d'administration
Université de Moncton

Jill Hiscock
Associate Director
Acadia Centre for Small Business & Entrepreneurship

Shelley Hessian
Project Manager - Surveys
Saint Mary's University Business Development Centre

Message #2

Attention Line: Atlantic Canadian Research Study

We apologize for interrupting your very busy schedules again, however, your participation is very important for the success of our study entitled "Entrepreneurship in University Environments". Recently, we sent you a letter and questionnaire seeking your participation in this study, which is designed to increase the knowledge concerning the different contextual variables that can promote or hinder entrepreneurial thinking in university environments. Your views are very valuable to us, regardless of your discipline, because of your knowledge of your academic environment and your experience as an academic administrator.

Completing this questionnaire will just take a few minutes of your time. You can participate by returning a completed survey in the envelope provided or you can access the survey on-line at http://www.stmarys.ca/adminsurvey . If you have already completed one, we thank-you and please disregard this message.

The results will only be reported globally from the entire sample rather than university by university and under no circumstances will results from individual universities or departments be reported. You have the right to refuse participation in the study or discontinue participation at any time without consequence.

Please know that your information will increase the body of knowledge in the area of entrepreneurship. We thank you in advance for your valuable time.

Regards,

Sylvie Berthelot , Ph.D.
Faculté d'administration
Université de Moncton
(506) 858-4222

Jill Hiscock
Associate Director
Acadia Centre for Small Business & Entrepreneurship
(902) 585-1603

Shelley Hessian
Project Manager - Surveys
Saint Mary's University Business Development Centre
(902) 429-4535

Academic Administrator Letter – Paper Survey

To the Attention of: ***All Academic Administrators of Atlantic Canadian Universities***

Subject: ***Request for participation in an Atlantic Canadian research study***
(This requires only a few minutes of your time)

November/December 2002

Ladies and Gentlemen:

Recently we sent you an email message asking for your participation in a study aiming to identify the institutional factors that support entrepreneurial development in university environments. At the request of some academic administrators and for your convenience, we are providing a paper version of the questionnaire. If you have already completed the questionnaire, we thank you and please disregard this letter.

Our study is designed to increase the knowledge concerning the different contextual variables that can promote or hinder entrepreneurial thinking in university students and involves all 18 Atlantic Canadian universities. Your views are crucial to the success of the study regardless of your discipline because of your knowledge of your academic environment and your experience as an academic administrator.

Your participation in this research will involve completing a questionnaire that will take a few minutes of your time. This questionnaire is being administered on an anonymous basis. Once you complete the attached questionnaire, place it in the self-addressed envelope provided and seal. Then return in your internal university mail. Remember, you have the option to complete the questionnaire on-line by visiting the following website: http://www.stmarys.ca/adminsurvey .

The results of this study will be synthesized in a final report and made available to all participating universities. These results will only be reported globally from the entire sample rather than university by university and under no circumstances will results from individual universities or departments be reported. You have the right to refuse participation in the study or discontinue participation at any time without consequence.

We thank you in advance for your valuable time.

Sincerely,

Sylvie Berthelot, Ph.D., CGA	Jill Hiscock	Shelley Hessian, B. Comm.
Assistant Professor	Associate Director	Project Manager - Surveys
Faculté d'administration	ACSBE	SMUBDC
Université de Moncton	Acadia University	Saint Mary's University
Tel.: (506) 858-4222	Tel.: (902) 585-1603	Tel.: (902) 429-4535

APPENDIX C - Faculty

Entrepreneurship in University Environments

L'Environnement universitaire de l'entrepreneurship

FACULTY SURVEY

General Instructions

For each question, either check, circle or indicate the number which corresponds to your answer.

Leave blank

1. At which university are you currently employed?

□ Acadia University
□ Atlantic Baptist University
□ Atlantic School of Theology
□ Dalhousie University
□ Mount Allison University
□ Mount Saint Vincent University
□ Memorial University of Newfoundland
□ Nova Scotia Agricultural College
□ Nova Scotia College of Art and Design
□ St. Francis Xavier University
□ Saint Mary's University
□ St. Thomas University
□ University College of Cape Breton
□ University of King's College
□ University of New Brunswick
□ Université de Moncton
□ Université Sainte-Anne
□ University of Prince Edward Island
□ Other, specify _____

2. Under which department do you primarily belong?

□ Architecture and Urban/Rural Planning
□ Arts and Humanities / Social Sciences
□ Business / Commerce / Management
□ Computer Science
□ Dentistry
□ Education
□ Engineering
□ Forestry and Environmental Studies
□ Law
□ Medicine
□ Health Profession
□ Public Relations
□ Science
□ Theology
□ Other, specify _____
_____

3. What is the highest level of academic education you have achieved?

□ Bachelor □ Master □ Ph.D. or equivalent □ Other, specify_____

4. How long ago did you receive your highest level of academic degree?
_____ year(s) (If less than 1 year, enter 0 years)

5. What is your academic rank?
□ Lecturer
□ Assistant Professor
□ Associate Professor
□ Full Professor
□ Adjunct/Invited Professor
□ Other, specify _____

6. Are you currently employed full-time or part-time with the university?
□ Full-time □ Part-time

Leave blank

7. Overall, please rate the level of importance each of the following characteristics/skills have for student success in your courses.

Very low	1	2	3	4	5	*Very high*	
Risk taking ability	____	____	____	____	____		___
Self-confidence	____	____	____	____	____		___
Need to achieve	____	____	____	____	____		___
Desire for independence	____	____	____	____	____		___
Need for power	____	____	____	____	____		___
Intuition (gut feeling)	____	____	____	____	____		___
Responsibility/Accountability	____	____	____	____	____		___
Self-esteem	____	____	____	____	____		___
Desire to control one's own destiny	____	____	____	____	____		___
Optimism	____	____	____	____	____		___
Perseverance	____	____	____	____	____		___
Desire for constant change	____	____	____	____	____		___
Competitiveness	____	____	____	____	____		___
Curiosity	____	____	____	____	____		___
Enthusiasm	____	____	____	____	____		___
Initiative/Active Involvement	____	____	____	____	____		___
Desire to complete a project from beginning to end	____	____	____	____	____		___
Empathy (ability to feel what others feel)	____	____	____	____	____		___
Perfectionism	____	____	____	____	____		___
Creative thinking/Innovativeness	____	____	____	____	____		___
Communication Skills	____	____	____	____	____		___
Ability to identify an opportunity to improve a situation	____	____	____	____	____		___
Ability to find required information	____	____	____	____	____		___
Ability to acquire expertise	____	____	____	____	____		___
Capacity to adapt to changes	____	____	____	____	____		___
Ability to handle pressure	____	____	____	____	____		___
Ability to maximize the potential of others	____	____	____	____	____		___
Leadership abilities	____	____	____	____	____		___
Ability to process feedback	____	____	____	____	____		___
Resourcefulness	____	____	____	____	____		___
Ability to learn from mistakes	____	____	____	____	____		___
Ability to use and apply new technology	____	____	____	____	____		___
Ability to put theory into practice	____	____	____	____	____		___

Leave blank

8. Overall, please indicate the frequency that you use each of the following teaching methods when delivering your courses?

	Never	1	2	3	4	5	*Always*	
Lecture								
Case Studies								
Mentoring								
Classroom Discussion								
Field Trip/Site Visit								
Lab								
Community- Based/ Real World Project								
Guest Speakers								
Simulations/Role-Play								
Independent Study								
Group Work								
Other (specify) _____								

9. How would you describe your use of external business, community and government networks to augment teaching?

Very low 1 2 3 4 5 Very high

10. Are you expected to participate in fundraising or revenue generation for your Faculty?

□ Yes □ No □ Don't know

11. Please rate the availability of financial resources for teaching activities within your university.

Very low 1 2 3 4 5 Very high

12. Please rate the level at which you engage in activities to earn supplemental income outside the university.

Never 1 2 3 4 5 Always

13. Please rate the level of difficulty and speed of change within your Faculty (i.e., modifying existing programs, introducing new courses and eliminating courses).

Difficulty: Very easy 1 2 3 4 5 Very hard

Speed: Very slow 1 2 3 4 5 Very fast

14. In your opinion, what level of support does your university place on innovation and new initiatives brought forth by faculty?

Very low 1 2 3 4 5 Very high

15. In your opinion, what level of support does your university place on innovation and new initiatives brought forth by students?

Very low 1 2 3 4 5 Very high

16. a) Please rate your level of personal interest in teaching activities.

Very low 1 2 3 4 5 Very high

Leave blank

b) Please rate your level of personal interest in research activities

Very low 1 2 3 4 5 Very high ___

17. Please rate the availability of financial resources for research activities within your university.

Very low 1 2 3 4 5 Very high ___

18. a) In your opinion, does your department have a critical mass of researchers to initiate and conduct research initiatives?

□ Yes □ No □ Don't know ___

b) How many tenured and tenure track faculty are in your department? _____ ___

19. a) Are you actively involved in research?

□ Yes □ No ___

If no, go to question 23

d) Please indicate the percentage of your research that is:

Applied	_____%
Basic/fundamental	_____%
Total	100%

e) Approximately, how many juried or reviewed publications have you had in the last three years?

_____

20. Do you participate in inter-university research networks?

Never 1 2 3 4 5 Always ___

21. How would you rate your relationship with business, industry and government in regards to conducting your research projects?

Very weak 1 2 3 4 5 Very strong ___

22. a) Please indicate the dollar amount of externally funded research for which you were the principal investigator in the last five years.

_____ dollars

b) Of the amount mention above, what dollar value came from private industry?

_____ dollars

23. Have you ever held a research chair?

□ Yes □ No ___

24. Does your university support (i.e. financial, advisory or structural) the commercialization of research results made by its faculty

□ Yes □ No □ Don't know ___

25. Have you been an owner of a business?

□ Yes □ No ___

26. Have you ever been a manager/director of a not-for-profit, humanitarian or charitable organization? (excluding university activities)

□ Yes □ No ___

Leave blank

27. a) Have you ever invented or improved a product, service or process?

□ Yes □ No

If no, go to part C of this question

b) If yes, did you ever obtain/register any of the following (please check all those that apply):

□ Patent
□ Copyright
□ Trademarks
□ Industrial Design
□ Integrated Circuit Topography

c) Have you ever held equity in a company with products and services based on your own research?

□ Yes □ No

28. What is the likelihood that you could apply your knowledge to create a new business or improve an existing business in the private sector?

Very unlikely 1 2 3 4 5 Very likely

Note: It is important to answer the next two questions (#29 and #30) spontaneously and base responses on your perceptions.

29. Please indicate your level of agreement with the following statements.

	Strongly disagree	1	2	3	4	5	*Strongly agree*
Entrepreneurs make a positive contribution to society.		____	____	____	____	____	
Entrepreneurs are admired within society.		____	____	____	____	____	
Becoming an entrepreneur is a good career option.		____	____	____	____	____	
Universities should invest resources in the development of entrepreneurship.		____	____	____	____	____	
Entrepreneurship should be part of every student's degree program within university.		____	____	____	____	____	

30. Which of the following statements more closely reflects your understanding of the term entrepreneurship? (Select one by checking the appropriate box)

□ Entrepreneurship is a process whereby a combination of resources, characteristics and knowledge are utilized to create and operate a profit-oriented business.

□ Entrepreneurship is a process whereby a combination of resources, characteristics and knowledge are utilized to recognize and act on opportunities that may improve the quality of life for others.

31. In your opinion, what do you believe the perception of entrepreneurship is within your university?

Very negative 1 2 3 4 5 Very positive

32. How long have you been teaching in the university environment? (If less than 1 year, enter 0 years)
_____ year(s)

33. How many years of work experience do you have outside the university setting? (If less than 1 year, enter 0 years)
_____ year(s)

34. In what year were you born? _____

35. What is your gender? □ Male □ Female

The survey is complete. Thank you for your assistance and co-operation.

Faculty Emails

Message #1

Attention Line: Faculty questionnaire

Hello:

We are a team of researchers from Atlantic Canadian Universities and we are seeking your assistance in conducting a study. Our study is designed to identify needs and developmental opportunities regarding entrepreneurship education, awareness and advocacy within all Atlantic Canadian universities. Your experience as a researcher and educator combined with the knowledge you have of academic environments could help us discover variables that can promote or hinder entrepreneurship development within universities.

Our data collection involves surveying faculty, students, academic administrators (deans, department heads), and alumni as well as conducting interviews with university presidents. The research project has been approved by all Atlantic University Research Ethics Boards. **To participate in the survey, simply click on the URL below.** This will take you to the research consent form. Once you give your consent, the survey will appear on the screen and **will take about 15 minutes to complete.** We would greatly appreciate your valuable cooperation.

Please click here to begin the survey: http://www.stmarys.ca/facultysurvey

With thanks,

Sylvie Berthelot, Ph.D.
Faculté d'administration
Université de Moncton

Jill Hiscock
Associate Director
Acadia Centre for Small Business & Entrepreneurship

Shelley Hessian
Project Manager - Surveys
Saint Mary's University Business Development Centre

Message #2

Attention Line: Atlantic Canadian Research Study - Faculty

We apologize for interrupting your very busy schedules again, however, your participation is very important for the success of our study entitled "Entrepreneurship in University Environments". Recently, we sent you a letter and questionnaire seeking your participation in this study, which is designed to increase the knowledge concerning the different contextual variables that can promote or hinder entrepreneurial thinking in university environments. Your views are very valuable to us, regardless of your discipline, because of your knowledge of your academic environment and your experience as a professor and researcher.

Completing this questionnaire will just take a few minutes of your time. You can participate by returning a completed survey in the envelope provided or you can access the survey on-line at http://www.stmarys.ca/facultysurvey . If you have already completed a survey, we thank you and please disregard this message.

The results will only be reported globally from the entire sample rather than university by university and under no circumstances will results from individual universities or departments be reported. You have the right to refuse participation in the study or discontinue participation at any time without consequence.

Please know that your information will increase the body of knowledge in the area of entrepreneurship. We thank you in advance for your valuable time.

Regards,

Sylvie Berthelot , Ph.D.
Faculté d'administration
Université de Moncton
(506) 858-4222

Jill Hiscock
Associate Director
Acadia Centre for Small Business & Entrepreneurship
(902) 585-1603

Shelley Hessian
Project Manager - Surveys
Saint Mary's University Business Development Centre
(902) 429-4535

Faculty Letter – Mail Survey

To the Attention of: ***All Professors of Atlantic Canadian Universities***

Subject: ***Request for participation in an Atlantic Canadian research study***
(This requires only a few minutes of your time)

November/December 2002

Dear faculty member:

Recently we sent you an email message asking for your participation in a study aiming to identify the institutional factors that support entrepreneurial development in university environments. At the request of some faculty members and for your convenience, we are providing a paper version of the questionnaire. If you have already completed the questionnaire, we thank you and please disregard this letter.

Our study is designed to increase the knowledge concerning the different contextual variables that can promote or hinder entrepreneurial thinking in university students and involves all 18 Atlantic Canadian universities. Your views are crucial to the success of the study regardless of your discipline because of your knowledge of your academic environment and your experience as a professor and researcher.

Your participation in this research will involve completing a questionnaire that will take a few minutes of your time. This questionnaire is being administered on an anonymous basis. Once you complete the attached questionnaire, place it in the self-addressed envelope provided and seal. Then return in your internal university mail. Remember, you have the option to complete the questionnaire on-line by visiting the following website: http://www.stmarys.ca/facultysurvey .

The results of this study will be synthesized in a final report and made available to all participating universities. These results will only be reported globally from the entire sample rather than university by university and under no circumstances will results from individual universities or departments be reported. You have the right to refuse participation in the study or discontinue participation at any time without consequence.

We thank you in advance for your valuable time.

Sincerely,



Sylvie Berthelot, Ph.D., CGA	Jill Hiscock	Shelley Hessian, B. Comm.
Assistant Professor	Associate Director	Project Manager - Surveys
Faculté d'administration	ACSBE	SMUBDC
Université de Moncton	Acadia University	Saint Mary's University
Tel.: (506) 858-4222	Tel.: (902) 585-1603	Tel.: (902) 429-4535

APPENDIX D - Alumni

Leave blank

Entrepreneurship in University Environments

L'Environnement universitaire de l'entrepreneurship

ALUMNI SURVEY

General Instructions

It is important to answer the questions spontaneously and base them on your perceptions. For each question, either check, circle or indicate the number, which corresponds to your perception.

Leave blank

1. In what year did you graduate from your most recent degree? _____ ⌊_⌋

2. a) What is the most recent degree you have obtained? (Check the appropriate box)

□ Certificate □ Bachelor □ Master □ Doctorate □ Other _____ ⌊_⌋

b) In which program area:

□ Architecture and Urban/Rural Planning	□ Law	⌊_⌋
□ Arts and Humanities	□ Medicine	⌊_⌋
□ Business / Commerce	□ Health Profession	⌊_⌋
□ Computer Science	□ Public Relations	⌊_⌋
□ Dentistry	□ Science	⌊_⌋
□ Education	□ Theology	⌊_⌋
□ Engineering	□ Other, specify _____	⌊_⌋
□ Forestry and Environmental Studies		⌊_⌋

c) From which university:

□ Acadia University	□ St. Francis Xavier University	⌊_⌋
□ Atlantic Baptist University	□ Saint Mary's University	⌊_⌋
□ Atlantic School of Theology	□ St. Thomas University	⌊_⌋
□ Dalhousie University	□ Technical University of Nova Scotia (TUNS)	⌊_⌋
□ University of King's College	□ University College of Cape Breton	⌊_⌋
□ Mount Allison University	□ University of New Brunswick	⌊_⌋
□ Mount Saint Vincent University	□ Université de Moncton	⌊_⌋
□ Memorial University of Newfoundland	□ Université Sainte-Anne	⌊_⌋
□ Nova Scotia Agricultural College	□ University of Prince Edward Island	⌊_⌋
□ Nova Scotia College of Art and Design	□ Other, specify _____	⌊_⌋

3. Which of the following statements more closely reflects your understanding of the term entrepreneurship? (Select one by checking the appropriate box)

□ Entrepreneurship is a process whereby a combination of resources, characteristics and knowledge is utilized to create and operate a profit-oriented business. ⌊_⌋

□ Entrepreneurship is a process whereby a combination of resources, characteristics and knowledge is utilized to recognize and act on opportunities that may improve the quality of life for others. ⌊_⌋

Leave blank

4. Please answer each of the following questions by checking the appropriate number.

	Never	1	2	3	4	5	Always	*Leave blank*
Do you perform tasks with great effort and energy?		___	___	___	___	___		___
Do you look for new challenges?		___	___	___	___	___		___
Do you strive to exceed your expectations?		___	___	___	___	___		___
Does persuading others or influencing their actions come naturally?		___	___	___	___	___		___
Do you like to be admired by others?		___	___	___	___	___		___
Is reputation and status important?		___	___	___	___	___		___
Are you competitive and do you love to win?		___	___	___	___	___		___
Do you seek the approval of those around you?		___	___	___	___	___		___
Do you prefer to work with less knowledgeable friends than with experts you do not know?		___	___	___	___	___		___
Are you self-confident?		___	___	___	___	___		___
Do you have a positive attitude regardless of the situation?		___	___	___	___	___		___
Are you persistent when confronted with difficult situations?		___	___	___	___	___		___
Do you have a tendency to find yourself solely responsible for everyone and everything?		___	___	___	___	___		___
Does uncertainty cause you stress?		___	___	___	___	___		___
Do you like taking risks?		___	___	___	___	___		___
Do you believe that failures are also opportunities to learn?		___	___	___	___	___		___
Do you like change?		___	___	___	___	___		___
Does competition increase your performance?		___	___	___	___	___		___
Does your success depend on chance?		___	___	___	___	___		___
Are you curious and do you enjoy discovering new things?		___	___	___	___	___		___
Are you creative when solving day-to-day problems?		___	___	___	___	___		___
Do you consider yourself to be a trendsetter?		___	___	___	___	___		___
Are you quick to take action?		___	___	___	___	___		___
Do you see things through to completion?		___	___	___	___	___		___
Do you prefer that others take overall responsibility for a project?		___	___	___	___	___		___

Leave blank

Do you put yourself in the place of others to feel what they feel?	___	___	___	___	___	___
Does the difficulty and complexity of situations scare you?	___	___	___	___	___	___
Do you adapt easily to change?	___	___	___	___	___	___
Do you like to take a leadership role?	___	___	___	___	___	___
Do you try to help others achieve their potential?	___	___	___	___	___	___
Do you know how to get the information you need to make decisions?	___	___	___	___	___	___
Do you use the knowledge and skills of others effectively?	___	___	___	___	___	___
Do you need to see the results of your efforts to evaluate your success?	___	___	___	___	___	___
Do you think about or look for business opportunities?	___	___	___	___	___	___
Do you act on your instincts?	___	___	___	___	___	___

5. Please answer yes or no to the following questions. (Check the appropriate answer)

	Yes	No	
Has one of your parents ever owned a business?	_____	_____	___
Is one of your close friends a small business owner?	_____	_____	___
Are you the eldest child in your family?	_____	_____	___
Are you or your parents immigrants?	_____	_____	___
When you were young, did you have a paper route or any other means of earning spending money?	_____	_____	___
Were you involved in initiating any student activities while at university?	_____	_____	___
Have you ever worked in a small or medium sized business?	_____	_____	___
Do you know of any resources or organizations in your area that support the creation of businesses?	_____	_____	___
Have you ever had an idea for a small business of your own?	_____	_____	___

6. Please rate the following factors, based on the influence they have had or are having on your career choices. (Check the appropriate answer)

Very weak	1	2	3	4	5	Very strong	
Parents	___	___	___	___	___		___
Extended family	___	___	___	___	___		___
Friends	___	___	___	___	___		___
Type of education available	___	___	___	___	___		___
Prospects of employment	___	___	___	___	___		___
Sports activities	___	___	___	___	___		___
University professors	___	___	___	___	___		___
Previous work experience	___	___	___	___	___		___

Leave blank

Personal interests						
Non-athletic extra curricular activities within university						
Teachers						
Other, specify _____						

7. Please indicate your level of agreement with the following questions. (Check the appropriate answer)

Strongly disagree	1	2	3	4	5	Strongly agree	
Entrepreneurs make a positive contribution to society.							
Entrepreneurs are admired within society.							
Becoming an entrepreneur is a good career option.							
Universities should invest resources in the development of entrepreneurship.							
Entrepreneurship should be part of every student's degree program within university.							

8. While attending university were you exposed to the career option of being an entrepreneur?

☐ Yes ☐ No ☐ Don't know

b) If yes, how?

_____

_____

9. Within your university studies, did you acquire the knowledge you need to start a business (i.e. identifying an opportunity and developing a business plan, etc.)?

☐ Yes ☐ No

10. Within your university studies, have you taken any business courses?

☐ Yes ☐ No

11. a) Do you currently own or operate a business?

☐ Yes ☐ No

If no, go to question #12

b) Which of the following best describes your business? (Select one)

☐ Started a business from ground zero
☐ Purchased an existing business
☐ Took over an existing family business
☐ Franchiser
☐ Franchisee
☐ Self-employed professional
☐ Other (please specify) _____

c) How long have you operated this business?

_____year(s)

Leave blank

d) Which of the following best describes the gross annual revenue level of your present business? (Select one)

□ Less than $99,000
□ Between $100,000 and $249,999
□ Between $250,000 and $499,999
□ Between $500,000 and $999,999
□ Between $1,000,000 and $4,999,999
□ Between $5,000,000 - $9,999,999
□ Between $10,000,000 - $49,999,999
□ Between $50,000,000 - $99,999,999
□ Over $100,000,000

e) How many employees do you currently have in this business (full-time equivalent)? _____

Skip to question #13.

12. How likely are you to start or buy your own business in the future? (Check the appropriate answer)

Very unlikely 1 2 3 4 5 6 7 Very likely

13. a) Are you or have you ever been a manager/director of a not-for-profit, humanitarian or charitable organization?

□ Yes □ No *If no, go to question #14*

b) If yes, what is/was your annual operating budget? _____

c) If yes, how many salaried employees do/did you have (full-time equivalent)? _____

Skip to question #15.

How likely is it that you will be a manager or director of a non-profit, humanitarian or charitable organization in the future?

Very unlikely 1 2 3 4 5 6 7 Very likely

15. a) Have you ever invented or improved a product, service or process?

□ Yes □ No If no, go to question #16

b) If yes, did you ever obtain/register any of the following (please check all those that apply):

□ Patent
□ Copyright
□ Trademarks
□ Industrial Design
□ Integrated Circuit Topography
□ none of the above

16. How likely is it that you will invent or improve a product, service or process in the future?

Very unlikely 1 2 3 4 5 6 7 Very likely

a) Based on your experience, what activities could be implemented within the university to increase business start-up by students?

_____

_____

b) Based on your experience, what activities could be implemented within the university to develop entrepreneurial characteristics and skills in students?

_____

_____

Leave blank

18. You are: □ Male □ Female ___

19. Which of the following best describes your employment situation? (You may choose more than one)

□ Full-time employee □ Business owner ___
□ Part-time employee □ Self-employed professional ___
□ Unemployed □ Other ___

20. What year were you born? _____ ___

21. What is your first language? □English □ French □ Other ___

22. a) Do you currently live in Atlantic Canada? □Yes □ No ___

If yes, the survey is complete. Thank you for your assistance and co-operation.

If no, please continue.

b) Where do you currently live?

_____

_____

c) Why did you leave Atlantic Canada?

_____

_____

d) Are you thinking of moving back to Atlantic Canada? □Yes □ No ___

e) If yes, in how many years? _____ ___

f) What would bring you back to Atlantic Canada sooner?

_____

_____

The survey is completed. Thank you for your assistance and co-operation.

Alumni Letter – Paper Surveys

To the Attention of: ***All Alumni of Atlantic Canadian Universities***

Subject: ***Request for participation in an Atlantic Canadian research study***
(This requires only a few minutes of your time)

September 2002

Dear University Alumni,

We are seeking your input for a study that will identify needs and developmental opportunities regarding entrepreneurship education, awareness and advocacy at the university level in Atlantic Canada. The purpose of this study, which is being sponsored by the Atlantic Canada Opportunities Agency (ACOA), is to increase the knowledge of entrepreneurship development within university environments and is being conducted by a consortium of researchers and partners representing all Atlantic Canadian universities. As a graduate of an Atlantic Canadian university, we would greatly appreciate you taking the time to complete the enclosed survey.

Your alumni office has randomly selected your name and mailed the enclosed survey at our request. In order for the results of the study to be representative of all Atlantic Canadian universities, we require a strong sample from each school. The enclosed survey is comprised of a series of questions which will help us determine attitudes towards entrepreneurship as well as identify variables that can promote or hinder entrepreneurship development at universities. It will take approximately 10 minutes of your time to complete. Once complete, we ask that you return the survey in the postage-paid return envelope.

There are no known harms associated with your participation in this research. Confidentiality will be respected and maintained by reporting results collectively from the entire sample rather than university-by-university. You have the right to refuse participation in the study and are free to discontinue participation at any time during the completion of the survey without consequence.

A final report will be completed during the 2002-03 academic year. For more information, please contact Jill Hiscock at the Acadia Centre for Small Business and Entrepreneurship at jhiscock@acadiau.ca

All universities in Atlantic Canada will benefit from the knowledge gained though this study. Thank you for your anticipated assistance in this endeavour.

Sincerely,


Sylvie Berthelot, Ph.D., CGA
Assistant Professor
Faculté d'administration
Université de Moncton
Tel.: (506) 858-4222

Jill Hiscock
Associate Director
ACSBE
Acadia University
Tel.: (902) 585-1603

Shelley Hessian, B. Comm.
Project Manager - Surveys
SMUBDC
Saint Mary's University
Tel.: (902) 429-4535

PLEASE NOTE: This research project has been reviewed and approved by the Research Ethics Board at your university. If you have any questions or concerns about this study, please contact Dr. Stephen Maitzen, Chair of Research Ethics, Acadia University, at smaitzen@acadiau.ca

APPENDIX E - Student

Entrepreneurship in University Environments

L'Environnement universitaire de l'entrepreneurship

STUDENT SURVEY

General Instructions

For each question, either check, circle or indicate the number which corresponds to your answers.

Leave blank

1. Which university do you currently attend?

□ Acadia University
□ Atlantic Baptist University
□ Atlantic School of Theology
□ Dalhousie University
□ Mount Allison University
□ Mount Saint Vincent University
□ Memorial University of Newfoundland
□ Nova Scotia Agricultural College
□ Nova Scotia College of Art and Design
□ St. Francis Xavier University
□ Saint Mary's University
□ St. Thomas University
□ University College of Cape Breton
□ University of King's College
□ University of New Brunswick
□ Université de Moncton
□ Université Sainte-Anne
□ University of Prince Edward Island
□ Other (specify) _____

2. Under which category is your major/discipline?

□ Architecture and Urban/Rural Planning
□ Arts and Humanities / Social Sciences
□ Business / Commerce / Management
□ Computer Science
□ Dentistry
□ Education
□ Engineering
□ Forestry and Environmental Studies
□ Law
□ Medicine
□ Health Profession
□ Public Relations
□ Science
□ Theology
□ Other (specify) _____

3. Are you a full-time or part-time student?

□ Full-time □ Part-time

4. a) What level of academic education are you currently working towards? (Check appropriate box)

□ Certificate □ Bachelor □ Master □ Ph.D. or equivalent □ Other, specify _____

b) What year are you in your present program?

□ 1st year □ 2nd year □ 3rd year □ 4th Year □ 5th year □ 6th year □ 7th year or more

Leave blank

5. a) Please rate your level of opportunity to develop each of the following characteristics and skills while attending university.

Very low	1	2	3	4	5	*Very high*	
Risk taking ability	____	____	____	____	____		___
Self-confidence	____	____	____	____	____		___
Need to achieve	____	____	____	____	____		___
Desire for independence	____	____	____	____	____		___
Need for power	____	____	____	____	____		___
Intuition (gut feeling)	____	____	____	____	____		___
Responsibility/Accountability	____	____	____	____	____		___
Self-esteem	____	____	____	____	____		___
Desire to control one's own destiny	____	____	____	____	____		___
Optimism	____	____	____	____	____		___
Perseverance	____	____	____	____	____		___
Desire for constant change	____	____	____	____	____		___
Competitiveness	____	____	____	____	____		___
Curiosity	____	____	____	____	____		___
Enthusiasm	____	____	____	____	____		___
Initiative/Active Involvement	____	____	____	____	____		___
Desire to complete a project from beginning to end	____	____	____	____	____		___
Empathy (ability to feel what others feel)	____	____	____	____	____		___
Perfectionism	____	____	____	____	____		___
Creative thinking/Innovativeness	____	____	____	____	____		___
Communication Skills	____	____	____	____	____		___
Ability to identify an opportunity to improve a situation	____	____	____	____	____		___
Ability to find required information	____	____	____	____	____		___
Ability to acquire expertise	____	____	____	____	____		___
Capacity to adapt to changes	____	____	____	____	____		___
Ability to handle pressure	____	____	____	____	____		___
Ability to maximize the potential of others	____	____	____	____	____		___
Leadership abilities	____	____	____	____	____		___
Ability to process feedback	____	____	____	____	____		___
Resourcefulness	____	____	____	____	____		___
Ability to learn from mistakes	____	____	____	____	____		___
Ability to use and apply new technology	____	____	____	____	____		___
Ability to put theory into practice	____	____	____	____	____		___

b) Do you believe the majority of characteristics and skills mentioned in question 5a should be developed in the university courses you take?

Never 1 2 3 4 5 Always ___

Leave blank

6. Overall, how often do your university professors use the following teaching methods in your classes?

	Never	1	2	3	4	5	*Always*	
Lecture		____	____	____	____	____		___
Case Studies		____	____	____	____	____		___
Mentoring		____	____	____	____	____		___
Classroom Discussion		____	____	____	____	____		___
Field Trip/Site Visit		____	____	____	____	____		___
Lab		____	____	____	____	____		___
Community Based/ Real World Project		____	____	____	____	____		___
Guest speakers		____	____	____	____	____		___
Simulations/Role-Play		____	____	____	____	____		___
Independent Study		____	____	____	____	____		___
Group Work		____	____	____	____	____		___
Other (specify) _____		____	____	____	____	____		___

7. a) Please answer the following questions by checking the appropriate number.

	Never	1	2	3	4	5	*Always*	
Do you perform tasks with great effort and energy?		____	____	____	____	____		___
Do you look for new challenges?		____	____	____	____	____		___
Do you strive to exceed your expectations?		____	____	____	____	____		___
Does persuading others or influencing their actions come naturally?		____	____	____	____	____		___
Do you like to be admired by others?		____	____	____	____	____		___
Is reputation and status important?		____	____	____	____	____		___
Are you competitive and do you love to win?		____	____	____	____	____		___
Do you seek the approval of those around you?		____	____	____	____	____		___
Do you prefer to work with less knowledgeable friends or with experts you do not know?		____	____	____	____	____		___
Are you self-confident?		____	____	____	____	____		___
Do you have a positive attitude regardless of the situation?		____	____	____	____	____		___
Are you persistent when confronted with difficult situations?		____	____	____	____	____		___
Do you have a tendency to find yourself solely responsible for everyone and everything?		____	____	____	____	____		___
Does the uncertainty of situations cause you stress?		____	____	____	____	____		___
Do you like taking risks?		____	____	____	____	____		___
Do you believe that failures are also opportunities to learn?		____	____	____	____	____		___
Do you like change?		____	____	____	____	____		___
Does competition increase your performance?		____	____	____	____	____		___
Does your success depend on chance?		____	____	____	____	____		___
Are you curious and do you enjoy discovering new things?		____	____	____	____	____		___

Leave blank

b) Please answer the following questions by checking the appropriate number.

Never	1	2	3	4	5	*Always*	
Are you creative when solving day-to-day problems?	____	____	____	____	____		☐
Do you consider yourself to be a trendsetter?	____	____	____	____	____		☐
Are you quick to take action?	____	____	____	____	____		☐
Do you see things through to completion?	____	____	____	____	____		☐
Do you prefer that others take overall responsibility for a project?	____	____	____	____	____		☐
Do you put yourself in the place of others to feel what they feel?	____	____	____	____	____		☐
Does the difficulty and complexity of situations scare you?	____	____	____	____	____		☐
Do you adapt easily to change?	____	____	____	____	____		☐
Do you like to take a leadership role?	____	____	____	____	____		☐
Do you try to help others achieve their potential?	____	____	____	____	____		☐
Do you know how to get the information you need to make decisions?	____	____	____	____	____		☐
Do you use the knowledge and skills of others effectively?	____	____	____	____	____		☐
Do you need to see the results of your efforts to evaluate your success?	____	____	____	____	____		☐
Do you think about or look for business opportunities?	____	____	____	____	____		☐
Do you act on your gut instinct?	____	____	____	____	____		☐

8. In your opinion, does your university recognize innovation and new initiatives brought forth by students?

Never 1 2 3 4 5 Always ☐

9. Please answer yes or no to the following questions. (Check the appropriate answer)

	Yes	No	
Has one of your parents ever owned a business?	____	____	☐
Is one of your close friends a small business owner?	____	____	☐
Are you the eldest child in your family?	____	____	☐
Are you or your parents immigrants?	____	____	☐
When you were young, did you have a paper route or any other means of earning spending money?	____	____	☐
Were you involved in initiating any student activities while at university?	____	____	☐
Have you ever worked in a small or medium sized business?	____	____	☐
Do you know of any resources or organizations in your area that supports the creation of businesses?	____	____	☐
Have you ever had an idea for a small business of your own?	____	____	☐

Leave blank

10. Please rate the following factors based on the influence they have/ or will have on your career choices. (Check the appropriate answer)

Very weak	1	2	3	4	5	*Very strong*	
Parents	____	____	____	____	____		☐
Extended Family	____	____	____	____	____		☐
Friends	____	____	____	____	____		☐
Type of education available	____	____	____	____	____		☐
Prospects of employment	____	____	____	____	____		☐
Sports activities	____	____	____	____	____		☐
University professors	____	____	____	____	____		☐
Previous work experience	____	____	____	____	____		☐
Personal interests	____	____	____	____	____		☐
Non-athletic extra curricular activities within university	____	____	____	____	____		☐
Teachers	____	____	____	____	____		☐
Other, specify _____	____	____	____	____	____		☐

Note: It is important to answer the next two questions (#11 and #12) spontaneously and base responses on your perceptions.

11. Please indicate your level of agreement with the following statements.

Strongly disagree	1	2	3	4	5	*Strongly agree*	
Entrepreneurs make a positive contribution to society.	____	____	____	____	____		☐
Entrepreneurs are admired within society.	____	____	____	____	____		☐
Becoming an entrepreneur is a good career option.	____	____	____	____	____		☐
Universities should invest resources in the development of entrepreneurship.	____	____	____	____	____		☐
Entrepreneurship should be part of every student's degree program within university.	____	____	____	____	____		☐

12. Which of the following statements more closely reflects your understanding of the term entrepreneurship? (Select one by checking the appropriate box)

☐ Entrepreneurship is a process whereby a combination of resources, characteristics and knowledge are utilized to create and operate a profit-oriented business. ☐

☐ Entrepreneurship is a process whereby a combination of resources, characteristics and knowledge are utilized to recognize and act on opportunities that may improve the quality of life for others. ☐

13. During university, have you been exposed to the career option of being an entrepreneur?
☐ Yes ☐ No ☐ Don't know ☐

14. Within your university studies, have you had the opportunity to acquire the knowledge you need to start a business (i.e. identifying an opportunity and developing a business idea, etc.)?
☐ Yes ☐ No ☐ Don't know ☐

Leave blank

15. Within your university studies, have you taken or are you presently taking any business courses?

□ Yes □ No

16. Please rate the likelihood that you will undertake the following activities.

	Very unlikely 1	2	3	4	5 *Very likely*
Start or buy your own business.	____	____	____	____	____
Be a manager/director of a not-for-profit, humanitarian or charitable organization.	____	____	____	____	____
Invent or improve a product, service or process.	____	____	____	____	____

17. What are you interested in doing upon graduation? Please rate your level of interest in each of the following options.

	Very low 1	2	3	4	5 *Very high*
Work for a small business/organization	____	____	____	____	____
Work for a large business/organization	____	____	____	____	____
Work for a not-for-profit organization	____	____	____	____	____
Work for government	____	____	____	____	____
Be a self-employed professional	____	____	____	____	____
Start my own business	____	____	____	____	____
Inherit or buy an existing business	____	____	____	____	____
Run my own business while working elsewhere full-time	____	____	____	____	____
Further education	____	____	____	____	____
Other (specify) _____	____	____	____	____	____

18. From the following list, please select three factors that will most significantly influence your career choice. (Select 3 only)

□ Opportunity to be creative and original
□ Freedom from close supervision
□ Opportunity to take responsibility
□ Financial security
□ Opportunity for training
□ Prospect for promotion
□ High starting salary
□ Provides an intellectual challenge
□ Dynamic and collaborative workplace
□ Opportunity to manage
□ Other (specify)_____

19. a) Please rate the interest you have in new information technology (i.e. e-business, e-learning).

Very low 1 2 3 4 5 Very high

b) Within your university studies, have you had the opportunity to acquire the knowledge you need to work with this new information technology?

□ Yes □ No □ Don't know

20. What is your gender? □ Male □ Female

21. In what year were you born? _____

22. What is your first language? □ English □ French □ Other

23. Are you a Canadian Citizen? □ Yes □ No

Leave blank

23. Are you from Atlantic Canada? ☐ Yes ☐ No ☐

24. Do you intend to stay in Atlantic Canada after you complete your studies? ☐ Yes ☐ No ☐ Don't know ☐

    If no, why? _____

25. What is your student ID number? (Optional - please complete if you wish to enter the contest*).

    _____

* There will be a random draw for one bursary of $500 and two bursaries of $250. Enter by providing your student ID number. This contact information will be used for purposes of the draw only and will be removed before the data is analyzed.

The survey is complete. Thank you for your assistance and co-operation.

Student Emails

Message #1

Attention Line: Potential Bursary for Your Participation

Hello:

We are a team of researchers from Atlantic Canadian Universities conducting a survey on entrepreneurial development at all 18 Atlantic University campuses. We need your views on how your university is helping you prepare to undertake future endeavours such as pursuing appropriate career opportunities.

If you complete this survey, which will take about 15 minutes of your time, you will be eligible to win either a $500 bursary, or one of two $250 bursaries.

We welcome your support in helping us understand more about entrepreneurship education at the university level. Please go to http://www.stmarys.ca/studentsurvey and complete our survey. You could have an impact on what happens at your university in the future.

Click here to start: **http://www.stmarys.ca/studentsurvey**

Regards,

Sylvie Berthelot, Ph.D.
Faculté d'administration
Université de Moncton

Jill Hiscock
Associate Director
Acadia Centre for Small Business & Entrepreneurship

Shelley Hessian
Project Manager - Surveys
Saint Mary's University Business Development Centre

Message #2

Attention Line: We need a few minutes of your time

Hi everybody:

Recently we sent you an email message asking for your participation in a study aiming to identify the institutional factors of your university that support entrepreneurial development. Because students are important contributors to the university environment, your views are crucial to the success of this study. We ask you to visit the following website and complete our survey: **http://www.stmarys.ca/studentsurvey**

If you have already completed it, thank you and please disregard this message.

This questionnaire will allow us to measure, on an anonymous basis, entrepreneurial traits among students, career objectives and perceptions of entrepreneurship. It will also allow us to identify variables that can promote or hinder entrepreneurial thinking in university students. Regardless
of your career objectives or program of study, your opinion interests us.

Completing this questionnaire will just take a few minutes of your time. To thank you, we will draw a $500 bursary and two $250 bursaries among the participants.

Thank you in advance for your participation. Please know that your information will increase the body of knowledge in the area of entrepreneurship.

Regards,

Sylvie Berthelot , Ph.D.
Faculté d'administration
Université de Moncton
(506) 858-4222

Jill Hiscock
Associate Director
Acadia Centre for Small Business & Entrepreneurship
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Shelley Hessian
Project Manager - Surveys
Saint Mary's University Business Development Centre
(902) 429-4535

Message #3

Attention Line: Remember we need your help

Hello everyone:

We would like to thank all of those students who have completed our on-line survey for the Atlantic Canadian universities study. In order for this study to be of maximum benefit, it is important that students in all disciplines and years of study are included. We are asking those of you who have not completed the survey, to visit the website and complete the survey so we have your point of view regarding your academic environment.

This survey is easy to complete and will only take a few minutes of your time. We would really appreciate you taking the time to provide feedback. Remember, we are drawing a $500 bursary and two $250 bursaries among the survey participants.

Please go to **http://www.stmarys.ca/studentsurvey** to complete our survey. All student views are vitally important.

Thank you in advance for your help.

Sylvie Berthelot, Ph.D., CGA
Faculté d'administration
Université de Moncton

Jill Hiscock
Project Coordinator
Acadia Centre for Small Business & Entrepreneurship

Shelley Hessian
Project Manager, Surveys
Saint Mary's University Business Development Centre

Message #4

Attention Line: Last Chance for Bursary

Recently you received a few email messages asking for your participation in a study aiming to identify the institutional factors of your university that support entrepreneurial development. Students are important contributors to the university environment and your views are vital to the success of this study. We ask you to visit the following website and complete our survey: http://www.stmarys.ca/studentsurvey . If you have already completed it, thank you and please disregard this message.

The survey will allow us to identify variables that can promote or hinder entrepreneurial thinking in university students as well as perceptions of entrepreneurship. Regardless of your career objectives or program of study, your opinion is important to us.

Completing this questionnaire will just take a few minutes of your time. To thank you, we will draw a $500 bursary and two $250 bursaries among the participants.

Thank you in advance for your participation.

Click here to start: **http://www.stmarys.ca/studentsurvey**

Regards,

Sylvie Berthelot, Ph.D., CGA
Faculté d'administration
Université de Moncton
(506) 858-4222

Jill Hiscock
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(902) 585-1603

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Student Letter – Mail Survey

November 2002

Dear Student,

We are seeking your input for a study that will identify needs and developmental opportunities regarding entrepreneurship education, awareness and advocacy at the university level in Atlantic Canada.

If you complete this survey, which will take about 15 minutes of your time, you will be eligible to win either a $500 bursary, or one of two $250 bursaries.

The enclosed survey is comprised of a series of questions. Once complete, we ask that you return the survey in the postage-paid return envelope and place in any Canada Post mailbox.

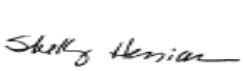
There are no known harms associated with your participation in this research. Confidentiality will be respected and maintained by reporting results collectively from the entire sample rather than university-by-university. You have the right to refuse participation in the study and are free to discontinue participation at any time during the completion of the survey without consequence.

A final report will be completed during the 2002-03 academic year. For more information, please contact Jill Hiscock at the Acadia Centre for Small Business and Entrepreneurship at jhiscock@acadiau.ca

As a student at an Atlantic Canadian university, we would greatly appreciate you taking the time to complete the enclosed survey. All universities in Atlantic Canada will benefit from the knowledge gained though this study. Thank you for your anticipated assistance in this endeavour.

Sincerely,





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PLEASE NOTE: This research project has been reviewed and approved by the Research Ethics Board at your university. If you have any questions or concerns about this study, please contact (Contact information inserted.)


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