



Developing Entrepreneurs Through Experiential Learning: The Master of Business, Entrepreneurship and Technology Program at the University of Waterloo, Canada

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Abstract. Literature on entrepreneurship education identifies experience as a critical aspect of entrepreneurial development. Entrepreneurs learn by problem-solving, experimenting and making mistakes. This mode of learning is frequently at odds with traditional instruction methods in universities. Entrepreneurship courses and programs must balance entrepreneurial learning with demands for academic rigor and a tradition of classroom based instruction and assessment. Consequently, experiential learning is often an adjunct to classroom based pedagogy, or provided as an extra-curricular activity. This paper describes the development of the innovative Master of Business, Entrepreneurship and Technology program at the University of Waterloo. The core of this program is a practicum in which students develop a commercialization plan for their business or intellectual property owned by a researcher or local business. Uniquely designed courses support this experience, rather than the practicum being an adjunct of the coursework. Implications of this approach for entrepreneurship education and outcomes from the first six cohorts of students are discussed.

Keywords: experiential learning, entrepreneurship development, technological entrepreneurship.

1. Introduction

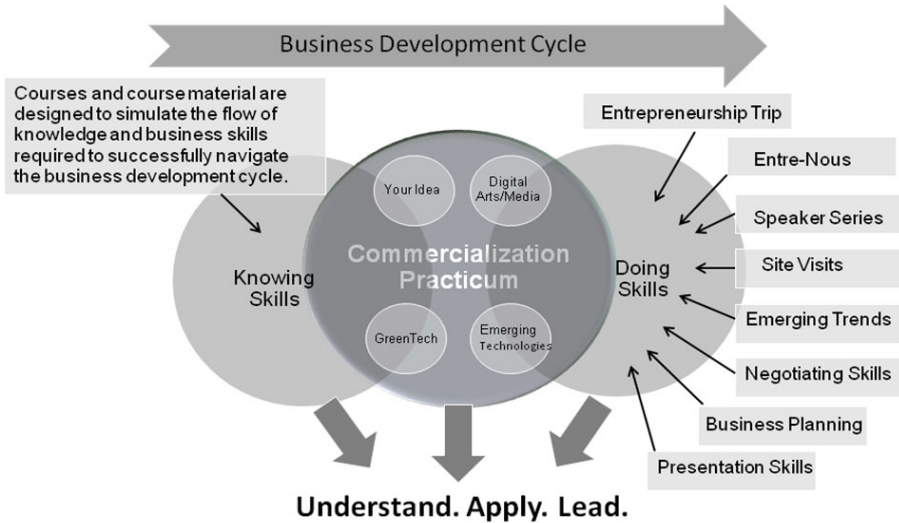
There is consensus in the literature on entrepreneurship education that effective learning of entrepreneurial skills and attitudes requires active approaches in which students apply knowledge in realistic situations that stimulate problem solving and creativity (Jones and English, 2003). Thus, entrepreneurship courses and programs, more so than other areas of business instruction, experiment with a variety of ways to bring the "real world" into the classroom. However, traditional notions of maintaining academic standards through rigorous summative assessment of student learning challenge the adoption of experiential learning as the primary mode of teaching. Experiential learning results in heterogeneous outcomes that are difficult to measure. Many university instructors are not

familiar with theories of experiential learning that could guide the specification and measurement of learning outcomes in this paradigm. Thus, experiential methods are frequently implemented as adjunct activities alongside traditional classroom-based teaching or as extra-curricular activities. In addition, entrepreneurship courses are typically part of a broader business curriculum, further diluting student exposure to experiential approaches.

Several authors who comment on the state of entrepreneurship education speculate that current use of experiential methods is insufficient for the needs of aspiring entrepreneurs. Benson (1989) and Antoncic et al (2004), for example, both argue that case studies, speeches by entrepreneurs, simulations and even business plan competitions are constrained by the four walls of the classroom. These methods do not provide the personal and authentic learning experiences that are critical to develop entrepreneurs. In response, an increasing number of business programs, especially those at the MBA level, include a learning-by-doing element through internships, consulting, or creating and running small ventures. These are realistic experiences, but not all programs integrate them with the classroom components of the degree (Tan and Ng, 2006). Entrepreneurship streams are a relatively recent addition to MBA programs, and in most cases, the programs are not specifically designed to support apprentice entrepreneurs. Recent criticisms of MBA curricula and the ability of MBA graduates to transform their knowledge into action are particularly relevant in the context of entrepreneurship education (e.g., Pfeffer and Fong 2002, 2004; Mintzberg, 2004; DeAngelo and Zimmerman, 2005; Gartner, 2005).

This paper describes the development of the one-year Masters of Business, Entrepreneurship and Technology (MBET) program at the University of Waterloo, Canada. The program was developed in response to the perceived shortcomings of extant business programs in supporting apprentice entrepreneurs, and the shortage of entrepreneurial business leaders who can bring innovations to commercial success (cf. Canadian Manufacturers and Exporters Association, 2001; Conference Board of Canada 2001, 2004; Martin and Porter, 2000; Government of Canada, 2002a, 2002b). Central to the program is a three-term practicum during which students develop a commercialization plan for their own technology-based venture, or for intellectual property owned by a researcher or local company. The practicum is the core of the program, providing a real world context in which students develop the business knowledge, soft skills and networks they need to commercialise their ideas. In contrast to most programs, the practicum is the focus of the MBET program, rather than an adjunct activity, and classroom components deliver knowledge just-in-time to support the experience. (See Figure 1.)

Figure 1: MBET practicum



The following sections describe the process used to develop the MBET program, and associated innovations in curriculum design and program assessment. We then describe outcomes in terms of student entrepreneurial activity from the first six cohorts of students, and finally, summarise the implications of the lessons learned from MBET for the design of entrepreneurship programs based on experiential pedagogy.

2. Developing the MBET Program

The motivation to develop the MBET program grew out of the University of Waterloo's (UW) distinctive strengths in cooperative education, technology transfer, research partnerships and an intellectual property policy in which ownership remains with the researcher. The University of Waterloo does not have a business school, but is renowned for its success in spinning out new ventures. The Waterloo Region (which encompasses the cities of Waterloo, Kitchener and Cambridge in southwestern Ontario) is one of Canada's most important breeding grounds for leading technology companies, including Research In Motion, Open Text Corporation, Com Dev International Ltd., and Dalsa Corporation.

Against this backdrop, university administrators, faculty from several disciplines, and community supporters (local technology businesses and alumni) rallied early in the new millennium to develop a unique entrepreneurship program that would address perceived weaknesses in extant business education. The Centre for Business, Entrepreneurship and Technology (CBET) was created to develop and manage the MBET program and future entrepreneurship related

initiatives. Initially the Centre lay outside the traditional faculty-based governance structure of the university, ensuring a multi-disciplinary and entrepreneurial approach. Later, the Centre became an academic unit within the Faculty of Engineering.

Discussions with faculty and members of an advisory board composed of successful entrepreneurs and community leaders resulted in the formation of a vision statement for the new program:

To be an entrepreneurship program of local and international renown, where the exceptional talents of graduates and an international community of committed stakeholders levers technology to create breakthrough opportunities that result in new market-leading businesses.

In essence, the MBET program intends to attract entrepreneurial students ("E") with technological backgrounds ("T") and provide them with a unique set of business skills, hands-on experience, networking opportunities and a nurturing environment ("B"), to develop their entrepreneurial abilities. The ultimate objective is creation of new technology-based ventures.

To transform this vision into reality, the program designers made innovative use of the strategy mapping method to identify stakeholder, financial, internal process and renewal strategies. Strategy maps have become popular in both the private and public sectors because they provide a visual model of how an organization can successfully execute its strategies (Kaplan and Norton, 2004). They are communication tools that help to tell the organization's story to insiders (faculty, staff, current students, and administrators) and outsiders (senior university officials, prospective students, donors, and alumni). Figure 2 shows the MBET strategy map beginning with the vision, key themes, and then for each of four perspectives, a desired goal and a set of strategies that will accomplish the goal. Each strategy box has more detail. As an example, a strategy is to develop "a differentiated educational adventure designed to produce tomorrow's innovators". Figure 3 decomposes this strategy into a value proposition that incorporates the input received from student focus groups and members of the advisory council as to what would truly differentiate the program. The key elements - providing an education adventure, unique design, uncommon experiences, inspiration, industry participation and a nurturing environment - provided the basis for developing the MBET curriculum.

As the advisory board reviewed early drafts of the curriculum, they were asked, "When you started out, if you had the opportunity of taking a program like MBET, what features would you have liked your program to include that may not be captured in the proposed curriculum?" Responses included networking, negotiations, sales skills, business process integration, presentation skills, and the opportunity to pitch ideas to experienced entrepreneurs, business angels and venture capitalists. Above all, the entrepreneurs on the advisory board stressed the

need for the program to be closely connected to high-technology businesses, and to provide opportunities for students to practice their skills in the real world.

Figure 2: MBET strategy map

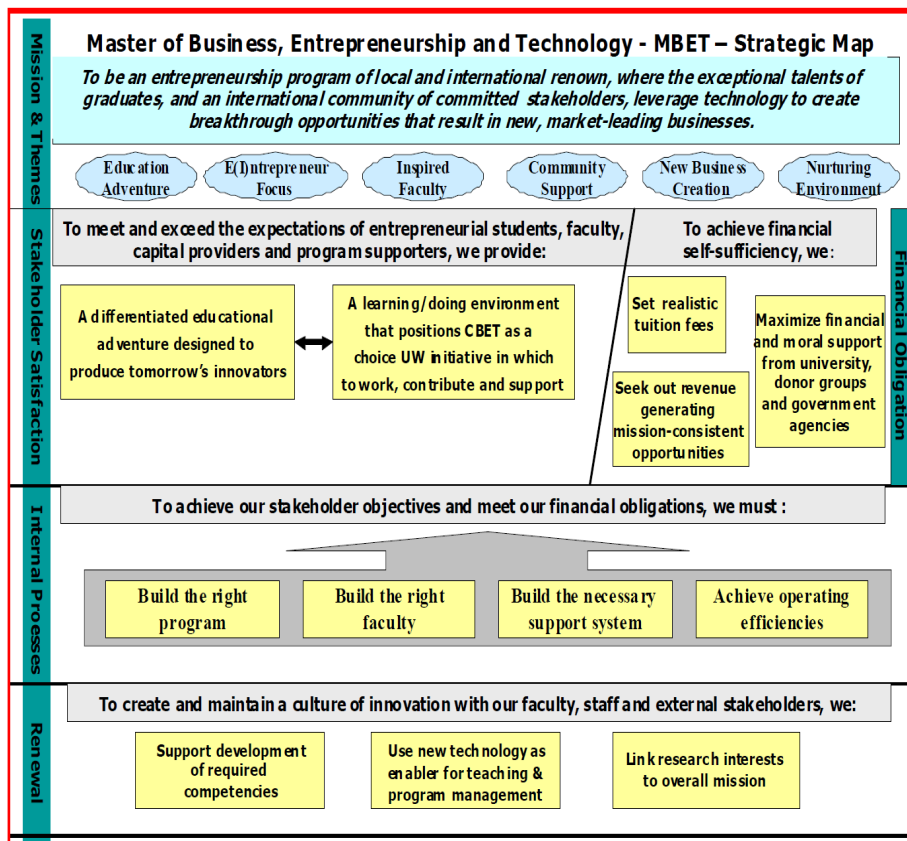
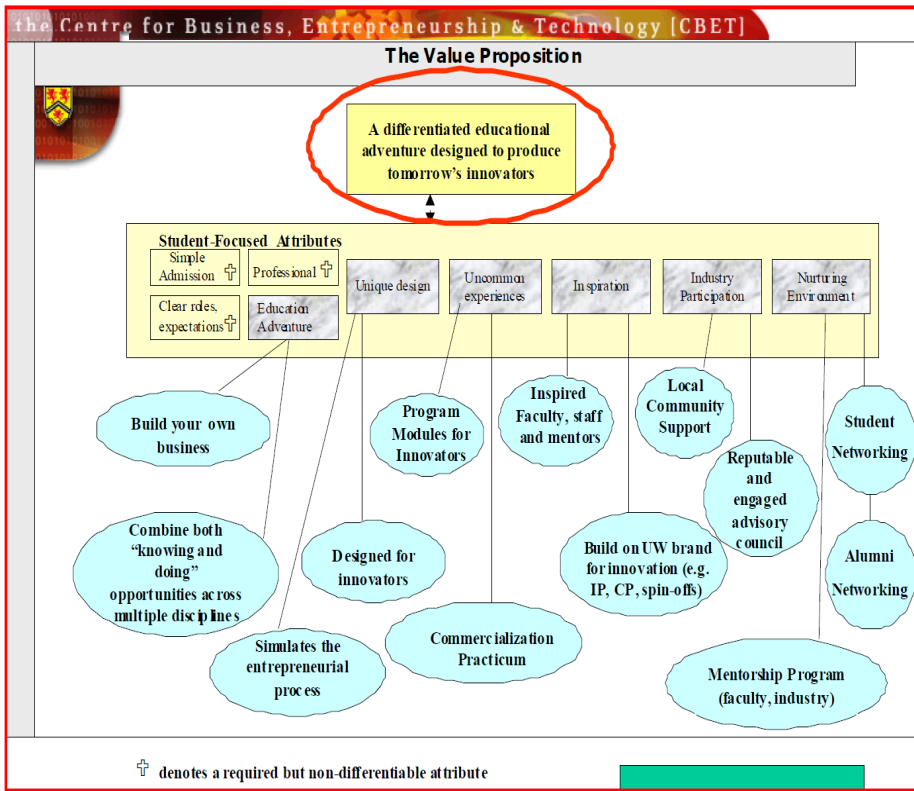


Figure 3: Detail for MBET value proposition



3. The MBET Curriculum

Figure 1 shows that the MBET curriculum has a "knowing" and a "doing" component, both of which support the central practicum experience. The practical component incorporates many of the traditional experiential activities used in entrepreneurship education. For example:

- an online integrated case that is specially written about a new technology under development;
- attendance at seminars and networking events offered by Communitech (the local technology industry association);

- guest speakers from the entrepreneurial and professional service communities;
- encouragement to enter local and international business competitions;
- visits to local companies, and an extended field trip to another high technology cluster (e.g., Route 128 in Boston).

These activities are managed within the context of a course within the program. The course modules reinforce academic concepts with critical analytical and soft skills, while also creating a sense of fun, excitement and connectedness. Examples of these experiential learning activities include Ignition Week (a boot camp), preparing business plans, enhancing presentation skills, developing a personal vision statement, integrative business games and simulations, negotiation exercises, sales modules, speaker series, *entre-nous* (an opportunity to discuss business challenges with volunteers from the professional services community), and business competitions. Students are encouraged to enter business and licensing plan competitions to refine their ideas, improve their presentation skills and get access to critical individuals and groups that can help them commercialize their innovations. Success at these competitions builds self-confidence for the participants, reinforces UW's reputation for innovation and entrepreneurship, and advances the goal of establishing new businesses.

In the "knowing" component, material in each subject area is presented in modules that support the practicum by introducing subject matter, not in a traditional discipline centric or term-by-term fashion, but as it is required for a particular phase in the entrepreneurial process. This is a significant departure from most educational paradigms. There are eight courses in the degree, covering the traditional business disciplines of accounting, finance, marketing, operations and management, along with application areas in management of technology, business planning, social entrepreneurship and internationalization.

The marketing course provides an example of how the courses support the practicum. Marketing is crucial to the formation of a successful technology-based new venture. Thus, the first term focuses on understanding how market-based assets add value to an organization, communications between R&D and marketing, sources of opportunities, identifying vertical markets, conducting market feasibility studies and demand forecasting. In addition to specific market research skills, a goal of the first term is to shift attitudes and build appreciation for the role of marketing in the commercialisation process.

During the second term, the course addresses product development issues including standards, platform design, flexible product/service offerings and alternative business models. Market planning issues of pricing, sales, distribution and communications leading up to the launch are also examined. In the final term, topics include developing a brand, public and investor relations, sales

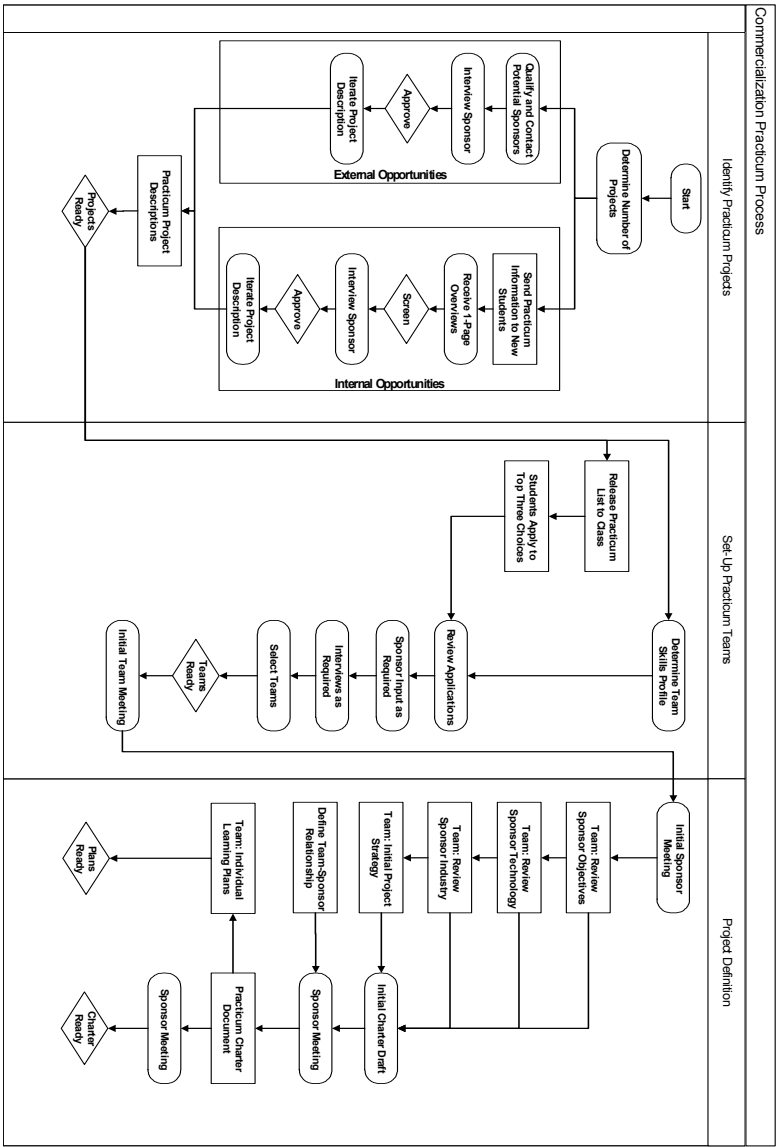
management (salesmanship is practiced in another part of the program), and marketing performance metrics.

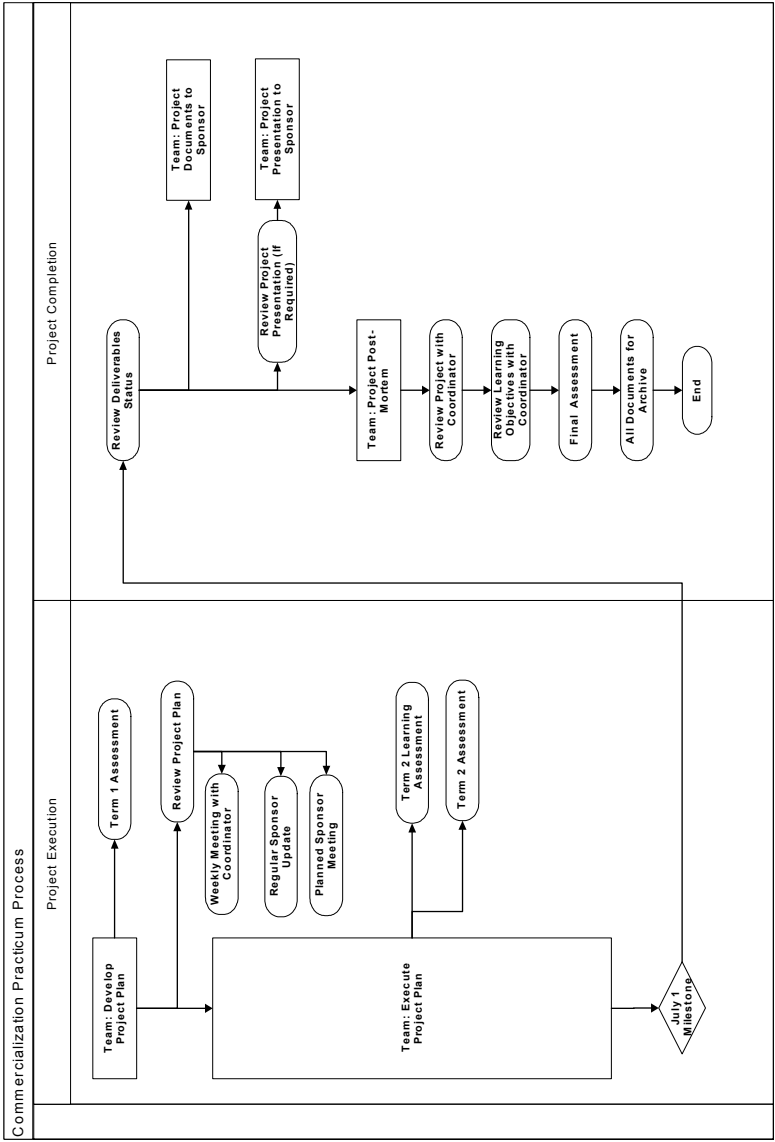
Assessment is linked to the commercialization practicum. Students prepare a market assessment for their practicum during the first term, complete a marketing plan during the second term, and determine how to execute one of the tactics from the plan during the third term. An element of the overall grade is also based on performance in an integrated case and activities that emphasize the integration between marketing and other business disciplines.

The practicum itself extends over all three terms. During the first term, students spend about 20% of their time on the practicum, increasing to 60% during the second term, and 80% during the final term. Commitments to classroom based activities and other soft skills experiences are reduced correspondingly as the year progresses. The practicum accommodates two broad categories of students. The first are students who enter the program with an already well-defined idea for a new business. The second are students who believe that building their own business is what they want to do in the future, but realize that their ideas are not yet adequately formed. Students in the first category are encouraged to use the expertise of the faculty, advisory council and service providers to continue the development of their businesses during the practicum. Students in the second category are paired with local companies and industry advisors to develop a commercialization plan for a specific company or promising intellectual property. Figure 4 illustrates the steps in the practicum process.

Irrespective of the type of practicum (self- or company-sponsored), each team's final project - which may include market research, a design for a product, profiles of desired management teams, licensing plans, technical and marketing feasibility studies, and/or a start-up business plan – is evaluated by a faculty advisor, members of the advisory council, service providers and/or the institution that originated the technology. The practicum gives students insights and experience in the early stages of entrepreneurial technology commercialization, various aspects of company formation and finance, and technology licensing and intellectual property issues.

Figure 4: MBET practicum process





4. Outcomes

The MBET program is now in its sixth year and has more than 150 graduates. Student numbers have grown from an initial class of 20, to approximately 60 students per year. Over the past three years, there have been 31 practicums - 14 initiated by students, 6 from faculty research, 6 from alumni, and 5 from local companies. A recent survey of MBET graduates found that:

- MBET Alumni have lead 69 business start-ups over the past five years. These businesses are operating in various industries including, manufacturing, alternative energy, IT and communications, consulting, and technology.
- Since graduating from the MBET program 75% of the alumni are associated with a start-up in various capacities including management, product development, consulting, and business development.
- The majority of start-ups associated with the MBET program are operating in Ontario, mostly within the Greater Toronto Area and Waterloo Region.

The success of the MBET program will ultimately be measured by its ability to generate relatively more new ventures and commercialized intellectual property than less focused graduate business programs. In addition to start-ups, there are less demonstrable measures of success for a program like MBET. Paradoxically, for example, one of the successes may be in helping students to realize that despite their passion for creating a new venture, their ideas or technologies may not be sufficiently robust to be commercially viable. A number of students end up as corporate entrepreneurs, or intrapreneurs, who will add significantly to the success of their employer, but whose outputs are difficult to measure. Nevertheless, the primary objective is to encourage innovation.

To monitor progress along the way, a balanced scorecard helps the MBET management team to measure annual outcomes for the objectives in the strategy map. The scorecard has between four and seven performance indicators for each of the stakeholder, financial, internal processes and renewal perspectives on the strategy map. The stakeholder perspective, for example, contains the seven objectives and their measures, shown in Table 1. The first goal is to increase the number of applications to the program. This is an important indicator because the number of applications to MBA programs in Canada have, in general, declined. The second goal is an important indicator of success in differentiating the program from other graduate business programs as students often shop around for a graduate program. The objective for MBET is to differentiate itself so that the goals of the program are clear, and a high proportion of those offered admission

actually enrol. The third goal is to maximize student satisfaction, which is measured by an exit survey consisting of questions about the preparation for developing and running a business, relevance to career goals, fit with expectations, and entrepreneurial culture. Responses to the questions, coupled with direct student feedback, provide the basis for understanding where improvements can be made.

Table 1: Measures for stakeholder perspective of balanced score card

Objective	Measure
Increase number of applications over previous year	Actual number of annual applications to MBET program
Maximize ratio of acceptances to offers	Ratio of acceptances to number of offers of admission made each year
Maximize student satisfaction	Overall score on exit survey (smaller surveys are also completed at the end of each term)
Maximize student/alumni loyalty	Rating on scale asking students/alumni if they would recommend MBET to a colleague or friend
Maximize advisory council satisfaction	Overall score on annual survey of advisory council members
Maximize satisfaction of commercialization practicum sponsors	Overall score on survey and verbal debrief of practicum sponsors
Increase faculty participation in MBET program outside of courses	Number of faculty participating annually in three or more MBET activities outside of the classroom

Reichheld (2003) argued that a single loyalty question can be substituted for the "complex black box" of the typical customer satisfaction survey. Following this advice, CBET asks graduating students to rate their agreement with the statement "*I would recommend the MBET program to a friend or colleague*". The responses provide insight into the future success of MBET, which is dependent on the degree to which graduates are willing to be advocates for the program. The final goals and measures relate to different elements of the stakeholder domain – the advisory council, practicum sponsors and faculty. Across all domains the program is approaching targets, but there are areas that need to be addressed, and there is a way to go before the program meets its stretch targets. Overall, the scorecard has proven to be a very helpful tool to assist in monitoring the degree to which the vision for the program is being realised.

5. Conclusion

The creation of the MBET program was motivated by well-documented problems in both Canada's innovation system, and extant graduate business programs. Central to MBET is an innovative model of experiential learning. The goal is to attract innovative students, and then provide experiences that help them to develop the managerial skills to convert opportunities into viable commercial businesses. The MBET program helps graduates lever their existing entrepreneurial talent and technology background with a knowledge of contemporary business skills and entrepreneurial practice. This is accomplished through a "knowing-doing" curriculum that simulates the commercialization process and provides students with a nurturing environment in which they can test out new ideas, develop networks, gain self-confidence and start their entrepreneurial journey equipped to avoid many of the common causes of failure among new ventures.

The literature on entrepreneurial learning identifies learning-by-doing as an essential characteristic of entrepreneurs (e.g., Raffo et al., 2000). Entrepreneurs learn by making mistakes, by experimenting and problem-solving (Cope, 2005). Industry specific knowledge and social skills are also important for successful entrepreneurship (Politis, 2005). All of these are difficult to achieve in the classroom. Recognizing this, entrepreneurship courses and programs incorporate experiential and problem-solving learning activities in their curriculum. However, tradition, institutional and other constraints often make it difficult for university entrepreneurship programs to embrace experiential learning. Most experiential activities are either confined within the classroom or are an adjunct to classroom centred pedagogy.

The designers of the MBET program were fortunate in being able to create a new entrepreneurship program from the ground up, without the constraints of having an existing graduate business program and associated courses and faculty. They listened carefully to advice from successful entrepreneurs who stressed the importance of real world experience, and then set about designing an innovative way to provide this within the context of a university masters program.

The distinct value proposition and the differentiated educational adventure that MBET provides is resonating well with the entrepreneurial audience that CBET seeks to attract. While applications to MBA programs have generally been declining (Kedrosky, 2005; Business Week, 2005), enrolment in MBET has grown steadily. More importantly, while students often shop around for an MBA program, resulting in many offers but a much smaller number of acceptances, a high proportion of students offered admission to the MBET program enrol. For many MBET is the only program to which they apply. Despite success in numbers of students, CBET has the constant issue of how to fund its intensive program of experiential learning activities such as networking events, workshops and trips to international business plan competitions. In addition to the practicum, these

activities require a time commitment of several hundred hours from both students and their faculty supervisors. As these activities are not research related, it can be difficult to reward faculty members, and access internal budgets. Thus, the Centre relies heavily on donations, grants and awards from various entrepreneurial organizations and individuals.

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