

**Assessing the impacts of school entrepreneurial initiatives:
A quasi-experiment at the elementary school level¹**

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Abstract

Purpose. Many countries around the world have now introduced entrepreneurship into their curricula and educational practices, starting at the elementary school level. However, recent studies show the relative (un)effectiveness of K-12 enterprise education on diverse learning outcomes. The purpose of this paper is to report on a research aimed at assessing the impacts of enterprise education on students' entrepreneurial attitudes.

Design/methodology/approach. The authors conducted a quasi-experiment between May and June 2017 to assess the entrepreneurial potential of students at Elementary Cycle 3 (10-12 years) in Quebec, Canada. Relying on attitude theory, the authors used Athayde's Attitudes toward Enterprise for Young People test, which assesses students' entrepreneurial potential through four entrepreneurial attitudes (leadership, creativity, achievement and personal control). The experimental group consisted of 11 classes which had conducted an entrepreneurial project during the 2016-2017 school year (n = 208 students), while the 7 classes of the control group had not (n = 151 students).

Findings. At first glance, data showed no difference between the two groups. Further investigation showed that private and Freinet (public) schools' students, both from the control group, show significantly higher leadership scores than those of the experimental group. In-depth analyses also show that increasing the number of entrepreneurial projects significantly impacted three of the four attitudes assessed, although negligibly.

Research limitations/implications. Taken together, those results question the relevance of single entrepreneurial activities in developing students' entrepreneurial attitudes. They also suggest the positive impact of a progressive, constructivist pedagogy in developing such entrepreneurial attitudes. Moreover, the paper raises several factors likely to impact students' entrepreneurial attitudes for further research.

Originality/value. K-12 enterprise education remains an understudied context, largely crossed by unproven statements. This research contributes to understand and give direction to educational initiatives targeting the development of young students' entrepreneurial attitudes.

Keywords. Assessment, Enterprise education, Entrepreneurial attitudes, Entrepreneurial potential, K-12 education

Paper type. Research paper

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1. Introduction

For several decades, entrepreneurship has generated a wealth of attention from both politics and academia. This interest in entrepreneurship is largely due to contemporary societal transformations that reflect the transition from a predominantly managerial economy to an economy that some describe as “entrepreneurial” (Audretsch and Thurik, 2000). Within such an entrepreneurial economy, where adaptability and innovation capacities are conditions of survival and success for businesses, small and medium-sized enterprises, rather than large companies, are becoming the drivers of growth, the main providers of new jobs and the guarantee of a greater competitiveness in a globalized market. This transition from one economy to another requires that individuals, communities, institutions, and states at various levels, rethink their place and role within a changing socioeconomic landscape. It is indeed now expected that all actors, from individuals to institutions, will acquire the necessary skills to self-govern (Peters, 2001). In developing what Bröckling (2016) calls an “entrepreneurial self”, a notion usually associated with neoliberalism (Holmgren and From, 2005; Scharff, 2016), the aim is to empower every actor, so that everyone become able to take control of his/her own future.

University has long been one of the preferred ways to boost entrepreneurship, by teaching students the knowledge and skills required to start up and manage their own business (Katz, 2003). However, many argue that it is too late, at the university level, to develop an entrepreneurial self, mindset, potential, or profile – whatever the denomination used –, with some seeing pre-school education as the best time to start developing it (Axelsson *et al.*, 2015). More and more, K-12 education – literally from Kindergarten to Grade 12 – is thus also seen as a good context to implement entrepreneurship (Ball, 1989; European Commission, 2006; Lackéus, 2015). Consequently, many countries around the world have now introduced entrepreneurship into their curricula and/or educational practices, starting at the elementary school level (European Commission/EACEA/Eurydice, 2016).

Nevertheless, as Champy-Remoussenard (2012) points out, the field of K-12 enterprise education remains largely crossed by unproven statements. According to those who support it, whether governments or specific school initiatives promoters, enterprise education would encourage motivation, perseverance, commitment and academic achievement, as well as the development of personal qualities in students, such as proactivity, self-confidence, sense of organization or leadership (e.g. Pilsh and Shimshon, 2007; Young, 2014). However, recent research challenges those statements by showing that different ways to implement enterprise education lead to different learning outcomes in students (Johansen and Schanke, 2014; Lackéus, 2017a; Moberg, 2014). In other words, as Matlay (2008) notes, at the postsecondary level, implementing enterprise education does not automatically lead to the achievement of the targeted goals, in terms of knowledge, skills and/or attitudes. This calls for more research to assess the impacts of school entrepreneurial initiatives on students.

There is a strong line of research devoted to assessing the impacts of entrepreneurship education in postsecondary education (e.g. Gorman, Hanlon and King, 1997; Nabi *et al.*, 2017; Pittaway and Cope, 2007), mainly through the evaluation of students’ entrepreneurial intentions. However, K-12 education remains an understudied context (Draycott *et al.*, 2011), especially the elementary school level. Yet, as Axelsson *et al.* (2015) argue, “childhood is considered the ideal stage to influence attitudes towards entrepreneurship” (p. 40). It is then surprising that entrepreneurship education research does not focus more firmly on early stages of schooling. This paper aims to contribute to

fill this gap by reporting on a quasi-experiment conducted at the elementary school level in Quebec, Canada.

The objective of the study is to assess the impact of school entrepreneurial projects on students' entrepreneurial attitudes (Athayde, 2009, 2012), at Elementary Cycle 3 (10-12 years old). The experimental group consists of 11 classes which had conducted an entrepreneurial project during the 2016-2017 school year ($n = 208$ students), while the 7 classes of the control group had not ($n = 151$ students). The first part of the paper shows the relevance of the study and present the theoretical framework relying on attitude theory. The second part of the paper highlights the method used. The last part of the paper presents and discusses the research results.

2. Literature review

Assessing the impacts of school entrepreneurial initiatives first and foremost implies to define the educational aims targeted by such initiatives. In the field of enterprise education, there been a debate historically about those aims (Gibb, 1987, 1993; Hytti and O'Gorman, 2004; Johnson, 1988). The very core of this debate consists in knowing what it means to introduce entrepreneurship at early stages of schooling. Indeed, talking about training entrepreneurs at the elementary school level appears to be neither relevant, nor desirable (Surlmont, 2007). Three educational aims^[1] related to the introduction of entrepreneurship in education (Figure 1) are usually distinguished in the literature (Breen, 2004):

- 1) Acquiring knowledge in entrepreneurship to better understand the phenomenon. Entrepreneurship is here viewed as a type of learning content to be taught (knowledge).
- 2) Developing specific entrepreneurial skills to become an entrepreneur. Entrepreneurship is here thought of as an occupational activity to which students are given an introduction (skills).
- 3) Developing personal characteristics, such as leadership or initiative, in order to become more entrepreneurial/enterprising in life in general. Entrepreneurship is here regarded as a process through which to grow personally (attitudes).

Some authors also simply proposed to divide enterprise education initiatives into two categories: a narrow, economic view – comprising the first two above aims – and a broad view – referring to the third aim (Deuchar, 2007)^[2]. Although simplistic in some ways (Lackéus, 2018), the narrow/broad dichotomy remains useful. At early stages of schooling, a broad view of entrepreneurship is indeed usually favored (Leffler, 2009; Cummins & Dallat, 2004), meaning that school entrepreneurial initiatives primarily target the development of enterprising students. Nevertheless, this scientific consensus, still precarious (Lackéus, 2015), creates a new debate, raised long ago (Caird, 1990), about the very meaning of being enterprising and, consequently, what should be developed in students. Most authors define “being enterprising” with lists of so-called entrepreneurial characteristics (traits, behaviours, attitudes, competencies, and so on) derived from psychological research on entrepreneurs. However, as Coffield (1990) noted long ago, no two lists are alike, and the situation has not dramatically evolved since then (Llewellyn & Wilson, 2003).

As for the broad view of entrepreneurship, it is still difficult today to know exactly what school are trying to develop in students throughout entrepreneurial initiatives, on one

hand, and what should consequently be assessed, on the other hand. As a matter of consequence, it is still a challenge to report on existing research aimed at assessing school entrepreneurial initiatives. Indeed, the variety of constructs used to assess outcomes of enterprise education makes almost impossible to compare the different studies. Regarding a broad view of entrepreneurship throughout the school path, examples of those constructs are: entrepreneurial competence as an overarching construct (Schelfhout *et al.*, 2016), entrepreneurial personality (Suarez-Alvarez and Pedrosa, 2016), enterprising tendency (Caird, 2006), or enterprise potential (Athayde, 2009). Some years ago, Edwards and Muir (2012) called for the need to go beyond the well-researched construct of entrepreneurial intention and other business-oriented outcomes to assess enterprise education. It is nevertheless important to admit that a lot remains to be done to achieve this.

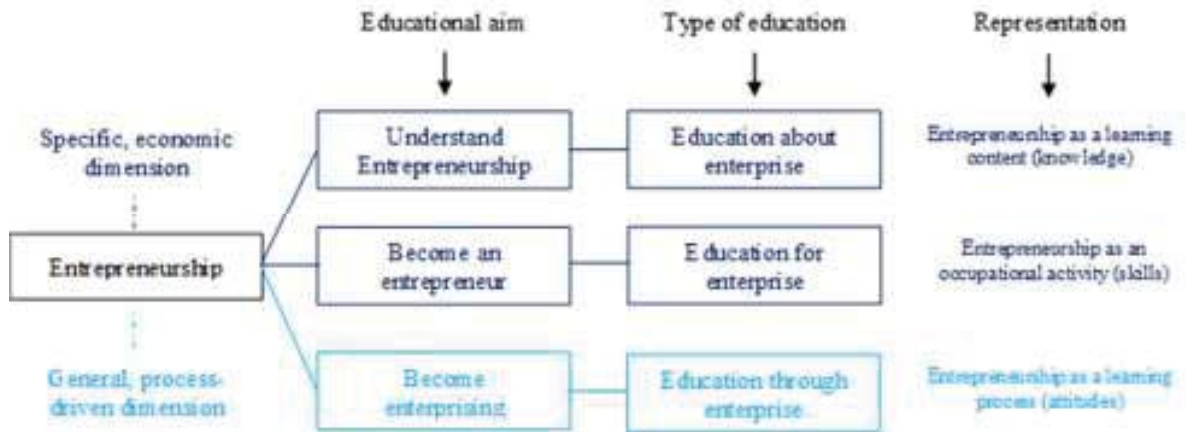


Figure 1: Educational aims related to entrepreneurship in education

To further delimit our literature review, we looked at research specifically aimed at assessing K-12 school entrepreneurial initiatives – i.e. at the elementary, lower secondary and upper secondary school levels. We then used the narrow/broad dichotomy to organize that body of literature.

In the narrow/economic perspective of entrepreneurship, authors generally assess the impacts of entrepreneurial education in terms of developing entrepreneurial skills, competencies, motivation and/or intentions in students, usually at the upper secondary school level. This line of research, which often focuses on different programs of *Junior Achievement* in different cultural contexts, shows mixed results. In Switzerland, Quesel *et al.* (2015) show that students participating in a mini-enterprise positively evaluate the cooperative work required by this activity, and are better to understand the social role of the entrepreneur. In the UK, Jones and Colwill (2013) show that mini-enterprises have a positive impact on students' entrepreneurial skills and intentions, while Moore *et al.* (2016) indicate the positive impact of mini-enterprises on the development of attitudes and knowledge for the transition to active life. In the Netherlands, the results of Oosterbeek *et al.* (2010) are much more mixed. According to them, mini-enterprises have no significant impact on the self-reported assessment of entrepreneurial skills, and a negative impact on entrepreneurial intentions. In Norway, Johansen (2016) shows that mini-enterprises do not have the same impact on girls as on boys, the intention of becoming a business owner being stronger for the latter. Ultimately, economic constructs related to entrepreneurship are of

little use with elementary school students who do not have immediate intentions or motivations to become entrepreneurs.

As for the impacts of the broad perspective of entrepreneurship, research results are still essentially anecdotal, with a few notable exceptions. Moberg (2014) shows that different conceptions of entrepreneurship – namely narrow or broad – lead to different types of learning among students. His research, conducted among 1,400 Danish lower secondary students, shows that groups that rely on a narrow perspective of entrepreneurship see an increase of their entrepreneurial intentions, but a diminution of their academic engagement; while groups that rely on the broad perspective of entrepreneurship show reverse results. Lackéus (2017a) reports on six different studies adopting an original qualitative perspective based on “Experience Sampling Method”. He shows that enterprise education has a weak or no effect on K-12 students’ entrepreneurial competencies. Although relying on the economic perspective of entrepreneurship through the study of the *Junior Achievement Company Program*, Johansen & Schanke’s (2014) research, conducted with 3,000 Norwegian high school students, is also interesting to mention here. These authors show that the program has a positive impact on school results at the lower secondary level, but no impact on the same indicator at the upper secondary level. They attribute this difference to the diverse possible ways to implement the program they studied. But the authors are not much explicit about what those diverse ways are, and which ones have an impact on school results. Ultimately, these few studies are indicative of the relative (un)effectiveness of enterprise education, but once again, the multiple constructs used make it difficult to do comparisons that could draw more general conclusions.

3. Theoretical background and hypothesis

The broad view of entrepreneurship targets the development of personal attitudes in students. For this research, we accordingly focused on attitude theory. We have therefore put aside research aimed at assessing personality traits (Brandstätter, 2010) and their associated measurement tools for young people (e.g. Caird, 2006; Dinis *et al.*, 2013; Suarez-Alvarez and Pedrosa, 2016). Indeed, personality traits are more static, i.e. specific educational initiatives over short time periods do not affect them. Attitudes, by contrast, are more dynamic, context-dependent, and always directed toward an object (whether a specific person, place, activity, concept and so on). The notion of attitudes has been discussed in entrepreneurship research for a long time. Krueger and Brazeal (1994), for instance, relate attitudes to an “entrepreneurial potential”. From their perspective, the entrepreneurial potential is a latent predisposition towards entrepreneurship that precedes entrepreneurial intentions. As noted by Robinson *et al.* (1991), Ajzen’s (1991) theory of planned behavior, well researched in entrepreneurship, also relates to attitude theory by focusing on one of its manifestation. Indeed, a more complex, multi-dimensional (or tripartite) view of attitudes acknowledges that they manifest in three ways: beliefs and thoughts (cognition), positive or negative feelings (affect), and behavioral intentions and predispositions to behave in a certain way (conation) (Robinson *et al.*, 1991).

Based on the *Entrepreneurial Attitude Orientation Scale* (EAO) originally elaborated by Robinson *et al.* (1991), Athayde (2009) developed a measurement tool specifically designed to assess young students’ entrepreneurial potential. Consistent with Krueger and Brazeal (1994), the entrepreneurial potential is thought of as a latent construct (see also, Moberg *et al.*, 2014). In Athayde’s (2009) words, “Latent enterprise potential was therefore operationalized as a constellation of attitudes toward certain characteristics associated with entrepreneurship” (p. 483). Based on a literature review, Athayde distinguishes four attitudes related to an entrepreneurial potential: leadership, creativity,

achievement and personal control. Whereas the reference EAO scale assesses adults' attitudes towards entrepreneurship in a business perspective, Athayde's *Attitudes towards Enterprise for Young People* (ATE) test measures specifically the "entrepreneurial potential" of young students still at school. The entrepreneurial potential, and its four related attitudes, here refer to a broad view of entrepreneurship, as it is assumed that young people do not have the intention or motivation to start a business and become entrepreneurs.

Although our literature review suggests mixed impacts of school entrepreneurial initiatives on diverse learning outcomes (such as personality traits, entrepreneurial competencies, school engagement or school results), Robinson *et al.* (1991) argue that education could more easily influence entrepreneurial attitudes, because of their malleable, context-dependent nature. For our research, we therefore hypothesised that school entrepreneurial initiatives would normally provide good opportunities for students to improve their entrepreneurial attitudes. Following Athayde (2009), we posited the following hypotheses:

H1. School entrepreneurial initiatives will have a positive effect on the students' entrepreneurial potential in terms of leadership (a), creativity (b), achievement (c) and personal control (d).

4. Method

Specific research context

To test our hypotheses, we focused on elementary schools in the French-speaking province of Quebec, Canada. Since the 1980s, entrepreneurship has been a major political concern in this Canadian province. During this time, the relocation of large companies' abroad resulted in high unemployment rates and massive rural exodus. Entrepreneurship therefore emerged as a solution to tackle the problem of unemployment and to diversify Quebec's regional economies. Educative discourses have rapidly aligned accordingly. As early as 1989, the Quebec's Higher Council of Education recommended that schools should develop a regional sense of belonging, spirit of enterprise, empowerment, and civic, social and economic literacy. Since then, entrepreneurship in K-12 education has faced constant development. In this specific context, data from the *Quebec Entrepreneurship Contest* is a good indicator of entrepreneurial dynamism in education. This contest specially targets and rewards young people in schools (from elementary school to university) who have carried out projects during the school year that reflect their entrepreneurial attitudes. In this respect, the 2016-2017 data show that nearly 40,000 students, most of which from elementary and secondary schools, participated in the contest.

In the province of Quebec, entrepreneurship at early stages of schooling is being developed mainly through entrepreneurial projects, i.e. student-led action projects that respond to a community need by creating a good, offering a service or organizing an event (Pelletier, 2005). For instance, students could produce something that will then be sold (product), open a toy library or a shop of school supplies in their school (service) or organize a show at school to support a cause or fund a project (event). Unlike mini-enterprises, entrepreneurial projects are not used to teach how to start a business, but rather to put students into action and to develop – this is what is indeed expected (Pelletier, 2005) – their entrepreneurial attitudes in the broad sense of the term. Entrepreneurial projects therefore do not need to be profitable, even if some money can be at play in the projects. This experiential way of implementing entrepreneurship falls in line with the way entrepreneurship was introduced in the *Quebec Education Program*. The latter states that the aim of introducing entrepreneurship into the curriculum is: "to enable students to

undertake and complete projects that develop their potential and help them integrate into society” (Ministry of Education, 2001, p. 45).

Regarding the specific research context of this study, it is to be understood that we explicitly considered school entrepreneurial projects and their impacts on students’ entrepreneurial attitudes. We therefore do not pretend to have measured the impact of other kind of first-hand entrepreneurial experiences, such as visiting a company or meeting an entrepreneur.

Research design and sample

Inspired by Moberg *et al.*’s (2014) approach, we carried out a quasi-experiment in May-June 2017 to assess the entrepreneurial potential of students at Elementary Cycle 3, in Quebec, Canada. In this context, Elementary Cycle 3 corresponds to the end of the elementary school level and comprises Grades 5 (10-11 years) and 6 (11-12 years).

The experimental group consists of 11 classes that have conducted an entrepreneurial project during the 2016-2017 school year ($n = 208$ students). Those classes were recruited through a call to participate relayed by the *Quebec Entrepreneurship Contest* to all its Elementary Cycle 3 participants. The 11 classes of the experimental group come from public schools, for a total of ten different schools well distributed throughout the province of Quebec and presenting deprivation indexes (2015-2016 version) ranging from highly favored to very disadvantaged.

The control group consists of seven classes that have not implemented an entrepreneurial project during the same school year ($n = 151$ students). The seven classes of the control group are distributed as follows: three classes from two different private schools, two classes from two different Freinet (public) schools and two classes from two different public schools. Those classes were recruited by a call to participate relayed on social media. The geographical distribution of the control group on the Quebec’s territory is also varied, but the schools come from privileged or slightly disadvantaged backgrounds. All classes, whether in the experimental or the control group, enrolled in the research on a voluntary basis and received no remuneration for their participation.

The research followed a *post hoc* design, meaning that only one measurement time, at the end of the school year (May-June 2017), was carried out for all class groups. The self-administered questionnaire was completed online (using *SurveyMonkey*) at school, under the supervision of the teacher in charge of each group, either at the school computer room or in the classroom using tablets. The parental authorization forms were collected by the teachers and sent to the researchers: 87 percent of the parents in the experimental group allowed their child to participate in the research, as compared with 86.7 percent for the control group. Tables 1 and 2 describe the sample.

Measurement tool

As described above, we used Athayde’s (2009) ATE test which assesses the “entrepreneurial potential” of youth. Items were designed to reflect the tripartite nature of attitudes (cognition, affect, behaviour). In the original research of Athayde (2009), validated the questionnaire in six secondary schools, with students from 16 to 19 years old ($n = 196$). The final questionnaire assesses the entrepreneurial potential through four attitudes: leadership (six items), creativity (four items), achievement (four items) and personal control (four items). The items are measured by a Likert scale ranging from 1 to 5 (from 1-completely disagree to 5-completely agree). In addition to its accurate

psychometric qualities, this questionnaire was favoured for the clarity and the limited number of its questions; two essential criteria to ensure the validity of responses of young students (10-12 years in this research).

We have verified the unidimensionality of the measure (measurement validity) of the four constructs and these have all proven one-dimensional, except for creativity. After analyzing the items, we removed two of them to keep only two items: “I think a good imagination helps to succeed in school” and “I like lessons that stimulate my imagination”. Fidelity analysis (Cronbach’s α) on the selected items indicates scores of 0.809 (leadership), 0.664 (creativity), 0.690 (achievement), and 0.639 (personal control), which is considered acceptable for new measures (Tabachnick and Fidell, 2007). The four attitudes are the dependent variables of this research: leadership (mean 3.68, SD = 0.76), creativity (mean 4.19, SD = 0.72), achievement (mean 3.48, SD = 0.76) and personal control (mean 3.70, SD = 0.73).

Table 1. General description of the sample

	Number of groups	Number of students	Validated questionnaires*
Experimental group	11	239	208
Control group	7	174	151
Total	18	413	359

* Parental authorizations and full answers.

Table 2. Level of education and gender

	Fifth grade	Sixth grade	Girls	Boys
Experimental group	88 (42.3%)	120 (57.7%)	111 (57.4%)	97 (46.6%)
Control group	76 (50.3%)	75 (49.7%)	95 (62.1%)	56 (37.1%)
Total	164 (45.7%)	195 (54.3%)	206 (57.4%)	153 (42.6%)

5. Results

We first made mean comparisons between the experimental and control groups. As can be seen in Table 3, the initial analysis does not reveal any significant difference between the students in the two different groups.

Since the control group sample includes classes from public, private and Freinet schools, we controlled for differences between these types of schools. Furthermore, we controlled for other variables that can impact our measures of attitudes: gender, age, having parents in business, and the number of entrepreneurial projects previously experienced at school. As can be seen in Table 4 with the ANCOVA results, students from private or Freinet schools, both from the control group, show significantly higher leadership scores. For the other dimensions, there is no significant difference worthy of mention.

Table 3. Differences between experimental and control groups on dependent variables

	Experimental	Control	Sig. (<i>p</i>)
Leadership	3.638	3.745	0.189
Creativity	4.192	4.179	0.861
Achievement	3.440	3.535	0.244
Personal control	3.725	3.440	0.464
N	208	151	

Table 4. Differences between groups according to the types of schools (ANCOVA)^{1,2}

	Experimental public	Control public	Control private	Control Freinet	Sig. (<i>p</i>) ³
Leadership	3.678 ^a	3.595 ^{bc}	3.935 ^b	4.005 ^{ac}	0.030
Creativity	4.218	4.287	4.341	4.220	0.817
Achievement	3.447 ^a	3.626	3.764 ^a	3.670	0.112
Personal Ctrl.	3.788	3.595	3.635	3.771	0.584
N	208	36	72	43	

¹ Variable controlled: Gender, Age, parents in business, and number of entrepreneurial projects

² Estimated marginal mean displayed (based on ANCOVA procedure)

³ A priori contrasts. Reference group: Experimental public.

^a, ^b and ^c = significant difference between groups at *p* = 0.05.

One of the challenges of a *post hoc* quasi-experiment design with non-equivalent groups is the fact that groups can be different from the start. To strengthen our analysis, we controlled for different situations that can influence the level of entrepreneurial attitudes, namely: age, gender, being in a private or Freinet school and having parents in business. Also, we wanted to know if being engaged in more than one entrepreneurial project could influence the entrepreneurial potential. We therefore continued the analysis with these different controls and put as independent variable the number of entrepreneurial projects carried out by the students during their school path. We specifically asked: “Have you ever experienced an entrepreneurial project at school?”, with “No” or “I do not know” choices (0), “Yes, but not this year” or “Yes, only this year” (1) and “Yes, many times, including this year” (2). The variable is distributed as follows: 0 = 123 cases (34.3 percent), 1 = 127 cases (35.4 percent) and 2 = 109 cases (30.4 percent). It was used as a continuous variable in linear regressions, as shown in Tables 5 and 6.

As can be seen in Tables 5 and 6, leadership is significantly influenced by entrepreneurial projects ($\beta = 0.173$, $p = 0.009$), but negligibly ($\Delta R^2 = 0.021$), and this by controlling for gender, age, having parents in business and the type of school (*H1a* confirmed). Creativity is also significantly influenced by entrepreneurial projects ($\beta = 0.132$, $p = 0.053$), but still negligibly ($\Delta R^2 = 0.012$) with the same controls (*H1b* confirmed). Achievement is also significantly influenced by entrepreneurial projects ($\beta = 0.184$, $p = 0.007$), and still negligibly ($\Delta R^2 = 0.024$) with the same controls (*H1c* confirmed). Finally, there is no link between personal control and entrepreneurial projects ($\beta = 0.013$, $p = 0.877$) (*H1d* rejected).

Table 5. Impact of entrepreneurial projects on leadership and creativity

	Leadership		Creativity	
	Std β	<i>p</i>	Std β	<i>p</i>
Gender	0.104 (.075)		-0.030 (.613)	-0.033 (.575)
Age	0.018 (.753)		0.092 (.125)	0.085 (.154)
Parents in business	0.163 (.005)		0.027 (.648)	0.026 (.657)
Private school ¹	0.056 (.348)		-0.014 (.822)	0.058 (.413)
Freinet (public) school	0.120 (.037)		-0.016 (.779)	-0.004 (.942)
Entrepreneurial projects		0.173 (.009)		0.132 (.053)
N	306 ²	306	306	306
R ²	0.054	0.075	0.012	0.024

¹ Default value = Public school without specific vocation ² On 359 questionnaires, 53 were incomplete or incoherent

Table 6. Impact of entrepreneurial projects on achievement and personal control

	Achievement		Personal control	
	Std β	<i>p</i>	Std β	<i>p</i>
Gender	-0.026 (.665)		-0.016 (.785)	-0.017 (.782)
Age	0.015 (.801)		0.072 (.225)	0.072 (.230)
Parents in business	0.118 (.047)		0.066 (.267)	0.066 (.269)
Private school ¹	0.037 (.540)		-0.054 (.374)	-0.048 (.499)
Freinet (public) school	0.060 (.302)		0.006 (.923)	0.007 (.910)
Entrepreneurial projects		0.184 (.007)		0.011 (.877)
N	306	306	306	306
R ²	0.019	0.043	0.013	0.013

¹ Default value = Public school without specific vocation

6. Discussion

Overall, Tables 3 and 4 show that participating in a single entrepreneurial project does not significantly impact the students' entrepreneurial attitudes. To explain this surprising result, one can question the actual involvement of every student in an entrepreneurial project. Pedagogical guides available in Quebec (e.g. Pelletier, 2005) state that entrepreneurial projects must come from, be led and managed by students. However, it is both difficult to prove and to measure if those guidelines are followed by teachers. It is likely that entrepreneurial projects are more often totally or partially initiated and/or led by teachers. However, students' active commitment toward all aspects of an entrepreneurial project is probably decisive in developing entrepreneurial attitudes. In this research, we only had little evidence, at a micro level, about entrepreneurial projects themselves, e.g. duration of the project, the type of project (product, service or event), the actual roles of the teachers and their students, or their respective involvement at different stages of the project.

In the same vein, entrepreneurial projects in Quebec are most of the time experienced following a group-based perspective, meaning that the entire class is involved in the project, especially at the elementary school level. It must be understood that, when a teacher or a class decides to engage in an entrepreneurial project, all pupils must participate. In other words, all students do not engage in those projects on a voluntary basis. It is therefore possible that all students do not play an active role as contributors of the projects' success. However, once again, one can think that entrepreneurial attitudes' development needs an active commitment toward the project. Reporting on findings of the *Global Entrepreneurship Monitor*, Athayde (2009) states that "voluntary training increases the likelihood of someone thinking of starting a business considerably more than

compulsory training” (p. 496). The same potentially applies to entrepreneurial projects regarding the development of entrepreneurial attitudes.

Interestingly, Table 4 also shows that private and Freinet (public) schools’ students, both from the control group, show significantly higher leadership scores. One way to explain this result can be found in the fact that both private and Freinet schools are selective. Indeed, Athayde (2012) demonstrates that students in selective schools score higher at the ATE test. Nonetheless, the story could be different for private and Freinet schools. Private schools’ students are selected through examinations and/or tuition fees. In other words, the socio-economic background of those students, as well as their academic commitment, could be higher from the start. As for Freinet (public) schools, parents (not students) are chosen based on their view of education and commitment towards the school. In this sense, parental support could have an impact on the students’ leadership. Similarly, Moberg (2014) demonstrates that perceived teacher support is positively associated with non-cognitive entrepreneurial skills.

Another way to explain this result could lie in the school culture and pedagogy, especially for Freinet schools. In the latter, all teachers work together following a common conception of education. Freinet pedagogy is notably based on cooperative learning, inquiry-based learning and democracy and is rooted in school-community interactions, i.e. many features associated with an enterprising way to teach (Deuchar, 2004; Jones and Iredale, 2010; Kearney, 2010; Leffler, 2009). Moreover, students in Freinet schools are explicitly encouraged to show initiative in both their class and the entire school. As Lackéus (2017a) notes, there are striking similarities between enterprise education, on the one hand, and progressive or constructivist education, like Freinet pedagogy, on the other hand. Table 4, essentially, suggests that being in a specific vocation school, with a unifying view of education, has an impact on the development of students’ leadership. Most importantly, it also suggests that a progressive pedagogy could be more important in developing an entrepreneurial potential than some specific entrepreneurial activities. This falls in line with the study of Moberg (2014) which shows that action-based teaching methods are positively associated with non-cognitive entrepreneurial skills, as well as Bell’s (2018) work that points out the supportive role of constructivist learning environments to develop enterprising graduates.

If Tables 3 and 4 show surprising results regarding the experimental group, Tables 5 and 6 are more encouraging. Tables 5 and 6 indeed show that increasing the number of entrepreneurial projects has a significant impact on three of the four attitudes assessed, although negligibly. In fact, entrepreneurial projects only explain 1.2-2.4 percent of the development of these attitudes. Some methodological limitations need to be put forward to nuance this result. Having more respondents, a pre-test/post-test design (see the limitations section), as well as a longitudinal follow-up would with no doubt strengthen the demonstration of the impacts of entrepreneurial projects. Furthermore, the variable “Number of entrepreneurial projects” could have been more accurately seized. Indeed, the students could answer “Yes, many times including this year”, but we had no further data to characterize those entrepreneurial projects (real number, duration, type of project, involvement of the students and so on). Moreover, the number of entrepreneurial projects was treated as a continuous variable in linear regressions. As a result, we could see that increasing the number of entrepreneurial projects had a little impact on the attitudes assessed; however, we do not know what number of projects would really make a difference. Notwithstanding those limits, what Tables 5 and 6 demonstrate is that increasing the number of entrepreneurial activities has an impact on the development of an entrepreneurial potential, as it was measured through attitudes. They also suggest once

again that entrepreneurial projects may not be the best way to develop an entrepreneurial profile, but further research is needed.

7. Limitations and future research

Some limitations of this research have already been highlighted earlier. To strengthen the demonstration of the impacts of entrepreneurial projects on students' entrepreneurial attitudes, future research would benefit from adopting two measurement times (pre-test/post-test). This remains nonetheless difficult in the Quebec context. Indeed, at the provincial level, entrepreneurial projects are made "visible" when they are presented to the *Quebec Entrepreneurship Contest*, i.e. when they are already in progress or even completed. Targeting a narrower territory could help to spot teachers who are used to implement entrepreneurial projects with their students year after year and enrol them at the beginning of the school year. But it could also add a sampling bias, namely involving only experienced teachers.

As noted earlier, this research concentrates on the impacts of entrepreneurial projects on students' entrepreneurial attitudes. This means that other kinds of school entrepreneurial initiatives were not considered, such as mini-enterprises, visiting a company or meeting an entrepreneur. These other kinds of first-hand entrepreneurial experiences could possibly have an impact on diverse manifestations of entrepreneurial attitudes (cognition, affect, behavior), just as Athayde (2009) shows it for the *Young Enterprise Company Program*. Moreover, Fellnhofer and Mueller (2018) show that role models have an indirect effect on students' entrepreneurial intentions. In the same way, meeting an entrepreneur could create affective conditions likely to impact young students' entrepreneurial attitudes. Indeed, entrepreneurial projects are not the only possible way to develop entrepreneurial attitudes.

Our discussion highlights some factors whose impacts on the development of students' entrepreneurial attitudes should be controlled in future research: being in a selective school, students' socio-economic background, experiencing more than one entrepreneurial initiative, having parents in business, parental support, teacher support as well as students' voluntary participation in entrepreneurial initiatives. Some recent research could help gain further theoretical knowledge about these factors (Hietanen and Järvi, 2015; Lepistö and Ronkko, 2013; Peltonen, 2015; Penaluna *et al.*, 2015; Ruskovaara and Pihkala, 2013; Seikkula-Leino *et al.*, 2015). Future research would furthermore benefit from better characterizing the entrepreneurial initiatives they study (duration and type of initiatives, degree of involvement of both teachers and students). Students' actual involvement in entrepreneurial initiatives, more particularly, is probably decisive in developing their entrepreneurial attitudes. Mix-methods research could also be very helpful to gain first-hand knowledge about these factors, by mixing for instance questionnaires and direct observations in classrooms.

To extend this research, several lines of inquiry could be further explored, among which: first, entrepreneurial attitudes do not only develop through entrepreneurial activities in school, but can be developed in other contexts (e.g. through other educative activities, at home, on playgrounds, through sport, cultural or social extracurricular activities); second, entrepreneurial attitudes probably take some time to develop and differences between students could appear more clearly later in their schooling. A longitudinal follow-up research design would here be helpful; third, teachers' pedagogical practices i.e. a progressive pedagogy within a constructivist learning environment may be more important than some specific entrepreneurial activities in developing students' entrepreneurial attitudes.

8. Conclusion

K-12 enterprise education is rapidly spreading all over the world (Leffler, Svedberg and Botha, 2010). Nonetheless, recent research questions the effectiveness of enterprise education (Lackéus, 2017a) and points out that diverse ways to implement school entrepreneurial initiatives lead to different learning outcomes (Johansen and Schanke, 2014; Moberg, 2014). Furthermore, K-12 enterprise education remains largely an understudied context (Draycott *et al.*, 2011), and especially the elementary school level. The purpose of this paper was therefore to contribute to fill this gap by reporting on a research aimed at assessing enterprise education at the elementary school level.

This research relies on attitude theory. In entrepreneurship research, attitudes are related to an entrepreneurial potential (Krueger and Brazeal, 1994), i.e. a latent predisposition (see also Moberg *et al.*, 2014) toward entrepreneurship that precedes entrepreneurial intentions. Following Athayde (2009), students' entrepreneurial potential was captured through four entrepreneurial attitudes: leadership, creativity, achievement and personal control. The research followed a *post hoc* quasi-experiment design, meaning that only one measurement time, at the end of the school year (May-June 2017), was carried out for all class groups, at Elementary Cycle 3 (10-12 years), in Quebec, Canada. The experimental group consists of 11 classes, all from public schools, which have conducted an entrepreneurial project during the 2016-2017 school year ($n = 208$ students), while the 7 classes of the control group, from different backgrounds (public, private and Freinet public school) had not ($n = 151$ students).

The two main findings of this study are: first, students of the control group, from private and Freinet (public) schools show significantly higher leadership scores than students from the experimental group; second, increasing the number of entrepreneurial projects has a significant impact on three of the four attitudes assessed, although negligibly. Taken together, those results question the relevance of single entrepreneurial activities to develop students' entrepreneurial attitudes. They also point out the possible positive impact of a progressive, constructivist pedagogy in developing such entrepreneurial attitudes (Bell, 2018; Moberg, 2014).

Ultimately, even though efforts in Quebec have led to encouraging results with more and more students reportedly involved in entrepreneurial initiatives each year, K-12 entrepreneurial initiatives nevertheless remain mostly isolated acts, implemented by self-motivated teachers, and sometimes totally or partially outside of school time. Furthermore, entrepreneurial initiatives remain poorly integrated into pedagogical practices in general. Indeed, in Quebec, the program is not prescriptive about pedagogical practices, meaning that teachers are free to implement whatever pedagogy they want, as long as their students learn the mandatory disciplinary contents. As Regele & Neck (2012) state for the US context: "schools must cover material that students will see on standardized tests, leaving little flexibility for entrepreneurship curricula" (p. 34). In other words, there is not much room for entrepreneurial projects in the classrooms, except maybe if the latter are conceived of as learning tools through which school subjects can be covered (Pepin, 2012, 2018).

As a matter of fact, a student who participates in an entrepreneurial project within a given year in his/her schooling is likely to never experience one again thereafter. Moreover, given the fact that K-12 enterprise education is being implemented randomly by self-motivated teachers, most students are likely to never experience any entrepreneurial activity. This observation can probably be broadened beyond the Quebec's context. Indeed, the European Commission (2013), in its Entrepreneurship 2020 Action Plan, recommends

that young people should have a least one practical entrepreneurial experience before leaving compulsory school. However, as our results suggest, experiencing only one entrepreneurial initiative is not enough to develop students' entrepreneurial attitudes. It can rather be thought that the more students experience entrepreneurial activities, the more they will develop their entrepreneurial attitudes. If governments are really concerned about developing young people entrepreneurial attitudes, enterprise education would probably require more coordinated efforts.

Notes

1. Lackéus (2017a,b) recently added his “value creation education.”
2. Lackéus (2018) proposed a progression model of five types of entrepreneurial education to go beyond the narrow/broad dichotomy. Although interesting, his proposition is still being debated.

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