

Predicting entrepreneurial motivation among university students

The role of entrepreneurship education

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Motivation
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Abstract

Purpose – The purpose of this paper is to better understand the main drivers of entrepreneurial motivation among university students and to determine whether entrepreneurship education has a moderating effect on improving the impact of knowledge base and entrepreneurship competencies on entrepreneurial motivation.

Design/methodology/approach – This study uses a mixed-method approach that combines qualitative interviews and a cross-sectional survey of a sample of 465 university students.

Findings – The study reveals that entrepreneurship competencies are a predictor of entrepreneurship motivation but that knowledge base is not. Additionally, entrepreneurship education does not improve the motivation of university students to become entrepreneurs. These findings suggest that, to increase entrepreneurial motivation, pedagogy should emphasize the development of students' entrepreneurial psychological and social skills by covering in particular the emotional dimension and critical thinking.

Originality/value – This research contributes to the literature on entrepreneurship education and provides strategic recommendations for university managers and education-policy makers.

Keywords Entrepreneurship education, Entrepreneurial motivations, Entrepreneurial competencies

Paper type Research paper

1. Introduction

Entrepreneurship is the creation and implementation of new opportunities in an environment marked by a high degree of complexity and uncertainty (Neck and Greene, 2011). It represents a key driver of the growth and sustainability of an economy, as well as a mechanism of social development (Rasmussen and Sorheim, 2006). The promotion of an entrepreneurial culture is sometimes seen as a panacea for complex problems such as low productivity, decline or economic stagnation, and high rates of youth and adult unemployment (Gray, 1998; Mayhew *et al.*, 2012). Therefore, it has been assumed as a priority area for public-policy makers. Developing a business structure capable of discovering and exploring opportunities in environments marked by dynamism, complexity, and uncertainty, as well as educating competent individuals to manage these projects, is a priority (Ronstadt, 1985). In this sense, entrepreneurship education has expanded significantly in most industrialized countries (Matlay and Carey, 2006; Rae *et al.*, 2014) and governments worldwide have sought to introduce a range of programs to support entrepreneurship in university education (Greene and Saridakis, 2008; Preedy and Jones, 2015).



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Higher education institutions pay particular attention to entrepreneurship because it allows them to assert themselves as active agents contributing to the economic and social development of their regions. In this context, entrepreneurship education is seen as a strategic response that may contribute to an increase in entrepreneurial activity (Laukkanen, 2000). Universities thus might have an important role in increasing the competence of their students, motivating them toward future entrepreneurial activity (Rasmussen and Sorheim, 2006).

Despite the recognized importance of entrepreneurship from an economic and social point of view, no generally accepted theory in the field yet exists (Bull and Willard, 1993; Henry *et al.*, 2005); the study of entrepreneurship still being in its “infancy” (Brazeal and Herbert, 1999, p. 29). Other authors also share this view by highlighting that entrepreneurship education research is still at the exploratory stage (see, e.g. Gorman *et al.*, 1997; Graevenitz *et al.*, 2010; Souitaris *et al.*, 2007) so, for the future of entrepreneurship education, “we need robust theoretical and conceptual foundations” (Fayolle, 2013, p. 693). Entrepreneurship theory has tended to systemize separate rather than accumulated theories (Fiet, 2000) and the existing paradigms only provide a limited understanding of the complexities of entrepreneurship education (Matlay, 2008; Colette, 2013). For example, the impact of entrepreneurship education on the motivations and skills for entrepreneurship is not consensual (Gorman *et al.*, 1997). Whereas some studies postulate that students who attended courses where entrepreneurship was part of the curriculum show a greater propensity and motivation to undertake entrepreneurial activities (see, e.g. Fenton and Barry, 2014; Iglesias-Sánchez *et al.*, 2016; Lee *et al.*, 2005; Peterman and Kennedy, 2003; Souitaris *et al.*, 2007; Zhang *et al.*, 2013), others argue that this evidence is not clear (see, e.g. Krueger and Brazeal, 1994; Heuer and Kolvereid, 2014; Pittaway and Cope, 2007). Thus, much of the research to date does not provide unequivocal empirical support for the view that entrepreneurship education increases entrepreneurial motivation (Cox *et al.*, 2002). Therefore, a need exists to develop additional research that might clarify this point (see, e.g. Joensuu *et al.*, 2015; Krueger and Brazeal, 1994; Matlay, 2006) by investigating possible explanations for the contradictory results observed in empirical studies (Colette, 2015; Fayolle, 2013).

This research aims to fill this need by contributing to the literature on entrepreneurship education and attempting to better understand the main drivers of entrepreneurial motivation among university students and by determining whether entrepreneurship education improves how the knowledge base (i.e. knowledge in business management) and entrepreneurship competencies (i.e. behavior traits and skills) affect entrepreneurship motivation. The central research questions are:

- RQ1. What is the impact of the knowledge base and entrepreneurship competencies on the motivation of university students to be entrepreneurs?
- RQ2. Does this impact differ between students with entrepreneurship education and those without?

The research combines two phases. Phase 1 is quantitative and is based on a survey administered to students from the University of Minho in Portugal. Phase 2 is qualitative and comprises four in-depth interviews with Portuguese university students.

This paper is organized as follows: First, we develop the theoretical background followed by the conceptual model and the research hypotheses. In the subsequent sections, the method is described and the findings of the study are reported. Finally, we present the conclusions and the main implications in the final section.

2. Background

2.1 Defining entrepreneurship

Perceiving what is meant by entrepreneurship is perhaps one of the most complex tasks in this area of research, given the myriad of existing definitions used to describe the phenomenon (Shane and Venkataraman, 2000). Additionally, several terms are used interchangeably, such as entrepreneur, enterprise, and small business (Henry *et al.*, 2005), which has resulted in a polarization of emergent theory (Matlay, 2005).

The heterogeneity and complexity of entrepreneurship through its multiple facets creates a challenge. On the one hand, some researchers (see, e.g. Kirzner, 1973; Drucker, 1985; Volkmann, 2009) argue in favor of models and common definitions as a crucially important basis for the development of the field. On the other hand, other authors (see, e.g. Audretsch, 2012; Bygrave and Hofer, 1991) consider that a single model of entrepreneurship would be insufficient to meet the requirements of the various stakeholders. Each entrepreneurial event is unique and the entrepreneurial process is the crystallization of complex variables and contingencies (Jack and Anderson, 1999), which means that entrepreneurship can be viewed from different angles. In this sense, multidisciplinary entrepreneurship is a positive challenge, because entrepreneurship can be seen not only from a purely economic perspective, but also as a social phenomenon (Steyaert and Katz, 2004). Along this line of thought, Gartner (1990) states that entrepreneurship is a very complex idea and that we must therefore recognize its multiple meanings. The key is to ensure that others know what we are talking about.

Entrepreneurship may be defined as an innovative act that creates a new ability to produce wealth (Drucker, 1985) or as the creation of a new organization (Gartner, 1985). For Bygrave (1989), entrepreneurship must be understood as a holistic process of transformation and change, in which the existing stability disappears. Shane and Venkataraman (2000) claim that entrepreneurship concerns the process by which we discover, evaluate, and explore opportunities to create future goods and services. This definition emerges as an important milestone for the study of entrepreneurship because it introduces “opportunities” as a concept of central importance from which several subsequent definitions derive (Gartner, 2001).

According to Bruyat and Julien (2001), entrepreneurship should focus on studying the relationship between the individual and value creation in the course of a process and within an environment that has certain specific features. In turn, Mitchell *et al.* (2002) argue that entrepreneurship should be understood as the search for economic wealth through creative initiatives undertaken by individuals operating in a given environmental context and constrained by limited resources. Entrepreneurship might also be defined as a dynamic process of creating incremental wealth by individuals who are committed to accepting the risks involved in terms of time, equity, and career (Hisrich *et al.*, 2005).

More recently, Timmons and Spinelli (2009) describe entrepreneurship as a way of thinking, reasoning, and acting that is oriented toward opportunity and which requires a holistic approach and a balanced form of leadership in order to create and to capture value; at its core is the creation or recognition of opportunities and the ability to seize them. Neck and Greene (2011) also state that entrepreneurship is the creation and implementation of new opportunities in an environment marked by a high degree of complexity and uncertainty. Table I provides an organized view of various definitions of entrepreneurship.

For the purpose of the present study, we adopted the definition of Shane and Venkataraman (2000, p. 218), which considers entrepreneurship as the “examination of how, by whom, and with what effects opportunities to create future goods and services

Table I.
Definitions of
entrepreneurship

Main definition/scope	Author(s)/Date
Innovative action that generates a new ability to produce wealth	Drucker (1985)
Creation of a new organization	Gartner (1985)
Holistic process of transformation and change in which the existing stability disappears	Bygrave (1989)
Process by which we discover, evaluate, and explore opportunities to create future goods and services	Shane and Venkataraman (2000)
Individual value creation in the course of a process and within an environment that has certain specific features	Bruyat and Julien (2001)
Search for economic wealth through creative initiatives undertaken by individuals operating in a given environmental context, constrained by limited resources	Mitchell <i>et al.</i> (2002)
Dynamic process of creating incremental wealth by individuals who are committed to the risks involved in terms of time, equity, and career	Hisrich <i>et al.</i> (2005)
Way of thinking, reasoning, and acting, which is oriented to the opportunity, in order to create and capture value	Timmons and Spinelli (2009)
Creating and implementing new opportunities in an environment marked by a high degree of complexity and uncertainty	Neck and Greene (2011)

are discovered, evaluated, and exploited.” This definition is oriented toward the action of entrepreneurship and considers entrepreneurship to be a result of interaction between individuals and opportunities in a given environmental context (Dutta *et al.*, 2011). This is precisely the sense in which entrepreneurship education plays a crucial role, because it can motivate students to take entrepreneurial action and to develop the necessary skills to identify, evaluate, and exploit the right opportunity and succeed in contexts marked by a high degree of uncertainty (Neck and Greene, 2011).

2.2 Entrepreneurship and education

2.2.1 Can entrepreneurship be taught? There is some debate as to whether or not entrepreneurship can be taught, with different and opposite approaches being discussed (Henry *et al.*, 2004, 2005). One approach highlights the personality traits of the entrepreneur and a different perspective focusses on behavioral characteristics.

The personality-trait approach emphasizes the personal characteristics of the individual, assuming that entrepreneurs have a unique set of features that enhance entrepreneurial activity. It further assumes that these traits are innate and cannot be learned or developed through education and training (Cope, 2005). Personality traits are predictable characteristics of individual behavior that help to explain discrepancies in the actions of various individuals in similar contexts. The advocates of this approach also discuss the personality traits that best characterize the entrepreneur (Llewellyn and Wilson, 2003), reporting five main characteristics that entrepreneurs possess and that distinguish them from others: the need to achieve, an internal locus of control, self-efficacy, tolerance of ambiguity, and pro-activeness (Rauch and Frese, 2007).

The behavioral approach is the antithesis of the personality-trait approach and suggests that entrepreneurship should be understood as a learning process (Minniti and Bygrave, 2001), where entrepreneurs respond to the environment and do not operate in a vacuum (Gartner, 1985). This environmental responsiveness implies that entrepreneurs develop a certain type of characteristics and skills, which goes against the idea that personality traits are immutable. Gartner (1989) states that the process in

which the entrepreneur is involved makes it unique and that an individual, even one with all the entrepreneurship traits, might not become an entrepreneur. Thus, the behavioral approach assumes that entrepreneurs can and should assimilate entrepreneurship skills. Along this line, Kuratko (2003, p. 11) states that “entrepreneurship, or some of its facets, can be taught.”

Although the debate regarding entrepreneurship teaching could be solved via the theoretical assumptions in the field, the emergent body of knowledge has been affected by conceptual and contextual difficulties (Joensuu *et al.*, 2015; Matlay and Carey, 2006), so that an overarching theory is still lacking (Colette, 2013; Fiet, 2000).

2.2.2 Importance and legitimacy of entrepreneurship education. Entrepreneurship education might be defined as the formal transfer of business knowledge (Young, 1997) or as a collection of formal lessons that educate, inform, and train students interested in developing new businesses (Bechard and Toulouse, 1998). It is a strategic response with the purpose of raising the level of entrepreneurial behavior in the sense that it explores students’ entrepreneurial potential (Laukkanen, 2000).

Entrepreneurship education is relevant because it stimulates economic and social development. In this connection, universities highlight the role of entrepreneurship education by presenting themselves as active agents that contribute to the economic and social development of their regions (Rasmussen and Sorheim, 2006). Conversely, entrepreneurship education is also important because the complexity of the entrepreneurial phenomenon requires specific skills on the part of the entrepreneur. Frequently, entrepreneurs struggle with numerous highly demanding challenges, and as such, need to have certain capabilities that allow them to be successful in their entrepreneurial activities (Neck and Greene, 2011). Entrepreneurial activity has a different profile from other professional activities and consequently entrepreneurs need specific education for this particular type of activity (Jones and Penaluna, 2013; Nilsson, 2012).

Entrepreneurship education has been offered in universities for about 70 years (Kuratko, 2005). Nevertheless, a lack of critical thinking still exists in entrepreneurship education (Fayolle, 2013), and despite the increasing demand, research and knowledge about how to teach entrepreneurship remains relatively underdeveloped (Colette, 2013; Dickson *et al.*, 2008; Kirby, 2004; Honig, 2004). Graevenitz *et al.* (2010, p. 103) convey this idea in stating “It is largely unknown how the courses impact students’ willingness to engage in entrepreneurial activity and what kind of learning processes are responsible for these effects.” Henry *et al.* (2005) and Jones and Matlay (2011) also note a wide divergence in educational entrepreneurship contents. This seems to be a characteristic of a new academic discipline, indicating that it lacks sufficient theoretical rigor to reach a consensus on fundamental questions (Fiet, 2000).

One question that remains unsolved is “what” should be taught and “how” (Ronstadt, 1990b). The link between research and teaching is important because the theoretical rigor of research is related to the rigor of the courses designed, which means that “If researchers do not conduct theoretically rigorous research, the content of entrepreneurship courses will suffer” (Fiet, 2000, p. 4). Therefore, theoretical and conceptual foundations are needed to support entrepreneurship programs and courses (Honig, 2004; Fayolle, 2013).

2.2.3 Role of entrepreneurship education. To drive students to entrepreneurial action, it is necessary to assess the factors that give rise to entrepreneurial behavior. According to Locke (2000), entrepreneurship is the result of integrating cognitive factors (knowledge and skills) with motivational factors. Thus, if entrepreneurship

education aims to contribute to increasing entrepreneurial activity, it should promote the acquisition and/or consolidation of students' knowledge and skills (Hynes, 1996) and motivate them to take entrepreneurial action.

Entrepreneurship education should stimulate the development of the knowledge base (i.e. knowledge in business management) and entrepreneurship competencies (i.e. behavior traits and skills), thereby creating value for students and fostering more-competent entrepreneurs (Neck and Greene, 2011) who are capable of coping with the complexity, disruption, and uncertainty of entrepreneurship environments (Ronstadt, 1990a). Mitchelmore and Rowley (2010) also state that competent entrepreneurs: have a greater chance to choose the best business opportunities; can better manage their businesses from a strategic point of view; and undertake higher quality actions – a fact that is reflected in the organization's results. However, besides empowering students, it is necessary to motivate them to entrepreneurial action.

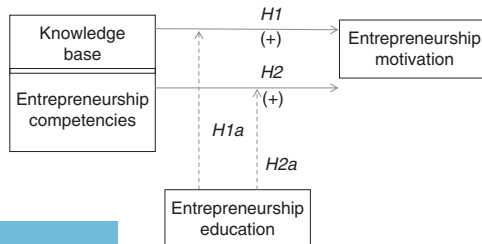
Understanding the factors that motivate individuals to take entrepreneurial action is a critical prerequisite for global comprehension of the entrepreneurial process (Herron and Sapienza, 1992; Kuratko *et al.*, 1997; Støren, 2014). Motivation helps to describe the process that leads individuals to engage in entrepreneurial behavior (Naffziger *et al.*, 1994). Furthermore, it is vital to uncover the motivational drivers of entrepreneurial behavior so that, within their sphere of influence, policy makers might suggest more effective programs to support and promote successful entrepreneurship (Hessels *et al.*, 2008; Volkmann, 2009; Rae *et al.*, 2012).

3. Conceptual model: predictors of entrepreneurial motivation among university students: the role of entrepreneurship education

This study proposes a model where the knowledge base and entrepreneurship competencies are antecedents of entrepreneurship motivation among university students. It further proposes that entrepreneurship education has a moderating effect on the relationships depicted in the model. That is, the effect of the knowledge base and entrepreneurship competencies on entrepreneurship motivation is greater for students with entrepreneurship education (Figure 1).

The term knowledge base refers to the base of knowledge transferred by universities and business schools to the potential entrepreneur. The knowledge emanates from traditional fields of business management, such as marketing, strategy, finance, human resources, business law, accounting, and business ethics (Henry *et al.*, 2004; Jones and Penaluna, 2013; Neck and Greene, 2011; Ronstadt, 1985). Prior knowledge (i.e. an individual's information on a particular subject matter; Venkataraman, 1997) leads to the identification of a greater number of entrepreneurial opportunities (Shepherd and DeTienne, 2005) and might increase the likelihood of success for those about to start a

Figure 1.
Predictors of entrepreneurship motivation among university students: the role of entrepreneurship education



new venture (Souitaris *et al.*, 2007). Nonetheless, knowledge related to business management, although it plays an extremely important role, is not enough to create a successful entrepreneur (Rae, 1997). Entrepreneurship must be recognized as a process that involves not only science but also art, and as such, students must have other competencies in addition to business management (Jack and Anderson, 1999). An approach focussed exclusively on knowledge acquisition is not enough to provide the necessary attributes for long-term success (Mitchelmore and Rowley, 2010). This involves taking students beyond the conventional boundaries; that is, simultaneously with the transfer of knowledge it is imperative to provide students with essential competencies in entrepreneurship (Jack and Anderson, 1999; Man *et al.*, 2008).

Entrepreneurship competencies are the competencies required to run a successful entrepreneurial action and includes a set of interrelated personality traits, skills, and knowledge possessed by the actual or potential entrepreneur (Lau *et al.*, 1999; Man *et al.*, 2002). Entrepreneurial competencies are often psychological or social skills (Tautila, 2010) and include important attributes such as leadership, the ability to identify opportunities, creativity, innovation, analytical skills, negotiation, communication, problem solving, exposure to technological change, flexibility and adaptability, critical thinking, networking ability, and teamwork building, among others (Henry *et al.*, 2004; Jack and Anderson, 1999; Jones and Penaluna, 2013; Rae, 1997; Ronstadt, 1990a; Solomon *et al.*, 2002). As indicated by Jones and Matlay (2011), the effectiveness of entrepreneurship education involves the unique set of “dialogic relations” that develops the person rather than delivering the facts.

Entrepreneurship is a phenomenon involving human action; that is, the entrepreneurial process exists because people act to exploit opportunities, and as such, the role of human action cannot be overlooked (Shane *et al.*, 2003). Along these lines, Shaver and Scott (1991) highlight the importance of economic circumstances, as well as that of marketing and finances. However, this alone is not enough. Above all, it is necessary to have the motivation to persist until the job is done and the objectives are achieved. Therefore, entrepreneurship competencies are seen as behavioral and observable and are linked to the origin, growth, and survival of companies (Bird, 1995).

The motivation to entrepreneurship represents a set of relevant personal goals to which potential entrepreneurs aspire and believe they can achieve through entrepreneurship. This belief motivates them to take entrepreneurial action (Kuratko *et al.*, 1997). To lead students to entrepreneurial behavior, education for entrepreneurship should focus on the importance not only of knowledge and crucial attributes for entrepreneurial activity, but also on developing attitudes favorable to entrepreneurship (Joensuu *et al.*, 2015; Martin and Laing, 1998). Attitudes consist of judgments that individuals make toward entrepreneurship and they have a direct relationship with entrepreneurial motivation in the sense that motivation is based on values; in other words, the conviction that entrepreneurship is beneficial or harmful, desirable or undesirable (Locke, 2000). Therefore, for students to feel motivated to undertake entrepreneurial activities, favorable attitudes toward entrepreneurship must be instilled within them. These attitudes derive from internal factors (the individual’s characteristics and personal experience) in conjunction with external factors (the socio-cultural context in which the potential entrepreneur operates) (Lee *et al.*, 2005).

Entrepreneurship education should seek to position itself as a knowledge base, to enhance favorable competencies, characteristics, and attributes for entrepreneurship, and in addition, to predispose students to entrepreneurial action. Thus, entrepreneurship education should prepare students for entrepreneurial activity by

constructing attitudes and values favorable to entrepreneurship so that they see it as something attractive, beneficial, and desirable and will be motivated to take entrepreneurial action (Martin and Laing, 1998). Additionally, a reciprocal relationship exists between competencies and motivation. That is, the greater is the degree of perceived entrepreneurship competencies, the greater is the motivation for entrepreneurial action (Lee *et al.*, 2005). Thus, we hypothesized the following:

- H1.* The knowledge base has a positive effect on entrepreneurship motivation.
- H2.* Entrepreneurship competencies have a positive effect on entrepreneurship motivation.

Entrepreneurship education seeks to increase the number and quality of entrepreneurs entering the economy and represents a mechanism facilitating entrepreneurial activity (Laukkanen, 2000). Therefore, for entrepreneurship education to contribute to increasing entrepreneurial activity, it should also promote the acquisition and/or consolidation of knowledge and competencies by students and motivate them to take entrepreneurial action. The combination of these factors gives rise to entrepreneurial behavior (Jones and Penaluna, 2013; Locke, 2000). Several studies have suggested that students attending courses where entrepreneurship is part of the curriculum show a greater propensity and motivation to engage in the creation of new businesses (see, e.g. Lee *et al.*, 2005; Peterman and Kennedy, 2003; Souitaris *et al.*, 2007). However, other authors argue that the evidence is not clear (see, e.g. Krueger and Brazeal, 1994), which justifies additional research to clarify this point, with the present study being a case in point. According to Fayolle (2013), some contradictory results relate to the non-inclusion of moderator variables in the analysis. Therefore, to test the moderating effect of entrepreneurship education on the model, and to confirm (or disconfirm) early contradictory conclusions, we also hypothesize the following:

- H1a.* The knowledge base more strongly affects entrepreneurship motivation for students with entrepreneurship education.
- H2a.* Entrepreneurship competencies more strongly affect entrepreneurship motivation for students with entrepreneurship education.

4. Research method

The empirical research entails a combination of quantitative (phase 1) and qualitative (phase 2) approaches.

4.1 Phase 1

In phase 1, we aimed to identify on a larger scale the impact of knowledge base and entrepreneurship competencies on the motivation to become an entrepreneur. This phase entailed the development of an on-line survey questionnaire which was applied to all undergraduate and postgraduate students attending master courses at the University of Minho in the academic year 2012-2013. Data analysis covered 465 cases. To assess non-response bias, early vs late respondents were compared (Armstrong and Overton, 1977). These respondents were found not to differ significantly in any dimension, suggesting that non-response bias is not a problem in this study. The data were also subjected to regression analysis using the SPSS statistical package.

4.1.1 Sample profile. Over half of the respondents (56.6 percent) were undergraduate students, and 43.4 percent were postgraduate students, which is in line with the

distribution of graduate and undergraduate students at the university. The respondents were studying economics and management (28.6 percent), other social sciences and humanities (26.5 percent), hard sciences and engineering (24.9 percent), life and health sciences (12.5 percent), and natural and environmental sciences (7.5 percent). The low response rate of some scientific domains corresponds to the lower representation of these domains in the University of Minho educational prospectus.

The majority of respondents were female graduate students (67.7 percent), aged 18-24 years (78.3 percent). This difference is partially explained by the fact that the University of Minho has more female student than male students (8,786, 52 percent; 8,073, 48 percent, respectively). Another reason for this asymmetry is that female students at the University of Minho are more receptive to filling out questionnaires than their male counterparts. Table II provides additional details of the sample profile.

4.1.2 Measures. The measures in the questionnaire were based on previous research and used the five-point Likert scale (ranging from 1 for “very low” to 5 for “very high” and from 1 for “totally disagree” to 5 for “totally agree”). Knowledge base was measured according to Matlay (2008). The items forming the entrepreneurship competencies scale were derived from Man *et al.* (2002, 2008) and Man and Lau (2005). To measure entrepreneurship motivation, we used a scale adapted from Kuratko *et al.* (1997), Robichaud *et al.* (2001), and Souitaris *et al.* (2007). The questionnaire also asked whether students had had classes in entrepreneurship education. The measurement statistics for the study constructs are summarized in Table III, and Table IV provides inter-construct correlations. All measures have acceptable reliability and psychometric properties. The items of each scale are included in Table AI.

	<i>n</i>	%
<i>Gender</i>		
Male	150	32.3
Female	315	67.7
Total	465	100.0
<i>Age</i>		
18-24	364	78.3
25-34	72	15.5
35-44	19	4.1
45-54	10	2.2
Total	465	100.0
<i>Level of education</i>		
Undergraduate	263	56.6
Postgraduate	202	43.4
Total	465	100.0
<i>Scientific domain</i>		
Life and health sciences	58	12.5
Exact sciences and engineering	116	24.9
Natural and environmental sciences	35	7.5
Social sciences and humanities	123	26.5
Economics and management	133	28.6
Total	465	100.0

Table II.
General profile
of sample

Table III.
Measurement characteristics for constructs – description, number of items, reliability, means, and standard deviations

Measure	Scale description	Source	Items	Cronbach α	Mean	SD
Knowledge base	Five-point Likert scale with endpoints as: 1 = very low 5 = very high	Matlay (2008)	7	0.90	2.6	0.91
Entrepreneurship competencies	Five-point Likert scale with endpoints as: 1 = strongly agree 5 = strongly disagree	Man <i>et al.</i> (2002, 2008) and Man and Lau (2005)	40	0.97	3.8	0.51
Entrepreneurship motivation	Five-point Likert scale with endpoints as: 1 = strongly agree 5 = strongly disagree	Souitaris <i>et al.</i> (2007), Kuratko <i>et al.</i> (1997) and Robichaud <i>et al.</i> (2001)	21	0.90	4.3	0.44

Table IV.
Intercorrelation for key study constructs

Construct	X1	X2	X3
Knowledge base X1			
Entrepreneurship competencies X2	0.510*		
Entrepreneurship motivation X3	0.202*	0.421*	

Note: *Correlation is significant at 0.01 level

4.2 Phase 2

The qualitative approach developed in phase 2 was aimed at achieving a better understanding of the quantitative outcomes obtained in phase 1, to establish the degree to which the results obtained in phase 1 were corroborated by the interviews. Four in-depth interviews were conducted with students from the University of Minho. The selection of interviewees was based on the following cumulative criteria: current students at the University of Minho from graduate and undergraduate courses; students with a business already established in the market, or students with business projects in progress; and students who participated in phase 1 of the study (Table V provides details of the interviewees).

The interview guide included the following topics: impact of entrepreneurship education on entrepreneurship competencies; impact of entrepreneurship education on entrepreneurship motivations; and which type of entrepreneurship education is most appropriate to promote effective entrepreneurship. The interviews were taped with the permission of the interviewees and lasted an average of 60 minutes. The interviews were transcribed verbatim. The transcripts were returned to the respective interviewees to assess the transcription accuracy and no changes were requested. The data were content analyzed, placing a significant emphasis on verbatim quotations from the interviewees.

5. Findings

Regression analysis was used to test the hypotheses. The main effect of entrepreneurship knowledge on entrepreneurship motivation ($\beta = -0.13$) is non-significant, thus rejecting *H1* (Table VI); in other words, we could not find evidence that knowledge base has a positive effect on entrepreneurship motivation. Although this result contradicts Martin and Laing (1998), it is in line with Souitaris *et al.* (2007), who found no significant correlation between learning and intention.

The main effect of entrepreneurship competencies on entrepreneurship motivation is significant ($\beta = 0.429, p < 0.001$), corroborating *H2* (Table VI), which postulates that entrepreneurship competencies have a positive effect on entrepreneurship motivation, in conformity with Lee *et al.* (2005).

The moderating effect of entrepreneurship education was tested by subgroup analysis (Table VII). The results reveal that no differences exist between the group of students with entrepreneurship education and the group without. The Chow test (Chow, 1960) also confirms that no significant statistical differences appear in the

Interviewee no.	Business area	Current situation	Background
1	Communication	Project in development	Communication sciences
2	Design	Business already in the market	Design and management
3	Chemical engineering	Project in development	Chemical and biological engineering
4	Architecture	Business already in the market	Architecture and management

Table V.
Profiles of interviewees

Independent variables	Entrepreneurship motivation
Knowledge base	-0.013ns
Entrepreneurship competencies	0.429***
R^2	0.178
Adjusted R^2	0.175

Notes: ns, non-significant. *** $p < 0.001$

Table VI.
Factors affecting motivation to be an entrepreneur

Independent variables	Entrepreneurship education ($n = 166$)	Non-entrepreneurship education ($n = 299$)
Knowledge base	-0.152ns	0.025ns
Entrepreneurship competencies	0.478***	0.396***
R^2	0.175	0.167
Adjusted R^2	0.165	0.161

Notes: ns, non-significant. *** $p < 0.001$

Table VII.
Factors affecting motivation to be an entrepreneur for students with entrepreneurship education vs those with non-entrepreneurship education

regression coefficients between the groups. Therefore, *H1a* is rejected, indicating that no evidence supports the proposition that students with entrepreneurship education have a higher motivation for entrepreneurship. Similarly, *H2a* is rejected, indicating that no evidence supports the proposition that entrepreneurship competencies more strongly effect entrepreneurship motivation for students with entrepreneurship education. These results are in line with those of Heuer and Kolvereid (2014) and contradict the results of studies that found that entrepreneurship education has a positive impact on entrepreneurship motivation (see, e.g. Lee *et al.*, 2005; Peterman and Kennedy, 2003).

6. Discussion

The results of this study suggest that the prior knowledge emanating from traditional fields in business management, such as marketing, strategy, finance, human resources, business law, accounting, and business ethics, is not decisive in motivating university students to undertake entrepreneurship. Conversely, the results reveal that entrepreneurship competencies significantly impact students' motivation to become entrepreneurs. That is, major competencies in areas such as relationships, concepts, organizing ability, strategy, and commitment are fundamental to motivate entrepreneurship among students. In addition to having management knowledge, graduate students need to feel confident in their entrepreneurship skills and competencies in order to become motivated to undertake entrepreneurial action.

The results of this study also revealed that entrepreneurship education does not moderate the effect of knowledge base and entrepreneurship competencies on entrepreneurship motivation, which might be explained by economic and other contextual dimensions largely ignored in previous studies. Because intentions are affected by exogenous influences such as traits and situational variables (Ajzen, 1991), these are worth studying. One explanation might be that entrepreneurship education provides a better understanding of the barriers to entrepreneurship and of the complexity of the external environment which, in certain cases and particularly in times of economic crisis, can even act as an inhibitor. This idea was highlighted by one of the interviewees:

[...] entrepreneurship education can prepare students for entrepreneurship, increasing their skills, but the improvement of skills may also be perverse, because students also gain a better understanding of the barriers to entrepreneurship and are more alert to the complexity of reality; this may be a factor that discourages students and makes them think twice before launching a business (Interviewee 1).

Another interviewee also pointed to the economic crisis that Portugal is currently experiencing, which might also discourage possible entrepreneurs, as illustrated in the following statement:

[...] In the current situation [Portuguese economic crisis], I doubt that entrepreneurship education is enough to motivate students to set up their business. It's more a question of self-motivation to entrepreneurship, which one has or does not have (Interviewee 3).

Another explanation may be related to the inadequacy of the entrepreneurship educational model (Laukkanen, 2000; Rasmussen and Sorheim, 2006). Many of the methodologies underlying entrepreneurship education are inadequate, making it essential to refocus on the question of pedagogy (Heuer and Kolvereid, 2014) and the adoption of more innovative approaches (Matlay and Carey, 2007; Neck and Greene, 2011). Edelman *et al.* (2008) also highlighted the gap between what is taught in

entrepreneurship and what entrepreneurs do. After analyzing several entrepreneurial educational programs, Kirby (2004) asserted that only rarely is the focus on developing students' skills and attributes, and instilling in them the behavior of the successful entrepreneur. The most popular curriculum format of entrepreneurship education in the USA focusses on "business plans" (Honig, 2004), and graduate institutions in Finland tend to stress the risks associated with a self-managed career (Tautila, 2010). This also appears to be the case with the entrepreneurship training model at the University of Minho and in most Portuguese universities in general, which are mainly centered around the development of business projects rather than around developing entrepreneurship skills and competencies. Such an approach can also be demotivating for students. This question was also raised by the interviewees who criticized the type of entrepreneurship education practiced in Portugal. The following quotes convey this idea:

Educating all [students] to become entrepreneurs is a fallacy [...]. To be effective, entrepreneurship education must be undertaken under certain conditions otherwise it will "fall on deaf ears." [...] the education model is centered on the creation of business projects that, in most cases, are later abandoned (Interviewee 4).

The teaching of entrepreneurship aims to fill gaps. But these gaps are not adapted to the needs we have today. The teaching of entrepreneurship is commercialized. Everything is framed for the creation of businesses and companies, forgetting the major goals – to provide tools and build capacities (Interviewee 2).

Interviewees highlighted that, to be effective, entrepreneurship education should focus on the development of entrepreneurship skills and competencies necessary to run a successful entrepreneurial activity, such as leadership, identification of opportunities, creativity, analytical skills, and negotiation, as illustrated in the following quote:

[...] The education model should focus on developing attributes such as the capacity for critical analysis, identification of opportunities, leadership, negotiation, among others, which, in essence, are relevant in day-to-day business and end up not being the subject of entrepreneurship education [...] education focused only on the creation of new business projects is not so useful [...] then again, entrepreneurship has two main areas – creating new businesses and entrepreneurship in organizations – and, therefore, education should not be limited to the development of business projects (Interviewee 4).

Laukkanen (2000) also highlights this issue by mentioning that "educate to entrepreneurship" is important, rather than only "teach to entrepreneurship." Teaching to entrepreneurship encompasses the study, construction, and development of theories about entrepreneurship, whereas educating to entrepreneurship focusses on the development of entrepreneurial skills and encouragement. Therefore, rather than new venture creation, entrepreneurship should be equated with creativity and change (Kirby, 2004) and focus on students' psychological growth (Tautila, 2010). Souitaris *et al.* (2007) also introduced an emotional angle to the entrepreneurship literature, confirming that inspiration (i.e. a change in hearts (emotion) and minds (motivation)) is the main driver of entrepreneurial intention and therefore that entrepreneurship curricula should also comply with this logic.

7. Conclusion

The main conclusion stemming from the current study is that, within the context of university students, entrepreneurship competencies are a predictor of entrepreneurship

motivation, whereas knowledge base is not. Additionally, entrepreneurship education is not relevant in improving the motivation of graduate students to become entrepreneurs. These findings are in line with those of Souitaris *et al.* (2007) and Heuer and Kolvereid (2014) and contradict studies that found that entrepreneurship education has a positive impact on entrepreneurship motivation (see, e.g. Peterman and Kennedy, 2003). In the Portuguese context, it was not possible to confirm that entrepreneurship education has a positive effect on entrepreneurial intention. One explanation is the exogenous and contextual variables that translate into differences in the general labor market, namely, in the transition from education to work in the context of the current economic crisis. The crisis Portugal is facing may inhibit the entrepreneurial intentions of young students who gain a greater awareness of the barriers to entrepreneurship and feel unmotivated by a specific adverse reality.

The results further suggest that, to increase students' entrepreneurial motivation, the pedagogy should emphasize the development of students' psychological and social skills relevant to entrepreneurship by covering not only the rational dimension, but especially the emotional dimension and critical thinking. In contrast to most existing models, which emphasize business-planning education and mainly support thinking "inside the box" (Honig, 2004), more innovative courses should focus on thinking "outside the box," inspiring students and effectively motivating them to undertake entrepreneurship (Souitaris *et al.*, 2007).

8. Implications

This study has implications for theory and practice. Regarding theory, the research contributes to the literature on entrepreneurship education. Although the study confirms the contradictory results found in previous research, it provides several useful explanations of such contradictory results, with a particular emphasis on the general inadequacy of the entrepreneurship educational model as practiced in most countries (i.e. mainly based on the development of business projects).

Based on this conclusion, the study also contributes to practice by offering additional insights and recommendations for education-policy makers and university managers. To raise students' motivation to become entrepreneurs, entrepreneurship education policy should focus on developing psychologically oriented entrepreneurship competencies rather than merely textbook knowledge. Universities should also pay special attention to hiring and training entrepreneurship teachers who are capable of designing and implementing such innovative and disruptive programs.

9. Limitations and future research

The study used a cross-sectional survey in a specific university, so the results cannot be fully generalized. Additionally, the study was conducted in Portugal, implying the particular context of an economic crisis, which might also explain the findings. Studying entrepreneurship motivations in similar contexts with larger samples would be relevant to confirm the trends revealed by the results of the present study.

Given the complexity of the phenomenon under study, future research should also consider situational variables, such as the status of the institution, the type of course, the degree level, and the length of the entrepreneurship course, among others, because such variables might have strong explanatory power. Furthermore, cultural and economic contextual dimensions might also be relevant in uncovering differences. The entrepreneurial intention in other countries facing economic crisis would also be worth studying.

Another limitation is the limited number of interviews. A full understanding of the contradictory results found in the literature also requires more in-depth qualitative research capable of uncovering the subtler aspects that may justify and explain such inconsistencies. Moreover, although difficult to implement given the costs and the necessarily long period of time, longitudinal data are much needed because it allows real actions, rather than intentions, to be captured.

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Appendix

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Construct	Item
Knowledge base	Corporate strategy
	Marketing
	Finances
	Human resources
	Business law
	Accounting
Entrepreneurial motivation	Business ethics
	Enables my personal growth
	Enables me to prove that I can be successful
	Enables my personal fulfillment
	Allows me to face challenges
	Is exciting
	Enables me to get monetary compensation based on merit
	Allows me to acquire economic wealth
	Makes it possible to increase opportunities for profit
	Allows me to get a comfortable life
	Helps me to increase personal income
	Enables me to get public recognition
	Allows me to be free
	Allows me to afford independence
	Allows me to be my own boss
	Allows me to have the power to make decisions
Allows me to have authority	
Allows me to choose my own tasks	
Allows me to participate in the whole decision-making process	
Allows me to ensure a secure future for the family	
Allows me to be close to family	
Enables increased funding for retirement	
Entrepreneurial competencies	Identify goods or services customers want
	Perceive unmet consumer needs
	Actively look for products or services that provide real benefit to customers
	Seize high-quality business opportunities
	Develop long-term trusting relationships with others
	Negotiate with others
	Interact with others
	Maintain a personal network of work contacts
	Understand what others mean by their words and actions
	Communicate with others effectively
	Apply ideas, issues, and observations to alternative contexts
	Integrate ideas, issues, and observations into more general contexts
	Take reasonable job-related risks
	Monitor progress toward objectives in risky actions
Look at old problems in new ways	
Explore new ideas	
Treat new problems as opportunities	
Plan the operations of the business	
Plan the organization of different resources	
Keep the organization running smoothly	

Table AI.
Scale
measurement items

(continued)

Construct	Item
	Organize resources
	Coordinate tasks
	Supervise subordinates
	Lead subordinates
	Organize people
	Motivate people
	Delegate effectively
	Determine long-term issues, problems, or opportunities
	Be aware of the projected directions of the industry and how changes might impact the firm
	Prioritize work in alignment with business goals
	Redesign the department and/or organization to better meet long-term objectives and changes
	Align current actions with strategic goals
	Assess and link short-term, day-to-day tasks in the context of long-term direction
	Monitor progress toward strategic goals
	Evaluate results against strategic goals
	Determine strategic actions by weighing costs and benefits
	Dedicate oneself to making the venture work whenever possible
	Refuse to let the venture fail whenever appropriate
	Possess an extremely strong internal drive
	Commit to long-term business goals

Table AI.

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