

Entrepreneurial intention and the effects of entrepreneurial education

Differences among management, engineering, and accounting students

Diego Passoni and Rafael Bianchini Glavam
Faculdades FUCAP, Capivari de Baixo, Brazil

Abstract

Purpose – The purpose of this paper is to compare the levels of entrepreneurial intention (EI) among academics from different fields of university knowledge and to evaluate the effect of entrepreneurial education (EE) on students taking management, engineering and accounting courses.

Design/methodology/approach – A survey has been conducted with 491 academics from different fields of knowledge at the Brazilian undergraduate level to compare their EI levels and to validate the effect of EE in the EI in management, engineering and accounting courses.

Findings – This study has demonstrated that EE has a positive effect on EI among undergraduate management and engineering students.

Research limitations/implications – This study has been restricted to some fields of knowledge within the undergraduate courses at university level. It has generated specific conclusions and recommendations that cannot be generalised. It suggests new lines of research from its results.

Practical implications – This study may encourage investment in EE programmes in certain fields of knowledge within institutions and communities that need to foster entrepreneurship as a driver of economic development.

Originality/value – This study provides empirical evidence of the impact of EE on EI among academics from different fields of knowledge in higher education institutions in Brazil, as well as compares and lists the undergraduate courses where students have more entrepreneurial intention.

Keywords Students, Brazil, Entrepreneurialism, Entrepreneurial intentions, Entrepreneurship education

Paper type Research paper

Introduction

With the level of competitiveness between corporations and nations potentially increasing this century, the need to seek different, modern and innovative ways of generating wealth and economic dynamism has encouraged and stimulated the spread of entrepreneurship courses and programmes at all educational levels and in the most distant and inhospitable regions of the planet (Katz, 2003).

As Kuratko and Hodgetts (2004) pointed out, entrepreneurship is a dynamic process of vision, change and creation that requires the application of a lot of energy and passion to be able to move in the direction of effectively implementing new ideas and creative solutions. However, academic courses and programmes can contribute to the enhancement of knowledge in management and in the progress of the psychological attributes and



behaviours associated with entrepreneurship (Lee *et al.*, 2011) and according to Do Paço *et al.* (2015), this can make all the differences in generating a new breed of entrepreneurs.

Because of the increasing awareness on the importance of entrepreneurship courses, investment and resulting expansion in entrepreneurship education have occurred at all levels of education, from primary school (Huber *et al.*, 2014) through high school (Peterman and Kennedy, 2003; Oosterbeek *et al.*, 2008; Sánchez, 2013), and above all, at the university level (Katz, 2003; Kuratko, 2005).

With the expansion of the range of entrepreneurship courses and because of the wide variety of objectives of each of these programmes (Liñán, 2004), in addition to the vast quantities of teaching tools and methodologies (Solomon *et al.*, 2002), there is still no consensus on which pedagogical model generates the best results in entrepreneurial education (EE) (Ruskovaara and Pihkala, 2013).

Does EE affect or alter the intention of your participant to enterprise? This questioning has been conducted by various researchers throughout the globe and over a considerable time span (Krueger *et al.*, 2000; Hytti and Kuopusjärvi, 2004; Moro *et al.*, 2004; Bhandari, 2006; Souitaris *et al.*, 2007; Oosterbeek *et al.*, 2010; Ferreira *et al.*, 2012; Chen *et al.*, 2015; Fayolle and Gailly, 2015; Westhead and Solesvik, 2016). However, there are still many questions and doubts about the effective academic proof of that relationship (Honig, 2004; Von Graevenitz, Harhoff and Weber, 2010; Lautenschläger and Haase, 2011).

Despite the recent advances in entrepreneurship studies in terms of visibility and importance, the theme of entrepreneurship education still lacks a more solid discussion, which helps in its maturation, orientation and dissemination in a more effective way. Their differences in relation to traditional education have generated the need for new pedagogical models, compatible with the skills and attitudes of the individual entrepreneur.

Thus, this study proposes to carry out a broad review of the literature on EE and its impact on the individual's intention to launch a business. It also intends to identify which field of university undergraduate courses, whether management, engineering, accounting, pedagogy and hospitality, has academics with the higher entrepreneurial intention (EI). In addition, it aims to perform a comparative analysis between the effects of EE on EI among students of the different fields of knowledge, to validate the positive effect thereof. In this way, it aims to enable the development of an agenda for specific future research on EE in different fields of knowledge at the university level.

Literature review

The relevance of entrepreneurship in all spheres of society today is extremely high, and more and more teaching and research institutions are focusing on the analysis and understanding of the varied nuances of this theme. These nuances have been identified and debated since the fifteenth century as a driver and promoter of economic growth and development in the most diverse regions of the world (Schumpeter, 1934). Going in the same direction, Naudé (2013) explained that the consolidation of the importance of the role of the entrepreneur in the process of economic strengthening and development has been a fundamental part in increasing the numbers of studies and research papers, as well as investments focused on this field. Premand *et al.* (2016) point out that in countries with delicate economic situations or developing countries, entrepreneurship plays an even more significant role in generating wealth, business opportunities, creating new jobs and it is for these reasons that it has been encouraged and stimulated through public policies of regional economic development.

EE is essential for economic and social development, whether regional, state or national, because it has been understood as a priority in political, economic and academic agendas and debates not only in Brazil but also in various countries around the world, including at the highest levels of UN discussion (UNCTAD Secretariat, 2015, LIMA *et al.*, 2015).

It is known that the development and implementation of entrepreneurship education programmes follow the recommendations of the United Nations Educational, Scientific and Cultural Organisation (UNESCO) for the twenty-first-century education, which are learning how to know, learning how to do, learning how to live and learning how to be. In addition to these dimensions, UNESCO recommends other aspects of modern education related to entrepreneurship, so that students develop the capacity to innovate, retain knowledge, develop their own projects and deal with changes, as explained by Lopes (2010).

Katz (2003) reported that the first study and research centre aimed at effectively analysing entrepreneurship was created by Professors Joseph Schumpeter and Arthur Cole in 1946 at the Harvard Business School and one year later, precisely seven decades ago, Professor Myles Mace taught 188 graduate students their first entrepreneurship class at the same institution in Boston. It was in the 1980s when the first phase of the propagation process of entrepreneurship and small business courses occurred. At that time, more than 300 American higher education institutions (HEIs) reported offering vacancies on courses or places specifically on the topic. At the beginning of the subsequent decade, that number almost tripled, reaching the incredible mark of 1,050 education entities that provided programmes with this content (Solomon *et al.*, 1994). This expansion seen in the US territory can also be perceived and identified in all regions of the globe, where in the past 30 years the explosion of the range of similar courses is very visible, with the clear strengthening of the perception of the population in seeking greater knowledge on the subject.

With this explosion of entrepreneurship courses offered by the most diverse HEIs, Kuratko (2005) explained that a wide range of methodological tools are being used and that experiential learning is being increasingly carried out in the transmission of knowledge about the subject. Solomon *et al.* (2002) reported the identification of the following learning tools:

- business plans (Hills, 1988; Vesper and McMullen, 1988, Presching, 1991; Gartner and Vesper, 1994; Gorman *et al.*, 1997);
- student start-ups (Hills, 1988; Truell *et al.*, 1998);
- practical consultancies with entrepreneurs (Klatt, 1988; Solomon *et al.*, 1994);
- computer simulations (Brawer, 1997);
- behavioural simulations (Stumpf *et al.*, 1991);
- interviews with entrepreneurs (Solomon *et al.*, 2002);
- real cases (Gartner and Vesper, 1994); and
- field visits and use of videos and films on the subject (Klatt, 1988).

The range of teaching methodologies and processes used in entrepreneurship education programmes is extremely broad, but Jones and Matlay (2011) stressed that the most used are debates, projects with current clients, cooperation with companies, seminars, workshops, hands-on training, work to develop entrepreneurial attitudes and business simulations.

The constant mutation and wide variety of pedagogical methodologies used in entrepreneurship programmes is the result, according to Solomon *et al.* (2002), of the

different demands and needs presented by the market. According to Kuratko (2005), it is possible to validate this question when verifying the creation of new interdisciplinary programmes for students in fields of study outside the management courses, such as programmes developed specifically for health sciences, arts, engineering and law academics, and to emphasise that the teachers are now constantly challenged to develop effective opportunities for entrepreneurship courses for the most diverse target audiences.

Welsh *et al.* (2016) pointed out that because of the conceptual changes on entrepreneurship, the new teaching methodologies, the different technological tools, the changes in the needs that the economy and society demand from learning in the subject and the differences in the results of scientific studies indicating the best way forward, the teaching of entrepreneurship undergoes a moment of ample transformation and adaptation. Even while experiencing this transition period, it is possible to highlight an abundant production of researchers on entrepreneurship education of the most diverse nationalities, such as that of McMullan and Long, 1987; Block and Stumpf, 1990; Charney and Libecap, 2000; Peterman and Kennedy, 2003; Shepherd, 2004; Honig, 2004; Fayolle, 2005; Kuratko, 2005; Wilson *et al.*, 2007; Guerra and Grazziotin, 2010; Welsh and Dragusin, 2011; Gibb, 2011; and Sánchez, 2013, and more recently, Do Paço *et al.*, 2015; Maresch *et al.*, 2016; Welsh *et al.*, 2016; Walter and Block, 2016; Ruskovaara *et al.*, 2016; Nabi *et al.*, 2010; Huq and Gilbert, 2017.

Within this range of heterogeneous pedagogical entrepreneurship programme methods, Lautenschläger and Haase (2011) divided entrepreneurship education from the 2000s into two major areas of education: one focuses on EE from the theoretical point of view, from research, from the transmission of knowledge about the subject and the other area approaches EE in a practical way, with tools to be used in the daily business life of the academic. In the recent literature, it is possible to note the growth of the focus on education aimed at teaching entrepreneurship with the aim of preparing, training and providing the tools for entrepreneurs to act in the market, going far beyond the transmission of theoretical knowledge on the subject (Cheung and Au, 2010; Elmuti *et al.*, 2012; Giovanela *et al.*, 2010; Peterson and Limbu, 2010).

Curran and Stanworth (1989) established a classification of entrepreneurship and education courses for micro and small entrepreneurs from the main objective of the programme, divided into four large groups:

- (1) training for micro, small and medium entrepreneurs, with the aim of preparing and providing the tools for them to face the challenges of their daily professional life;
- (2) specific training for owners of micro, small and medium enterprises, focusing on certain areas, demands, needs or peculiarities of their business;
- (3) information on SMEs, with the intention of disseminating information about these types of companies so that the students could envisage a career opportunity; and
- (4) education with an interest in awakening the EI and in offering the knowledge necessary to achieve this will, by teaching them to effectively implement their business, from conception to the opening of the company.

Liñán (2004) made a suggestion to improve the model presented by Curran and Stanworth (1989) to make it more modern and suitable to the most dynamic and competitive demands of the market, classifying and dividing the programmes into four areas:

- (1) education for entrepreneurial dynamism with the aim of stimulating proactive and dynamic behaviours in the managers of companies and awakening the EI;

- (2) specific and continuous training of the entrepreneur to develop the skills and abilities of companies in operation and improve their productivity, efficiency and professional effectiveness;
- (3) education for start-up, which aims to prepare the individual to be the MD of a company, with essentially practical content and material, meeting the latent needs of the process of planning, structuring and opening an organisation; and
- (4) theoretical knowledge about entrepreneurship with the purpose of disseminating knowledge about the challenges faced within micro-, small- and medium-sized companies.

Morris *et al.* (2013) emphasised that EE can serve as a platform both for students to become intent on becoming owners of their own businesses as they believe it being possible to turn students into successful entrepreneurs who effectively possess the skills necessary to achieve high organisational performance against an extremely competitive market.

Bird (1988) pointed out that intention is a state of mind that focuses the attention of a person, hence his/her experience and action, towards a specific goal or the way to achieving something. Having an EI means that the individual is committed to starting a new business (Krueger, 1993). Fayolle and Gailly (2015) explained that EI is influenced by a considerable number of personal and environmental factors.

To be able to make a correct measurement of the relationship between EE and EI, it is fundamental to verify and analyse which of the existing models is the most appropriate to guide this research. The theory of planned behaviour (TPB) proposed by Ajzen (1991) identifies three background attitudes to the effective existence of intention: the personal desire to perform certain behaviour, social perception about the implementation of certain behaviour and behavioural control. Shapero developed the "Model of the Entrepreneurial Event" (SEE) in 1982, which was clearly intended as a model of specific intentions related to the act of enterprise. Shapero and Sokol (1982) established the importance of self-efficacy in this process, in which Scherer *et al.* (1989) underscored the relationship between self-efficacy and the recognition of opportunities generating intentions of owning your own business. In SEE, it is assumed that inertia is the guide of human behaviour up to the moment that something interrupts or destabilises this movement and it includes the individual's desire to have his/her own business (verifying intra- and extra-personal impacts) and the capacity of the individual to accomplish that desire as variables.

Krueger *et al.* (2000) considered that TPB and SEE are two equivalent models that are valuable tools to analyse the process of creation of companies and that highlight the existence of the propensity to act as a factor in the Shapero model (Shapero and Sokol, 1982) as a necessary volitional element to properly measure the EI.

There are several recent studies seeking to identify factors that relate to EE with the intention of the individual to enterprise (Krueger *et al.*, 2000; Bhandari, 2006; Barkovic and Kruzic, 2010; Byabashaija and Katono, 2011; Díaz-Casero *et al.*, 2012; Díaz-García and Jiménez-Moreno, 2010; Li, 2006; Ferreira *et al.*, 2012; Hytti and Kuopusjärvi, 2004; Moro *et al.*, 2004; Oosterbeek *et al.*, 2010; Peterman and Kennedy, 2003; Souitaris *et al.*, 2007).

Honig (2004) explained that despite the substantial amount of studies and surveys that seek to relate EE with the increasing enterprise intention of its participants, follows the existence of theoretical and empirical disagreements about the effective proof of this correlation.

Corroborating with the affirmation of Honig (2004), Von Graevenitz *et al.* (2010) and Lautenschläger and Haase (2011) also claimed that the debate on the proof of this correlation

remains open; even with studies and research works that have shown that EE increases EI, there is enough contention on this issue.

Meta-analytic research was carried out to address these questions. [Martin *et al.* \(2013\)](#) conducted a meta-analysis using the main studies in the databases of academic journals, business and management education around the world and of North American associations as a cornerstone to verify the effectiveness of education and training in entrepreneurship in several factors. The result obtained from 42 studies examined proved the existence of the relationship between EE and the EI. However, in the same year, [Rideout and Gray \(2013\)](#) presented research where they performed an extensive analysis of published studies on EE at the university level between 1997 and 2011, confronting such results, in which they concluded that it was not possible to verify and faithfully attest a solid cause-and-effect relationship between EE and EI.

[Bae *et al.* \(2014\)](#) had already performed a broader meta-analysis, reviewing 73 studies with a total of 37,285 responses and found a significant correlation between EE and EI.

In view of the lack of consensus on the effects of EE, several authors such as [Honig \(2004\)](#), [Von Graevenitz *et al.* \(2010\)](#), [Lautenschläger and Haase \(2011\)](#), [Martin *et al.* \(2013\)](#), [Rideout and Gray \(2013\)](#), [Ruskovaara *et al.* \(2016\)](#) and [Welsh *et al.* \(2016\)](#) suggested more research in this area to be carried out to respond concretely to the conflicting points that still exist.

[Maresch *et al.* \(2016\)](#) also emphasised the importance of further work in the comparison of the effect of EE on different fields of study at university level because of the different results that each field of training has presented outside the teaching of entrepreneurship.

The level of entrepreneurial intent in university students has been studied and analysed in several different ways in the past decade ([Kristiansen and Indarti, 2004](#); [Souitaris *et al.*, 2007](#); [Wu and Wu, 2008](#); [Turker and Sonmez Selçuk, 2009](#); [Pruett *et al.*, 2009](#); [Bickenbach *et al.*, 20017](#)): some of these sought to carry out a comparative analysis between regions of the same nation or from different countries ([Kristiansen and Indarti, 2004](#); [Pruett *et al.*, 2009](#); [Liñán *et al.*, 2011](#); [Bickenbach *et al.*, 2017](#)), others intended to understand which are the factors that interfere in the EI level of the students analysed, and only the study realised by [Maresch *et al.* \(2016\)](#) sought to compare the impact of entrepreneurship education at the level of EI among university students of engineering and business. In this way, it is clear that even though there is a great amount of content and research previously done on the subject in general, there are still specifics that need to be deepened to better understand all the dimensions of this vast field of study.

Taking these notes into consideration, this work presents the following hypotheses to be tested:

- H1.* There is a significant difference in the entrepreneurial intention among academics from different undergraduate courses.
- H2.* Academics who have undertaken any EE programme have a higher entrepreneurial intention than academics who do not have any contact with entrepreneurship courses.
- H3.* There is no significant difference in the entrepreneurial intention between academics from different undergraduate courses who undertook any EE programme.

Methodology

The methodology corresponds to the set of procedures adopted for the studies in their scientific rigor allowing to deepen in the approach ([Almeida, 2011](#)) and to be based on the

problem formulated, thus showing the different categories of typologies of the contemplated research (Beuren, 2008; Vergara, 2014).

As for the purpose of the present research, it is an exploratory and descriptive nature. This is because of the review of published academic papers on entrepreneurship education and EI and the methodologies used to reach the research objectives, ascertaining and perceiving the facts without the modification of the information found (Andrade and de Andrade Martins, 2010); (Ruiz, 2008), seeks detailed knowledge about entrepreneurship and increases the researcher's intimacy with content (Marconi and Lakatos, 2015).

The research is characterised as a practical study, the present work is based on the perquisition of the reality of university students linked to the EE programmes of the most diverse courses and areas of knowledge about the EI (Yin, 2015). Regarding the result of the research, it is configured as applied, because it generates knowledge in response to the solution of specific problems in a specific situation (Gil, 2010).

The logic of the research is deductive because initiates of a conceptual and theoretical structure defined on education and EI for the application in the chosen sample, hence, part of the knowledge of the facts for the understanding of these (Richardson, 2011). Andrade and de Andrade Martins (2010) emphasised that the deductive method aims at the general thought for a particular as a way to predict manifestations arising from theories. Candiotto *et al.* (2011) corroborated when they said that the fundamental objective of deduction is to establish the already-defined demonstrations.

The primary data were collected from the application of a questionnaire with previously established questions (Severino, 2007). Therefore, it should be noted that the approach to the problem is predominantly quantitative, with qualitative aspects; qualitative, because the results are described in a descriptive way as a direct source of data (Almeida, 2011) and quantitative, because the instrument of collection was made available online and analysed using quantitative methods, with the help of SPSS 24 software. The research result is typified as applied because it generates knowledge in response to the solution of specific problems in a particular situation (Gil, 2010). As for technical procedures, it is a survey because information is obtained directly from a group of people that intended to understand (Richardson, 2011; Beuren, 2008; Gil, 2010; Cooper and Schindler, 2016).

The instrument used was a questionnaire with 50 questions, applied in 491 business, accounting sciences, law, environmental engineering, civil engineering, production engineering, mechanical engineering, hospitality and pedagogy undergraduate-level students in Brazil, who were selected according to the courses in which they were enrolled, aiming to encompass the most diverse areas of study for future analytical comparison purposes. The questionnaires were applied between September and November 2016. Before the questionnaire was sent to the students participating in the study, two pretests were carried out: the first one with 30 university students to verify the perfect understanding of the questions and information requested, after some punctual corrections, a new test was applied to validate the questionnaire with other 20 undergraduate students. To review and direct the aspects of the research, the pretest, according to Richardson (2011), is a previous application of the questionnaire to a group similar to what will be researched effectively.

The questionnaire had 50 questions, 10 for correct identification filter of the respondent and 40 for effective data collection. In this group, we specifically questioned the intention to participate in trainee programmes, to seek jobs in the public and/or private service and the level of the EI on each of the participants, using the five-point Likert scale of verification, which according to Costa (2011) emphasises besides the ease of handling, the confirmation of the consistency in the metrics that have already used this scale collaborates positively in the most diverse researches. According to Cooper and Schindler (2016), this scale allows to

establish a parameter between being favourable or unfavourable about the object of interest of the research objective, which Richardson (2011) classified as positive and negative affirmations.

Results

As the first step, descriptive statistics of the EI of each participant were produced, separated by the undergraduate courses of each participant (Table I) and in the sequence the descriptive statistics of the EI were realised, divided by undergraduate course, comparing the results of the EI between those who had already completed any EE programme (Table II). It is important to note that within the sample of 491 academics, 134 academics

Course	Statistics	Bias	Standard error	Bootstrap ^a
				95% BCa lower confidence Interval
<i>Management</i>				
Average	3.63	0.00	0.14	3.34
Standard deviation	1.447	−0.009	0.073	1.297
<i>Accountancy</i>				
Average	3.90	0.01	0.13	3.62
Standard deviation	1.402	−0.012	0.085	1.226
<i>Law</i>				
Average	3.77	−0.01	0.30	3.18
Standard deviation	1.445	−0.040	0.199	1.005
<i>Environmental engineering</i>				
Average	4.06	0.00	0.29	3.38
Standard deviation	1.237	−0.075	0.257	0.806
<i>Civil engineering</i>				
Average	3.88	0.00	0.41	3.06
Standard deviation	1.668	−0.074	0.268	1.094
<i>Production engineering</i>				
Average	3.77	0.00	0.17	3.41
Standard deviation	1.467	−0.014	0.090	1.290
<i>Mechanical engineering</i>				
average	3.87	0.01	0.15	3.58
Standard deviation	1.241	−0.020	0.104	1.058
<i>Hospitality</i>				
Average	3.63	0.00	0.39	3.00
Standard deviation	1.188	−0.101	0.212	0.916
<i>Pedagogy</i>				
Average	3.77	0.01	0.15	3.47
Standard deviation	1.290	−0.014	0.084	1.132
<i>Total</i>				
Average	3.80	0.00	0.06	3.68
Standard deviation	1.378	−0.004	0.035	1.315

Note: ^aUnless indicated otherwise, the bootstrap results are based on 1,000 stratified bootstrap samples

Table I.
Entrepreneurial
intention

Table II.
Entrepreneurial
intention vs
entrepreneurial
education

from the management, accounting and production engineering courses had entrepreneurship disciplines. The other 355 respondents had no entrepreneurship programmes, either because they were in the initial stages or because of the effective absence of EE in the matrix curricular of their courses.

Among the academics analysed, the ones that showed the highest average score in EI were the environmental engineering students who reached 4.06 on the five-point scale, followed by the accounting students with a score of 3.90 and other engineering students. The academics with the lowest EI among the participants were those from the management and hospitality courses, who achieved a score of 3.63 on the five-point scale. When considering all the students participating in the sample, the average EI was 3.80 points.

The variation of scores obtained among the respondents in the management course (3.63) and the environmental engineering course (4.06), as it is possible to analyse in [Table I](#) and [Figure 1](#), validates *H1* by demonstrating a significant difference in EI among academics from different fields of undergraduate study.

By exploring the data among the academics participating in the survey, who have already undertaken one or more entrepreneurship programmes, from the management, accounting and production engineering courses, the result did not exhibit a pattern. Students from the management and production engineering courses who completed some sort of EE presented a score for EI that was significantly greater than those who have not yet had contact with EE, with a positive difference of 0.32 and 0.19 points, respectively. However, students from the accounting course exhibited a negative difference of 0.06 points, not making it possible to assert that in all courses examined, the academics who undertook some type of entrepreneurship programme increased their EI. By analysing them

Course	EE	Average	SD
Management	No	3.46	1.458
	Yes	3.78	1.433
	Variation	0.32	–
Accountancy	No	3.93	1.365
	Yes	3.87	1.471
	Variation	–0.06	–
Production engineering	No	3.66	1.610
	Yes	3.85	1.369
	Variation	0.19	–

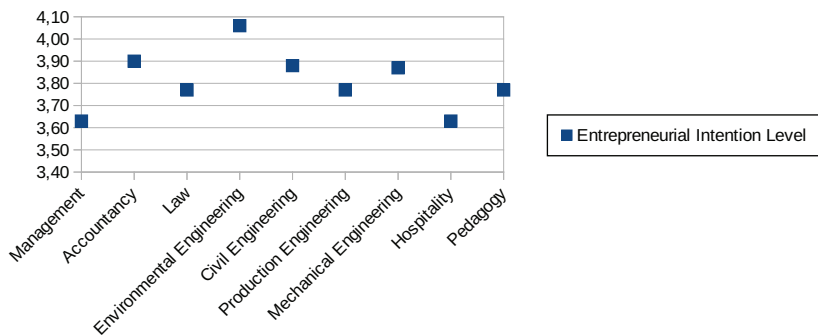


Figure 1.
Entrepreneurial
intention level ×
course

separately, it is possible to affirm that EE generated an increase in the EI between the academics of production engineering and management. However, it did not have the same effect on accounting students, which only partially validates *H2* presented in this research.

The level of EI of the academics who underwent any EE programme is quite similar regardless of the course in question; the score of the students from the management course (3.78) is the lower than the engineering (3.85) and the accounting students (3.87) (Table III). However, there is no significant difference between academics from different undergraduate courses who have undertaken any EE programme, which corroborates and validates *H3* of this study.

Conclusions

The objective of this study was to verify students whose courses showed a greater intention to undertake and, in addition, seek to analyse the effect of the EE on EI from the different academic perspectives to verify if the impact of EE in the EI would be the same in spite of the differences between the profiles, perspectives and market opportunities of the students in each of the courses tested.

With the result of this research, it was possible to prove that among the undergraduate courses analysed, the students from the environmental engineering course were the ones who presented the highest degree of EI at the undergraduate level, and the students from all the engineering courses demonstrated a higher EI than the management students.

This study also presented different results in terms of the effect of entrepreneurship education in the EI in students who undertook some kind of entrepreneurship programme. In management courses such as administration, the effect of EE on EI was more pronounced. It also had a significant result in the engineering course analysed; however, in the course of the financial field studied, accounting, the effect of EE on EI was irrelevant.

In this way, this result corroborates with the studies of [Honig \(2004\)](#), [Von Graevenitz et al. \(2010\)](#) and [Lautenschläger and Haase \(2011\)](#), who claimed that it is not possible to have a conclusive and effective result on the effect of EE on the individual's EI.

Even with the general management course being developed to train managers capable of competing in the market, this study demonstrated that when future managers have not yet had contact with EE, their EI is substantially lower than the average of the students from other undergraduate courses, and that after completing an entrepreneurship programme, their EI score rises sharply, practically reaching the general average at the university level.

This work also showed that after completing the EE programmes, academics from different undergraduate fields, such as management, accounting and production engineering, tend to have very similar EI indexes, without very significant variations between them, a result different from those who have never participated in entrepreneurship courses.

One of the limitations of this study was that it did not seek to identify other factors that might have influenced the variation of the effect of entrepreneurship education on the EI. This was very clear when analysing the case of accounting students. What were the reasons for the entrepreneurship education not to have a positive effect on EI within this group,

Course	EE	Average	SD
Management	Yes	3.78	1.433
Accountancy	Yes	3.87	1.471
Production engineering	Yes	3.85	1.369

Table III.
Entrepreneurial
intention vs
entrepreneurial
education

when this occurred in the other two groups analysed? What were the variables that caused this difference?

Future studies in the field may seek to deepen this difference in results across the courses analysed to understand what other factors are limiting the influence of EE in EI within accounting students. Another path to analyse is also whether the methodology of the EE programme has an influence on the EI of its participants. As this study did not analyse this question, it is another point to be validated in new research.

It would also be interesting to replicate the research on EI in different undergraduate courses in other regions of the world to verify if the results achieved are similar in other locations and to conduct a longitudinal study with the same group of students to verify whether before and after the EE, the result of EI changed significantly.

Therefore, this study was important in identifying and validating the relevance of entrepreneurship programmes in the promotion of EI within undergraduate courses in the fields of administration and engineering in Brazilian HEIs. This should encourage investment in these programmes by educators, university managers, companies and public authorities with the purpose of fostering entrepreneurship and consecutively seeking to boost economic and social growth in those places.

References

- Ajzen, I. (1991), "The theory of planned behavior", *Organizational Behavior and Human Decision Processes*, Vol. 50 No. 2, pp. 179-211.
- Almeida, M.D.S. (2011), "Elaboração de projeto, TCC", Doctoral dissertation, dissertação e tese: uma abordagem simples, prática e objetiva, Atlas, São Paulo.
- Andrade, M.M. and de Andrade Martins, J.A. (2010), *Introdução à metodologia do trabalho científico: elaboração de trabalhos na graduação*, Atlas.
- Bae, T.J., Qian, S., Miao, C. and Fiet, J.O. (2014), "The relationship between entrepreneurship education and entrepreneurial intentions: a Meta-analytic review", *Entrepreneurship Theory and Practice*, Vol. 38 No. 2, pp. 217-254.
- Barkovic, D. and Kruzic, D. (2010), "Students' perceptions and intentions towards entrepreneurship: the empirical findings from Croatia", *Business Review*, Vol. 14 No. 2, pp. 209-215.
- Beuren, I.M. (2008), *Como elaborar trabalhos monográficos em contabilidade*. -3. Reimpr, Atlas, São Paulo.
- Bhandari, N.C. (2006), "Intention for entrepreneurship among students in India", *Journal of Entrepreneurship*, Vol. 15 No. 2, pp. 169-179.
- Bickenbach, F., Dohse, D. and Liu, W.H. (2017), "University students' entrepreneurial intentions: a comparative analysis of Hong Kong and Guangzhou", *China & World Economy*, Vol. 25 No. 2, pp. 60-84.
- Bird, B. (1988), "Implementing entrepreneurial ideas: the case for intention", *Academy of Management Review*, Vol. 13 No. 3, pp. 442-453.
- Block, Z. and Stumpf, S.A. (1990), *Entrepreneurship Education Research: experience and Challenge*, Center for Entrepreneurial Studies, New York University, Leonard N. Stern School of Business.
- Brawer, F.B. (1997), "Simulation as a vehicle in entrepreneurship education", *ERIC Digest*, Vol. 97 No. 1, pp. 433-469.
- Byabashaija, W. and Katono, I. (2011), "The impact of college entrepreneurial education on entrepreneurial attitudes and intention to start a business in Uganda", *Journal of Developmental Entrepreneurship*, Vol. 16 No. 1, pp. 127-144.
- Candiotto, C., Bastos, C.L. and Candiotto, K.B. (2011), *Fundamentos da pesquisa científica: teoria e prática*, Vozes, Petrópolis, RJ.

-
- Charney, A. and Libecap, G.D. (2000), *Impact of Entrepreneurship Education*, Kauffman Center for Entrepreneurial Leadership, p. 45-60.
- Chen, S.C., Hsiao, H.C., Chang, J.C., Chou, C.M., Chen, C.P. and Shen, C.H. (2015), "Can the entrepreneurship course improve the entrepreneurial intentions of students?", *International Entrepreneurship and Management Journal*, Vol. 11 No. 3, pp. 557-569.
- Cheung, C.K. and Au, E. (2010), "Running a small business by students in a secondary school: its impact on learning about entrepreneurship", *Journal of Entrepreneurship Education*, Vol. 13, p. 45.
- Cooper, D.R. and Schindler, P.S. (2016), *Métodos de Pesquisa em Administração-12a Edição*, McGraw Hill, Brasil.
- Costa, F.D. (2011), *Mensuração e desenvolvimento de escalas: aplicações em administração*, Ciência Moderna, Rio de Janeiro.
- Curran, J. and Stanworth, J. (1989), "Education and training for enterprise: problems of classification, evaluation, policy and research", *International Small Business Journal: Researching Entrepreneurship*, Vol. 7 No. 2, pp. 11-22.
- Díaz-Casero, J.C., Ferreira, J.J.M., Mogollón, R.H. and Raposo, M.L.B. (2012), "Influence of institutional environment on entrepreneurial intention: a comparative study of two countries university students", *International Entrepreneurship and Management Journal*, Vol. 8 No. 1, pp. 55-74.
- Díaz-García, M.C. and Jiménez-Moreno, J. (2010), "Entrepreneurial intention: the role of gender", *International Entrepreneurship and Management Journal*, Vol. 6 No. 3, pp. 261-283.
- Do Paço, A., Ferreira, J.M., Raposo, M., Rodrigues, R.G. and Dinis, A. (2015), "Entrepreneurial intentions: is education enough?", *International Entrepreneurship and Management Journal*, Vol. 11 No. 1, pp. 57-75.
- Elmuti, D., Khoury, G. and Omran, O. (2012), "Does entrepreneurship education have a role in developing entrepreneurial skills and ventures' effectiveness?", *Journal of Entrepreneurship Education*, Vol. 15, p. 83.
- Fayolle, A. (2005), "Evaluation of entrepreneurship education: behaviour performing or intention increasing?", *International Journal of Entrepreneurship and Small Business*, Vol. 2 No. 1, pp. 89-98.
- Fayolle, A. and Gailly, B. (2015), "The impact of entrepreneurship education on entrepreneurial attitudes and intention: hysteresis and persistence", *Journal of Small Business Management*, Vol. 53 No. 1, pp. 75-93.
- Ferreira, J.J., Raposo, M.L., Gouveia Rodrigues, R., Dinis, A. and do Paço, A. (2012), "A model of entrepreneurial intention: an application of the psychological", *Journal of Small Business and Enterprise Development*, Vol. 19 No. 3, pp. 424-440.
- Gartner, W.B. and Vesper, K.H. (1994), "Experiments in entrepreneurship education: successes and failures", *Journal of Business Venturing*, Vol. 9 No. 3, pp. 179-187.
- Gibb, A. (2011), "Concepts into practice: meeting the challenge of development of entrepreneurship educators around an innovative paradigm: the case of the international Entrepreneurship Educators' Programme (IEEP)", *International Journal of Entrepreneurial Behavior & Research*, Vol. 17 No. 2, pp. 146-165.
- Gil, C.A. (2010), *Como elaborar projetos de pesquisa*, Atlas, São Paulo.
- Giovanela, A., Tvzská, D.E., Gouveia, A.B.C., Frâncio, S. and Dalfovo, O. (2010), "As características da disciplina de empreendedorismo em Instituições de Ensino Superior (IES) do Estado de Santa Catarina", *Revista Gestão Universitária na América Latina-GUAL*, Vol. 3 No. 1.
- Gorman, G., Hanlon, D. and King, W. (1997), "Some research perspectives on entrepreneurship education, enterprise education and education for small business management: a ten-year literature review", *International Small Business Journal*, Vol. 15 No. 3, pp. 56-77.
- Guerra, M.J. and Grazziotin, Z.J. (2010), "Educação empreendedora nas universidades brasileiras", *Educação empreendedora: conceitos, modelos e práticas*, pp. 67-91.

- Hills, G.E. (1988), "Variations in university entrepreneurship education: an empirical study of an evolving field", *Journal of Business Venturing*, Vol. 3 No. 2, pp. 109-122.
- Honig, B. (2004), "Entrepreneurship education: toward a model of contingency-based business planning", *Academy of Management Learning & Education*, Vol. 3 No. 3, pp. 258-273.
- Huber, L.R., Sloof, R. and Van Praag, M. (2014), "The effect of early entrepreneurship education: evidence from a field experiment", *European Economic Review*, Vol. 72, pp. 76-97.
- Huq, A. and Gilbert, D. (2017), "All the world's a stage: transforming entrepreneurship education through design thinking", *Education+ Training*, Vol. 59 No. 2, pp. 155-170.
- Hytti, U. and Kuopusjärvi, P. (2004), "Evaluating and measuring entrepreneurship and enterprise education: methods, tools and practices", available at: www.entrevva.net
- Jones, C. and Matlay, H. (2011), "Understanding the heterogeneity of entrepreneurship education: going beyond Gartner", *Education+ Training*, Vol. 53 Nos 8/9, pp. 692-703.
- Katz, J.A. (2003), "The chronology and intellectual trajectory of American entrepreneurship education: 1876-1999", *Journal of Business Venturing*, Vol. 18 No. 2, pp. 283-300.
- Klatt, L.A. (1988), "A study of small business/entrepreneurial education in colleges and universities", *The Journal of Private Enterprise*, Vol. 4 (Fall), pp. 103-108.
- Kristiansen, S. and Indarti, N. (2004), "Entrepreneurial intention among Indonesian and Norwegian students", *Journal of Enterprising Culture*, Vol. 12 No. 1, pp. 55-78.
- Krueger, N. (1993), "The impact of prior entrepreneurial exposure on perceptions of new venture feasibility and desirability", *Entrepreneurship: Theory and Practice*, Vol. 18 No. 1, pp. 5-22.
- Krueger, N.F., Reilly, M.D. and Carsrud, A.L. (2000), "Competing models of entrepreneurial intentions", *Journal of Business Venturing*, Vol. 15 Nos 5/6, pp. 411-432.
- Kuratko, D.F. (2005), "The emergence of entrepreneurship education: development, trends, and challenges", *Entrepreneurship Theory and Practice*, Vol. 29 No. 5, pp. 577-598.
- Kuratko, D.F. and Hodgetts, R.M. (2004), *Entrepreneurship: Theory, Process, Practice*, South, Mason, OH.
- Lautenschläger, A. and Haase, H. (2011), "The myth of entrepreneurship education: seven arguments against teaching business creation at universities", *Journal of Entrepreneurship Education*, Vol. 14, p. 147.
- Lee, L., Wong, P.K., Der Foo, M. and Leung, A. (2011), "Entrepreneurial intentions: the influence of organizational and individual factors", *Journal of Business Venturing*, Vol. 26 No. 1, pp. 124-136.
- Li, W. (2006), "Entrepreneurial intention among international students: testing a model of entrepreneurial intention", *USASBE Small Business Advancement National Center*.
- Lima, E., Lopes, R.M.A., Nassif, V.M.J. and Silva, D. (2015), "Ser seu Próprio Patrão? Aperfeiçoando-se a Educação Superior em Empreendedorismo/interested", *Revista De Administração Contemporânea*, Vol. 19 No. 4, p. 419.
- Liñán, F. (2004), "Intention-based models of entrepreneurship education", *Piccola Impresa/Small Business*, Vol. 3 No. 1, pp. 11-35.
- Liñán, F., Urbano, D. and Guerrero, M. (2011), "Regional variations in entrepreneurial cognitions: start-up intentions of university students in Spain", *Entrepreneurship and Regional Development*, Vol. 23 Nos 3/4, pp. 187-215.
- Lopes, R.M.A. (2010), *Educação empreendedora: conceitos, modelos e práticas*, Elsevier.
- McMullan, W.E. and Long, W.A. (1987), "Entrepreneurship education in the nineties", *Journal of Business Venturing*, Vol. 2 No. 3, pp. 261-275.
- Marconi, M.D.A. and Lakatos, E.M. (2015), *Técnicas de pesquisa*, Atlas, São Paulo.
- Maresch, D., Harms, R., Kailer, N. and Wimmer-Wurm, B. (2016), "The impact of entrepreneurship education on the entrepreneurial intention of students in science and engineering versus

- business studies university programs", *Technological Forecasting and Social Change*, Vol. 104, pp. 172-179.
- Martin, B.C., McNally, J.J. and Kay, M.J. (2013), "Examining the formation of human Capital in entrepreneurship: a Meta-analysis of entrepreneurship education outcomes", *Journal of Business Venturing*, Vol. 28 No. 2, pp. 211-224.
- Moro, D., Poli, A. and Bernardi, C. (2004), "Training the future entrepreneur", *International Journal of Entrepreneurship and Small Business*, Vol. 1 Nos 1/2, pp. 192-205.
- Morris, M.H., Webb, J.W., Fu, J. and Singhal, S. (2013), "A competency-based perspective on entrepreneurship education: conceptual and empirical insights", *Journal of Small Business Management*, Vol. 51 No. 3, pp. 352-369.
- Nabi, G., Holden, R. and Walmsley, A. (2010), "Entrepreneurial intentions among students: towards a re-focused research agenda", *Journal of Small Business and Enterprise Development*, Vol. 17 No. 4, pp. 537-551.
- Naudé, W. (2013), "Entrepreneurship and economic development: theory, evidence and policy", Browser Download This Paper.
- Oosterbeek, H., Van Praag, M. and Ijsselstein, A. (2008), "The impact of entrepreneurship education on entrepreneurship competencies and intentions: an evaluation of the junior achievement student mini-company program", Tinbergen Institute discussion papers, TI 2008-038/3.
- Oosterbeek, H., Van Praag, M. and Ijsselstein, A. (2010), "The impact of entrepreneurship education on entrepreneurship skills and motivation", *European Economic Review*, Vol. 54 No. 3, pp. 442-454.
- Peterman, N.E. and Kennedy, J. (2003), "Enterprise education: influencing students' perceptions of entrepreneurship", *Entrepreneurship Theory and Practice*, Vol. 28 No. 2, pp. 129-144.
- Peterson, R.T. and Limbu, Y. (2010), "Student characteristics and perspectives in entrepreneurship courses: a profile", *Journal of Entrepreneurship Education*, Vol. 13, p. 65.
- Premand, P., Brodmann, S., Almeida, R., Grun, R. and Barouni, M. (2016), "Entrepreneurship education and entry into self-employment among university graduates", *World Development*, Vol. 77, pp. 311-327.
- Presling, W.A. (1991), "Education by projects", *Journal of Small Business & Entrepreneurship*, Vol. 9 No. 1, pp. 55-59.
- Pruett, M., Shinnar, R., Toney, B., Llopis, F. and Fox, J. (2009), "Explaining entrepreneurial intentions of university students: a cross-cultural study", *International Journal of Entrepreneurial Behavior & Research*, Vol. 15 No. 6, pp. 571-594.
- Richardson, R.J. (2011), *Pesquisa Social: métodos e Técnicas*, 12th ed., Atlas, São Paulo.
- Rideout, E.C. and Gray, D.O. (2013), "Does entrepreneurship education really work? A review and methodological critique of the empirical literature on the effects of university-based entrepreneurship education", *Journal of Small Business Management*, Vol. 51 No. 3, pp. 329-351.
- Ruiz, J.Á. (2008), *Metodologia científica—guia para referências de estudos*.
- Ruskovaara, E., Hämäläinen, M. and Pihkala, T. (2016), "HEAD teachers managing entrepreneurship education—empirical evidence from general education", *Teaching and Teacher Education*, Vol. 55, pp. 155-164.
- Sánchez, J.C. (2013), "The impact of an entrepreneurship education program on entrepreneurial competencies and intention", *Journal of Small Business Management*, Vol. 51 No. 3, pp. 447-465.
- Scherer, R.F., Adams, J.S., Carley, S.S. and Wiebe, F.A. (1989), "Role model performance effects on development of entrepreneurial career preference", *Entrepreneurship Theory and Practice*, Vol. 13 No. 3, pp. 53-72.
- Schumpeter, J.A. (1934), *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle* (Vol. 55), Transaction publishers.
- Severino, A.J. (2007), *Metodologia do trabalho acadêmico científico*, 23th ed., Cortez, São Paulo.

- Shapero, A.S. and Sokol, L. (1982), "Social dimensions of entrepreneurship, *Sexton, DL y Vesper, KH Encyclopedia of Entrepreneurship*, Kent, CA, pp. 72-90.
- Shepherd, D.A. (2004), "Educating entrepreneurship students about emotion and learning from failure", *Academy of Management Learning & Education*, Vol. 3 No. 3, pp. 274-287.
- Solomon, G.T., Duffy, S. and Tarabishy, A. (2002), "The state of entrepreneurship education in the United States: a nationwide survey and analysis", *International Journal of Entrepreneurship Education*, Vol. 1 No. 1, pp. 65-86.
- Solomon, G.T., Weaver, K.M. and Fernald Jr, L.W. (1994), "Pedagogical methods of teaching entrepreneurship: an historical perspective", *Gaming and Simulation*, Vol. 25 No. 3, pp. 67-79.
- Souitaris, V., Zerbini, S. and Al-Laham, A. (2007), "Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources", *Journal of Business Venturing*, Vol. 22 No. 4, pp. 566-591.
- Stumpf, S.S., Dunbar, R.L. and Mullen, T.P. (1991), "Simulations in entrepreneurship education: oxymoron or untapped opportunity", *Frontiers of Entrepreneurship Research*, Vol. 11, pp. 681-694.
- Truell, A.D., Price Jr, W.T. and Joyner, R.L. (1998), "Job satisfaction among community college occupational-technical faculty", *Community College Journal of Research and Practice*, Vol. 22 No. 2, pp. 111-122.
- Turker, D. and Sonmez Selçuk, S. (2009), "Which factors affect entrepreneurial intention of university students?", *Journal of European Industrial Training*, Vol. 33 No. 2, pp. 142-159.
- UNCTAD Secretariat (2015), "Division on Investment and Enterprise: results and Impact – Report 2015" *United Nations Conference on Trade and Development (UNCTAD)*, Geneva, available at: http://unctad.org/en/PublicationsLibrary/diae2015d1_en (pdf), (accessed 28 April 2017).
- Vergara, S.C. (2014), "Gestão de pessoas", *Projetos e relatórios de pesquisa em administração*, Vol. 7.
- Vesper, K.H. and McMullen, W.E. (1988), "Entrepreneurship: today courses, tomorrow degrees?", *Entrepreneurship Theory and Practice*, Vol. 13 No. 1, pp. 7-13.
- Von Graevenitz, G., Harhoff, D. and Weber, R. (2010), "The effects of entrepreneurship education", *Journal of Economic Behavior & Organization*, Vol. 76 No. 1, pp. 90-112.
- Walter, S.G. and Block, J.H. (2016), "Outcomes of entrepreneurship education: an institutional perspective", *Journal of Business Venturing*, Vol. 31 No. 2, pp. 216-233.
- Welsh, D.H. and Dragusin, M. (2011), "Entrepreneurship education in higher education institutions as a requirement in building excellence in business: the case of the University of North Carolina at Greensboro", *Forumware International*, Vol. 1, pp. 266-272.
- Welsh, D.H., Tullar, W.L. and Nemati, H. (2016), "Entrepreneurship education: process, method, or both?", *Journal of Innovation & Knowledge*, Vol. 1 No. 3, pp. 125-132.
- Westhead, P. and Solesvik, M.Z. (2016), "Entrepreneurship education and entrepreneurial intention: do female students benefit?", *International Small Business Journal*, Vol. 34 No. 8, pp. 979-1003.
- Wilson, F., Kickul, J. and Marlino, D. (2007), "Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: implications for entrepreneurship education", *Entrepreneurship Theory and Practice*, Vol. 31 No. 3, pp. 387-406.
- Wu, S. and Wu, L. (2008), "The impact of higher education on entrepreneurial intentions of university students in China", *Journal of Small Business and Enterprise Development*, Vol. 15 No. 4, pp. 752-774.
- Yin, R.K. (2015), *Estudo de Caso: Planejamento e Métodos*, Bookman editora.

Further reading

- Liñán, F. and Fayolle, A. (2015), "A systematic literature review on entrepreneurial intentions: citation, thematic analyses, and research agenda", *International Entrepreneurship and Management Journal*, Vol. 11 No. 4, pp. 907-933.
- Solomon, G. (2007), "An examination of entrepreneurship education in the United States", *Journal of Small Business and Enterprise Development*, Vol. 14 No. 2, pp. 168-182.
- UNCTAD Secretariat (2011), "Entrepreneurship education, innovation and capacity-building in developing countries", United Nations Conference on Trade and Development (UNCTAD), Geneva, available at: http://unctad.org/en/docs/ciimem1d9_en.pdf (accessed 28 April 2017).

Corresponding author

Diego Passoni can be contacted at: diegopassoni@outlook.com

Reproduced with permission of copyright owner. Further reproduction prohibited without permission.