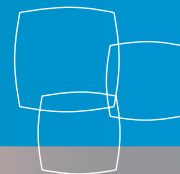




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The Teaching and Practice of Entrepreneurship within Canadian Higher Education Institutions

December 2010



Small Business and Tourism Branch
Industry Canada

Chris Parsley, Manager
Manique Weerasinghe, Economist

Canada 

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Cat. No. lu188-103/2010E-PDF
ISBN 978-1-100-17514-0
60841

Aussi offert en français sous le titre *L'entrepreneuriat au sein des établissements canadiens d'enseignement supérieur : théorie et pratique, décembre 2010*.

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ACKNOWLEDGEMENTS

The authors would like to acknowledge Anne Brazeau-Monnet from the Association of Canadian Community Colleges (ACCC) and Timothy-Daniel Daus from the Canadian Federation of Business School Deans (CFBSD) for their support in helping coordinate the entrepreneurship education survey across universities and colleges in Canada. The authors would also like to recognize the contributions of Denis Martel, Louise Gravel and Riham Elbadri to the final report.

ABSTRACT

In 2009, Industry Canada conducted a survey to identify the framework in which entrepreneurship education is delivered in Canada — an area where detailed aggregate information is largely absent — as well as how the option to be entrepreneurial is promoted and encouraged amongst students.

The survey was conducted online, and delivered to universities and colleges across Canada. Business school deans and directors of entrepreneurship centres were identified as the target participants. The overall response rate was 33 percent. A total of 36 universities and 32 colleges participated in the survey, representing more than 60 percent of the total undergraduate population in Canada between 2007 and 2008.

The survey involved questions related to six areas of entrepreneurship education: strategy, institutional infrastructure, resources, teaching and learning, development and outreach. Findings from the survey identified two areas of concern, presented below, regarding entrepreneurship education.

Student Access to Entrepreneurship Education

- Close to 40 percent of institutions surveyed did not have an underlying strategy to deliver entrepreneurship education.
- A limited number of students had access to entrepreneurship education — 28 percent of institutions had an objective to deliver entrepreneurship opportunities to students in all faculties.
- Courses in entrepreneurship were primarily found within the business and engineering subject areas.

Support for Early-Stage Entrepreneurship on Campus

- More than 40 percent of institutions did not have external links to investors to offer some financing options to students interested in entrepreneurship.
- 18 percent of institutions tracked the number and growth of ventures started by graduates.
- 48 percent of institutions funded entrepreneurship activities with short-term/project funding (1–2 year commitment).

1. INTRODUCTION

Entrepreneurship has been established as a government priority. Over the last decade, government programs have promoted research and development (R&D) within the higher education sector to increase the production and development of new knowledge and the attraction and retention of world-class researchers. Taken together, R&D and new knowledge are entrepreneurial opportunities. As such, higher education institutions are in a position to play a significant role in developing an entrepreneurial advantage in Canada. Providing young potential entrepreneurs with appropriate skills and support is an important element in building a global competitive advantage.

Over time, the focus of entrepreneurship education has evolved beyond the original goal of venture creation to emphasize the development of entrepreneurial behaviours and skills. Attention has also been directed towards building both business skills and theoretical/strategic planning skills, along with the intent to deliver entrepreneurship education to various disciplines across campus.

To complement the role educational institutions play in driving innovation, higher education institutions will need to support business development to generate an adequate return on R&D efforts and investments.

In this regard, Industry Canada conducted a survey on entrepreneurship education across Canadian universities and colleges in line with the department's mandate to support and facilitate an entrepreneurial economy. The purpose of the survey was to identify the framework in which entrepreneurship education is delivered in Canada — an area where detailed aggregate information is largely absent — as well as how the option to be entrepreneurial is promoted and encouraged.

2. THE SURVEY

2.1 DIMENSIONS/SUB-DIMENSIONS

The survey was developed by the European Commission in relation to a framework model that identifies six core dimensions of entrepreneurship education, which are further divided into sub-dimensions:¹

i) **Strategy:** Policies and goals that illustrate the degree of an institution's commitment to entrepreneurship education.

Sub-Dimensions

- **Entrepreneurship goals:** Entrepreneurship objectives embedded in the institution's mission statement or overarching goals to promote entrepreneurship.
- **Entrepreneurship policies:** Established written institution-wide policies / action plans to support entrepreneurship.
- **Strategic embeddedness:** Appointed persons (principal/provost, pro-vice-chancellor/dean/ professor/lecturer) with management influence to oversee the implementation of policies and goals.

1. For a copy of the European Commission report, visit http://ec.europa.eu/enterprise/policies/sme/promoting-entrepreneurship/education-training-entrepreneurship/higher-education/index_en.htm.



ii) Institutional Infrastructure: Sources of support outside the classroom for those interested in entrepreneurship.

Sub-Dimensions

- **Approaches:** Access to entrepreneurship departments, entrepreneurship centres, incubator facilities and/or technology transfer offices.
- **Entrepreneurship appointments:** Appointed entrepreneurship chairs (tenured and non-tenured), not including associate and assistant professors, to support entrepreneurship across campus.
- **Research in entrepreneurship:** Research on entrepreneurship and entrepreneurship education.
- **Cross-discipline structures:** Structures to permit students to receive credit towards their degree for taking entrepreneurship courses. The sub-dimension also considers cross-faculty entrepreneurship activities to offer opportunities for students from different faculties to work together.

iii) Resources: Funding and resources dedicated to entrepreneurship education.

Sub-Dimensions

- **Budget allocation:** Financial support for entrepreneurship education and an overall budget for entrepreneurship.
- **Income generation:** Money raised for entrepreneurship education.
- **Type of funding:** Established financial commitments towards entrepreneurship education (short-, medium- or long-term financing).

iv) Teaching and Learning: Theoretical learning component of entrepreneurship education.

Sub-Dimensions

- **Courses:** Number of courses in entrepreneurship education, by level of study (undergraduate, graduate, postgraduate).
- **Degrees:** Access to degree programs in entrepreneurship, by level of study.
- **Curriculum:** Methods used in the development of an entrepreneurship curriculum, such as learning from other institutions (within Canada and internationally), liaising with practitioners or cross-faculty/interdisciplinary collaboration.
- **Teaching methods:**² Use of lectures, case studies, practitioners, project teams, company visits and/or simulations.
- **Extracurricular activities:** Use of seminars, business plan competitions, company visits, matchmaking events between students and external stakeholders, mentoring schemes.

v) Development: Processes in place to evaluate and monitor the effectiveness of entrepreneurship education.

Sub-Dimensions

- **Evaluation:** Formalized evaluation procedures to follow up on attaining entrepreneurship goals and strategies.
- **User-driven improvement:** Evaluation of entrepreneurship courses to measure the outcome of courses from the perspective of students and end-users (employees, investors, etc.).

2. Due to technical difficulties, data related to the teaching methods sub-dimension are not reliable.

- **Human resource development and management:** Recognition of staff achievements in entrepreneurship education, requirement of staff to have entrepreneurial experience, inviting guest lecturers.

vi) **Outreach:** Links with community and connecting students with those experienced in entrepreneurship.

Sub-Dimensions

- **Alumni:** Kept in touch with alumni, involved alumni in entrepreneurship activities.
- **Links with stakeholders:** Established links with foundations, private companies, entrepreneurs, government, science parks / incubators or specialized bodies in entrepreneurship.
- **Community engagement:** Students provided with internships, work projects and business competitions to develop entrepreneurial mindsets and skills.

The six dimensions used in this survey represent the fundamental elements behind a framework for entrepreneurship education.

2.2 METHODOLOGY

Before administering the survey in Canada, representatives from one university, one college, the Canadian Federation of Business School Deans (CFBSD) and the Association of Canadian Community Colleges (ACCC) reviewed and commented on the *Survey of Entrepreneurship Education in Higher Education in Europe* to ensure it was conducive to the Canadian higher education system.

The online Canadian survey included a preliminary assessment (nine questions) and a main survey of 68 questions. The purpose of the preliminary assessment was to establish an overall profile of an institution to determine if it provided an adequate level of entrepreneurship education to warrant continuing with the main survey.

To qualify for the survey, the institution had to satisfy at least one of three criteria:

- The institution offers curricular or extracurricular activities focusing on the development of entrepreneurial behaviour, skills, knowledge, mindsets and experiences.
- The institution offers courses in which entrepreneurship accounts for more than 25 percent of the course curriculum.
- The institution has offered entrepreneurship education for more than one year.

2.3 TARGET PARTICIPANTS

Business school deans and directors of entrepreneurship centres were the target participants for the survey. With the assistance of the CFBSD and ACCC, a contact list was generated.

2.4 RESPONSE RATES

In total, 204 institutions were invited to participate in the survey — 69 universities and 135 colleges. A total of 36 universities responded and qualified to complete the main survey, for a university response rate of 52.2 percent (Table 1). A total of 32 colleges participated in the survey, for a college response rate



of 23.4 percent. Included in this sample are seven colleges that responded to the survey invitation but did not qualify to complete the main survey. Given that the college sample population was twice as large as the university pool, it is hard to determine if the low response rate amongst colleges was due to an absence of entrepreneurship education at the college level or simply due to a low survey response rate.

The overall response rate for the survey was 33 percent, representing more than 60 percent of the total undergraduate population in Canada between 2007 and 2008.³ Appendix C provides a complete list of participating institutions.

Table 1: Response Rates (%) by Institution and Canadian Region

Canadian Region	University Response Rate (%)	College Response Rate (%)	Total Response Rate (%)
West (British Columbia, Alberta, Yukon, Northwest Territories and Nunavut)	78.6	18.9	35.3
Prairies (Manitoba and Saskatchewan)	33.3	18.8	22.7
Ontario	56.5	51.6	53.7
Quebec	55.6	9.3	17.3
Atlantic (New Brunswick, Newfoundland and Labrador, Nova Scotia and Prince Edward Island)	29.4	20.0	25.9
Total Response Rate	52.2	23.4	33.0

2.5 SPIDER DIAGRAMS

Institutions were given an indexed average score for each dimension and sub-dimension. Spider diagrams (using a score from 0 to 100) were used to compare the scores of each institution against three Canadian subsets:

- (i) average score of the five institutions that scored highest in the survey;
- (ii) average score of the five institutions that scored lowest in the survey; and
- (iii) average overall score of the Canadian sample.

The same three subsets were created using the European Union (EU) data to compare each Canadian institution with those in the EU. In total, 14 spider diagrams were developed for each institution, which are housed in an online benchmarking tool. A future Industry Canada report will analyze the comparison of the Canadian and EU subsets.

2.6 ONLINE BENCHMARKING TOOL

Each participating institution was given a unique username and pass code to access its respective spider diagrams on the online benchmarking tool (<http://entrepreneurshipsurveycanada.niras.dk/>). To maintain confidentiality, institutions were only allowed access to their spider diagrams and not those of other institutions. Non-participating institutions can access the site to view the spider diagrams of the three Canadian and EU subsets to compare Canada's overall performance in the entrepreneurship education framework.

3. Representation based on full-time equivalencies, see Appendix B.

3. KEY FINDINGS

Overall, the survey shows Canadian higher education institutions are actively involved in offering entrepreneurship education as well as in providing a network of practitioners and the necessary facilities to support students interested in entrepreneurship.

The findings of the report illustrate that institutions are active in providing support for entrepreneurship on campus. In the 2007–2008 academic year, 98 percent of the surveyed institutions offered at least one undergraduate course in entrepreneurship, and 23 percent of institutions offered one or more degree programs in entrepreneurship (irrespective of study level). Furthermore, 80 percent of institutions offered entrepreneurship extracurricular activities, such as seminars/workshops, business plan / venture capital competitions and mentoring/coaching. However, overall enrolment levels suggest that entrepreneurship is a specialized discipline. Amongst the institutions, 2.5 percent of students completed an entrepreneurship course and 2.1 percent participated in entrepreneurship extracurricular activities.

The survey also identifies two areas of concern. The first relates to student access to entrepreneurship education. Entrepreneurship is an activity that is applicable and relevant to students in all disciplines who are interested in starting a business. However, having an overall objective to deliver entrepreneurship education within an institution was absent in over two thirds of responding institutions. In most cases, entrepreneurship education was offered in only one or two (principally business and engineering) faculties. While institutions do make efforts to motivate and support entrepreneurship opportunities on campus, less than one third of surveyed institutions had an objective to deliver entrepreneurship opportunities to students in all faculties.

The second area of concern refers to the mechanisms within the entrepreneurship education framework to generate economic benefits. Specifically, these concerns relate to the limited and sporadic support for early-stage business ventures and the availability (or lack thereof) of other methods of knowledge transfer to society.

Approximately 200 ventures were created in 2007–2008 amongst the surveyed institutions, and the survey does demonstrate the presence of support for these ventures. However, there are gaps and inconsistencies in this overall system of support. Eighty percent of institutions indicated that a significant number of graduates had shown an interest in entrepreneurship education by participating in business plan competitions, incubators and internships, yet 40 percent of institutions did not have external links to investors, half did not have links to professional service providers and over 75 percent did not have any incubators to support the new ventures of interested entrepreneurs. In contrast, the more popular mechanisms used to support commercialization were technology transfer offices and consultancy work. These gaps in the overall system of support may limit the long-term benefit from entrepreneurial activities within Canadian educational institutions.

Overall findings from the survey show that Canadian institutions performed well in certain areas within the framework. However, evidence indicates that such efforts are often fragmentary. The purpose of this report, therefore, is to contribute new information and initiate discussion on the role of universities and colleges in entrepreneurship education and support.



4. DIMENSION 1: STRATEGY

Key Findings: Most institutions did not have an institution-wide strategy to deliver entrepreneurship education. Entrepreneurship education policies were predominantly found at the faculty level, which may limit the access students from other faculties have to entrepreneurship education.

Becoming an institute that fully supports entrepreneurship entails a complex process that requires parallel actions in a number of areas. It goes beyond providing entrepreneurship courses and/or engaging in efforts such as making use of placement programs in start-ups, establishing incubator facilities or appointing professors of entrepreneurship.

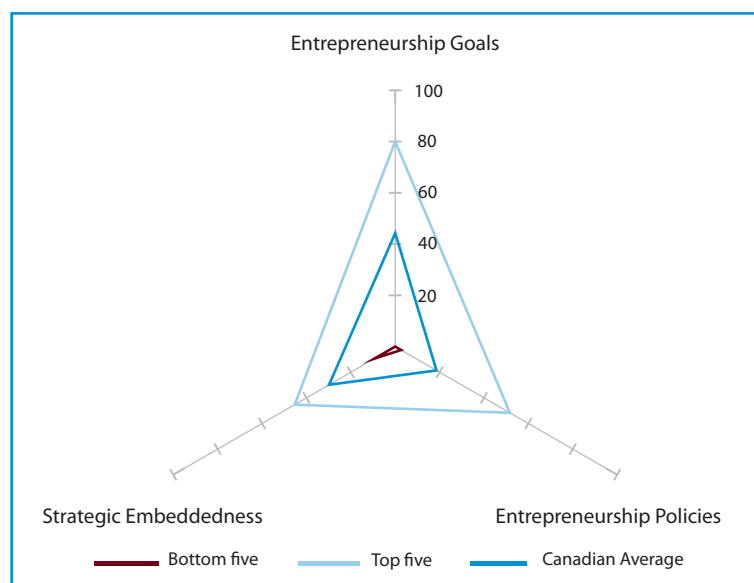
The strategy dimension of the survey seeks to identify a commitment within the institute to provide an entrepreneurial environment. A central element of facilitating sustainable and effective entrepreneurship education is to embed entrepreneurship in the overall strategy of the institution. Defining overarching and measurable entrepreneurship goals can stimulate this development and lay a framework to assess the impact of entrepreneurship education activities. The commitment to deliver entrepreneurship education is further reinforced if the goals are included in the overall mission statement of the institution.

4.1 FINDINGS

Figure 1 illustrates how the three Canadian subsets (top five, bottom five and average score) compare within the three sub-dimensions of the strategy dimension:

- **Entrepreneurship goals:** Entrepreneurship objectives embedded in the institution's mission statement or overarching goals to promote entrepreneurship.
- **Entrepreneurship policies:** Established written institution-wide policies / action plans to support entrepreneurship.
- **Strategic embeddedness:** Appointed persons (principal/provost, pro-vice-chancellor/dean/ professor/lecturer) with management influence to oversee the implementation of policies and goals.

Figure 1: Spider Diagram of Strategy Dimension (score out of 100)



Across all three sub-dimensions, the average score for Canada and the top five institutions was highest in the entrepreneurship goals sub-dimension, suggesting that institutions were more inclined to have established goals than policies or strategic embeddedness. For example, all of the top five institutions placed fostering entrepreneurial behaviour, skills and mindsets as an overarching entrepreneurship goal for the institution.

Although the difference in the average scores for Canada and the top five institutions was smallest in the strategic embeddedness sub-dimension, both scores were below 50, suggesting that more can be done to ensure that the person responsible for entrepreneurship education has sufficient management influence to implement policies. The average score for the bottom five institutions in Canada was below 10 in all three sub-dimensions.

Most institutions have general entrepreneurship goals; however, few have specific measurable goals (Table 2)

- Only 28 percent of institutions instilled an overarching goal to provide access to entrepreneurship education for all students.
- Moreover, while 51 percent aim to foster entrepreneurial behaviours, skills and mindsets amongst students, close to 40 percent of institutions did not have any institution-wide entrepreneurship goals.

Table 2: Percentage of Institutions with Various Overarching Entrepreneurship Education Goals

Overarching Entrepreneurship Education Goals	Total Institutions (%)	University (%)	Degree-Granting College (%)	Technical Institutes (%)
Foster entrepreneurial behaviours, skills and mindsets	51	61	40	33
Inspire students to seek an entrepreneurial career or life	39	47	30	27
Seek opportunities to commercially exploit knowledge	33	47	10	13
Provide access to entrepreneurship opportunities for all students	28	33	30	13
Increase the number of graduate start-up businesses	20	28	10	7
Maximize technology transfer revenue	15	22	—	7
Entrepreneurship education should generate income	3	3	10	—
Institution doesn't have entrepreneurship goals	39	31	40	60

“—” indicates no institution or region responded.

Strategic policies to deliver entrepreneurship education are sparse at the institution level and lie predominantly within specific faculties, such as business and engineering

- At the institution level, only 23 percent of institutions had written institution-wide policies / action plans for undertaking entrepreneurship education.
- At the faculty level, 46 percent of institutions had policies / action plans in place.
- Across faculties there was limited exposure to entrepreneurship education:
 - 75 percent of institutions had entrepreneurship rooted in business studies;
 - 15 percent of institutions had entrepreneurship rooted in technical (engineering) disciplines; and
 - 5 percent of institutions had entrepreneurship rooted in social sciences.



A dean was more likely (44 percent) to be accountable for entrepreneurship education

- Dean — 44 percent of institutions.
- Professor — 21 percent of institutions.
- No one — 18 percent of institutions.
- Amongst entrepreneurship champions: Individuals who act as a spokesperson/advocate at the management level to support entrepreneurship activities:
 - Most were self-appointed; and
 - Most were primarily employed in the business, technical, health care and natural sciences areas, which may reinforce limited access and delivery of entrepreneurship education on campus.

5. DIMENSION 2: INSTITUTIONAL INFRASTRUCTURE

Key Findings: The most common types of institutional infrastructure — entrepreneurship centres and technology transfer offices (TTOs) — are present at less than half of the institutions.

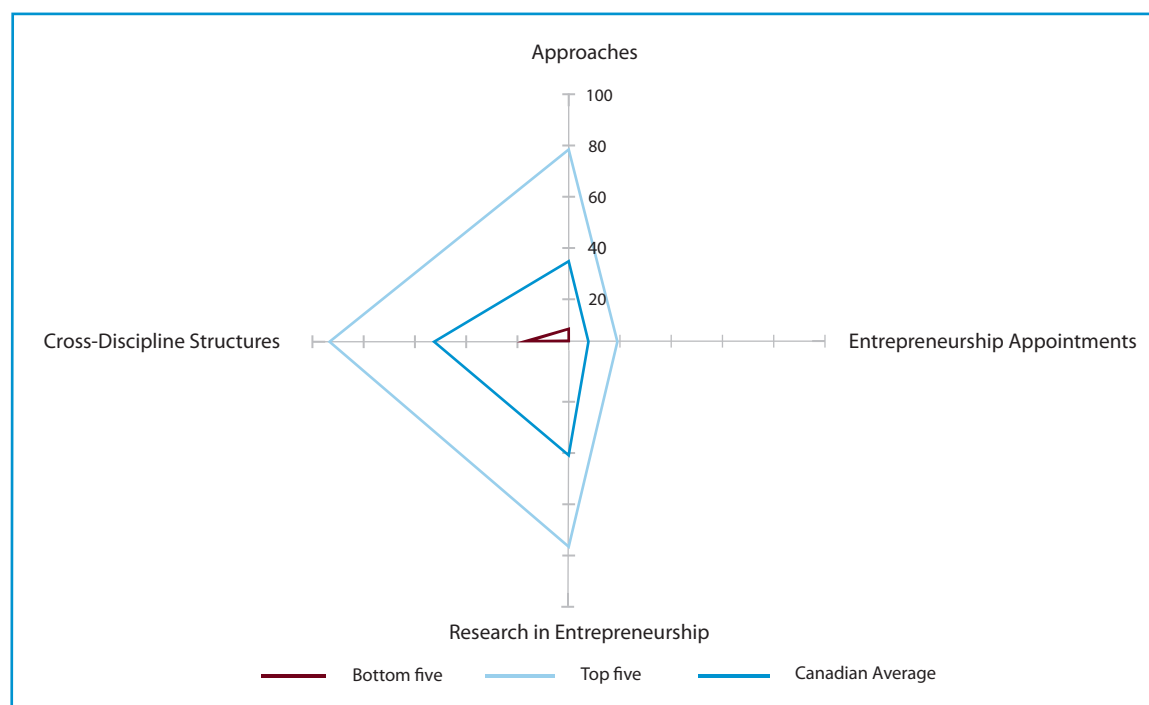
The institutional infrastructure dimension isolates the facilities that institutions have established in support of entrepreneurship education. These facilities support entrepreneurship at different stages of the business development cycle. To be effective, such infrastructure seems to require many different elements to support entrepreneurship at each stage of the business development cycle. However, given limited resources, institutions may be forced to focus on a limited number of elements, thus possibly favouring licensing, for example, over venture creation.

5.1 FINDINGS

Figure 2 illustrates how the three Canadian subsets compare within the four sub-dimensions of the institutional infrastructure dimension:

- **Approaches:** Access to entrepreneurship departments, entrepreneurship centres, incubator facilities and/or technology transfer offices.
- **Entrepreneurship appointments:** Appointed entrepreneurship chairs (tenured and non-tenured), not including associate and assistant professors, to support entrepreneurship across campus.
- **Research in entrepreneurship:** Research on entrepreneurship and entrepreneurship education.
- **Cross-discipline structures:** Structures to permit students to receive credit towards their degree for taking entrepreneurship courses. The sub-dimension also considers cross-faculty entrepreneurship activities to offer opportunities for students from different faculties to work together.

Figure 2: Spider Diagram of Institutional Infrastructure Dimension (score out of 100)



The average score of the top five institutions compared with the average score for Canada was greater than 35 points for all but the entrepreneurship appointments sub-dimension, where the difference was greater than 10 points. This finding suggests room for improvement within the institutional infrastructure dimension for Canadian institutions when compared with the top five institutions. The average score for Canada and the top five institutions was highest in cross-discipline structures, suggesting that institutions were actively involved in providing access to entrepreneurship education across campus. For example, all of the top five institutions offered cross-faculty activities (curricular and extracurricular). As well, four of the top five institutions allowed entrepreneurship courses to be credited towards the students' program of study.

The most common types of institutional infrastructure — entrepreneurship centres and technology transfer offices — are present at less than half of the surveyed institutions (Table 3)

Table 3: Comparing the Presence of Entrepreneurship Centres and Technology Transfer Offices (TTOs)

Employees	Entrepreneurship Centre (%)	TTO (%)
At least one full-time employee	34	46
Less than one full-time employee	13	3
Institution does not have this facility	53	51

Entrepreneurship Centre: a central location that provides entrepreneurs with access to educational programs, networking opportunities, equipment and resources either on campus and/or within the community. These centres typically require a relatively larger budget and more administrative planning than technology transfer offices.



Technology Transfer Office: Manages the use of university research results for public benefit, by providing patenting, licensing and other commercialization support to faculty and researchers within the institute or community.

- Table 3 illustrates that half the number of surveyed institutions did not have either an entrepreneurship centre or a technology transfer office.
- However, a greater percentage of institutions allocated at least one full-time employee to technology transfer offices compared with entrepreneurship centres (Table 3). This preference reflects findings from a recent study by Maxwell and Lévesque suggesting that universities are more inclined to host TTOs due to the short-term benefits from the sale of licences. The authors further illustrate that the TTO model provides no incentive for the university to pursue other, possibly more profitable, commercialization methods. Inevitably the innovation is sold prematurely, often resulting in the flow of long-term economic benefits to the location of the licensee rather than the region in which the innovation was funded/developed.⁴

Technology Incubator: This type of facility predominantly focuses on the end of the business development cycle by providing experienced business support, high-quality facilities and management services for business start-ups.

- Only 25 percent of institutions had incubator facilities. Of these, 60 percent assisted more than 10 graduate start-ups and 40 percent assisted less than 10 graduate start-ups.

Each type of institutional infrastructure facilitates a specific stage in the business development cycle, from conception to start-up. Many institutions that hosted incubator facilities also hosted other types of facilities.

Of the 25 percent of institutions that hosted incubator facilities:

- 80 percent had technology transfer offices — focus on licensing and patents.
- 87 percent had entrepreneurship centres — focus on preliminary business development stage.
- 87 percent offered cross-faculty entrepreneurship activities — focus on theory development from opportunity.
- 80 percent supported entrepreneurship education goals with dedicated funding.

These findings suggest that the majority of institutions that host incubator facilities also support other facilities, providing a framework to assist student entrepreneurship through each stage of the business development cycle. The financial commitment to establish such a network may motivate universities to consider alternative and cheaper modes of commercialization, such as licensing through TTOs.

To resolve the conflict on the part of universities trying to decide between short-term gains from licence fees and the cost and risk of alternative modes of commercialization, Maxwell and Lévesque⁵ suggest

4. Maxwell, A. and M. Lévesque, in press. "Technology incubators: facilitating technology transfer or creating regional wealth?" *International Journal of Entrepreneurship and Innovation Management*.

5. Ibid.

a partnership between university incubators and regional economic development agencies. Such a partnership creates future research opportunities and a flow of donations from successful entrepreneurs and alumni to universities, while supporting the local region through new ventures, graduates and co-op students.

6. DIMENSION 3: RESOURCES

Key Findings: Most funding was allocated towards entrepreneurship activities (curricular and extracurricular), mainly on a short-term basis, thereby limiting support for the long-term development of the entrepreneurial capacity on campus.

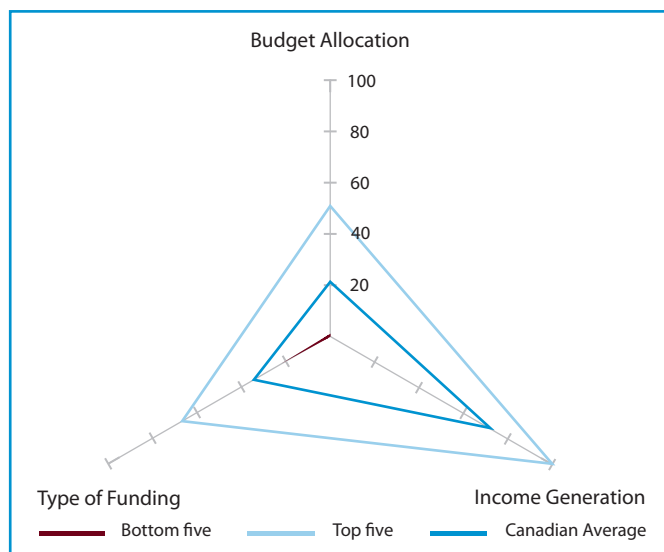
The resource dimension determines how entrepreneurship is funded within an institution. Sustainability of entrepreneurship education is closely related to the type and source of funding as the more long term the funding, the more sustainable the development of entrepreneurship is. This translates to a balance between dedicated funding to accomplish specific entrepreneurship education goals and short-term funding to support entrepreneurship curricular and extracurricular activities. Furthermore, entrenching entrepreneurship education as a permanent element within an institution is more likely to happen if entrepreneurship activities can generate income on their own and/or attract external funding to the institution.

6.1 FINDINGS

Figure 3 illustrates how the three Canadian subsets compare within the three sub-dimensions of the resource dimension:

- **Budget allocation:** Financial support for entrepreneurship education and an overall budget for entrepreneurship.
- **Income generation:** Money raised for entrepreneurship education.
- **Type of funding:** Established financial commitments towards entrepreneurship education (short-, medium- or long-term financing).

Figure 3: Spider Diagram of Resource Dimension (score out of 100)



The average score of the top five institutions (100 points) and Canada (72 points) was highest in the income generation sub-dimension, suggesting that a high number of institutions are active in one or more of the following income-generating activities — receiving donations from alumni and other philanthropists or charging fees to attend seminars and/or workshops. The average scores are below 50 points for Canada in the budget allocation and type of funding sub-dimensions, possibly indicating areas for improvement in terms of allocating funds and increasing the duration of the financial commitment towards entrepreneurship education.

Entrepreneurship education budget varies by type of institution

- Average size of entrepreneurship education budget (2007–2008):
 - Universities: \$430 000
 - Degree-granting colleges: \$78 000
 - Technical institutes: \$44 000

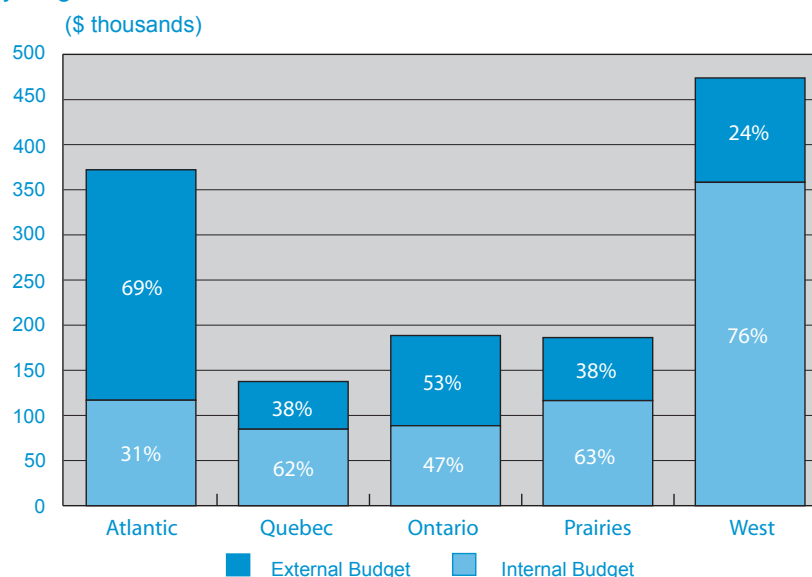
The average entrepreneurship education budget in the Western region was three times the average entrepreneurship education budget in Quebec (Figure 4)

- The Western region (British Columbia, Alberta, Yukon, Northwest Territories and Nunavut) and the Atlantic region, on average, had the largest budgets for entrepreneurship education.
- Quebec had the lowest average entrepreneurship education budget of approximately \$138 000.

Institutions were asked to determine what proportion of their total entrepreneurship education budget was derived from internal and external funding.

- **Internal funding:** Financial commitment within the institution towards the development of entrepreneurship education in the short and long term.
- **External funding:** Funding from external stakeholders (government funding, donations and alumni donations) usually comes with restrictions and clauses. Generally not a steady source of income for long-term projects.

Figure 4: Average Entrepreneurship Education Budget, and Breakdown between Internal and External Funding, by Region



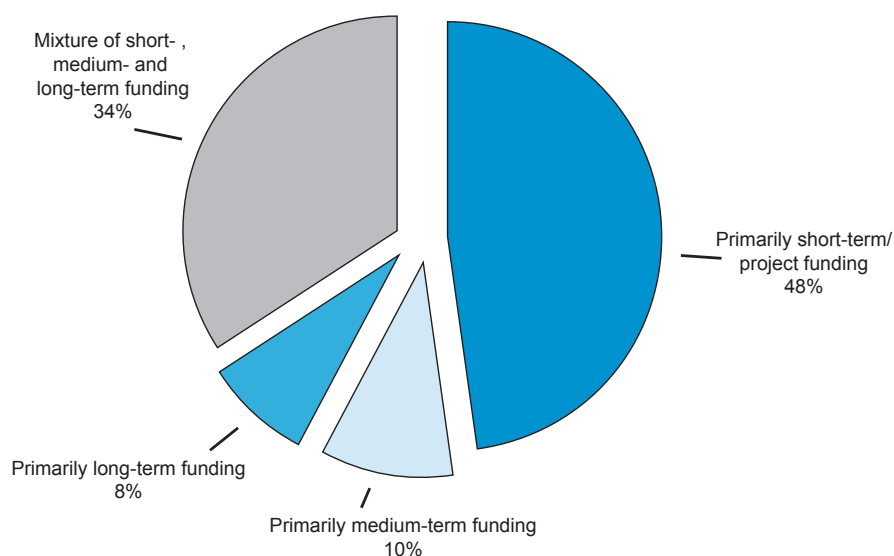
Internal funds provided the majority of entrepreneurship education budgets, except in the Atlantic region; in Ontario, internal and external funding were roughly equal

- By institution, a split of 51 percent from internal funding and 49 percent from external funding was common for the entrepreneurship education budgets of most universities and colleges.
- By province, internal funds provided more than 60 percent of the entrepreneurship education budgets in the West (British Columbia, Alberta, Yukon, Northwest Territories and Nunavut), the Prairies (Manitoba and Saskatchewan) and Quebec. An equal split was found in Ontario, while almost 70 percent of the entrepreneurship education budget in the Atlantic region was attributed to external funding.

Close to half of the surveyed institutions support entrepreneurship education in the short term, suggesting a limited commitment to the development of entrepreneurship education in the long run (Figure 5)

- 48 percent of institutions primarily funded entrepreneurship activities with short-term/project funding (1–2 year commitment).
- Slightly more than one third (34.4 percent) of institutions supported entrepreneurship activities with a mixture of short-term (1–2 years), medium-term (3–5 years) and long-term (5+ years) funding.

Figure 5: Average Entrepreneurship Education Budget, by Duration of Funding



Approximately three quarters of institutions exhibiting a long-term financial commitment to entrepreneurship education established at least one type of institutional infrastructure

- Of the institutions that allocated medium-, long- or mixed-term funding to entrepreneurship activities (curricular or extracurricular), 72 percent hosted at least one type of entrepreneurship infrastructure (entrepreneurship department, entrepreneurship centre, TTO, incubator facilities).
- In comparison, of those institutions that allocated only short-term funding to entrepreneurship activities, 66 percent hosted at least one type of entrepreneurship infrastructure.



Approximately 72 percent of surveyed institutions raised funds for entrepreneurship education through one or more income-generating activities (Table 4)

- 48 percent of institutions generated income through donations from stakeholders.
 - Approximately 60 percent of universities raised funds in this manner.
- Other popular income-generating activities included donations from alumni and fees from hosting seminars.
- 28 percent of institutions did not participate in income-generating activities.
 - By institution, 73 percent of technical institutes did not participate in income-generating activities compared with 10 percent of colleges and 14 percent of universities.

Table 4: Percentage of Institutions Raising Funds through Income-Generating Activities

Income-Generating Activities	University (%)	Degree-Granting College (%)	Technical Institutes (%)
Donations from stakeholders	61	50	13
Donations from alumni	53	40	13
Fees to attend seminars, workshops, etc.	53	30	13
Advisory services	33	20	—
Publication revenues	11	—	—
No income-generating activities	14	10	73

“—” indicates no institution or region responded.

7. DIMENSION 4: TEACHING AND LEARNING

Key Findings: The majority of courses in entrepreneurship education are delivered within the business and engineering subject areas, limiting exposure to would-be entrepreneurs in areas such as medicine or environmental studies. Entrepreneurship requires a non-traditional teaching approach and most institutions do so by utilizing a variety of methods, including a practical hands-on approach to entrepreneurship.

The teaching and learning dimension covers curricular and extracurricular activities administered through the institution's entrepreneurship education framework. Curricular activities include the development of an entrepreneurship curriculum using various courses and teaching methods. This also includes activities to encourage collaboration amongst faculties within institutions. Extracurricular activities include the use of non-traditional teaching methods.

7.1 FINDINGS

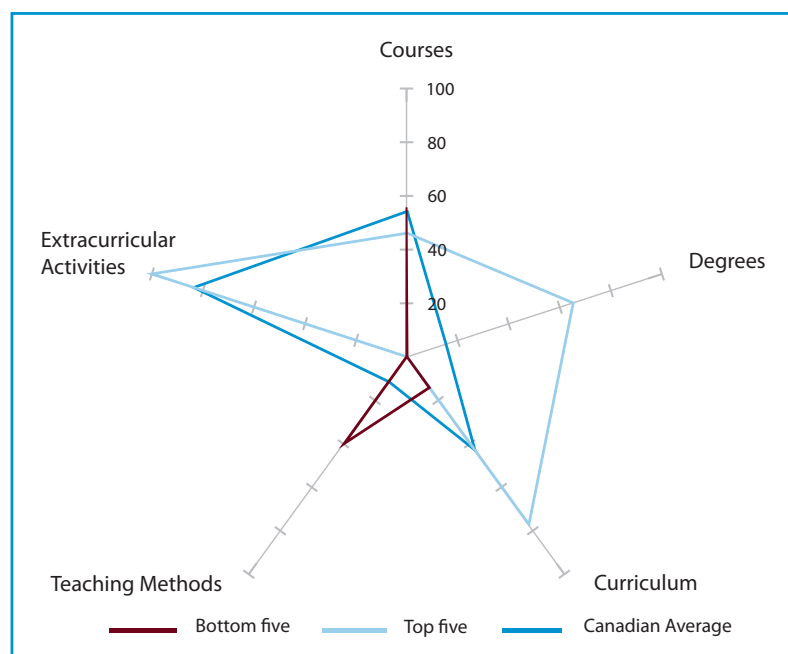
Entrepreneurship education can be delivered either through a curriculum of courses/programs (curricular activities) or through practical hands-on experiences via business competitions or case studies (extracurricular activities). Of the surveyed institutions, in the 2007–2008 academic year, an equal proportion of students participated in curricular (2.5 percent) and extracurricular (2.3 percent) entrepreneurship activities, suggesting no preference in the way entrepreneurship education is delivered.

Figure 6 illustrates how the three Canadian subsets compare within the five sub-dimensions of the teaching and learning dimension:

- **Courses:** Number of courses in entrepreneurship education, by level of study (undergraduate, graduate, postgraduate).

- **Degrees:** Access to degree programs in entrepreneurship, by level of study.
- **Curriculum:** Methods used in the development of an entrepreneurship curriculum, such as learning from other institutions (within Canada and internationally), liaising with practitioners or cross-faculty/interdisciplinary collaboration.
- **Teaching methods:**⁶ Use of lectures, case studies, practitioners, project teams, company visits and/or simulations.
- **Extracurricular activities:** Use of seminars, business plan competitions, company visits, matchmaking events between students and external stakeholders, mentoring schemes.

Figure 6: Spider Diagram of Teaching and Learning Dimension (score out of 100)⁷



The average score for Canada and the top five institutions was high in the extracurricular activities sub-dimension, suggesting institutions offered seminars/workshops, business plan / venture capital competitions and/or mentoring schemes / personal coaching in support of offering practical hands-on experience to students. Amongst the top five institutions, one university scored below 20 in the course sub-dimension relative to the other four universities that scored between 45 and 62. As shown in Figure 6, this resulted in a low average score in the course sub-dimension for the top five institutions, relative to the overall Canadian average score.

The average score for Canada was low in the curriculum sub-dimension, indicating that institutions in Canada can further develop their entrepreneurship curriculum through exchanges on teaching methods at national or international levels or through liaising with entrepreneurs/practitioners when developing entrepreneurship teaching material. The average score for Canada was also low in the degree sub-dimension, suggesting that students may not have access to a structured approach to entrepreneurship that offers a series of courses related to various stages of the business development cycle.

6. Due to technical difficulties, data related to the teaching methods sub-dimension are not reliable.

7. Not all of the top five Canadian institutions responded to all of the teaching methods listed in the survey.



Most entrepreneurship courses were found at the undergraduate level

- At the undergraduate, graduate and postgraduate levels, the majority of institutions offered one to five courses in entrepreneurship (Table 5).
- On average, the most entrepreneurship courses (7.5 courses) were found at the undergraduate level. The content of these courses primarily focuses on the assessment of business development needs, opportunity recognition and problem solving.

Table 5: Percentage of Institutions Offering Entrepreneurship Courses, by Level of Study

Number of Entrepreneurship Courses Offered	Undergraduate (%)	Graduate (%)	Postgraduate (%)
	N = 60*	N = 42*	N = 16*
0 courses / not applicable	2	31	63
1–5 courses	48	45	38
6–10 courses	30	12	0
More than 10 courses	20	12	0

* N represents the number of institutions that offer each level of study.

- Irrespective of study level, 23 percent of institutions offered one or more degree programs in entrepreneurship.

Guest lecturers were used to compensate for the limited degree of entrepreneurship experience amongst academic faculty**Entrepreneurship experience is not required for teaching entrepreneurship**

- The most common in-class teaching methods used were case studies, lecturing and project teams. In addition, 59 percent of surveyed institutions often used in-class visits from entrepreneurs and practitioners.
- 66 percent of institutions had more than five academic staff involved in entrepreneurship activities. However, while more than 75 percent of institutions did not require staff to have actual entrepreneurship experience, 80 percent of institutions used guest lecturers or practitioners with practical experience in entrepreneurship to some extent.

Table 6: Percentage of Institutions Offering Entrepreneurship Courses and/or Entrepreneurship Degrees, by Subject Area and Type of Institution

Subject Area	Total Institutions (%)	University (%)	Degree-Granting College (%)	Technical Institutes (%)
Business studies	95	94	100	93
Technical (engineering)	39	39	50	33
Food industry and home economics	21	17	30	27
Arts	20	22	20	13
Natural sciences	13	19	—	7
Social sciences (except business studies)	13	14	10	13
Health care	13	8	30	13
Agriculture	11	14	10	7
Pedagogy/education	5	6	10	—
Humanities and theology	5	8	—	—
Public security / defence	3	—	20	—

“—” indicates no institution or region responded.

Student access to entrepreneurship courses was restricted to specific areas of study

- The majority of institutions (Table 6) offered entrepreneurship courses through business studies (95 percent) and technical (engineering) studies (39 percent).
- Universities, in general, offered entrepreneurship courses in a greater number of subject areas than degree-granting colleges or technical institutes, and were more likely to permit students to enrol in courses outside their faculty.

Non-traditional teaching methods are commonly used as a form of hands-on technical training

In addition to curricular activities, common forms of extracurricular activities included seminars/workshops (66 percent), business plan / venture capital competitions (62 percent) and mentoring schemes / personal coaching (57 percent) (Table 7).

Table 7: Percentage of Institutions Offering Extracurricular Entrepreneurship Activities, by Type of Institution

Extracurricular Activity	Total Institutions (%)	University (%)	Degree-Granting College (%)	Technical Institutes (%)
Seminars/workshops	66	75	80	33
Business plan / venture capital competitions	62	81	60	20
Mentoring schemes / personal coaching	57	64	60	40
Company visits	46	50	60	27
Matchmaking events	43	56	30	20
None offered	16	8	—	47

“—” indicates no institution or region responded.

8. DIMENSION 5: DEVELOPMENT

Key Findings: Most institutions identified some degree of interest in entrepreneurship amongst students; however, most institutions did not have the necessary evaluation procedures to monitor the quality and effectiveness of these activities or to identify areas for improvement and development.

The development dimension focuses on whether institutions continuously improve the quality of their entrepreneurship activities by evaluating whether the institution takes into account the needs and wishes of present and past users (students and alumni) and indirect “end-users” (potential employers, venture capitalists, etc.) when developing/improving their entrepreneurship education program.

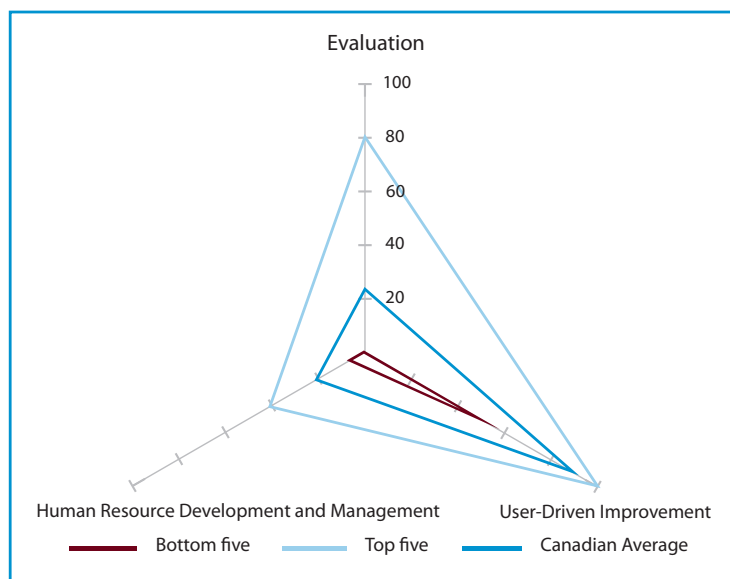
8.1 FINDINGS

Figure 7 illustrates how the three Canadian subsets compare within the three sub-dimensions of the development dimension:

- **Evaluation:** Formalized evaluation procedures to follow up on attaining entrepreneurship goals and strategies.
- **User-driven improvement:** Evaluation of entrepreneurship courses to measure the outcome of courses from the perspective of students and end-users (employees, investors, etc.).
- **Human resource development and management:** Recognition of staff achievements in entrepreneurship education, requirement of staff to have entrepreneurial experience, inviting guest lecturers.



Figure 7: Spider Diagram of Development Dimension (score out of 100)



The evaluation sub-dimension score indicates that Canadian institutions do not tend to use formalized evaluation procedures to track the progress of implementing entrepreneurship education goals and strategies. However, the high score in the user-driven improvement sub-dimension indicates that Canadian institutions evaluate curricular courses to a greater extent to measure the attitudes amongst students and end-users, such as investors and employers.

The average score for Canada and the top five institutions was low in the human resource development and management sub-dimension, suggesting room for improvement in terms of acknowledging staff achievements related to supporting entrepreneurship on campus and ensuring that staff teaching entrepreneurship have the necessary skills and competencies.

Evaluation procedures to track and identify development of entrepreneurship education on campus are not present in most institutions

- Only 23 percent of institutions had formalized evaluation procedures to follow up on the progress of achieving entrepreneurship goals and implementing entrepreneurship strategies.
- 20 percent of institutions evaluated entrepreneurship courses by measuring how end-users (employers and investors) evaluated the entrepreneurial skills and attitudes of students from their institution.
- Almost half of the institutions (48 percent) did not have any procedures in place for evaluating the anticipated medium- and long-term effects of entrepreneurship courses.

Although more than 80 percent of institutions (Table 8) estimated that graduates had shown some interest/demand in entrepreneurship by participating in business plan competitions, incubators or internships in start-ups, few institutions followed up on the long-term effects of such activities.

- 48 percent of institutions did not have evaluation procedures in place to identify the medium- and long-term effects upon student mindsets and skills.
- 62 percent of institutions indicated they kept in touch with alumni.
- 34 percent of institutions did not track alumni.
- 18 percent of institutions tracked the number and growth of ventures started by graduates.

Table 8: Percentage of Students Graduating with Practical Entrepreneurship Experience,* 2007–2008

Graduates with Entrepreneurship Experience	Total Institutions (%)	University (%)	Degree-Granting College (%)	Technical Institutes (%)
None	5	3	0	13
Less than 10%	48	47	60	40
10–50%	26	31	30	13
More than 50%	7	8	0	7
Cannot make an estimation	15	11	10	27

*Measured by participation in business plan competitions, incubators or internships in start-ups.

9. DIMENSION 6: OUTREACH

Key Findings: While institutions establish links with those experienced in entrepreneurship and private companies to provide access to practise-oriented activities, 41 percent of institutions did not have links to investors, limiting available finance options on campus for those who want to pursue entrepreneurship.

The outreach dimension takes into account that developing entrepreneurial mindsets amongst students is not entirely a theoretical exercise.

In most educational settings, students are often isolated from the external environment. In order for students to develop an entrepreneurial mindset as well as entrepreneurial behaviour and skills, external stakeholders can offer students opportunities to gain practical experience through various outreach activities.

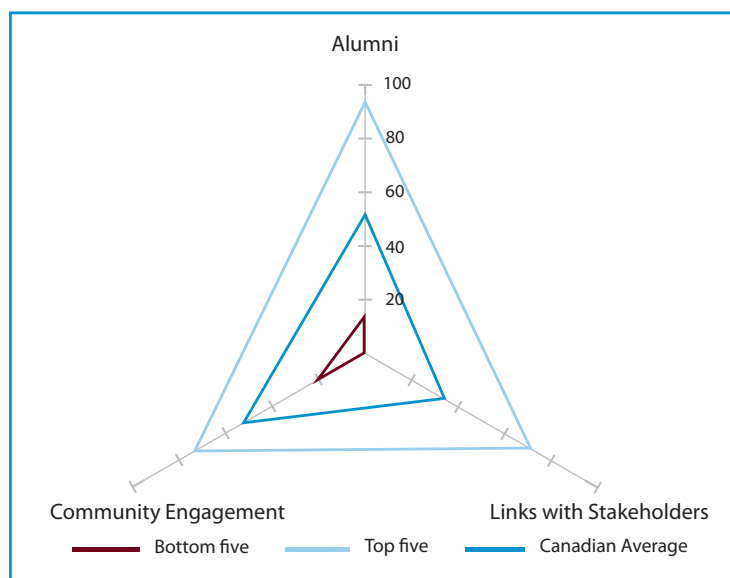
9.1 FINDINGS

Figure 8 illustrates how the three Canadian subsets compare within the three sub-dimensions of the outreach dimension:

- **Alumni:** Kept in touch with alumni, involved alumni in entrepreneurship activities.
- **Links with stakeholders:** Established links with foundations, private companies, entrepreneurs, government, science parks / incubators or specialized bodies in entrepreneurship.
- **Community engagement:** Students provided with internships, work projects and business competitions to develop entrepreneurial mindsets and skills.



Figure 8: Spider Diagram of Outreach Dimension (score out of 100)



Of the three sub-dimensions, the average score for Canada and the top five institutions was highest in the community engagement sub-dimension, suggesting that institutions are actively involved in the community by offering student internships, work projects and business competitions to develop entrepreneurial mindsets and skills in a real-world context.

A majority of the top five institutions track alumni and involve alumni in entrepreneurship activities, and have links with stakeholders that make an actual contribution to the institution's entrepreneurship activities. The scores for the Canadian average in these two sub-dimensions were approximately 20 points lower, however, suggesting some opportunities for improvement.

Common external stakeholders for promoting and supporting entrepreneurship were entrepreneurs and private companies (Table 9)

- The most common external stakeholders were private companies (84 percent) and entrepreneurs (84 percent).
- Other stakeholders with an interest in promoting the idea of being entrepreneurial and providing networking opportunities were government (77 percent), foundations (61 percent) and specialized bodies supporting entrepreneurship (60 percent).

Amongst external stakeholders that provide support to start-ups (commercialization):

- 41 percent of institutions did not have links to investors, such as venture capitalists or banks. Given entrepreneurs require at least a business plan and financing to start a business, a greater number of institutes could facilitate financing options on campus.
- 51 percent of institutions did not have links with professional service providers to provide assistance to interested entrepreneurs in areas such as accounting, marketing and income taxes.
- 61 percent of institutions did not have science parks / incubators to offer facilities and management support to start-ups.

Table 9: Percentage of Institutions with Links / No Links to Select External Stakeholders

External Stakeholders	Links (%)	No Links (%)
Private companies	84	16
Entrepreneurs	84	16
Government	77	23
Foundations	61	39
Specialized bodies supporting entrepreneurs	60	39
Investors (venture capitalists, banks, etc.)	59	41
Professional service providers*	49	51
Science parks / incubators**	39	61

* Provide consulting services (e.g., accounting, marketing, income tax).

** Focus on support for start-ups and/or interactions between industry and start-ups.

Knowledge-transfer to society is one measure of entrepreneurship that can take the form of venture creation as well as licensing, consultancy work and/or academic spinoffs (Table 10)

- In the 2007–2008 academic year, a total of 281 ventures were created — 167 by university graduates and 114 by college graduates.
- Of other forms of knowledge transfer:
 - Consultancy work was the most popular.
 - Approximately one third of institutions transferred knowledge via academic spinoffs (venture creations), licensing agreements and/or intellectual property rights.
 - However, 25 percent of the institutions did not transfer knowledge to society
 - Based on a small sample, by institution, a greater proportion of technical institutes (53 percent) did not transfer any form of knowledge to society.

Table 10: Percentage of Institutions Transferring Knowledge to Society

Type of Knowledge Transfer	Total Institutions (%)	University (%)	Degree-Granting College (%)	Technical Institutes (%)
Academic spinoffs (venture creations)	33	42	10	27
Licensing agreements	26	44	—	—
Patents / intellectual property rights	33	53	—	7
Product/process design	26	39	20	—
Consultancy work	64	81	60	27
Institution transferred knowledge in other ways	15	17	—	20
Institution did not transfer knowledge	25	11	30	53

“—” indicates no institution or region responded.

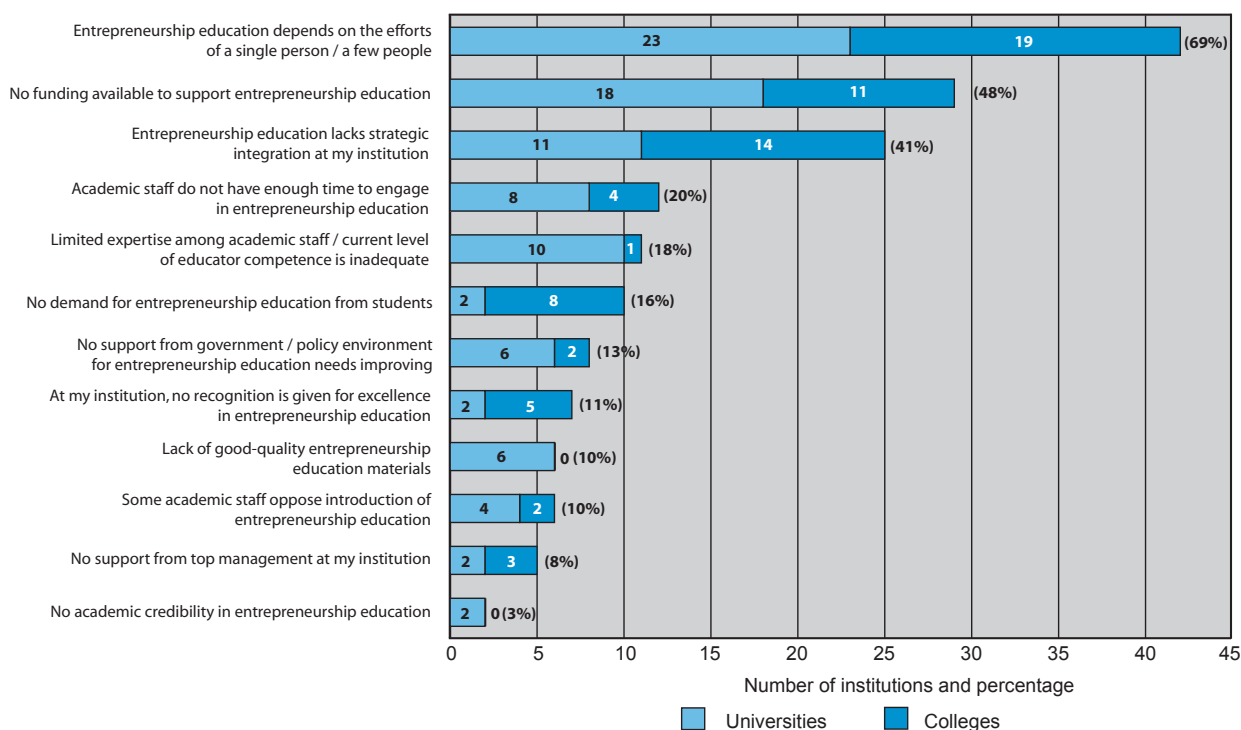
10. BARRIERS TO ENTREPRENEURSHIP EDUCATION

Overall, the findings of the survey have shown Canadian institutions to be engaged in providing entrepreneurship education. The approach to entrepreneurship education, however, seems to be fragmentary across the six dimensions, as institutions perform well in certain dimensions and fall short in others. To identify possible reasons for this, institutions were asked to indicate three barriers to entrepreneurship education that they face.



Figure 9 lists the number and the percentage of institutions (universities and colleges) that identified each barrier as a challenge to providing entrepreneurship education.

Figure 9: Barriers to Entrepreneurship Education, by Type of Institution (number and percentage)



As shown in Figure 9, 42 of the 61 surveyed institutions identified the dependency of entrepreneurship education on the efforts of a single person / a few people as one of the three main barriers to entrepreneurship education. Such a barrier limits accessibility of entrepreneurship education across campus as most often the single person / few people responsible for entrepreneurship education are situated in one particular faculty. This corroborates findings in the strategy dimension indicating that in 44 percent of institutions a dean was the primary person responsible for entrepreneurship education, thereby concentrating entrepreneurship education within a particular faculty.

The second most common barrier was a lack of funding for entrepreneurship education, identified by 29 of the 61 surveyed institutions. The resource dimension of the survey showed that close to half of the surveyed institutions supported entrepreneurship education through short-term funding, thereby limiting the degree of commitment institutions place on developing a cohesive entrepreneurship education framework on campus.

The third most common barrier was a lack of strategic integration of entrepreneurship education across institutions. Two of the three most common barriers amongst institutions were strategic in nature, suggesting the need amongst management to acknowledge entrepreneurship education and commit to deliver it across campus.

11. CONCLUSIONS

Canadian higher education institutions are actively involved in offering entrepreneurship education at the theoretical level as well as in providing a network of practitioners and the necessary facilities to support students interested in entrepreneurship.

However, the findings in many areas across the six survey dimensions indicate that more could be done to further encourage and promote entrepreneurship activities within higher education institutions.

Entrepreneurship education requires an adequate and cohesive framework that encompasses the various dimensions of entrepreneurship education. The survey results have highlighted a number of strong initiatives and practices that are present but also several gaps in the educational efforts around entrepreneurship. In the end, the development of a comprehensive framework to provide access to and support for entrepreneurship will depend on the desired outcomes of the entrepreneurship education system.



APPENDIX A: THREE WELL-RANKED INSTITUTIONS THAT SUPPORT ENTREPRENEURSHIP EDUCATION, BY DIMENSION

Dimension	Institution		
Strategy	Université Laval	Nova Scotia Community College	Ryerson University
Institutional Infrastructure	Wilfrid Laurier University	Ryerson University	HEC Montréal
Resources	McGill University	University of Alberta	University of Waterloo
Teaching and Learning	University of New Brunswick – Fredericton	Cégep de Chicoutimi	Mount Royal University*
Development	McMaster University	Trinity Western University	Mount Royal University*
Outreach	University of Toronto	University of Alberta	University of Waterloo

* Previously known as Mount Royal College.

APPENDIX B: ESTIMATION OF SURVEY SAMPLE REPRESENTATION

University Level	Canada	Survey Sample		Share (%)
Undergraduate enrolment (FTE) ^a	731 354	500 190		68.4
Total enrolment (FTE) ^a	934 365	673 546		72.1
Total institutions ^b	66	36		54.5
College Level		College	Degree-Granting College	
Total enrolment (FTE) ^c	378 570	81 300	88 329	44.8
Total institutions ^d	140	15	10	17.9
Overall				
Overall enrolment (FTE)	1 312 935	843 175		64.2

Note: Full-Time Equivalence (FTE) calculated by counting two part-time students for one full-time student.

^a Source: Postsecondary Student Information System, Statistics Canada.

^b Source: Canadian Federation of Business School Deans, CFBSD.

^c Source: Postsecondary Student Information System, Statistics Canada.

^d Source: Association of Canadian Community Colleges, ACCC.

APPENDIX C: LIST OF PARTICIPANTS

Universities (36)

- Acadia University
- Algoma University College
- Bishop's University
- Brock University
- Capilano University
- Concordia University
- Concordia University College of Alberta
- HEC Montréal
- McGill University
- McMaster University
- Memorial University of Newfoundland
- Queen's University
- Ryerson University
- Simon Fraser University
- St. Francis Xavier University
- The King's University College
- Thompson Rivers University
- Trinity Western University
- Université Laval
- University of Alberta
- University of British Columbia
- University of Guelph
- University of Lethbridge
- University of New Brunswick – Fredericton
- University of Ontario Institute of Technology
- University of Ottawa
- University of Prince Edward Island
- University of Regina
- University of Saskatchewan
- University of the Fraser Valley
- University of Toronto
- University of Victoria
- University of Waterloo
- University of Western Ontario
- Wilfrid Laurier University
- York University

Colleges (32)

- Algonquin College
- Cambrian College
- Cégep de Chicoutimi
- Cégep Limoilou*
- Centennial College
- Champlain Regional College
- College of New Caledonia
- College of the Rockies*
- Conestoga College Institute of Technology and Advanced Learning
- Fanshawe College
- George Brown College
- Georgian College
- Heritage College
- Holland College
- Kemptville College*
- La Cité collégiale*
- Loyalist College
- Medicine Hat College*
- Mount Royal University**
- Niagara College
- Northern College of Applied Arts and Technology
- Northern Lakes College
- Nova Scotia Community College
- Okanagan College
- Parkland College*
- Red River College
- Saskatchewan Institute of Applied Science and Technology
- Sault College
- Seneca College
- St. Clair College
- The Michener Institute for Applied Health Sciences*
- Yukon College

* These colleges did not qualify to complete the main survey and, as such, are not included in the survey sample.

** Previously known as Mount Royal College.



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