EFFECTIVE ONLINE ENTREPRENEURIAL EDUCATION: IS IT POSSIBLE?

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ABSTRACT

Entrepreneurial education opportunities have literally exploded in recent years. In addition to traditional classroom offerings, apprentice entrepreneurs now also have Web-based education options that have been greatly enhanced. However, where classroom education assessments have been the subject of many studies, online training has been scarcely documented. This therefore begs the question: Can online education provide not only greater access and opportunities for more people to develop entrepreneurial skills, but do so with the same relative effectiveness as classroom teaching? To answer this question, a survey was conducted with 395 university students enrolled in an introductory entrepreneurship course. The students were given the option of taking the online or classroom versions of the course. The results indicate that all of the students achieved the course's academic objectives satisfactorily, but the students enrolled in a classroom section of the course reported having better achieved the objectives than those who completed the online version of the course. The findings also show that the students enrolled in the online course reported the highest interest in one day becoming an entrepreneur. It is important to note that an increase in entrepreneurial interest was observed among all of the students who completed both versions of the course, which is a highly encouraging finding.

INTRODUCTION

The field of entrepreneurship has long been divided as to whether individuals are born entrepreneurs or if they can become one. Although it is true that some people are gifted with traits or skills that are generally associated with entrepreneurs, it appears increasingly clear that these entrepreneurial skills and competencies can be developed, in particular through education (Kuratko, 2005; Neck, Green & Brush, 2014). Entrepreneurial education opportunities have in fact literally exploded in recent years. In addition to traditional classroom offerings, apprentice entrepreneurs now also have Web-based education options that have been greatly enhanced. However, where classroom education assessments have been the subject of many studies, online training has been scarcely documented (Arbaugh et al., 2010). This therefore begs the question: Can online education provide not only greater access and opportunities for more people to develop entrepreneurial skills, but do so with the same relative effectiveness as classroom teaching? To answer this question, we decided to observe students enrolled in an introductory entrepreneurship course at Université Laval (UL), an institution that promotes entrepreneurship in all its forms as well as online education.

In this communication, the specific context of this study will first be described, taking special care to provide relevant links with the literature on entrepreneurship education and online

training. This will be followed by a presentation of the course taken by the students, in particular to position this course along the entrepreneurship education continuum. The research methodology used to address the research question will then be discussed. The presentation of the results and data analysis will be an opportunity for a productive discussion of online entrepreneurship education. As this study is exploratory in nature, its limitations will be highlighted, as will the promising avenues for research it puts forward.

THE SPECIFIC CONTEXT OF THIS STUDY

Entrepreneurship at UL

Since the 1970s, entrepreneurship has been the subject of continuous development at UL. In 1993, the university founded Entrepreneuriat Laval (Entrepreneurship Laval), a business incubator, accelerator and facilitator whose mission is to promote business start-ups directly at the university in order to place commercial value on both the students' business ideas and the new knowledge that emerges from research (products, processes, services). To date, more than 600 businesses have received start-up support from Entrepreneuriat Laval, which now has more than 2,000 members using one or another of its services.

The early 2000s were a major milestone in the evolution of entrepreneurship on campus. This is a time during which UL, composed of 17 faculties, charted a new course. First, it focused its training more specifically on a cross-sectoral development of entrepreneurial skills. Second, it posted a very inclusive vision of entrepreneurship so as to incubate the entrepreneurial potential of its community through various types of projects: Technological innovations, social entrepreneurship, business takeovers, collective entrepreneurship, self-employment, etc. If UL's position were to be characterized, it would fall within the scope of the "enterprise education" concept, which focuses on personal development, soft skills and entrepreneurial skills and competencies, rather than strictly the creation of businesses (Table 1). UL therefore did not adhere to a narrow definition of entrepreneurship education that can only result in becoming an entrepreneur. It rather espoused a broader definition of entrepreneurship, one that is based on the personal development of project leaders as well as creativity, independence, initiative and being action driven, all of which come together to shape a person's entrepreneurial spirit.

Table 1
DEFINITIONS OF ENTERPRISE AND ENTREPRENEURSHIP EDUCATION*

Enterprise education is the application of creative ideas and innovations to practical situations–with enterprise education aiming to produce individuals with the mind-set and skills to respond to opportunities, needs and shortfalls, with key skills including taking the initiative, decision making, problem solving, networking, identifying opportunities and personal effectiveness. Enterprise provision can be applied to all areas of education, extending beyond knowledge acquisition to a wide range of emotional, social and practical skills.
Entrepreneurship education is the application of enterprise skills specifically to the creation and growth of organisations, with entrepreneurship education focusing on developing skills and applying an enterprising mind-set in the specific contexts of setting up a new venture, developing and growing an existing business or designing an entrepreneurial organisation.
*Excerpt from the *Enterprise Education Impact in Higher Education and Further Education: Final Report*, issued by the Department for Business & Skills (2013, p. 15), which is based on the criteria set forth by the Quality Assurance Agency for Higher Education in the United Kingdom. It should be noted that the distinction between the concepts of "enterprise education" and "entrepreneurship education" is mainly drawn in the United Kingdom, whereas in the United States, the term "entrepreneurship education" encompasses both concepts (Lackéus, 2015).

This evolution of UL's entrepreneurial vision led to the implementation of the Profile entrepreneurial (Entrepreneurial Profile) in 2004, which is a 12-credit academic track that has now been incorporated into no fewer than 50 undergraduate programs to enable students to plan, implement and manage various types of projects in connection with their passion or field of study. On average, nearly 130 students from various faculties enrol in this profile every year.

UL's entrepreneurial ecosystem is intended for both students who wish to discover entrepreneurship and those who actually intend to create a business. This ecosystem is built around a number of initiatives, all of which support an entrepreneurial continuum structured into three phases: Prospecting (discovery, awareness rising), promoting (supporting, creating, taking action) and operating (start-up and project development assistance).

While all UL faculties have a connection with entrepreneurship, the Faculty of Business Administration (FSA ULaval) plays a leading role. The Faculty features several short and long entrepreneurship programs at both the undergraduate and master's levels. The program that draws the highest number of students is without a doubt the undergraduate entrepreneurship certificate (30 credits), which can be completed entirely online. On average, more than 150 new students enrol in this certificate program every year since it was launched in 2013.

Online Education at UL

As elsewhere in the world, online education is clearly on the increase in Canada. From 2011 to 2016, the number of university institutions offering online courses has increased by 11% and enrolment has grown by approximately 10% per year (Bates, 2017). In Québec, from 2003 to 2012, the proportion of students enrolled in at least one online course jumped from 6% to 11.6% across all Québec universities (Conseil supérieur de l'éducation, 2015). This recent increase in online education in Québec can partly be attributed to UL, which is where online education has seen the strongest growth. For example, in the winter 2018 semester, 60% of UL students were enrolled in at least one online course.

Within the campus, FSA ULaval is the faculty that offers the highest number of short and long programs that can be completed entirely online, including the MBA. It is also the faculty that offers the highest number of online courses (267 sections in 2016-2017, which represents 26.7% of the total course offering) and posts the highest number of total enrolments in its online courses (21,491 in 2016-2017, which represents more than 46% of the total enrolments at FSA ULaval). In many cases, the courses are offered throughout the academic year in three versions: Classroom only, online only or a combination of the two delivery modes ("blended learning"). When teachers develop an online version of a course, they are accompanied in this process by a team of techno-pedagogy professionals who are there to guide them, inform them about the best practices and introduce them to the information technology tools that are available to them. As pointed out by Moghadam, Zaefarian & Salamzadeh (2012), virtual learning is inherently different from the traditional learning methods and this requires designing and developing teaching methods appropriate for such a learning environment. In many cases, the classroom and online sections of a given course share common exams, which to a certain extent makes it possible to assess whether the learning outcomes of the students are equivalent for both sections. Both the courses and the teachers are systematically evaluated by the students, so any problematic situation can be readily identified. However, these quality control safeguards are not necessarily enough to reassure accrediting bodies such as the Association to Advance Collegiate Schools of Business (“AACSB”) or the European Foundation for Management Development (“EFMD”) regarding the quality of online education offered by a business school. EFMD has in

fact recently implemented an online course certification system named “EOCCS”, somewhat in the same vein as the "Quality Matters" certification service in the United States. Should an institution not have the time and resources to have its entire online course offering certified, it would nevertheless be useful to check whether the students achieve a course's objectives as well online as they do in the classroom. Given that entrepreneurship is the field for which the course offering at FSA ULaval is the most extensive, it appeared relevant to compare online and classroom courses in terms of learning outcomes. This process is all the more interesting as there are many skeptics as to the possibility of instilling entrepreneurial attitudes and skills other than through experiential learning, which may be difficult to achieve online. The course selected for the purposes of this study is the introductory entrepreneurship course titled "Being Entrepreneurial: Passion for Creation and Action," offered by FSA ULaval to all students on the campus.

Course Titled "Being Entrepreneurial: Passion for Creation and Action" (ENT-1000)

This three-credit course was originally designed in 2004 as the basic course for the Entrepreneurial Profile. An online version was developed at FSA ULaval a few years later. This course is the gateway to entrepreneurship in all its forms at UL. The 15 week course is available to all undergraduate students, regardless of discipline and has no academic prerequisites. For some students enrolled in an entrepreneurial program or the Entrepreneurial Profile, this is a mandatory course, whereas it is an elective course for the other students. Of all the entrepreneurship courses offered across the campus, it is by far the one that attracts the most students: An average of more than 1,100 students takes this course every year, most of whom (2/3) choose to complete it online.

The purpose of this course is to raise student awareness about entrepreneurship and for them to discover and develop their entrepreneurial potential as they learn to identify and assess business opportunities. For many, this is an opportunity to test whether an entrepreneurial career is the right path for them. This course is primarily "about" entrepreneurship, but it also includes educational activities that are usually associated with education “for” entrepreneurship, more specifically through ideation and opportunity recognition exercises (Table 2).

Table 2
DEFINITIONS OF EDUCATION “ABOUT” AND “FOR” ENTREPRENEURSHIP

Education “about” entrepreneurship is a content-laden and theoretical approach that focuses on transmitting declarative knowledge about what entrepreneurship is and what entrepreneurs are and do, with the aim of giving a general understanding of entrepreneurship as a phenomenon.
Education “for” entrepreneurship is practice-oriented; it aims to stimulate the entrepreneurial process and give budding entrepreneurs the required business skills, knowledge and tools to start a new venture.
Source: Moberg et al. (2014); Lackéus 2015; Mwasalwiba, 2010

The classroom and online sections have a similar syllabus in terms of learning objectives, themes covered and mandatory readings. In terms of deliverables, students are required to draft an entrepreneurial outline in teams based on a business idea they have generated. In the classroom sections, the outline must also be presented orally. Two exams are scheduled: One mid-term and one final.

For the classroom sections, the teaching method is based on a combination of lectures, classroom exercises, guest speakers, discussions and readings. For the online section, educational activities are delivered in asynchronous mode in the form of PowerPoint presentations that guide

the mandatory readings and video capsules of entrepreneurs or experts who illustrate the concepts under study. A discussion forum is available for students to exchange among themselves and to comment on the educational activities. An institutional academic platform called "Mon Portail" (My Portal) can be accessed by students via the Internet. The pedagogical approach used to teach entrepreneurship, both in the classroom and online, essentially corresponds to the "supply model" as represented in the theoretical framework of entrepreneurship education developed by Nabi et al. (2017) as part of their systematic review of the literature on the impact of entrepreneurial education (Figure 1).

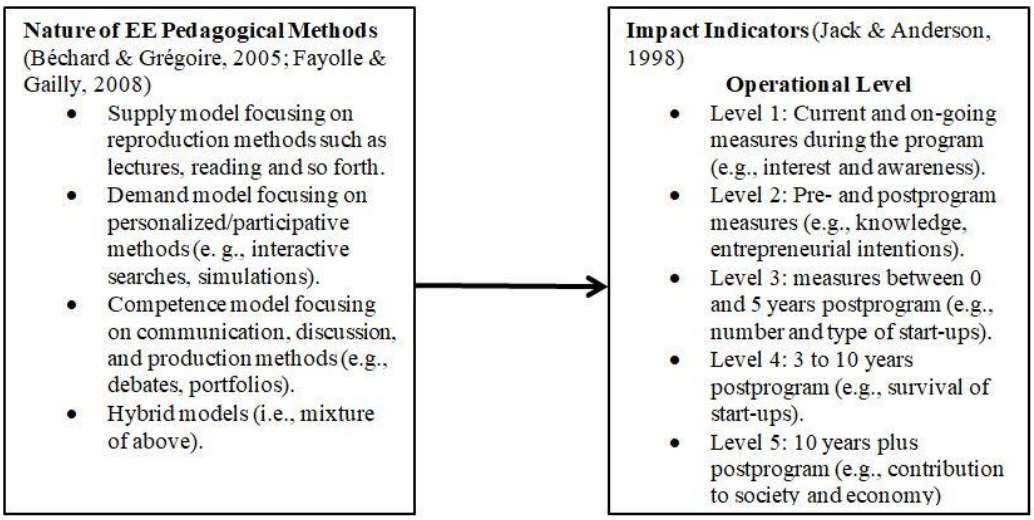

FIGURE 1
AN INTEGRATED TEACHING MODEL FRAMEWORK ENCOMPASSING EE IMPACT AND UNDERPINNING PEDAGOGY

RESEARCH METHODOLOGY

Sample

In order to assess the impact of online entrepreneurship education on the learning outcomes of students, an online survey was carried out at the end of the winter 2017 semester with the 395 students enrolled in the course titled "Being Entrepreneurial: Passion for Creation and Action." Students had the option of enrolling in the online or classroom version of the course. The online section drew 252 students, whereas 143 students chose to attend the course in the classroom, the latter group being divided into three sections of 57, 46 and 40 students respective.

Data Collection Method

A 16-question survey was designed to measure the acquisition of various entrepreneurial knowledge components (6 dimensions), the acquisition of entrepreneurial skills and competencies (5 dimensions) and whether the course's general objectives were achieved (5 dimensions). These variables were measured using five-point Likert scale, where 1="Yes, very much" and 5="No, not at all." The indicators selected to measure the impact of the course closely match the course's academic objectives in terms of entrepreneurial content, skills and

competencies. The data collection instrument was developed in collaboration with the teachers and a research assistant who had previously taken the course, by taking special care to use the same vocabulary that was used in the teaching material and the syllabus. The goal was to make sure that the students assigned the same meaning to the questions, thereby contributing to the validity of the survey. It should be noted that the questions targeted the students' perceptions of their learning outcomes after completing the course and were not objective measures of learning outcomes. This method of gauging the impact of a course is an accepted practice in the field of education (Kraiger, Ford & Salas, 1993) and entrepreneurship (Kozlinska, Mets & Roigas, 2017).

Questions were also formulated to measure the students' entrepreneurial propensity. Given that the students came from a variety of backgrounds and were likely to embrace very different entrepreneurial pathways, the students were presented with four entrepreneurial positions. More specifically, the students were asked whether they would one day be interested in:

1. Creating a for-profit business;
2. Creating a business with a social, cooperative, artistic or other mission;
3. Becoming a self-employed worker;
4. Taking over or purchasing an existing business.

This question targeted their interest before enrolling in the course (t1) and after completing it (t2), which made it possible to measure the effect of taking the course on their entrepreneurial propensity (t2–t1). The students' interest was measured using a five-point Likert scale, where 1="Yes, definitely interested" and 5="No, definitely not interested."

The indicators developed for the purposes of this study qualify as low level impact measures according to the theoretical framework developed by Nabi et al. (2017) (Figure 1). Their systematic review in fact revealed that entrepreneurial intention is by far the most widely used low level impact indicator.

The survey was distributed online at the end of the semester via the virtual academic platform used by all students. In order to increase the stability of the measures and contribute to their reliability, the survey was only open for a period of one week beginning at the end of the semester and ending just before the final exam. As such, the students' opinions could only be minimally influenced by external factors (e.g. their results on the final exam), which suggests that their answers would have been the same had they completed the survey twice during this period. In order to encourage the students to complete the survey, a one-point bonus was awarded to any student who filled out the questionnaire. This was a successful strategy, as it yielded a response rate of 87.34%.

Data Analysis

In order to identify the effect of the "online" delivery mode on learning outcomes and entrepreneurial interest, t-tests and Chi square variance tests were performed on the data collected from the students enrolled in the online and classroom versions of the course.

RESULTS

Table 3 provides an overview of the respondents' demographic characteristics. A little more than half of them were male, which is consistent with most of the studies on this subject, which reveal a stronger attraction to entrepreneurship among men (St-Jean & Duhamel, 2017). The students making up the sample were relatively young, as 75% of them were under 25 years of age. The Chi square tests did not reveal any significant differences between the two groups (online versus classroom students) in terms of demographic characteristics.

Table 3
DEMOGRAPHIC CHARCATERISTICS OF THE SAMPLE

	Total of All Sections		**Online Section**		**Classroom Section**	
Gender	**n**	**%**	**n**	**%**	**n**	**%**
Male	152	44.06	102	45.13	50	42.02
Female	193	55.94	124	54.87	69	57.98
Total	345	100%	226	100%	119	100%
Age	**n**	**%**	**n**	**%**	**n**	**%**
Under 25	267	77.39	172	76.11	95	79.83
25 to 35	70	20.29	49	21.68	21	17.65
Over 35	8	2.32	5	2.21	3	2.52
Total	345	100%	226	100%	119	100%

More than 40% of the students were from the Faculty of Business Administration. The remaining 60% were students from the arts and humanities (17%), engineering (13%), health science (9%), pure and applied science (8%) and other fields not covered (13%). This widely varied clientele reflects the diversity of entrepreneurial pathways that is encouraged at UL.

Comparisons in Terms of Learning Outcomes

Table 4 highlights significant differences in the learning outcomes between the two course delivery modes. More specifically, the students who completed the course in the classroom on average assigned a lower score (indicating higher acquisition of knowledge or competencies) than those who completed the course online.

Generally speaking, the students who completed the course in the classroom perceived having acquired more knowledge during the semester than their colleagues who took the online version of the course. It should be pointed out, however, that the scores reveal a high degree of learning in both cases (online and classroom groups). The mean scores are all between 1 ("Yes, very much") and 2 ("Very much"), other than for acquisition of knowledge in connection with assistance and support to entrepreneurs, which indicated a slightly lower degree of learning than 2 ("Very much") among the online students. This theme is covered differently with the two groups. The classroom students have the opportunity to have an entrepreneurial mentor and his or her mentee as guest speakers, followed by a discussion on the various types of entrepreneurial support that is available to them. In comparison, the online students only read texts on this

subject, which may explain their perception of having acquired less knowledge than their classroom counterparts.

Table 4
COMPARISONS IN TERMS OF KNOWLEDGE ACQUISITION

Variables	*P*	Delivery Mode			
		Classroom (n=119)		Online (n=226)	
		Mean	Standard Deviation	Mean	Standard Deviation
Acquisition of knowledge in connection with:					
• the factors that encourage individuals to go into business and fulfil their projects	**	1.65	0.66	1.97	0.89
• the specificities of entrepreneurs	**	1.66	0.75	1.91	0.82
• the various entrepreneurial pathways	**	1.65	0.68	1.89	0.84
• the various phases of entrepreneurial project creation and development		1.68	0.74	1.88	0.83
• the constraints involved in moving from idea to project and from action to success		1.90	0.82	1.94	0.84
• assistance and support to entrepreneurs	***	1.68	0.73	2.22	0.91
Mean score for knowledge acquisition	**	1.70	0.58	1.97	0.68
1 (Yes, very much), 2 (Very much), 3 (Somewhat), 4 (Not very much), 5 (No, not at all)					
* significant at $\rho \leq 0.1$ ** significant at $\rho \leq 0.01$ *** significant at $\rho \leq 0.0001$					

The differences between the two groups are more pronounced when we look at competency acquisition (Table 5) and the degree to which the general academic objectives were achieved (Table 6), most of which are statistically significant.

Table 5
COMPARISONS IN TERMS OF SKILL AND COMPETENCY ACQUISITION

Variables	*P*	Delivery Mode			
		Classroom (n=119)		Online (n=226)	
		Mean	Standard Deviation	Mean	Standard Deviation
Acquisition of skills and competencies in connection with:					
• Drafting a business model	***	1.91	0.76	2.39	0.89
• Generating creative ideas	***	1.93	0.80	2.40	0.96
• Identifying ideas that can potentially be transformed into opportunities		2.06	0.91	2.18	0.91
• Working as a team in a productive and efficient manner	**	2.09	0.96	2.50	1.07

• Presenting an entrepreneurial project in a convincing manner	**	1.93	0.78	2.32	0.93
Mean score for skill and competency acquisition	***	1.98	0.64	2.35	0.75
1 (Yes, very much), 2 (Very much), 3 (Somewhat), 4 (Not very much), 5 (No, not at all)					
* significant at $\rho \leq 0.1$ ** significant at $\rho \leq 0.01$ *** significant at $\rho \leq 0.0001$					

Table 6
COMPARISONS IN TERMS OF THE DEGREE TO WHICH THE GENERAL COURSE OBJECTIVES WERE ACHIEVED

Variables	***P***	**Delivery Mode**			
		Classroom (n=119)		**Online (n=226)**	
		Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Achievement of the general course objectives:					
Identifying your position on the entrepreneurial continuum	**	1.96	0.92	2.23	0.88
Developing your sense of initiative	**	2.16	0.90	2.46	0.94
Developing your entrepreneurial spirit	*	1.89	0.78	2.14	0.93
Developing your creativity	***	2.02	0.83	2.53	1.03
Discovering your entrepreneurial potential	**	1.88	0.84	2.19	0.94
Mean score for achieving the objectives	***	1.98	0.66	2.31	0.76
1 (Yes, very much), 2 (Very much), 3 (Somewhat), 4 (Not very much), 5 (No, not at all)					
* significant at $\rho \leq 0.1$ ** significant at $\rho \leq 0.01$ *** significant at $\rho \leq 0.0001$					

A few comments are in order. It should first be pointed out that only the students in the classroom section learn to work with the new generation Business Model framework developed by Osterwalder & Pigneur (2011). The entrepreneurial outline they produce must refer to this model's nine basic blocks. The students enrolled in the online section are also required to draft an entrepreneurial outline, but more in the form of an entrepreneurial idea validation exercise that is carried out before drafting a business plan. Given that the concept of "business model" is covered and, perhaps more importantly, used only in the classroom sections, it is hardly surprising to find a significant difference between the two groups in terms of their perceptions of the competencies they have developed.

It appears to be significantly more difficult for the students in the online section to learn to generate creative ideas and develop their creativity. First, the distance teacher has no control over the manner in which the team brainstorming exercise is carried out. Some teams meet in person for this activity, but more students simply share their ideas by email. In contrast, the classroom students are required to participate in an ideation exercise with their teams in the classroom. Second, there is a notable difference in the instructions given by the teachers for this exercise. In the classroom sections, students are encouraged to generate "crazy" ideas, which can later be refined or cast aside, whereas online students are encouraged to generate ideas that are

original, but viable. In other words, the ideation process funnel is much wider in the classroom sections, which leaves more room for creativity.

Learning how to work efficiently in teams appears more difficult online, even though the entrepreneurial outline must be drafted as a team in both the online section (teams of four students) and classroom groups (teams of five to six students). It should be noted that the nature of the interactions among the virtual team members is unknown and that no constraints are imposed on the students in terms of how their virtual team is to function. In contrast, the teams in the other sections are required to complete two classroom exercises in preparation for the entrepreneurial outline. Furthermore, they see each other every week as their presence in the classroom is mandatory. These conditions are therefore likely to be more favourable to learning how to work in a team. It is reasonable, however, to question the relevance of this academic objective in an introductory entrepreneurship course. While it is true that an increasing number of businesses are created by teams, the ability to work in a team is not an entrepreneurial skill per se. Thus, the entrepreneurial skill nomenclature drafted by Lackéus (2015) refers to interpersonal skills and leadership, rather than the ability to work in a team. In addition, according to a recent study, requiring entrepreneurship students to work on a team project decreases their need for achievement, most likely because they have trouble identifying their own individual contribution to the team's results (Canziani et al., 2015).

We also see a significant difference in terms of the students' ability to present a project in a convincing manner. However, although both groups are required to submit a written entrepreneurial outline, only the classroom teams are required to make a "rocket pitch"-style oral presentation. The entire last session of the semester is in fact dedicated to this activity. Students are asked to evaluate their peers' presentations through the eyes of a potential investor, thereby increasing the level of competition among the teams. All of this helps create an event that is rich with emotion, which is likely to have a positive impact on the development of entrepreneurial skills (Lackéus, 2014). It is therefore not surprising that the students enrolled in the classroom section have a higher perception of having improved their ability to make a convincing presentation.

It should be pointed out that the only skill for which there was no significant difference between the two groups was identifying ideas that could potentially be transformed into opportunities. The mean scores are in fact excellent (2.06 and 2.18/5). This is a very positive finding, as this is precisely the main skill this course seeks to develop in students. Also noteworthy are the scores for two objectives: Developing one's entrepreneurial spirit (1.89 and 2.14/5) and discovering one's entrepreneurial potential (0.88 and 2.19/5), which reveal a high degree of achievement (2=Very much).

Comparisons in Terms of Entrepreneurial Interest

The findings regarding entrepreneurial interest offer a different perspective as, in this case, the most positive (thus lowest) scores are found among the students enrolled in the online section. In addition to expressing higher interest at the beginning of the semester (Table 7), they also did so after completing the course (Table 8). It is interesting to note that the students enrolled in the classroom section saw their interest grow more than the online students during the semester (Table 9), but they never reached the same interest levels as the online students, other than in taking over or purchasing an existing business.

In terms of preferred entrepreneurial pathways, both the classroom and online student sections were relatively less drawn to businesses of a social or artistic nature. The most popular

pathway was the creation of a for-profit business. Also noteworthy is a significantly higher interest in becoming self-employed among the online students at the end of the semester.

Table 7
COMPARISONS OF ENTREPRENEURIAL INTEREST BEFORE THE COURSE (t1)

Variables	***P***	**Delivery Mode**			
		Classroom (n=119)		**Online (n=226)**	
		Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Interest before the course (t1) in:					
Creating a for-profit business		3.29	1.66	2.86	1.48
Creating a business of a social, cooperative or artistic nature	*	4.36	1.30	4.25	1.46
Becoming a self-employed worker		3.47	1.51	2.95	1.47
Taking over or purchasing an existing business	***	3.87	1.55	3.64	1.56
1 (Yes, definitely interested), 2 (Yes, very probably), 3 (Probably), 4 (Probably not), 5 (No, definitely not interested)					
* significant at $\rho \leq 0.1$ ** significant at $\rho \leq 0.01$ *** significant at $\rho \leq 0.0001$					

Table 8
COMPARISONS OF ENTREPRENEURIAL INTEREST AFTER THE COURSE (t2)

Variables	***P***	**Delivery Mode**			
		Classroom (n=119)		**Online (n=226)**	
		Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Interest after the course (t2) in:					
Creating a for-profit business	*	2.69	1.54	2.36	1.38
Creating a business of a social, cooperative or artistic nature		3.66	1.63	3.84	1.63
Becoming a self-employed worker	**	3.02	1.53	2.53	1.40
Taking over or purchasing an existing business		2.95	1.54	3.25	1.68
1 (Yes, definitely interested), 2 (Yes, very probably), 3 (Probably), 4 (Probably not), 5 (No, definitely not interested)					
* significant at $\rho \leq 0.1$ ** significant at $\rho \leq 0.01$ *** significant at $\rho \leq 0.0001$					

Table 9
COMPARISONS OF THE DIFFRENCES BETWEEN MEASURES OF INTEREST AT t2 AND t1

Variables	*P*	Delivery Mode			
		Classroom (n=119)		Online (n=226)	
		Mean	Standard Deviation	Mean	Standard Deviation
Difference between interest at t2 and t1 in:					
Creating a for-profit business	*	0.60	1.16	0.50	1.02
Creating a business of a social, cooperative or artistic nature	*	0.70	1.13	0.41	1.11
Becoming a self-employed worker		0.46	1.03	0.42	1.03
Taking over or purchasing an existing business	**	0.92	1.17	0.39	1.03

* significant at $\rho \leq 0.1$ ** significant at $\rho \leq 0.01$ *** significant at $\rho \leq 0.0001$

RESULTS AND DISCUSSION

In light of the results presented above, it would appear that the students enrolled in the online section were generally less successful in achieving the course's objectives, particularly with regard to competencies, skills and attitudes. The most obvious explanation is that online education is less effective than classroom teaching in helping students acquire entrepreneurial competencies. The reality is likely more nuanced and deserves an examination of further explanations, especially given that several previous studies comparing the learning outcomes of online and classroom courses found no differences in outcomes between the two delivery modes, whereas others found that the online students actually performed better (Callister & Love, 2016).

An initial explanation resides in the pedagogical approaches used to facilitate the learning process. As mentioned above, the syllabuses for the two sections are similar, but not identical. In the classroom section, students are given more opportunities to be in action mode, particularly during the ideation exercise prior to their drafting of the entrepreneurial outline and their oral presentation of the outline. The competencies thus most affected are the ability to generate creative ideas, to work as a team in a productive and efficient manner and to present an entrepreneurial project convincingly. Although the course was initially identified as of the "supply" type according the theoretical framework put forward by Nabi et al. (2017) (Figure 1), it is possible that the ideation and pitch exercises may have had a more significant effect than expected on the learning outcomes of the classroom students. The "classroom" version of the course would therefore be more of a "hybrid" type course, incorporating pedagogical elements from the "Competence Model," which would explain the differences in learning outcomes. However, it would be conceivable to reproduce these pedagogical activities online, as it is technically possible to create an online collaborative work environment that recreates the face-to-face interactions that benefit the classroom students. In fact, it appears that the greater the students' perception of having collaborated, the greater the learning they report (Arbaugh & Benbunian-Fich, 2007; Benbunian-Fich & Hiltz, 2003), as learning is facilitated when students form a "community of learners" (Niess & Gillow-Wiles, 2013). Similarly, the technological means by which an oral presentation can be given online in real time or on video can recreate the atmosphere of a pitch contest (Archer & Axe, 2010). The findings reported by Liebowitz (2003)

echo this view: The students' perceptions of their ability to apply a wide variety of communication skills were as high among those who had taken the course online, with access to an online forum, as those who completed the course in the classroom. Adjustments in the content of certain sessions (e.g. concept of a business model) or instructions for the deliverables (e.g. ideation) would also be likely to level the differences between the two groups in terms of learning perceptions. The characteristics of the online course that appear to have hindered student learning are not inherent to this delivery mode. One should therefore not conclude that the differences observed can entirely be attributed to the fact that the course was offered online, but rather focus on the teaching methods that were used.

An alternative explanation of the observed learning perception differences may lie in the entrepreneurial interest the students held before enrolling in the course. As was reported above, the students enrolled in the online course expressed a higher interest in going into business even before the beginning of the semester. It is therefore reasonable to assume that they had already learned about the steps required to get there, paid more attention when the subject was covered in the media or had perhaps discussed their project with an advisor or an entrepreneur. In short, they were likely better prepared on average than their classroom colleagues. Given that the measure of perceived learning outcomes is the difference between perceptions at stages t2 and t1 that the students attribute to having taken the course, it is more difficult for an expert at t1 to improve as much as a novice. Furthermore, if a student is engaged in a creation process, he or she is likely to consult several individuals during the semester for the project to go forward, which makes it difficult for that student to pinpoint the learning outcomes that can be directly attributed to having taken the course.

On the subject of perceptions, these are also a limitation of this study, as they are not an objective measure of the knowledge and competencies the students have acquired. Furthermore, the measure of knowledge and competencies at t1 was taken retrospectively to t2, which is less reliable than if it had been taken at t1. However, these learning outcome measurement instrument limitations were the same for all students; they alone cannot explain the learning outcome differences observed. Two other methodological limitations should also be pointed out. First, the size of the classroom sections was much smaller than the online section, which is likely to affect student learning. Second, there was no control for the "teacher" effect, where two people shared classroom teaching duties and a third was responsible for the online section. According to Bae et al. (2014), the passion and enthusiasm expressed by a teacher are likely to influence the relationship between the education received and entrepreneurial intention. In the same vein, we did not take into account the interactions between the teacher and the students, whereas the frequency of positive and constructive interactions appears to be a factor that significantly influences the learning outcomes of online courses (Eom & Ashill, 2016).

It is worth restating that the purpose of this study was not to assess the more long-term impact of the training on the students' careers. The course under study is introductory in nature; it does not aim to "create" entrepreneurs but rather to spark the students' interest and make them aware of their entrepreneurial potential. Furthermore, the interest of this study was in documenting and comparing two different delivery modes for a single course. In this regard, this process answers the call by Nabi et al. (2017), who deplore the lack of details about the pedagogical approaches used in the articles they reviewed, as a result of which they suggest that future studies should compare the impact of different teaching methods for the same content. We believe this study should be replicated after making the suggested pedagogical and technological changes to the online version of the course to improve the students' learning experience. It is a

safe bet that the differences observed between the two delivery modes would be attenuated. Should any differences remain, however, online entrepreneurship education should not be discarded. It would be important to offset these differences given the undeniable advantages this delivery mode provides in terms of accessibility and flexibility. For example, providing this online option made it possible for several students outside of the Québec City region to take this entrepreneurship course. One-third of the students enrolled in the online section in fact lived more than 100 km from the university campus. Several students also held full-time or part-time jobs that limited their availability to attend the course in the classroom.

UL's entrepreneurial ecosystem provides a number of pathways to those who, for a variety of reasons, choose to follow their entrepreneurial education online, but who nevertheless wish to experience the benefits of "human contact" to push their projects forward. Entrepreneuriat Laval advisors are available to supervise students who have an entrepreneurial project they wish to develop. Aspiring entrepreneurs also have access to a mentoring service, not to mention the resources at their disposal if they enrol in the Entrepreneurial Profile. The situation would certainly be much different if the students did not have access to such resources. Indeed, education and training alone are necessary but insufficient if no other kind of support is provided to budding entrepreneurs (Radovic et al., 2012).

That being said, it is important to keep in mind that, overall, the students who took the online course felt on average that the course had enabled them to acquire various entrepreneurial knowledge, skills and competencies (mean score of 1.97 for knowledge and 2.35 for competencies, where 2="Very much" and 3="Somewhat"). Moreover, not only did their interest in one day becoming an entrepreneur remain intact, it actually grew.

CONCLUSION

The purpose of this study was to investigate whether taking an introductory entrepreneurship course online rather than in the classroom had an impact on the students' learning outcomes and their interest in one day becoming an entrepreneur. The findings indicate that all of the students achieved the course's objectives in a very satisfactory manner, but that the students enrolled in the classroom section of the course were left with the impression of having better achieved the course objectives than the students enrolled in the online section. A closer analysis of the data suggests that the differences observed can partly be attributed to the pedagogical approaches that were used in the online course. In other words, the characteristics of the online course that appear to have hindered the students' learning are not inherent to this delivery mode. Incorporating pedagogical activities that require students to learn in action into the online course would most likely improve the students’ learning outcomes. The findings also indicate that, overall, the students' interest in one day becoming an entrepreneur increased as a result of taking the course and that, furthermore, this interest was more pronounced among the students who had chosen to take the course online. This fact should not be overlooked given that, in addition to knowledge and competency acquisition, the purpose of entrepreneurial education is for students to discover and fulfil their entrepreneurial potential.

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