Universidade de Aveiro
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Departamento de Economia, Gestão e Engenharia Industrial

MARIANA SALAS FIGUEIREDO

O ENSINO DO EMPREENDEDORISMO: O PAPEL DO DOCENTE, OS MÉTODOS PEDAGÓGICOS E A SUA RELAÇÃO COM A INTENÇÃO EMPREENDEDORA

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Dissertação apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Gestão realizada sob a orientação científica da Doutora Ana Isabel Dias Daniel, Professora Auxiliar Convidada do Departamento de Economia, Gestão e Engenharia Industrial da Universidade de Aveiro e do Doutor António Carrizo Moreira, Professor Auxiliar do Departamento de Economia, Gestão e Engenharia Industrial da Universidade de Aveiro.

Aos meus pais, pelo incentivo, força e coragem.

o júri

presidente

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palavras-chave

Empreendedorismo, educação em empreendedorismo, docente, métodos pedagógicos, intenção empreendedora.

resumo

Pode o empreendedorismo ser ensinado ou, melhor, pode este ser aprendido? Esta é uma questão que tem alimentado uma ampla discussão. Indubitavelmente, a educação tem um papel essencial no desenvolvimento de atitudes e na promoção de competências. Este pressuposto tem fomentado a proliferação de iniciativas e de cursos que visam o ensino do empreendedorismo. A importância do espírito empreendedor leva à criação de actividades de promoção e encorajamento dos jovens a terem perfis mais empreendedores.

O ensino do empreendedorismo tem hoje um papel fundamental na promoção de uma mentalidade empreendedora nos jovens, estimulando o desenvolvimento de competências que extravasam a área empresarial. O impacto desta unidade curricular está dependente da estratégia e da metodologia de ensino-aprendizagem escolhida, bem como da sua capacidade de implementação efectiva. Naturalmente, as metodologias e estratégias de ensino-aprendizagem colocam ao docente e às instituições de ensino o desafio de encontrar metodologias não tradicionais e formas alternativas para leccionar o tema.

Assim, este estudo pretende explorar, através da teoria do comportamento planeado, o efeito da educação empreendedora na intenção empreendedora dos alunos e a relação entre as duas. Adicionalmente, o papel essencial e desafiante do docente na educação empreendedora é explorado, contribuíndo para um maior entendimento daquele que tem um papel central na educação, mas marcadamente pouco explorado na literatura.

Os resultados encontrados reforçam a solidez da teoria do comportamento pleaneado e mostram que os alunos aumentaram as suas intenções empreendedoras, o conhecimento e a percepção do contexto institucional após a frequência de uma disciplina de empreendedorismo. Adicionalmente, encontrou-se um consenso nos objetivos da educação para o empreendedorismo, com pedagogias, contéudos e formas de avaliação semelhantes e dificuldades de gestão de tempo e de recursos.

palavras-chave

Entrepreneurship, entrepreneurship education, teacher, pedagogic methods, entrepreneurial intention.

abstract

Can entrepreneurship be taught, or be learned? This is a question that brings a broad debate to the table. Indubitably, education has an essential role in attitude development and competences promotion. This assumption has fostered entrepreneurship initiatives and course proliferation, seeking to teach entrepreneurship to individuals. The increasing importance of the entrepreneurial spirit leads to the creation and promotion of entrepreneurship initiatives and encouragement of youngsters to have entrepreneurial profiles.

Today, entrepreneurship education has a crucial role promoting entrepreneurial mindset s in younger people. It stimulates competence and skill development, which extends beyond the business world. The effects of such education depend on strategy and teaching pedagogies, but mostly on its effective implementation. This gives teachers and higher education institutions the challenge of finding nontraditional methodologies and alternative ways to teach the subject.

Therefore, this study aims to explore, through the theory of planned behavior, the effects of entrepreneurship education and its relationship with entrepreneurial intention. Additionally, the essential and challenging role of the teacher is explored, contributing to a better understanding of its significance in entrepreneurship education that is remarkably poorly explored in the literature.

Findings reinforce the strength of the theory of planned behavior as an intention measure; in addition, students were found to increase their entrepreneurial intentions, entrepreneurial knowledge and institutional context perceptions after taking a higher education course. Concerning teachers, a consensus was found between their education aims and similarities among their pedagogic methods, topics and forms of evaluation, along with time and resource management struggles.

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List of Acronyms

A	Attitude
CTX	International Context
EI	Entrepreneurial Intention
ESE	Entrepreneurial Self-Efficacy
K	Knowledge
KMO	Kaiser-Meyer and Olkin
PBC	Perceived Behavioral Control
SN	Social Norms
TPB	Theory of Planned Behavior

Chapter I - Introduction

Entrepreneurship *"is a powerful driver of economic growth and job creation" (European Commission, 2013a, p. 3),* in the sense that it creates new jobs, new firms, opens up new markets and it encourages new skills and capabilities; it makes economies more competitive and innovative through development of new products and services, which improves productivity and generates wealth (European Commission, 2013a, 2013b; Karimi et al., 2013; Oosterbeek, van Praag, & Ijsselstein, 2010). It has become one of the most potent economic forces the world has experienced (Kuratko, 2005) and hence, numerous government initiatives are created to stimulate entrepreneurial spirit, culture and mindset on societies, and still is being identified as one of the key competences of countries and an essential area to be developed (European Commission, 2008b, 2011; OECD, 2009).

Recently, entrepreneurship has emerged as one of the most vital, dynamic fields of research, encompassing other areas as such as management, economics, and other social sciences (Audretsch, 2012). It has gained prominence in leading disciplinary and mainstream management journals (Wiklund, Davidsson, Audretsch, & Karlsson, 2011). The research has grown exponentially, there is no denying – entrepreneurship has been a "hot topic" in society, in education and in academic research in the last decades (Landström, 2005). Most academic studies about entrepreneurship address its economic benefits, showing it as a bridge for employment generation or as an innovation driver (van Praag & Versloot, 2007). Indeed, there is empirical research that supports positive links between entrepreneurial activity and economic outcomes like economic growth and innovation (Oosterbeek et al., 2010; van Praag & Versloot, 2007).

Entrepreneurship is more than just business creation; seeking opportunities, taking risks and having the drive of pushing an idea into reality is also part of the entrepreneurial reality, what Kuratko (2005) calls the special perspective that permeates entrepreneurs: it can be developed in individuals and organizations in order to bring forth creative ideas. Entrepreneurial qualities are considered to be a necessity in order to cope with the unpredictable changes of the business world (Kuratko, 2005) and as such, entrepreneurship education is a priority for all educational levels (European Commission, 2011, 2013a, 2013b). However, its complex, dynamic and unpredictable nature poses a challenge (Neck & Greene, 2011). Hence, the way one understands, views and experiences entrepreneurship is very different (Mueller, 2012).

In the last decades, entrepreneurship education has expanded in most industrialized countries, and this considerable growth of the number of courses provided can be seen as symptom of governmental belief in a positive impact that entrepreneurship may have on the socio-economic infrastructure of a nation or region. Policy makers believe that increased levels of entrepreneurship can be reached through education, especially entrepreneurship education (European Commission, 2011; Redford, 2013b). Henceforth, such education has been encouraged and implemented in schools in various European countries (European Commission, 2013a) and especially in the United States (Kuratko, 2005). Also, it is expected that better entrepreneurship education will result in an increasing number of quality entrepreneurs in a country's economy (Matlay, 2008) and as such, researchers, scholars and trainers all have a very important role in multiplying the knowledge inherent to entrepreneurship (Redford, 2013b). The European Commission (2013a) suggests that entrepreneurship is one of the highest return investments in Europe, since whether or not they start a business, young people will benefit from entrepreneurial learning, like business knowledge, creativity, initiative, tenacity, teamwork, understanding risk and sense of responsibility, which helps them transform ideas into action, and increases their chances of getting employed. Here, the role of tertiary education is particularly important, going far beyond the delivery of knowledge. And entrepreneurship is seen as a key enabler of innovation at European level, as it helps bridging the gap

between education and innovation (European Commission, 2013a, 2013b). But while there is a clear effort to expand entrepreneurship programs, there are many concerns about the rigor of such programs and doubts about its contents, topics and pedagogies, which makes entrepreneurship education relevant to study in a theoretical and practical perspective (Lorz, 2011).

While entrepreneurship education has obtained a major role in the industrial and educational policy agendas of today's world, the European Commission (2011) claims that the teacher should assume the role of a facilitator of learning. They highlight several qualities in the entrepreneurial teacher giving emphasis to the progress that needs to be done to achieve an ideal educational system. Several studies have researched innovative approaches to teaching entrepreneurship (Fayolle & Gailly, 2008; Heinonen, 2007; Heinonen & Poikkijoki, 2006); nonetheless there are more concerns with program content, methods and topics mostly, see Mwasalwiba (2010), and research about the role of the teacher has been very scarce – notably, studies by Finnish scholars who researched about objectives and aims of teachers when in the classroom (Hytti, 2008; Hytti & O'Gorman, 2004; Ikävalko, Ruskovaara, & Seikkula-Leino, 2009; Seikkula-Leino, Ruskovaara, Ikavalko, Mattila, & Rytkola, 2010).

But are entrepreneurial education efforts having positive effects? Impact of entrepreneurship education involves various ways of measuring it: a common one is assessing students' entrepreneurial intentions. In a higher education setting, Lorz (2011) indicates that a lot of studies that assess the impact of entrepreneurship education have positive results; however, those that report a positive impact either use ex-post examinations that, in this sense, do not measure the direct impact of an entrepreneurship program. Hence, this has been noted by scholars (Lorz, 2011; Oosterbeek et al., 2010; Pittaway & Cope, 2007; Sánchez, 2013; von Graevenitz, Harhoff, & Weber, 2010), who call for more research into the impact of entrepreneurship education. More specifically, in Portugal, the research on the entrepreneurship in a higher education setting has also focused on the understanding and predicting the university students' entrepreneurial intention (Couto & Tiago, 2009; do Paço, Ferreira, Raposo, Rodrigues, & Dinis, 2011; Redford, 2013a; Rodrigues, Raposo, Ferreira, & Do Paço, 2010; Teixeira & Forte, 2009).

This dissertation is focused on understanding the relationship between entrepreneurship education and entrepreneurial intention, but also on how teachers see entrepreneurship education and how they implement it. Also methods, topics and program research is covered. This study's research was conducted in the University of Aveiro, using an ex-ante, post-ante design for analysing students' entrepreneurial intentions and 9 teachers were interviewed. In sum, this dissertation aims to understand the impact of entrepreneurship education at two separate levels: a) the students, and b) the teacher.

This dissertation is structured as follows: First, a literature review of entrepreneurship education that includes both a more theoretical part of the literature and a more practical view of methods, topics and the teacher. Afterwards, entrepreneurial intention is analysed and the conceptual model follows. The second chapter overviews the methodology used in this study, concerning research objectives and the sample. The following chapter covers the findings of this research, both at student and teacher level. Finally, a conclusion finishes the dissertation, highlighting thoughts, limitations and directions for further research.

Chapter II: Literature Review

> *Entrepreneurship matters. It matters for individuals, organizations, and countries* (Minniti & Lévesque, 2008, p. 603)

Entrepreneurship is acknowledged as one of the primary drivers of industrial dynamism, economic development, growth and innovation. Therefore, it has been recognized as being of fundamental importance for the economy (European Commission, 2013b; Heinonen & Poikkijoki, 2006; Kuratko, 2005; Rideout & Gray, 2013; von Graevenitz et al., 2010). Consequently, entrepreneurship has become an important economic and social phenomenon as well as a popular research subject - emerging as one of the most vital, dynamic, and relevant fields (Fayolle & Gailly, 2008; Raposo & do Paço, 2011; Wiklund et al., 2011). It has flourished within economics, management/business administration, sociology, psychology, strategy, marketing, finance, geography and others. It encompasses a variety of research traditions, perspectives, and methods (Carlsson et al., 2013). However, its nature is complex, chaotic, and without linearity (Neck & Greene, 2011). It is not something static, but an ongoing process, uncertain, dynamic, highly complex, and embedded in various contexts (Kuratko, 2005; Mueller, 2012). Moreover, the complexity of entrepreneurship is also reinforced because of the fast-paced business environment, which means that the entrepreneurial process is very unpredictable (Mueller, 2012; Sarasvathy & Venkataraman, 2011). That being said, it is a heterogeneous and complex subject, with respect to its own methods and approaches, resulting in an even more complex literature (Audretsch, 2012; Davidsson & Wiklund, 2001; Matlay, 2008; Wiklund et al., 2011).

The word "entrepreneurship" means different things to different people (Bennett, 2006). There are very different notions of entrepreneurship throughout the literature, with different aspects and approaches. Low and MacMillan (1988, p. 141) simply refer to it as *"creation of new enterprise",* while Krueger and Brazeal (1994, p. 91) define entrepreneurship as "*the pursuit of opportunity irrespective of existing resources*", for example. Shane and Venkataraman (2000, p. 218) define it as *"the scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited".* (Gries & Naudé, 2011, p. 217) understand entrepreneurship as *"the resource, process and state of being through in which individuals utilize positive opportunities in the market by creating and growing new business firms"* and the (European Commission, 2012, p. 7) finds entrepreneurship to be "*an individual's ability to turn ideas into action".*

Furthermore, while there is no consensus among the research community on the right definition of entrepreneur or entrepreneurship, there seems to be a common feeling that this field of research is yet to have well defined boundaries when it comes to its research objectives and topics covered, while still lacking a clear conceptual framework (Busenitz et al., 2003; Lorz, 2011; Low & MacMillan, 1988; Shane & Venkataraman, 2000; Wiklund et al., 2011) It is often referred to as a fragmented field and some researchers even go far as to say there will not ever be a consensus nor a definition that can include every aspect of entrepreneurship as we know it (Gartner, 2007). Sarasvathy and Venkataraman (2011) urge the scientific community to stop thinking of it only as a phenomenon and observe actual experienced entrepreneurs in action, stressing the need for reformulating entrepreneurship.

2.1 Historical Overview

> *"Schumpeter (1934) defined entrepreneurship as "carrying out new combinations." Knight's (1921) definition focused on the ability to predict the future successfully. Kirzner's (1973) concept is closely linked to arbitrage and the ability to correctly anticipate where the next market imperfections and imbalances will be. […] And Gartner (1985b) defined entrepreneurship as the creation of new organizations"* (Low & MacMillan, 1988, p. 140).

In spite of being a "hot topic" on the political agendas of today's world (O'Connor, 2013) entrepreneurship as a concept has a very long history. To our understanding of the entrepreneurial behavior of today, several economists and researchers such as Say, Knight, Schumpeter,, McClelland, Kirzner, David Birch, and Baumol are among the most influential contributors (Lorz, 2011; Minniti & Lévesque, 2008). Starting in 1732, the first economist to use it was Richard Cantillon (Minniti & Lévesque, 2008). The basic characteristic of Cantillon's analysis was the emphasis on risk. For him, entrepreneurship is a matter of foresight and willingness to assume risk. He focused on the purpose of the entrepreneur, who makes mindful choices about resource allocation with the purpose of exploitation of resources, as a means to accomplish as high a financial return as possible (Landström, 2005).

A few decades later, Jean-Baptiste Say stresses the managerial role of the entrepreneur as someone who had a central role in both production and distribution (van Praag, 1999) and Schumpeter's concept of the entrepreneur as a central player in the capitalist society of his time was described in detail in the thirties. He underlines his role as an agent of change, an innovator and a resourceful person (McCaffrey, 2009; van Praag, 1999). Schumpeter discussed the occupation of the entrepreneur as an individual who tends to break the equilibrium, by introducing innovations - the new combinations - into the system (Carlsson et al., 2013). With the United States as a major industrial power, at the end of the nineteenth century, one of the most well-known economists was Frank Knight. He argued that entrepreneurial returns result from activities that cannot be predicted and entrepreneurial competence, or skills, are the ability of an individual to deal with uncertainty (Landström, Harirchi, & Åström, 2012; O'Connor, 2013).

In mid-twentieth century, mainly in the 1940s, scholars and researchers started taking interest in entrepreneurship. McClelland's work, twenty years later (1961), was one of the most notable at the time, giving emphasis to the "need for achievement" in a society. As a consequence, the works of McClelland and other authors meant that personal qualities of the entrepreneur were a topic of intense research in the 1970's and the 1980's (Landström et al., 2012). Notably, we can also find the works of Israel Kirzner, who focused on the role of knowledge and entrepreneurial discovery, in the process of market equilibration and resource coordination. Also, in 1979, David Birch's work showed that most of the United States' new jobs were created by new and small firms, not large corporations. This had a serious impact in the entrepreneurship community, providing foundation for the inclusion of small businesses in the analysis of economic development (Landström et al., 2012; O'Connor, 2013).

Throughout the 1990s, most entrepreneurial research became extremely fragmented, and it mainly consisted of empirical explorations of subject (Landström et al., 2012) In their breakthrough article, (Shane & Venkataraman, 2000, p. 217) emphasize that "*to date, the phenomenon of entrepreneurship has lacked […]a conceptual framework. Rather than explaining and predicting a unique set of empirical phenomena, entrepreneurship has become a broad label under which a hodgepodge of research is housed.*" This had lead researchers to question the legitimacy of the field itself, like Low (2001). More recently, Landström et al. (2012) conclude that theoretical development has been very slow:

> *"While some of the most influential empirical works were produced during the 1990s and early 2000s, […] in a theoretical sense the field is based on fairly old framework imported from*

> *mainstream disciplines, such as Schumpeter[…], Kirzner […] , Knight […] and Casson […]* (Landström et al., 2012, p. 1167).

Currently, one can find different contexts to entrepreneurship literature, notably the organizational context, performance criterion and entrepreneurial behavior (Audretsch, 2012). Within the first, one finds analysis of concepts like the type of organization, age and its ownership; in the second, one finds studies about performance outcomes and growth, innovation measuring and its role in defining a firm's performance; finally, in the third, studies are focused on the behavior of the entrepreneur and his/her ability to create or take advantage of an opportunity. We can find some research within the realm of the entrepreneur's characteristics, the perception of him/herself as an entrepreneur or sense of self efficacy. This thesis can be positioned in this last context.

2.2 Entrepreneurship education: an extensive debate

> *"Knowing a lot about entrepreneurship is hardly sufficient to make one successful entrepreneur […] as entrepreneurship educators, we are not training memories, we are training minds. Education changes students; entrepreneurial education is no different. Here, more than anywhere, we can assess that change and we can use that assessment to nurture our students' education* (Krueger, 2009, p. 35).

The European Commission (2011, p. 2) has stated that entrepreneurship education should be seen "*as a process through which learners acquire a broad set of competencies that can bring greater individual, social and economic benefits since the competences acquired lend themselves to application in every aspect of people's lives."* For others, entrepreneurship education programs can be seen "*in a wide sense as any pedagogical program or process of education for entrepreneurial attitudes and skills, which involves developing certain personal qualities. It is therefore not exclusively focused on the immediate creation of new businesses."* (Fayolle, Gailly, & Lassas-Clerc, 2006, p. 702). The credibility of entrepreneurship education as a way to promote entrepreneurial growth and as a panacea for economic and social crisis is evident for academics, governments and public authorities (Henry, 2013; Solomon & Matlay, 2008). It has developed into a widespread phenomenon (Bae, Qian, Miao, & Fiet, 2014; Katz, 2003; Kuratko, 2005), and been established as a legitimate field of research, along with being formally recognized as a taught discipline in higher education institutes (Henry, 2013; Pittaway & Cope, 2007).

In this sense, the creation of entrepreneurship learning initiatives, programs and allocation of resources towards these kind of activities is very common, as well as the analysis of the best practices through measuring direct and indirect impacts of entrepreneurship on business creation (Fayolle et al., 2006; Sánchez, 2013; von Graevenitz et al., 2010). As a consequence, entrepreneurship programs are growing worldwide (Béchard & Grégoire, 2005; Bennett, 2006; Fayolle & Gailly, 2008; Katz, 2003; Kuratko, 2005; Solomon & Matlay, 2008), mostly since the first entrepreneurship course, in Harvard, circa 1945 (Katz, 2003; Mwasalwiba, 2010), and is featured at the tertiary, secondary and even primary level of education. Also, there are many publications, reports and other type of papers on this matter, given its important political agenda status (European Commission, 2008b; Fayolle, 2013; Henry, Hill, & Leitch, 2005a).

Béchard and Grégoire (2005) indicate that entrepreneurship education literature is mainly structured around four preoccupations: (1) with the social and economic roles of entrepreneurship education for individuals and society; (2) with the systematization of entrepreneurship education; (3) preoccupations with the content matter to be taught and how this content should be delivered; and (4) with considering the needs of individual students in structuring teaching interventions. This dissertation is concerned with the first and the third preoccupations, as it is understood that both are very much related, since the success entrepreneurship education depends on how well one teaches and how this is delivered to students.

Pittaway and Cope (2007) identify two different areas of analysis within the realm of this topic. On the one hand, the first is about the political branch of entrepreneurship education, mainly the government's role in promoting this type of education, its funding methods and the outputs such education generates. Usually, the employment of recent graduates is analysed, along with the enterprise's role in promoting entrepreneurship policies. On the other hand, we can find some literature more focused on the impact of specific forms of entrepreneurship education, which are the best pedagogic methods and how the orientation/vocation for entrepreneurship can shape a student's intention or propensity to be an entrepreneur:

> *"It is possible to understand entrepreneurship education systemically; in the sense of being able to identify contextual factors; inputs into a system; educational processes; and, outputs […] the idea of 'entrepreneurship education' as one thing would appear to be rather problematic suggesting further effort is required to begin the development of detailed taxonomies and typologies based on current international practice"* (Pittaway & Cope, 2007, p. 11).

Still, hoping that these training initiatives will help societies create better entrepreneurs and better firms, Liñán (2007) argues there is still little evidence of the effectiveness of entrepreneurship education; it is hard to understand its impact and even determine what exactly it is.

2.2.1 Can entrepreneurship be taught?

> *"As educators, as consultants, and as policy advisers we can assist this process through helping empower potential entrepreneurs who will be better able to seize opportunities when the environment presents them"* Krueger and Brazeal (1994, p. 102).

One of the most prominent debates in the entrepreneurship field is the problem of whether entrepreneurs are born like one or are they made - this has led researchers to question whether entrepreneurship be taught or not (Fayolle et al., 2006; Neck & Greene, 2011; Rideout & Gray, 2013). Fiet (2001b) emphasizes that the resolution of the given debate is extremely important to the field of entrepreneurship because it is linked to our theoretical assumptions on the subject, in the sense that determines what is taught or how it is taught - until there is not a general theory of entrepreneurship, all current theories of how can entrepreneurs succeed are incomplete or inaccurate (Fiet, 2001b; Henry et al., 2005a).

Haase and Lautenschläger (2011) conceptualize that the origin of this debate is in two oppositional concepts that describe the nature and also the learning processes of the entrepreneur: the trait approach and the behavioral approach. The first has its focus on the entrepreneur's individual characteristics and so potential entrepreneurs are born, not made. This was later challenged, notably by Gartner (1989), with the behavioral approach. This has to do less with an entrepreneur's personality and more with his behavior and the decisions he makes based on his surroundings.

Hindle (2007) has a very interesting opinion regarding this debate. He asks why is that people do not ask if doctors, lawyers or engineers are born, not made, or even if the vocational skills of these professions can be taught. He feels there is no justification for entrepreneurship to be unteachable. The same idea has been advocated by Fayolle and Gailly (2008):

> *"Most people […] accept readily enough, for instance, that a person of reasonable intelligence and dexterity can be taught the fundamental principles of medicine and how to apply them to an act of surgery; say taking out an appendix. No doctor is ever 'born', qua doctor. All are made: through education. However, some doctors are better than others, through a combination of different intrinsic factors (for example, greater intelligence, greater natural dexterity) […] (Hindle, 2007, p. 108).*

Recently, The trait approach has been heavily criticized (Haase & Lautenschläger, 2011). For a while now, the debate seems to be partial to the behavioral approach – entrepreneurship can indeed be taught and is not based on personality alone. In this line of thought, there have been, for a while, a consensus among authors that entrepreneurship can be taught (Fayolle & Gailly, 2008; Kuratko, 2009; Raposo & do Paço, 2011; Silva, Lopes, Palma, & Lopes, 2013). By comparing the former two, Silva *et al.* (2013) argue that the second has more advantages, as the individual behavior is explicit, measurable, recognizable and demonstrable. As the entrepreneurial behavior is susceptible of change and development, it is not something rigid; therefore not difficult to change, as the trait approach had conceived initially. However, the old question is still, to this day, revived in public debates and some still argue that entrepreneurship is indeed a matter of personality, talent and temperament that cannot be taught (Fayolle & Gailly, 2008) and entrepreneurship education could not compensate for missing characteristics of the entrepreneurs such as talent (Haase & Lautenschläger, 2011).

2.2.2 The aims of entrepreneurial education

Rasmussen and Sørheim (2006) differentiate two main areas of entrepreneurship education: a) education about entrepreneurship and b) education for entrepreneurship. The first is about development, building and studying of entrepreneurship theory; the second has to do with stimulating and developing skills, knowledge and competencies for entrepreneurship practice – stimulate the entrepreneurial process and teach the mechanics for creating new start-ups. Thus, educating about entrepreneurship concerns knowledge transference while educating for entrepreneurship is about learning and developing skill and aptitudes (Haase & Lautenschläger, 2011; Laukkanen, 2000; Liñán, Rodríguez-Cohard, & Rueda-Cantuche, 2011; Matlay, Jesselyn Co, & Mitchell, 2006; Silva et al., 2013).

From here, most authors conceptualize the objectives surrounding entrepreneurship education by relating it to its supposed outcomes. The consensus is that entrepreneurship education is aimed at creating or increasing entrepreneurial attitude, spirit or even culture among individuals or communities (Henry et al., 2005a; Henry, Hill, & Leitch, 2005b; Kirby, 2004; Mwasalwiba, 2010) Others see it as aimed for job creation (Mwasalwiba, 2010), or associating it with helping individuals or groups with choosing an enterprising approach (Henry et al., 2005a, 2005b; Kirby, 2004; Matlay, 2005; Matlay et al., 2006; Mwasalwiba, 2010; Vesper & Gartner, 1997). Garavan and O′Cinneide (1994a), in turn, understand that the ultimate measures of entrepreneurship education are the acquisition of knowledge that relates to entrepreneurship; the techniques and the analysis of business situations and also the stimulation of entrepreneurial talent and skills.

Fayolle et al. (2006) consider that entrepreneurship education has the following objectives: 1) learning to become an enterprising individual; 2) learning to become an entrepreneur (or an expert in the field of entrepreneurship); and 3) learning to become an academic (teacher or researcher in the field of entrepreneurship). Each objective should be planned escaping the “one size fits all” approach, considering entrepreneurship in its wide diversity, and taking into account the range of theoretical choices, pedagogical methods, the institutional context and different objectives (Fayolle & Gailly, 2008; Kirby, 2007).

Similarly, Liñán et al. (2011) have focused on the objectives that can be pursued through entrepreneurship education: entrepreneurial awareness education; education for start-up; continuing education for entrepreneurs; and education for entrepreneurial dynamism: while the first has to do with increasing knowledge about entrepreneurship and consideration for an alternative career path, the second means to prepare the owner of a small business. The third tends to do with specialized adult education, for improvement of existing entrepreneur’s abilities and the last one is meant to encourage dynamic entrepreneurial behaviors after the enterprise is already operating.

2.2.3 Lack of consensus in entrepreneurship education

Despite the interest of many scholars in the nature of entrepreneurship education and in the explosion of research papers within the entrepreneurship field, it has been clear there is not any consensus in entrepreneurship education (Béchard & Grégoire, 2005; Fayolle & Gailly, 2008; Fiet, 2001b; Katz, 2003; Kuratko, 2005; Solomon & Matlay, 2008). Consequently, how could there be a consensus for entrepreneurship education as a teaching subject? (Fayolle & Gailly, 2008)

> *"Understanding entrepreneurship education requires entrepreneurship itself to be conceptualized. At the moment, there is no consensus definition of entrepreneurship, let alone entrepreneurship education"* (Liñán, 2007, p. 243)

Solomon, Duffy, and Tarabishy (2002) first gathered attention by implying that there were serious concerns about the maturity of entrepreneurship as a field, and the audience was reminded that there was lack of theoretical consensus in this field (Mwasalwiba, 2010; Pittaway & Cope, 2007). He underlined that it was the pedagogy that could not meet the innovative needs of students, and the quality of what was offered was not enough (Gibb, 2002; Neck & Greene, 2011) And while some agree a lot of progress has been made in the field, there are still researchers who agree it is not fully legitimate (Fayolle, 2013; Hindle, 2007; Katz, 2008; Mueller, 2012).

In fact, this outlook of a general lack of consensus in entrepreneurship education and its fragmentation is also mentioned by Garavan and O'Cinneide (1994b); Gibb (2002), Fayolle et al. (2006), Pittaway and Cope (2007), Mwasalwiba (2010), Fayolle (2013) and others. It is rather clear that this has been the distinctive nature of this field of research for more than 20 years. Mwasalwiba (2010) explains that there are still disagreements within the most pivotal concepts of the field, like entrepreneurship itself. He mentions a fragmented progress, which have a solid impact on the interpretations of entrepreneurship education, entrepreneurial orientation and many other terms. In this direction, a common theoretical background is imminent for success.

More recently, Fayolle (2013) points out that the existence of a common theoretical background is still not clear and that one could agree on a lack of knowledge in this particular area of research. We find, in the literature, suggestions of active pedagogies but no evidence of its success. As such, he emphasizes fragmentation, lack of theory, critical approach and legitimacy as the main problems of this field right now. He recommends the creation of a professional "entrepreneurship education" community, with shared values and objectives to change the actual nature and practices of entrepreneurship education. Rideout and Gray (2013) conceived a literature review of entrepreneurship education that has led them to believe studies are mostly limited, either to university based outcomes, pedagogy studies (programs and curriculums), or empirical studies with attempts to provide control groups, for example. The real question, for the authors is:

> *"[…] In truth, E-ed appears to be one of those phenomena where action and intervention have raced far ahead of the theory, pedagogy and research needed to justify and explain it […]The real question we need to answer is: What type of E-ed, delivered by whom, within which type of university, is most effective for this type of student, with this kind of goal, and under these sets of circumstances?"* (Rideout & Gray, 2013, pp. 346-348)

Hindle (2007) feels that the rapid proliferation of research contributions are not vital to the field of entrepreneurship. This is because the community does not take time to reflect on the contextual and philosophical fundamentals of the process itself. Similarly, Meyer (2011) states that most of the current focus of entrepreneurship researchers is to publish in top level journals and, as such, give much more thought to statistical metrics and new econometric trends rather than studying the subject of

entrepreneurship per se. He urges for the need of a new paradigm, for entrepreneurship is stalled in both researching and teaching, drawing from old paradigms from neoclassical economics.

2.3 Entrepreneurship education in practice – higher education programs, teaching methods and the role of the teacher

Entrepreneurship has attracted attention as a career choice (Fayolle & Gailly, 2008; Kolvereid, 1996a, 1996b) and Hytti (2008, p. 132) maintains that *"if there is a strong interest in entrepreneurship as a desirable career option, it makes sense to place the focus on providing programs that support the activity"*. This section covers entrepreneurship education in practice: the literature's stance on the matter of higher education programs, methods and topics of choice, as well as the role of the teacher. Before that, a contextualization of entrepreneurship education in a specific higher education setting follows, also covering the case of Portugal.

2.3.1 Entrepreneurship and higher education

Entrepreneurship education in a higher education context has been evolving rapidly worldwide (Redford, 2013b). It presents a special challenge, since teachers need to prepare their students for practice, while embedding theoretical knowledge - universities play a very important role as creators and disseminators of high level knowledge (Mueller, 2012).

It has been now more than 60 years since the first entrepreneurship course was held in the Harvard Business School by Myles Mace, in 1947 (Katz, 2003; Solomon et al., 2002). At the start of the XXI century, there were 44 specific academic journals and mainstream management journals were devoting more and more issues to entrepreneurship; and entrepreneurship education had increased to more than 2,200 courses at over 1,600 schools in the United States (Katz, 2003; Kuratko, 2005). Here, several universities have created entrepreneurship courses, which means more and more entrepreneurship majors are being offered to students.

Conversely, this not the case in Europe - entrepreneurship education is still trying to find its place. Formally recognized as one of the key competences in Europe (Redford, 2013a, 2013b), the European Commission (2008a) has postulated that courses and entrepreneurship activities should be part of higher education institutions strategies and more visibility should be given to the institutional commitment to entrepreneurship. While it has been growing at a steady pace, a lot still needs to be done. A lot of efforts are fragmented and driven by external actors, instead of the educational system itself. Battles for support and funding for entrepreneurship activities take place internally, and a lot of teachers are traditional in their teaching approach. Institutional policies get in the way of developing an entrepreneurial spirit and culture within European universities (Wilson, 2008). Since the demand for entrepreneurship education is increasing (Küttim, Kallaste, Venesaar, & Kiis, 2014) more resources like teachers and funding are necessary in order to meet expectations (European Commission, 2008a). In addition, the European context is very particular, since it encompasses a lot of cultural differences between the countries. And despite the fact that there is an enormous pressure for the promotion of entrepreneurial education, programs and activities should be in line with the local context (Hytti, 2008).

Henry (2013) argues that policy makers at the global and European level usually expect a wide and complex range of outcomes from entrepreneurship education, which go far beyond of what can be expected in a reasonable way. And while there is no doubt of the helpfulness of suggested pedagogies, methods and prescriptive content, there are many complex challenges to be taken care of, like traditional style environments, large classes and limited teaching support. Resources are usually limited, and assessment methodologies inappropriate. What we are left with is an entrepreneurship educator with an impossible task: producing highly entrepreneurial individuals for solving economic and societal problems.

Kuratko (2005) states that we stand in a point of what can be imagined and what can be accomplished has never been smaller, so he calls for institutional reform, in order to get the legitimacy and place that entrepreneurship deserves.

2.3.2 The case of Portugal

Whilst european entrepreneurship education started developing in the mid-nineties, it is relatively new in Portugal (Redford, 2006). It has been discussed recently, and there are still many question marks about the state of entrepreneurial education in the country (Correia Santos, Pimpão, Costa, & Caetano, 2013). When the Global Entrepreneurship Monitor (GEM) researched Portugal (2012), education was considered insufficient and the methods inefficient. Primary and secondary entrepreneurial education was considered very poor however management and business higher education was seen in a very positive light.

Nevertheless, within higher institutions, most colleges have entrepreneurship courses available and there seems to be a legitimate concern for entrepreneurship education. This topic was, in early years, considered as a subject associated with economic and management degrees. However, this seems to be changing and entrepreneurship modules are available to students from engineering, technical studies, social sciences and even health sciences (Correia Santos et al., 2013; Thompson, Gonçalves, Medina, & Amaral, 2013).

Since entrepreneurship education is relatively new in Portugal, it is considered that development is an urgent necessity. Redford (2006) conducted a survey in which he found that a lot of courses first started in 2003. Specifically, 27 entrepreneurship programs were identified - these focused on management, finance and marketing. He indicates business plans and lectures as the main method for teaching entrepreneurship and rarely, the use of simulations, role-playing or internships were present. Entrepreneurship teachers in Portuguese universities had their focus on teaching how to create a business. He found that a few courses were more oriented for entrepreneurial mindset creation and teaching the importance of entrepreneurship and others were more focused on the creation of businesses itself (Redford, 2006).

More recently, in the 2010-2011 academic year, Correia Santos et al. (2013) conducted another research, where they found 338 higher education programs, a big difference from the 2004-2005 previous survey, and a lot more graduate programs, mostly on masters' degrees. They noted a lot of regional contrasts in such programs and also that the offer was extended to a wide array of study areas - management, economics, engineering, social and human sciences, health sciences, and others (Correia Santos et al., 2013)

It should be noted that this is the most recent information and, presently, no more surveys were found, in Portugal, that addressed teachers, course content and pedagogies with regards to entrepreneurship. One can see that methods were still very traditional, and a lot of expectations were held for a field that was just in its infancy in the country. The 2010-2011 course survey did provide more information, as the course availability exploded in higher education and all around the country. Thompson et al. (2013) stress that entrepreneurship training needs to be regarded as an important issue in the Portuguese educational system. Saraiva (2013) recommended that higher education institutions should be focused on moving their human capital to entrepreneurship, joining students, teachers, researchers and other staff and try to make this conglomerate aware of basic entrepreneurship knowledge and developing entrepreneurial competencies. Besides this, Saraiva (2013) argues that a big component of entrepreneurship education should be monitoring the results and managing the objectives; without it, it would be very difficult to achieve efficiency and consistency in entrepreneurial education in the country.

2.3.1 Programs

Entrepreneurship education programs have been on the agenda of academic research for a few years now; the outcomes are different according to the specific objectives of each entrepreneurship education program (Gartner & Vesper, 1994; Janssen, Eeckhout, & Gailly, 2007). Bennett (2006) argues that the main distinction in entrepreneurial education programs is between those that underline practical business management skills, and those which reinforce the development of certain attributes within the participant. Kirby (2004) and Mwasalwiba (2010) report that entrepreneurship programs have, in their content, three main focuses:

i. Programs where the focus is giving orientation and creating awareness about entrepreneurship;

ii. Programs where the focus is the development of competences for new venture creation or self-employment;

iii. Programs where the focus is on small business survival and growth.

The literature lacks consensus on program content, aims and topics (Fiet, 2001a, 2001b; Honig, 2004; Katz, 2003; Kirby, 2007; Liñán, 2007; Mwasalwiba, 2010). In particular, Fiet (2001a, 2001b) has reported that each institution has its very own way of creating an entrepreneurship program: he reviewed 18 different syllabi and reported that they all had 116 different topics and that only one third of the programs overlapped. Garavan and O'Cinneide (1994a) also suggest that the main problem with entrepreneurship education is lacking "appropriateness of curricula and training programs" to prepare students for real life situations. In addition, the impression that entrepreneurs have different learning needs at different development stages has been acknowledged by many, like Henry et al. (2005a).

Krueger, Reilly, and Carsrud (2000) underline that an efficient entrepreneurship program could have an impact on many variables, such as the entrepreneurial intention of students. Regarding entrepreneurship university programs and training initiatives, some agree that the presence of entrepreneurship education programs in the university is an incentive for students in their choice of pursuing an entrepreneurial career. This is also true when a positive image is associated with real entrepreneurs (Fayolle & Gailly, 2008). One example is Autio, Keeley, Klofsten, Parker, and Hay (2001) analysis of the impact of student's perceptions of entrepreneurship: resources and other university support mechanisms positively influence attitudes toward an entrepreneurial career (Fayolle & Gailly, 2008).

Hytti (2008) highlights the creation of more and more programs will not necessarily result in more start-ups, despite the growing demand for them. Fayolle and Gailly (2008) suggest that teachers need to identify conditions and several factors that allow them to keep control over the implementation of their program; educators need to create the right conditions for more efficient learning. They identify two main constraints for this to happen: time and context. Program duration and its implementation may difficult the entrepreneurial learning as well. Other difficulties include the availability of resources, lecturers and financial budget (Heinonen, 2007).

2.3.3 Methods

Another relevant debate in entrepreneurship education is: How should it be taught? (Henry et al., 2005a; Kuratko, 2005; Mwasalwiba, 2010). It was noted in this review that when researching learning methods that a lot of authors referenced studies from early 1990s to early two 2000s: mainly Garavan and O'Cinneide (1994a), Fiet (2001a) and Gibb (1993, 2002). Notably, Mwasalwiba (2010) conducted an extensive review that shows the most commonly used pedagogic methods in entrepreneurship education are lectures, case

studies and group discussions. Other methods traditionally used are business plan creation; business/computer or game simulations; videos and filming; role models or guest speakers; project works; presentations; study visits and workshops.

Several authors categorize these between traditional methods and innovative methods: the first more passive, usually involving lectures and the second more action oriented, involving problem-solving exercises, exploring case studies and other activities (Bennett, 2006; Carayannis, Evans, & Hanson, 2003; Garavan & O'Cinneide, 1994a; Heinonen & Poikkijoki, 2006; Mwasalwiba, 2010). They sustain that traditional teaching methods do not activate entrepreneurship: focus is on business management mechanics, ignoring the complex environment in which entrepreneurs operate (Bennett, 2006; Garavan & O'Cinneide, 1994a). Active pedagogies on the other hand, facilitate the learning process - free-thinking, decision making and task completion attitudes are encouraged (Bennett, 2006; Carayannis et al., 2003; Gibb, 1993). Although active methods are encouraged throughout the literature, there is still no evidence of their success (Fayolle, 2013). Ironically, the most popular teaching method, as Mwasalwiba (2010) reports, are lectures, which are widely accepted as a traditional, passive method (Bennett, 2006; Heinonen & Poikkijoki, 2006). Fiet (2001a) reported understanding why lectures are so popular; they are tangible, easy to accomplish and do not require much investment. However, Haase and Lautenschläger (2011) considered that class lectures are losing some appeal, but business plans are still very popular, along with guest speakers.

Teaching methods are usually addressed in the literature with several experiments or testing, like the entrepreneurial-directed approach by Heinonen and Poikkijoki (2006), the multidisciplinary teams approach by García-Rodríguez, Gil-Soto, and Ruiz-Rosa (2012) or Fayolle et al. (2006) methodology. This reflects what authors think are the best pedagogical approaches. Given its status as something you only learn by experience, some authors criticize the idea of the excessive importance given to making a business plan in entrepreneurship programs (Honig, 2004). García-Rodríguez et al. (2012) and Honig (2004) argue that using business plans as a method is a bad idea because it supports thinking "in the box" and an entrepreneurial mindset requires innovation and creativity, regarded as "outside the box". However, Souitaris, Zerbinati, and Al-Laham (2007) suggest a well-adjusted program needs a business-planning component.

Bennett (2006) tell us that entrepreneurship lecturers do not agree on how entrepreneurship courses should be taught. Akola and Heinonen (2006) found that traditional methods such as lectures were more negatively criticized by the students. They note that some traditional methods should be complemented with entrepreneurial approaches: learning by doing and providing students with opportunities to participate and control the learning situation. This is because the traditional format ignores the essence of the entrepreneurial process. Mwasalwiba (2010) underlines that despite the general understanding that students should be having a more action-oriented approach rather than a traditional one, there still are some who recommend not totally abandoning theory-based teaching. Fayolle and Gailly (2008) claim a universal pedagogy recipe for entrepreneurship does not exist. There is a wide collection of methods and the choice depends on the objectives, course contents and limitations imposed by the institutional context.

Furthermore, some researchers emphasize that a lot of initiatives in entrepreneurship training are lacking in coherence, because they do not address the real necessities of an entrepreneur (Henry et al., 2005a, p. 105):

> *"Indeed, there is often a significant gap between the perceptions of the training providers and those of the entrepreneurs in terms of training needs […] If one begins to examine what is actually taught in an entrepreneurship program, it becomes clear that some programs tend to be more task oriented rather than behavior oriented, focusing on specific skills for small business management […]"* (Henry et al., 2005a, p. 105).

Fayolle and Gailly (2008, p. 580) say the main problem is that little research on assessment of each method has been made - learning by doing can be praised in the field of entrepreneurship in some pedagogical situations or extremely inappropriate in others: *"The selection of the pedagogical methods for each entrepreneurship education course should rely upon their adequacy and a priori efficiency regarding the objectives, the audience characteristics, the contents and the constraints due to the institutional context".* They conclude that as it is not known yet which pedagogical method or approach is better than the others, interesting challenges will rise for academic research in this area.

Concerning evaluation methods, not much was found. Mentoor and Friedrich (2007) found in their study that the most common methods of assessment are tests, examinations, assignments and the business plan. Fayolle et al. (2006) highlight that it is possible to evaluate knowledge or skills acquired, student's interest awareness and intention. They indicate satisfaction, attendance rates, participation and motivation to be common forms of evaluation and recommend, by the end of the program to identify progress by evaluating project management, team work or creative capacity.

2.3.4 Topics

Traditionally, entrepreneurship education programs had to do solely with venture creation, generating a variety of different ideas and exploiting business opportunities (Kirby, 2007). Fiet (2001a) underlines most textbooks deal with teaching students how to start their own business; this tendency in topics has influenced entrepreneurship educators everywhere. The author found that strategy/competitive analysis, managing growth, discovery/idea generation, risk and rationality, financing (mainly business angels) and creativity were the leading areas: *"Although there were no clean categories, the 18 syllabi include enough different topics to create six and a half different courses"* (Fiet, 2001a, p. 3). He added that most of the topics covered come from the already established literature of other several disciplines, like risk and rationality, which originated from finance and economic literature or even creativity, which comes from psychology.

Moreover, Mwasalwiba (2010) stressed that the most popular topics or typical subjects on an entrepreneurship course are resource management and finance; marketing and salesmanship; idea generation and opportunity discovery; business planning; managing growth; organization and team building; new venture creation; small business management and risk and rationality.

A lot of authors find that entrepreneurship course contents reflect different approaches when building the curriculum - different modules and several variations can be found (Bennett, 2006; Garavan & O'Cinneide, 1994a; Mwasalwiba, 2010). Matlay (2005) found out that this is very much a concern for entrepreneurship education– such a wide variation of course design, content and delivery has generated a big debate around entrepreneurship education effectiveness. The same lack of common definition appears again as a defining characterizing of entrepreneurship education programs, methods and topics covered (Fiet, 2001a; Matlay, 2005). Haase and Lautenschläger (2011) believe that the most fundamental competences tend to be hard skills such as business creation and management, business plans, finance and marketing and soft skills like creativity, leadership, risk taking propensity, proactiveness, among others. Motivation and attitude is essential. Kirby (2007) emphasizes that it is important to move from the traditional paradigm of new venture creation and tools to start a business; more attention should be given to entrepreneurial behavior and attributes. Hence, the content of courses and process of learning need to be different. He suggests topics such as communication skills, creativity, critical thinking, leadership, negotiation, problem-solving, and time management. Kirby (2007) also maintains that teaching how to deal with ambiguity and uncertainty is necessary for success.

Bennett (2006) found two tendencies: some focus on skill-training and others on attribute development. The first deals with teaching people mechanics of managing a business, for the most part, and usually

concerns the topics of raising finance, legal regulation and marketing problems. The second is concerned with attribute development, with inculcating attitudes like innovativeness, risk taking willingness, creativity, determination and self-direction. Skill-training is very popular in universities because they claim that businesses rarely fail from lack of innovativeness of the individual, but from the manager's ignorance of management, marketing, finance, budgetary control, employee recruitment and other topics. (Bennett, 2006; Garavan & O'Cinneide, 1994a; Gibb, 2002). The second approach is concerned that quality entrepreneurs are intangible and enigmatic, and each entrepreneurial act is very unique, with complex interactions; as such, program contents should enhance thinking and reflection (Bennett, 2006).

So how to evaluate if programs are successful? How to know what is the right approach or the right materials? Fayolle et al. (2006) defend that limiting evaluation to their impact can be very misleading since it is sometimes only visible much later. Another issue is the variability of such programs, different countries and different institutions may have very different approaches, objectives and methods. For the most part, authors call for the building of common theoretical frameworks and perspectives on entrepreneurship education: *"From this point-of-view, there should be no successful entrepreneurship teaching program without a good design strongly rooted in a scientific knowledge"*(Fayolle & Gailly, 2008, p. 586). Nonetheless, another question remains: how to build, in a collaborative way, a common theoretical framework in a field where its richness comes from its diversity?

2.3.5. The role of the teacher

Teachers have a fundamental role in entrepreneurship education, since they "*are able to foster entrepreneurial and enterprising learning"* (Fayolle & Kyrø, 2008, p. 289). A symposium of the European Commission (2011) proposes a few qualities of the ideal entrepreneurial teacher: the need for passion, confidence, leadership, energy and open-mindedness. One also finds debates about the teacher's role in entrepreneurship education in the literature and how fundamental it is to create that entrepreneurial spark with the students (European Commission, 2011; Seikkula-Leino et al., 2010). But, mostly, pedagogy issues and the theoretical side of teaching entrepreneurship are of more concern, with recommendations for teachers, (Ajzen, 1991; Fayolle & Gailly, 2008; Fiet, 2001a; Heinonen & Poikkijoki, 2006; Henry et al., 2005a; Mwasalwiba, 2010; Seikkula-Leino et al., 2010).

The nature of entrepreneurship, especially its complexity, makes it a very difficult topic to teach (Gibb, 2002), and education needs to deal with its complexity, and the challenge it represents (Kuratko, 2005). Other authors argue the main concern of researchers has been whether this development is maintained by supporting mechanisms, resources and availability of knowledge, especially concerning teachers (Fayolle & Gailly, 2008; Fayolle & Kyrø, 2008).

Fayolle and Gailly (2008) emphasize it is vital that the entrepreneurship teacher should get informed about the practices and the configurations of the pedagogical situations and contexts before implementing anything in the classroom. The teacher needs to understand how individual emotions and motivations outside the classroom affect the learning process. Understanding the subject, the concepts and evaluating students' interactions and results is essential. Redford (2013b) stresses that entrepreneurship education competencies are difficult to teach, mainly because they are cross curricular. This is sometimes a problem, since as there are differences in how the teaching of this subject is approached and a multitude of topics the teacher is supposed to know about: *"An entrepreneurship educator is often expected to know everything about every field"(Neck & Greene, 2011, p. 56).* In another note, Macosko, Johnson, and Yocum (2009) understand that teaching students to be entrepreneurs is a challenge from a pedagogical perspective, because a lot of educators are ill-prepared to use an active learning pedagogy, in the sense that they feel more comfortable in a more passive pedagogy, like lectures. The challenge is to understand which approach is more adequate in the classroom; while most authors consider an active pedagogy to be

the best, other authors, like Fayolle and Gailly (2008) agree that no pedagogy is proven to be better, and it is up to the teacher to figure the best possible approach in a given situation.

Heinonen and Poikkijoki (2006) argue it is the dynamic role of the student in the learning process that is important, a process which should encourage co-participation (teachers and students). Ikävalko et al. (2009) also maintain that the teacher should be ready to reflect critically and assess how students have learned so far. In this point of view, teachers are key promoters of entrepreneurship education. Their practices and methods can be a heavy influence to students; as such, it's important that the major concepts of entrepreneurship are well-known to them (Fayolle & Kyrø, 2008; Heinonen & Poikkijoki, 2006; Hytti, 2008; Ikävalko et al., 2009; Seikkula-Leino et al., 2010). Seikkula-Leino et al. (2010) conducted a series of interviews with entrepreneurship teachers in which they were asked about their methods, practices and objectives. They concluded that teachers have no broader understanding of entrepreneurship education strategies or curricula. And while they may have some reflections on education, they're strong enough to strengthen practical entrepreneurship education:

> *"[…] the teachers implied that the terms and concepts were familiar to them, but it is obvious that there was no specific theoretical basis or definition backing up their statements. […] we could see that since teachers are somewhat motivated and have some ideas, although rather limited ones, about the aims and practices of entrepreneurship education, there is some appearance of reflection" (Seikkula-Leino et al., 2010, p. 125)*

In conclusion, there seems to be a clear lack of conceptual links In fact, the teacher has a key role in entrepreneurship education, one that has not been fulfilled yet. Teachers are left with a multitude of tasks, objectives and choices to make that depend on his/her understanding of adequate methods, since there are not any common theoretical foundations in entrepreneurship education: *"If there are no common definitions, no idea about the content and processes of education […] there will not be any progress in the guiding role of entrepreneurship education"(Ikävalko et al., 2009, p. 17).*

Schleicher (2012) reinforces this idea - there is no best way of teaching, which is even truer nowadays than in the past. He highlights the need of a rich repertoire of teaching strategies, combining approaches and the deep knowledge of how and when to use different methods. Some authors, such as Fayolle and Kyrø (2008) consider that not many programs are available and very few teachers are involved; they argue that without good training practitioners, there cannot be good training in entrepreneurship. Teacher training initiatives are also highly recommended by other researchers and organisms and it is argued that entrepreneurship education can only be effective if teachers receive such training (European Commission, 2011, 2013b; Schleicher, 2012).

2.4 Entrepreneurship as an intentional process

Entrepreneurship is seen as an intentional process: *"it seems evident that much of what we consider 'entrepreneurial' activity is intentionally planned behavior"* (Krueger et al., 2000, p. 413) It is critical to understand this in order to understand the consequences of our actions. Intentionality is typical of emerging organizations; however it may be unplanned, like a new opportunity. In spite of reacting to market opportunities, entrepreneurs still think about starting a business and do not become entrepreneurs overnight (Bird, 1988; Krueger et al., 2000) Understanding intentions is especially useful when the phenomenon is rare, obscure or unpredictable, like entrepreneurship (Ajzen, 1991; Krueger et al., 2000; Lee, Wong, Foo, & Leung, 2011).

Intentions represent the belief that someone will perform a certain behavior, that someone will act (Krueger, 2000). Therefore, intent precedes actions and action requires effort; if we are willing to try, we first must have an intention. We create mental plans of what we intend and how we intend to do it (Ajzen,

1991; Krueger, 1993, 2000; Krueger & Brazeal, 1994; Krueger et al., 2000; Shapero & Sokol, 1982). Liñán (2007) argues that personal intention is a key element in the entrepreneurial process and intentions have proven to be the best predictors of planned behavior. Thus, a strong intention should eventually result in an attempt to start a business (Singh, Rakesh, & Prasad, 2012). Krueger et al. (2000) explain that we predict behavior by observing intentions toward that same behavior and that studying of these intentions proves extremely useful.

> *"In its simplest form, intentions predict behavior, while in turn, certain specific attitudes predict intention. Intentions thus serve as a conduit to better understanding the act itself […] As such, intentions serve as important mediating variables between the act of starting a business venture and potential exogenous influences. Intentions toward behavior are absolutely critical to understanding other antecedents"* (Krueger et al., 2000, p. 143)

Historically, entrepreneurial intention has had a strong connotation with the concept of behavior and, therefore, built on a psychological background. Authors usually define entrepreneurial intention as one's desire to own or start a business. It can be defined as *"self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future*" (Thompson, 2009, p. 676). Clearly, it is, for Thompson, not a question of yes or no, "*I have this intention*", but either in a scale of a very low intention to a very high one.

Some university programs are structured with means to increase entrepreneurial awareness and preparing aspiring entrepreneurs (Bae et al., 2014; Garavan & O'Cinneide, 1994a; Liñán, 2004). This relationship between entrepreneurship education and entrepreneurial intentions is very close because the first is well fit for the development of entrepreneurial skills and knowledge (Bae et al., 2014; Honig, 2004). As such, intentions are commonly used as a form of measurement after an entrepreneurship program (Souitaris, Zerbinati, & Al-Laham, 2007). Bae et al. (2014), indicate that the literature has identified theoretical perspectives and argue that entrepreneurship education is positively related to entrepreneurial intentions. Martin, McNally, and Kay (2013) have found that entrepreneurial education is positively linked to entrepreneurship outcomes. Pittaway and Cope (2007) found that entrepreneurship education impacts on propensity and intentionality of learners. Many authors now have tried to find evidence as to whether entrepreneurship programs have a positive impact on entrepreneurship intention of students (Bae et al., 2014; Carayannis et al., 2003; Garavan & O'Cinneide, 1994b; Henry et al., 2005a; Lüthje & Franke, 2003; Oosterbeek et al., 2010; Rideout & Gray, 2013; Souitaris et al., 2007; von Graevenitz et al., 2010).

2.4.4 Intention Models

Another notion that is commonly associated with entrepreneurial intentions is the concept of opportunities; before we can act on them, we have to identify those opportunities. As such, understanding what promotes or inhibits entrepreneurial activities requires that we understand how perceived opportunities are constructed. Hence, intention models are interesting because they provide theory-driven conceptual framework (Krueger, 2000). These models help us understand how an individual decision is made (Küttim et al., 2014) and afterwards, action is taken: *"From a research perspective, intentions models have proven consistently robust both in explanatory power and in predictive validity […]"* (Krueger, 2000, p. 10).

Consequently, several researchers (Ajzen, 1991; Bird, 1988; Boyd & Vozikis, 1994; Davidsson, 1995; Krueger & Brazeal, 1994; Shapero & Sokol, 1982) have elaborated various intention models which have tried to explain the relationship between the individual's personal characteristics and their entrepreneurial intentions. Fayolle and Liñán (2014) point out that there are three models that serve as a guide for understanding entrepreneurial intentions and their development: a) Bird's (1988) model for the implementation of entrepreneurial ideas; b) Shapero and Sokol's (1982) entrepreneurial event model; and

c) Ajzen's (1991) theory of planned behavior. Within these, the first two have received the most attention in the literature (Küttim et al., 2014; Lee et al., 2011).

2.4.4.1 Theory of Planned Behavior

This theory was initially proposed by Fishbein and Ajzen around 1975-80, with the name theory of the reasoned action (Ajzen & Fishbein, 2005). It was further developed as the theory of planned behavior and it is proven to be very popular within researchers that measure entrepreneurial intention among specific groups (Karimi et al., 2013; Kolvereid, 1996a, 1996b; Kolvereid & Isaksen, 2006; Krueger, 1993; Krueger & Brazeal, 1994; Krueger & Carsrud, 1993; Lee et al., 2011; Liñán & Chen, 2009; Lorz, 2011; von Graevenitz et al., 2010). Briefly, this theory deals with intentions to perform different behaviors and how these can be predicted (with accuracy) from attitudes toward that behavior, subjective norms and perceived behavioral control. Here, the major idea is an individual's intention to perform a given behavior and hence, the motivational factors that influence behavior are intentions - how hard someone will try to do something or the effort he/she puts in something (Ajzen, 1991, 2011).

The general rule is that the stronger the intention to engage in behavior, the more likely should be its performance. Thus, behavioral achievement depends jointly on motivation/intention and ability. As such, Ajzen (1991) explains the formation of intentions through three conceptually independent determinants of intention. The first is someone's attitudes toward the act, which refers to the degree to which a person has a favorable or unfavorable evaluation of same behavior - it depends on expectations about personal impacts of outcomes resulting from such behavior (Krueger et al., 2000); the second is subjective norm - it refers to the social pressure perceived by the individual to engage or not in such behavior, for example, what the family thinks about the individual's intention to start a business. The third and final is degree of perceived behavioral control which is connected to the perceived ease or difficulty of performing said behavior. It is also related to perceptions of competence, or self-efficacy. A general rule is that the more favorable the attitude and subjective norm towards a behavior and the greater the degree of perceived behavioral control, the stronger should be the person's intention to engage something that he/she is considering (Ajzen, 1991; Krueger, 2000; Krueger et al., 2000; Singh et al., 2012).

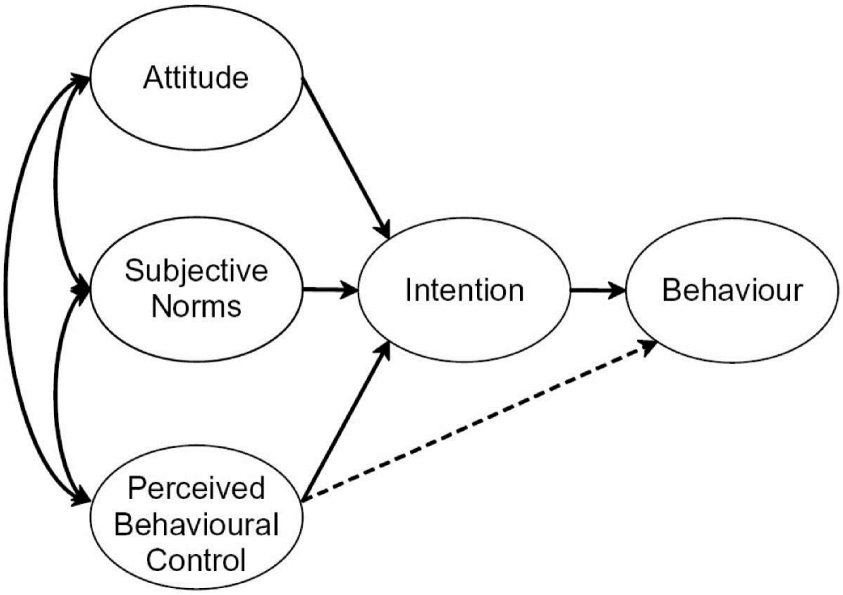

Figure 1 – The theory of planned behavior (Ajzen, 1991).

However, it should be noted that the importance of the three concepts in the prediction of intention is expected to vary across different situations:

> *"Thus, in some applications it may only attitudes have a significant impact on intentions, in others that attitudes and perceived behavioral control are sufficient to account for intentions, and in still others that all three predictors make independent contributions" (Ajzen, 1991, p. 188)*

Kolvereid (1996a, 1996b) was one of the first to validate this theory by prediction employment status choice intentions and praises Ajzen (1991)'s constructs as contributors to the explanation of intentions. Although there have been some criticism towards this theory, notably in the realm of the reliability of the constructs, these are tackled by Armitage and Conner (2001), in which they support, through meta-analysis, the theory of planned behavior as a predictor of intentions and behavior. Ajzen (2011) himself explains that while the theory of planned behavior is an accurate predictor of intentions, it may not be enough to fully explain intentionality and behavior and adds that increasing one of more predictors would increase its reliability – the amount of explained variance in intentions or behavior. (Ajzen, 2002, 2011; Armitage & Conner, 2001).

2.4.4.2 Entrepreneurial Event Model

A theory that is intrinsically connected with the concept of entrepreneurial intention is Shapero and Sokol's (1982) paradigm of entrepreneurial event formation. The aim of this model is to explain the processes that lead to an "entrepreneurial event", such as a new firm creation. In this specific context, intentions are derived from perceptions of desirability and feasibility and also from a propensity to act. In other words, the choice of starting a new firm depends on these three elements (Ajzen, 1991; Guerrero, Rialp, & Urbano, 2008; Krueger et al., 2000; Lorz, 2011).

> *"Shapero defined perceived desirability as the personal attractiveness of starting a business, including both intrapersonal and extrapersonal impacts. Perceived feasibility is the degree to which one feels personally capable of starting a business […] Empirical measures of self-efficacy (antecedents of perceived feasibility) assess beliefs that one can personally execute a given behavior ('I can get 8 out of 10 calculus problems right')"* (Krueger et al., 2000, p. 419)

Shapero and Sokol (1982) conceptualize that perceptions of feasibility and desirability are products of cultural and social environments and, hence, help determine which actions will be considered and consequentially taken. Individuals have various perceptions of desirability and feasibility - one might find desirable but not feasible to become an entrepreneur, a world famous chef or a painter, for example. The propensity to act was conceptualized by Shapero as the personal wiliness to act on someone's own decisions and hence, it reflects volitional aspects of intentions. It is argued that opportunity depends on control perceptions: gaining control by taking action.

2.4.4.3 The entrepreneurial idea model

Bird's model of intention, developed in 1988, emphasizes the importance of intentions for organizational development and for the implementation of entrepreneurial ideas. She proposes entrepreneurial intention is a state of mind that guides the actions of the entrepreneur on the way to the development and implementation of the business and the model's basis. It is argued that although entrepreneurial ideas begin with inspiration, intention and attention are necessary to make them a reality. Thus, intention is structured by rational, analytic and casual processes and it is framed and structured by intuitive, holistic and contextual thinking. Also, the development of an intentional posture requires that individual aligns himself to unique purpose and direction in synch with the entrepreneurial environment (Ajzen, 1991; Bird, 1988; Boyd & Vozikis, 1994). Boyd and Vozikis (1994) further explored this previous model by suggesting

the concept of self-efficacy, or the person's perceived capacity of performing a task, to be an influence in the process of new venture creation. It is clarified that the integration of the concept of self-efficacy provides an added insight to the development of entrepreneurial intentions and its cognitive process. . However, due to apparent non-existent empirical validation, this model was discarded (Fayolle & Liñán, 2014).

2.4.4.4 The entrepreneurial potential model

Throughout the literature, one can find several adaptations of the conceptual models or theories that were highlighted, namely Boyd and Vozikis (1994); Autio et al. (2001) and Krueger and Brazeal (1994). For instance, the last one draws from the theory of planned behavior, entrepreneurial event model and the self-efficacy concept to form a conceptual model that considers entrepreneurs as being made and not born.

As such, Krueger & Brazeal (1994) assert that they are made through a perceptive-driven enactive process which begins with forging the potential for being an entrepreneur. They consider both literature dominant models – theory of planned behavior and entrepreneurial event model – along with the concept of self-efficacy, as it is a predictor of opportunity recognition:

> *"The theory of planned behavior and Shapero's model of the entrepreneurial event overlap considerably. […] at the risk of oversimplifying the models, perceived feasibility in SEE corresponds to perceived behavioral control in TPB (both correspond to perceived self-efficacy); TPB's other two attitude measures are subsumed by SEE's perceived desirability"(Krueger & Brazeal, 1994, pp. 95-95)*.

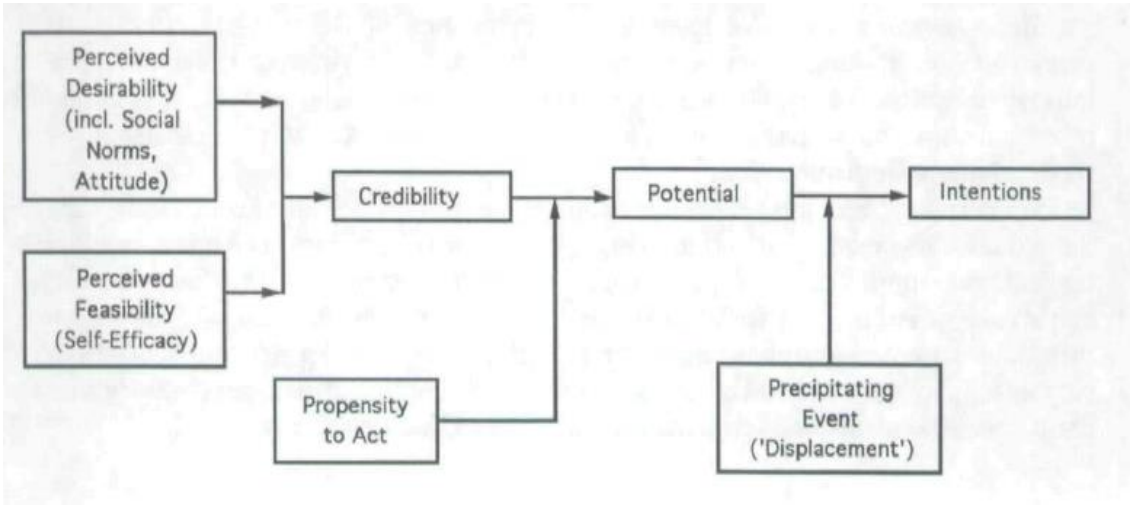

Figure 2 - The entrepreneurial event model (Kruger and Brazeal, 1994).

Following this model, Guerrero et al. (2008) argue that the entrepreneurial potential model is one of the stronger models, since it draws from the main conceptual models in the literature; conceptualizing and testing the notion of entrepreneurial potential - an entrepreneurial event needs the potential to start a firm that is defined in the three critical construct above listed.

2.4.4.5 Determinants of Entrepreneurial Intentions

Davidsson (1995) developed an economic-psychological model of factors that influence one individual's intentions to go into business, as he explains. He asserts that the main determinant of one's intention is the conviction that starting a business is a suitable alternative. In his model, the personal background influences the individual's general attitudes and domain attitudes. These factors influence the conviction

which in turn shapes the intention. More specifically, the decision to start a business is regarded as something planned for some time and preceded by an intention to do so. He explains that in some specific cases, the intention can be formed shortly before the decision. So he assumes that intentions do predict behavior, but imperfectly. He also argues that convictions are the main driver behind intentions.

Moreover, the situational factors are crucial; actual employment status can be one of the biggest influences on one's decision to start a firm. Shapero & Sokol's (1982) entrepreneurial event model also has this in consideration; Krueger & Brazeal (1994) argue that situational influences can be assumed to have the stronger influence in the behavior (Davidsson, 1995). Authors underline the importance of the conviction variable in the study and the introduction of competitiveness as a novelty in these kind of studies (Ajzen, 1991; Davidsson, 1995; Guerrero et al., 2008).

2.4.4.6 Self-efficacy

Albert Bandura's notion of self-efficacy, originally proposed in (1977), is also a widely accepted measurement for the entrepreneurial intention of a person. While Bandura (1977) argues that this concept refers to individual's belief in their personal capability to accomplish a set of tasks or accomplishment in a job, Gibbs (2003, p. 3) defines this as the *"belief that one is capable of exercising personal control over one's behavior, thinking and emotions".* To Sánchez (2013) it is a much useful concept to explain human behavior and it plays an important role in determining an individual's choice, for example. So, individuals with a higher self-efficacy for a certain task are also more likely to persist in that task or pursue the same task than other individuals with lower self-efficacy (Bandura, 1977; Sánchez, 2013). The concept of self-efficacy as it is argued by McGee, Peterson, Mueller, and Sequeira (2009) can be seen as an important antecedent of new venture intentions.

Some authors measure entrepreneurial intentions with extended notions of self-efficacy, such as entrepreneurial self-efficacy (ESE). ESE was first developed by Chen, Greene, and Crick (1998, p. 295) as *the "strength of a person's belief that he or she is capable of successfully performing the various roles and tasks of entrepreneurship. It consists of five factors: marketing, innovation, management, risk-taking and financial control*". They explain this is a construct that can be an identifiable characteristic of the entrepreneur and as such, one's ESE depends on perceived behavioral control over these 5 elements (Bae et al., 2014; Chen et al., 1998; Fitzsimmons & Douglas, 2011; Krueger et al., 2000). There have been a few authors exploring entrepreneurial intentions and its relationship with entrepreneurial self-efficacy (Alvarez, DeNoble, & Jung, 2006; Fayolle, 2005; Forbes, 2005; Hao, Seibert, & Hills, 2005). While some praise it as a very important construct in recent literature (Forbes, 2005) others question its legitimacy and consider that self-efficacy alone is more appropriate for measuring entrepreneurial intentions and a preferable construct (McGee et al., 2009).

2.5 Development of the conceptual model

2.5.1. Why the theory of planned behavior?

While it has been mentioned that the impact of a program or a course on its students or participants is indeed an adequate criteria of evaluation, another question remains: how does one measure it? How can someone measure a change in a state of mind? And how to isolate education factors from other factors that may indeed have impacted on one's entrepreneurial intention? These questions are posed by Fayolle and Degeorge (2006), who discuss the difficulties that arise when one tries to study the impact of an entrepreneurship program. Indeed, some researchers have demonstrated that some course methods are more efficient than others: Akola and Heinonen (2006) have analyzed 26 entrepreneurship courses in five different European countries and Arasti, Falavarjani, and Imanipour (2012) have explored teaching methods in entrepreneurship graduate courses, while Conners and Ruth (2012) analyzed factors that

influenced success in an introductory entrepreneurship course. And while teaching methods are being researched and explored in entrepreneurship education along with peers' influence in the classroom, the importance of the transmission of information/value to students is identified by Bae et al. (2014) as potential research in entrepreneurship education-entrepreneurial intentions relationship.

This is where the theory of planned behavior becomes an interesting choice for measurement in this study, for many reasons. It was conceived by Ajzen (1991) in order to explain emerging entrepreneurial behavior. For this reason, various intention models (Bird, 1988; Davidsson, 1995; Krueger, 1993; Krueger & Carsrud, 1993; Shapero & Sokol, 1982) have been created, associated with the belief that venture creation is an intentionally planned behaviour (Fayolle & Degeorge, 2006). Also, the idea that intention is indeed a better way to predict behavior than attitudes and other psychological or sociological variables is present, as well (do Paço et al., 2011). Most importantly, much of what is considered entrepreneurial activity is intentionally planned behavior, and intentions prove to be the most valuable tool to predict a phenomenon such as entrepreneurship which involves unpredictable time lags and is hard to observe (Bird, 1988; Souitaris et al., 2007; Kruger et al., 2000):

> *"Witness the tremendous emphasis on the business plan in virtually every academic and practical treatment on starting a new business. Even in cases where a unique catalyzing event like being downsized may spur the individual to the entrepreneurial act, there are often indications of a long time interest and desire to be in business for one's self. [...] We best predict, rather than explain, any planned behavior by observing intentions toward that behavior […] Intentions are the single best predictor of planned behavior"*(Krueger et al., 2000, p. 413).

The theory of planned behavior has been tested several times and the results offer strong statistical support (Autio et al., 2001; Krueger et al., 2000; Souitaris et al., 2007). Fayolle et al. (2006) add that the theory of planned behavior has been repeatedly applied and empirically tested, proving itself to be valid research material. While this study considered the use of Shapero & Sokol's (1982) entrepreneurial event model, some authors argue that it focuses more exclusively on venture creation per se and not so much the evolution of the entrepreneurial behavior (Fayolle et al., 2006). For the reasons presented, the theory of planned behavior was the intention model chosen to measure the impact of entrepreneurship education in this study.

2.5.2. Hypothesis

The antecedents that constitute one's intention to start a business are still a subject discussed of discussion (Roxas, 2013). Determining the impact of entrepreneurship education on entrepreneurial intentions is of important theoretical, pedagogical and political interest (Fayolle et al., 2006; Liñán et al., 2011; Roxas, 2013).

Students selected for this study are higher education students, engaged in an entrepreneurship course during one semester from different majors and different Portuguese universities. Since this is an ex-ante post- ante research, it can be expected that by the end of the semester (Tend) attitude towards the behavior, social norms and perceived behavioral control will be higher than before. This is because attending an entrepreneurship training course has been associated with higher entrepreneurial intention (Almobaireek & Manolova, 2012; Küttim et al., 2014; Lorz, 2011; Souitaris et al., 2007) even in the case of secondary students (Sanchéz, 2013). Oosterbeek et al. (2010), on the other hand, found that the impact of a specific entrepreneurship program had no impact over student's entrepreneurial skills and their intention of becoming an entrepreneur is even negative. The present study seeks to understand if a higher education entrepreneurship program has any positive relationship to attitudes towards entrepreneurship, social norms and perceived behavioral control of Portuguese students. In addition, entrepreneurial knowledge and institutional environment constructs were also compared. This was done in order to

understand the effects that an entrepreneurial course in higher education had on student's perception of the institutional environment and of their entrepreneurial-related knowledge. Building of the hypothesis translated into the following conceptual model:

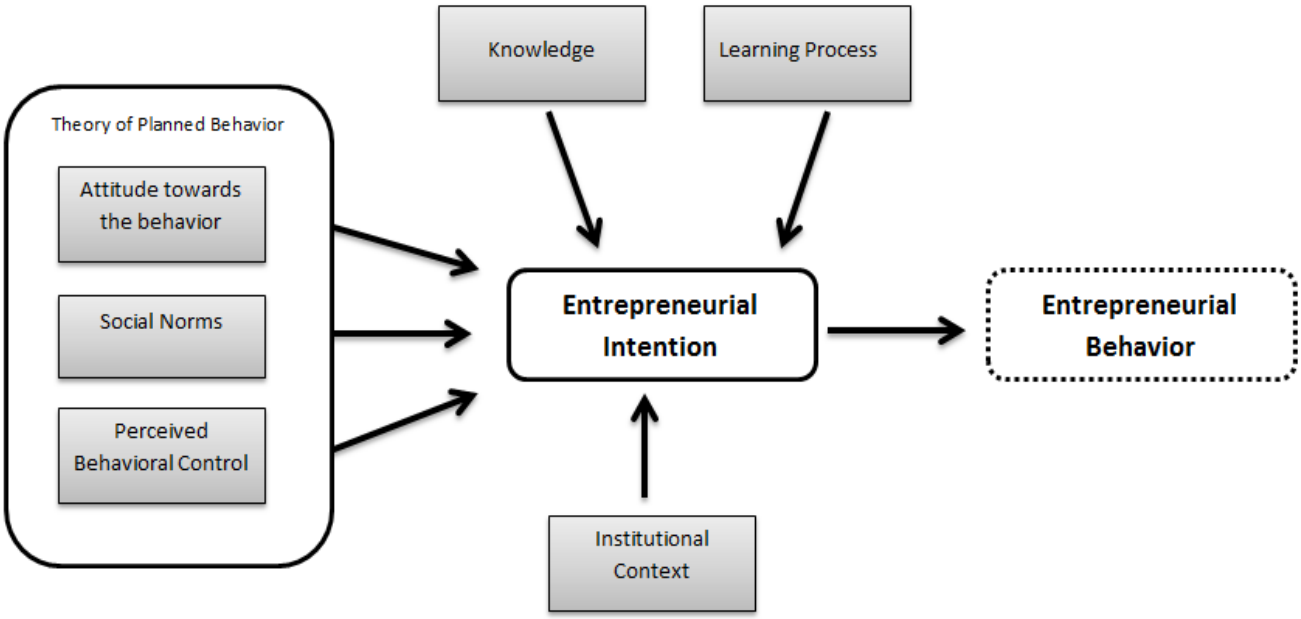

Figure 3 - Entrepreneurial intention conceptual model

In this model, arrows imply a significant relationship with entrepreneurial intention. Learning processes are not specified between pedagogic methods and lecturer because it was still early to imply that either had a significant relationship with entrepreneurial intention. In addition, other types of learning processes such as the audience and the course objectives, that were not measured in this study may indeed have an important role on predicting entrepreneurial intention.

H1: An entrepreneurship higher education course positively influences students' perceptions of:

(h1a) Attitude towards the behavior

(h1b) Social norms

(h1c) Perceived behavioral control

(h1d) Entrepreneurial intention

(h1e) Entrepreneurial knowledge

(h1f) Entrepreneurial institutional context

It was of particular interest for this study to understand if the teacher's profile and teaching methods had any implications in student's entrepreneurial intentions. In fact, Krueger and Brazeal (1994) had first conceptualized an intention model that conceived both the theory of planned behavior and the entrepreneurial event model into one, showing their compatibility, and bringing to the table the role of exogenous influences – hypothesized exogenous factors that could precipitate, facilitate or inhibit influence to one's beliefs and attitudes. Furthermore, authors such as Kolvereid (1996a, 1996b) and Autio et al.

(2001) designed models to research the entrepreneurial intention of students (Fayolle et al., 2006). Theory of planned behavior constructs have been shown to be positively related to entrepreneurial intention (Autio et al., 2001; Lorz, 2011; Souitaris et al., 2007).

Fayolle et al., (2006) therefore argue that it is possible to use the theory of planned behavior to study the effect of entrepreneurial training program in the emergence of entrepreneurial intention. They tackled this problem by developing an innovative conceptual model that could aid researchers when analyzing the impact of entrepreneurship training courses – they used the theory of planned behavior and course related variables such as institutional setting, audience, type of course, course objectives, course content, teaching and training methods and approaches.

Since this study focuses on the role of the teacher and its pedagogic methods, it was also fit to use the theory of planned behavior parallel to what we feel can be exogenous influences on student's perception of entrepreneurship – the teacher per se, and their teaching methods of choice. In this sense, the institutional context of the university and the prior (and afterwards) knowledge that students have were also elements considered to be exogenous influences for the students. Having this in mind, the conceptual model was developed in order to better understand entrepreneurial intention in this specific context.

H2: The greater the attitude towards the behavior, social norms and perceived behavioral control, the greater the entrepreneurial intention.

The ever increasing popularity of entrepreneurship education programs and courses is driven by the assumption that education may serve as a "*preparatory function in relation to venture initiation*" (Roxas, 2013, p. 435). Higher education institutions are challenged to bestow upon their students the motivation, knowledge, skills and abilities for firm creation and play a determinant role (Franco, Haase, & Lautenschläger, 2010) Still, there are different and fragmented views on the importance that these courses have on students' entrepreneurial intentions (Fayolle et al., 2006; Liñán et al., 2011; Roxas, 2013).

For Roxas (2013), entrepreneurial knowledge represents a potential entrepreneur's capability to recognize opportunities and pursue them, therefore, being able to comprehend, interpret and apply new information in novel ways, which are at the core of entrepreneurship. The author argues that the effect of entrepreneurial knowledge is not necessarily direct on entrepreneurial intention and so he aimed to understand the contribution of entrepreneurial knowledge on the development of the entrepreneurial stance:

> *"Specifically, the development of an individual's cognitive stock of knowledge and its influence on entrepreneurial decision making are less understood […] For instance, there are significant research gaps about the link between entrepreneurship education programs and the development of the [entrepreneurial knowledge] necessary to nurture entrepreneurial desires, motivations or intentions"* (Roxas, 2013, p. 434).

Liñán et al. (2011) also explored entrepreneurial knowledge, highlighting that personal knowledge may significantly influence venture creation decision. Yet, they found that it has no direct impact on intention, but an indirect effect on the antecedents of entrepreneurial intention, like feasibility. The authors argue that it may have to do with study limitations.

This study seeks to understand the role that entrepreneurial knowledge plays in an individual's entrepreneurial intention, after taking an entrepreneurship course. It was inquired if students' felt capable of doing entrepreneurship related activities, before and after taking the entrepreneurship course. These include being capable of analyzing the market, the competition, defining strategies, making a value

proposition, using project management tools, making a negotiation, evaluating a project economically and financially, and others. A hypothesis was built:

H3: The greater the entrepreneurial knowledge, to the greater students' entrepreneurial intention.

Some researchers have looked into the importance of the institutional context and how contextual barriers and support factors have a significant part to play in the student's entrepreneurial intentions (Autio et al. 2001; Lüthje and Franke, 2003). In this particular case, a higher education setting may play an important role in defining a student's entrepreneurial intention; most notably, Lüthje and Franke (2003) found that perceived contextual barriers and support factors in the university may facilitate (or not) students' entrepreneurial behavior. Supporting entrepreneurship as an alternative career and intensifying educational activities and entrepreneurial programs is encouraged by the authors because this helps enhancing students' perceptions of entrepreneurship. Autio et al. (2001) also explore the university environment and its entrepreneurial support mechanisms, underlining that those help shaping students' perceptions of entrepreneurship as a career choice. They expected that entrepreneurial intent was moderated by social context variables (characteristic of university environments). Also Varela and Jimenez (2001) found that student's entrepreneurial intentions are higher in universities were the investment on entrepreneurial education and mentoring was higher. This study intends to find if indeed the university environment, in this context, helps defining entrepreneurial intention and hence, its presence on the conceptual model.

H4: The greater students' entrepreneurial context perceptions, the greater are students' entrepreneurial intention.

The importance of variables like the pedagogical approach, program content and design and other educational aspects have dealt with limited attention; some authors indeed suggest that some pedagogical methods may be more effective than others, while other researchers indicate that these methods may be decisive factors for success (Volkmann, 2004). Fayolle (2013) argues that there is still lack of knowledge to what constitutes the best entrepreneurial pedagogical combinations for specific students, what are the best pedagogies - by comparing them with the same students and the same objectives. The author suggests that more emphasis should be given to evaluation and measurement of entrepreneurship programs.

In a recent study, Küttim (2014) recommended exploring teacher's methods and student's views on them. Entrepreneurship curriculum design is different among universities (Edwards & Muir, 2005) and so we find different approaches proposed by different authors: Arasti et al. (2012) highlight that entrepreneurship education is as effective as teacher's skills and his/her choice of pedagogical methods. Akola & Heinonen (2006) could not find an effective combination in terms of necessary knowledge in the entrepreneurial process and an effective learning method. One might say the biggest challenge is the appropriateness of curriculum design and teaching methods when developing students' entrepreneurial intentions (Garavan & O'Cinneide, 1994a; Keat, Selvarajah, & Meyer, 2011). One of the aims of this study is to understand if learning methods are positively related to entrepreneurial intention after taking an entrepreneurship course.

As underlined throughout this study, entrepreneurship education is expected to be successful and as such, teachers do play a central role in delivering and promoting it (Seikkula-Leino et al., 2010). The teacher's role is often, in entrepreneurship education, at a crossroads (Seikkula-Leino et al. (2010). Teachers' have difficulties in achieving the balance between being the coach and the instructor: if they leave students to work independently, teachers should give students the opportunity of working with minimum supervision in order for them to understand the entrepreneurial process and its difficulties; however if they are not supervised or do not get feedback, they may find the experience frustrating and the project getting nowhere. Another concern is the amount of workload around the project – it may involve leaving the school environment (Hytti & O'Gorman, 2004).

To our knowledge, no studies explored the particular role of the teacher and entrepreneurial intention. Since the choice of teaching methods and the teacher are deeply connected (Hytti & O'Gorman, 2004), one of the research questions arousing is if indeed different teaching approaches could have a different impact on entrepreneurial intentions. Followed by the debate can entrepreneurship be taught, it was inquired if the profile of a certain teacher (with or without entrepreneurial experience) could be at all related to entrepreneurial intention. Exploring the role of the teacher is one of the objectives here and as such, we build the hypothesis:

H5: Type of lecturer (h5a) and learning methods (h5b) are significantly related to student's entrepreneurial intention.

Control variables such as demographics (age, gender), considered to possibly exert influence on entrepreneurial intention, were also tested, however no hypothesis were developed. Souitaris et al., (2007) found that demographic control variables did not help predict entrepreneurial intention. It was decided to test them here to see which results they would produce. This study's control variables include age, gender, type of lecturer and type of learning.

Chapter III: Methodology

3.1 Objectives

This investigation has a clear objective: to understand the impact of entrepreneurship education programs in a higher education setting. From here, the investigation departs in two different ways: the impact that the teacher has on the way the program is taught, evaluated and overall conducted, and what difficulties may arise during the same program; and subsequently, the impact that this program has on the student's entrepreneurial intention and if he/she is satisfied with the course overall.

The aim is to gain a better understanding of the impact of entrepreneurship education, mainly the syllabus, the teacher and the pedagogy used and their role in motivating students' entrepreneurial intention. Moreover, this study aims to understand what is the impact that the teacher has in his/hers students' entrepreneurial intentions and if their choices, in terms of what is taught, have any kind of influence in entrepreneurial intentions or shaping students' attitudes towards entrepreneurship or perception of entrepreneurship.

The instrument to measure such relationship is the theory of planned behavior, as its usefulness in predicting a behavior has been demonstrated (Ajzen, 1991).The aim of this chapter is to discuss what methods were used to answer the questions raised by this investigation, such as the details of the sample, how the questionnaires were developed and how data was collected and used in this study.

3.2 Research method

In the preparation of this dissertation a mixed methodology was used consisting on of both quantitative and qualitative analysis. The reason for this choice was that the study of pedagogies and methods in the classroom is mainly a qualitative one. It sets the tone for exploring new topics with regards to entrepreneurship education. The nature of the topic of entrepreneurship education itself is so vast and diverse that it was felt as the proper path for studying, testing and analyzing the research questions and their hypotheses.

To understand the impact of entrepreneurship education courses in student's entrepreneurial intention an ex-ante and ex-post testing design was used. The data was acquired through questionnaires that were passed to students at the beginning and at the end of their entrepreneurship curricular unit, i.e. before and after the entrepreneurship programs. A paired sample approach was used to match the answers at the beginning and at the end of the semester. This method was selected in order to assess students' entrepreneurial intention and any modification that might occur between the beginning and the end of the entrepreneurship course. The flexibility of the questionnaire as a measuring instrument was helpful to gather the answers of a large amount of students and compare their entrepreneurial intentions. Also, a control group was used to compare the results between those who attend entrepreneurships classes and to achieve more reliable conclusions.

For the teachers, a case study methodology was used, by conducting semi-structured interviews. Since there are not preliminary studies on this area, case studies are considered to be most adequate (Yin, 2003). In this sense, the uses of a case study allowed to "*investigate a contemporary phenomenon within its real-life context especially when the boundaries between the phenomenon and context are not clearly evident*" (Yin, 2003, p. 13). This was done with the purpose of understanding the methods, pedagogies and materials in class used and how they shape the entrepreneurship classes. This method allows for the use of quantitative and qualities data, and for using past theoretical studies to guide analysis and data collection. The aim is to select a small number of cases to illustrate different teacher profiles and analyze

its relationship with the development of student's entrepreneurship attitudes or perception of entrepreneurship.

3.2.1 Instruments

3.2.2 Questionnaire

Before starting to elaborate the questionnaire, much literature was reviewed and discussed to understand the best way to measure entrepreneurial intention. At first, several articles were reviewed to understand the scales used in other studies (Kolvereid, 1996a, 1996b; Liñan & Chén, 2009; Lorz, 2011; Souitaris *et al.,* 2007; von Graevenitz, 2010). It was understood that the literature had very well defined scales for this problem; mainly the scales of Liñan & Chén (2009), and also Kolvereid's (1996a; 1996b) self-employment scales were very common in studies which had entrepreneurial measurements as their objective. Also relevant and persistent in the literature was the theory of planned behavior as a method of measurement, since it is widely accepted as a reliable form of testing entrepreneurial intentions. It was also common a reference to Shapero & Sokol's (1982) constructs; this was considered for this questionnaire, however, the lack of consensus to whether entrepreneurial self-efficacy is a better construct to measure entrepreneurial intentions than the theory of planned behavior was the main reason why it was not considered. Liñan & Chén's (2009) scale for this same purpose was therefore used in this dissertation questionnaire, as the theory of planned behavior was the eligible theoretical concept along with its constructs.

The skeleton of the questionnaire was, hence, an overview of the student's background, such as age, gender, area of studies, academic degree and work experience. After that, a question about the expectations of the entrepreneurship course ensued. Following this first part, questions regarding entrepreneurial intentions were next. Three constructs – attitude, social norms and perceived behavioral control – form the core of the theory of planned behavior. Items regarding each construct were perceivably evaluated by each subject in a scale of 1 to 7, indicating their level of agreement with each statement. Afterwards, students were asked about their perception of the institutional setting – the university ecosystem – and how they felt about the role of the university in promoting an entrepreneurial culture. These were adapted from OECD and European Commission (2012) guiding for entrepreneurial universities. Following this six-item question, students were asked about their entrepreneurial knowledge: if they felt capable of developing a value proposition, for example. Finally, entrepreneurial intention questions were adapted from Liñan & Chén (2009). Students were inquired about their intention towards becoming an entrepreneur: if they have merely thought about it, or are determined to do so or if it is their professional objective.

3.2.3 Interview Development

In the beginning, it was given consideration to administrate another questionnaire, this time for the teachers. However that idea was discarded, considering that the in-depth knowledge we wanted could not be obtained with a simple questionnaire and it was felt that a semi-structured interview would be a better method to understand the role of the teacher in entrepreneurship education. The interviews were structured in such a way that it privileged the teacher's point of view on entrepreneurship education, objectives and results of entrepreneurship classes, but mainly the pedagogies and the topics covered in with each class. Interview development followed three main questions (Seikkula-Leino et al., 2010; Seikkula-Leino, 2010): (1) What aims do you have for entrepreneurship education? (2) How do you put entrepreneurship education into practice? (3) What results have you achieved in entrepreneurship education? Table 1 shows the interview script: the first section covers the professional background of teachers, the second part is concerned with the pedagogical methods, approaches, topics and evaluation and the final block is constituted by general questions which are commonly addressed in the literature. These questions are based on recommendations by European Institutions (European Commission, 2006;

European Commission, 2009; European Commission, 2013; European Commission, 2012; OECD, 2009) in order to assess what teachers taught about what was necessary to change/implement in entrepreneurship education. They include the stress to implement teacher training, creation of PhDs and the ever remaining question: can entrepreneurship be taught? And if so, is it easier to teach when you have (or do not have) entrepreneurial experience?

Table 1 - The Interview script

Background
What is your academic background?
Tell me about your publications in Entrepreneurship.
Tell me about your professional experience.
Why did you start teaching?
Aims, methods, results
What do you usually teach? To what students?
What objectives do you have for entrepreneurship education?
What kind of pedagogic methods do you use? Which are more important?
What kind of topics do you cover? Which are more important?
How do you conduct evaluation?
Did you have any struggles? Difficulties? Do you have any difficulties/constraints now?
Tell me about your student feedback.
Personal Views
Can entrepreneurship be taught?
Do you consider teacher training (in entrepreneurship) relevant?
Should more PhDs (in entrepreneurship) be created?

3.3 The sample

For this experiment, the criteria for subjects was that they had to be university students taking, for the first time, the course of entrepreneurship and a control group who had never had the subject before. After data collection, there were 496 students who responded to the questionnaire. There were 293 students who responded the questionnaire at the beginning of the semester and another 203 responded it at the end of the semester. This, of course, meant that not all of the students that replied to the questionnaire the first time did it a second time. With that said, the sample would be reduced to 163 students who had their answers properly paired, during statistical analysis. Of these, 23 would be control group students.

Meanwhile, there were 9 teachers interviewed, from different universities. The aim was to correlate each classes with their teacher; particularly the type of lecturer and type of method used. This was to be done with universities from the north and the center regions of Portugal. However, due to very few to none responses from other students of several universities, this meant that variables related to learning methods and type of lecturer during class were not used with all classes. Thus, while all teachers were interviewed, not all of their students could be reached, reducing teacher sample in statistical analysis from 9 to 6. Hence, in statistical analysis only teachers A, B, C, D, E, and I and pertaining classes were included. All interviews were, however, discussed in the results.

Chapter IV: Results

4.1 Sample characterization

This sample was constituted by 9 teachers and 496 students, of which 163 are utilized for testing of our hypothesis, based on a paired sample logic in which students were compared at two points in time: at the beginning and end of the semester. Factor analysis and multicollinearity tests were performed first to assess the questionnaire's reliability. This section provides a description of the paired sample (163 students) that was used in the analysis. Within the sample, there are 57 male students, as opposed to 106 female students, with a 35 to 65% percentage each as shown in Figure 5.

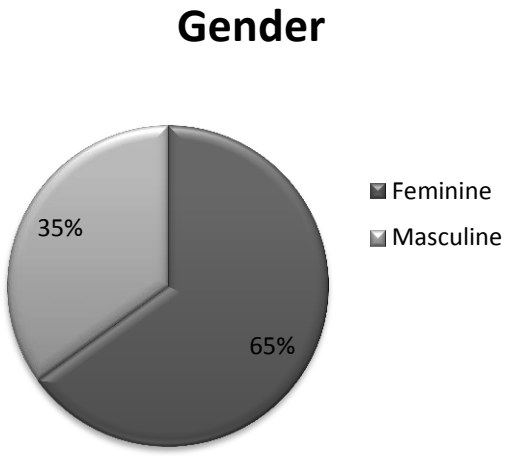

Figure 4 – Percentage of each gender in the study

In addition, this sample covered students aged from 19 to 51. Age average of participants was 22 years, approximately, whereas the mode was 20, which is constituted by 43 students (26.4% of the sample). Figure 6 shows both the frequency and the percentages of the age distribution.

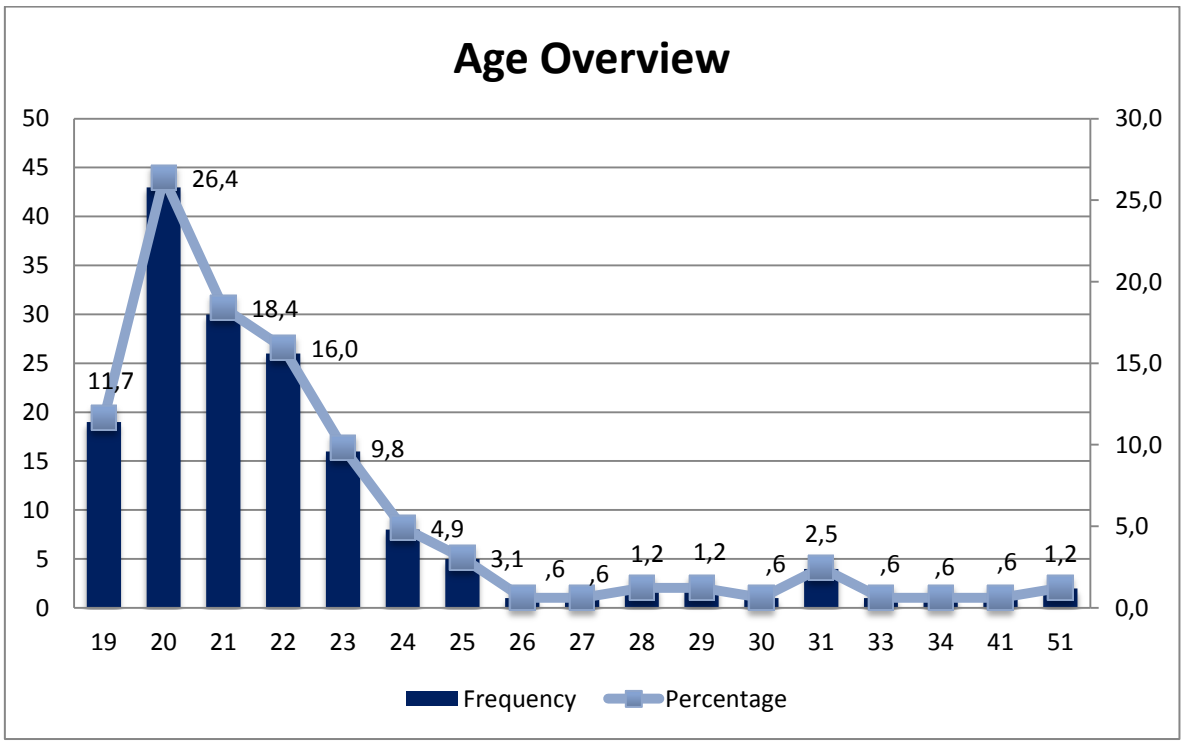

Figure 5 - Age of participants

Questionnaires were forwarded to six higher institutions; however the proportion of answers from universities other than Aveiro University was much lower. It is important to clarify that these answers include only those students who responded in the beginning and at the end of this study. They are of course, lower than the actual number of answers. Those that are represented in this study include the University of Aveiro, with 111 students, University of Porto, with 13 students, University of Minho, with 6

students and also the Higher School for Technology and Management of Águeda (ESTGA), with 33 students.

There are 111 students enrolled in bachelor's degrees and 52 in master's degrees. This is, respectively, 68,1% and 31,9% of answers. Within these, most students were enrolled in their third year, or final year of the licentiate. Figure 7 displays the percentage distribution of students in each respective year.

Students were also asked for information on their scientific areas, which are depicted in the graph below: life and health sciences, exact sciences and engineering, natural sciences, and social sciences. Students enrolled in social sciences had the biggest percentage, a total of 46% (75 students). Secondly, students from exact sciences and engineering, a total of 33.7%, or 55 students. Thirdly, there were students from life and health sciences, with 30 people, 18.4%. Finally, there were students from natural sciences, only 3 of them, which accounted for 1.8% of the sample.

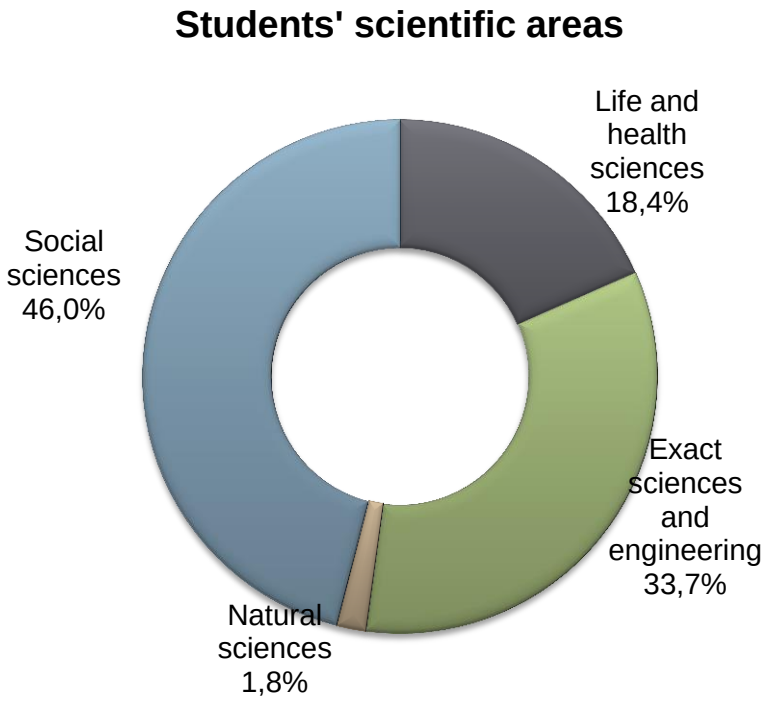

Figure 6 - Percentage of scientific areas in the study

There were students enrolled in several different courses; these included economics, marketing, business management, innovation management, tourism, management and industrial engineering, quality management, retail management, biology, biotechnology, biomedical sciences, civil engineering, chemistry, new communication technologies, applied languages, languages and business relations, office administration studies and public administration.

Lastly, the questionnaire asked if they were full-time students, or if they worked and studied at the same time. The majority were full-time students, 147 of them, which is 90.2% of the sample. Students working and studying at the same time were 9.8% of the sample, 16 of them.

Moreover, students were inquired about their professional experience: the options were none, internship, part-time, full-time for less than 1 year or full-time for more than 1 year. As one can see in figure 8, the majority of students had either an internship or part-time experience or no professional experience at all.

Full-time experience was indicated by 21 students, accounting for 12.9% of the answers, whereas no experience had 42.9% and taking an internship or a part-time job had accounted for 44,2% of the global answers.

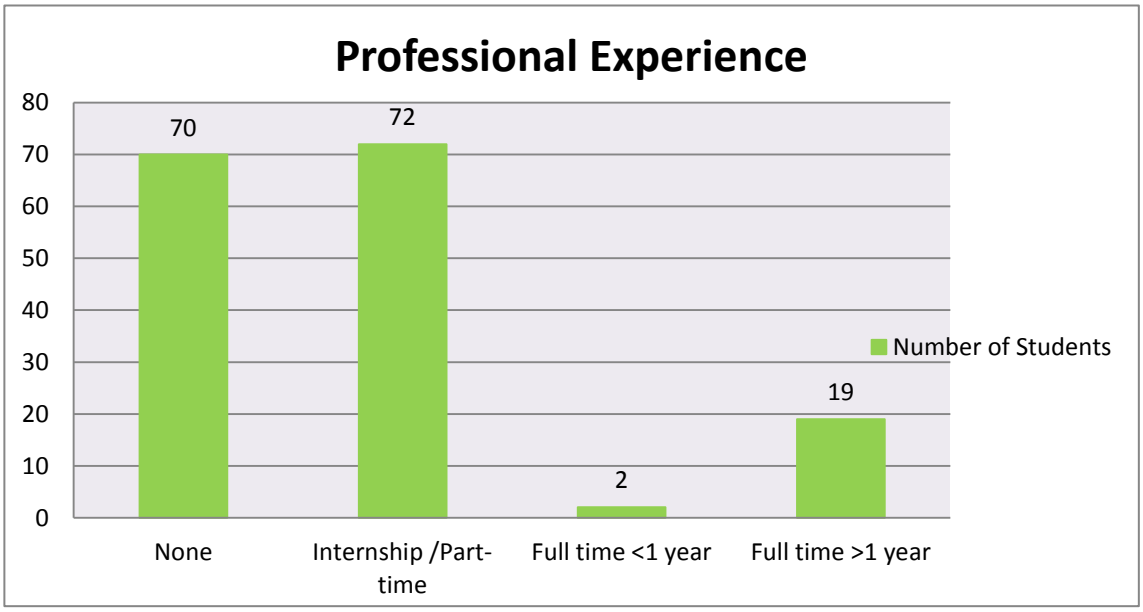

Figure 7 - Students' professional experience

4.2 Selection Bias

The sample that was used comprises university students, who are enrolled in an entrepreneurship course. This course can be either mandatory or voluntary, since the sample includes students of diverse backgrounds. This means that there are, for example, business students (and others) that have entrepreneurship as a mandatory discipline and students from health sciences, for example, which have chosen to take the discipline optionally. Levene's test for equality of variances is interpreted, which involves examining the homogeneity of the variance between two groups (Acton, Miller, Fullerton & Maltby, 2009). We found both groups, in table 2, to be representative of what is to be analysed – entrepreneurial intentions of higher education students.

Table 2 - Sample means and Levene's Test

	EI[1]-Start	A-Start	PBC-Start	SN-Start	K-Start	Ctx-Start	EI-End	A-End	PBC-End	SN-End	K-End	Ctx-End
N												
Exp. Group	140	140	140	140	140	130	139	140	140	140	140	140
Control Group	23	23	23	23	23	22	23	23	23	23	23	23
Mean												
Exp. Group	3.707	4.658	2.993	4.691	3.826	4.653	4.556	4.608	3.737	4.657	4.659	5.075
Control Group	3.507	4.261	3.043	4.333	3.560	4.568	4.051	4.087	2.913	4.420	3.961	4.420
Levene's Test												
F	0.082	0.059	0.004	0.000	2.046	1.057	0.01	0.147	0.060	0.089	0.570	0.303
Equality of Means												
t	-0.601	-1.581	0.210	-1.190	0.857	0.355	-1.714	-1.820	-3.657***	-0.792	-2.975**	-2.677**
df	161	161	161	161	161	161	160	161	161	161	161	161

*p≤0.05 **p≤0.01 ***p≤0.001

[1] Where: **A**- Attitude towards the behavior; **PBC** – Perceived Behavioral Control; **SN –** Social Norms; **CTX** – Context; **K-**Knowledge; **EI –**Entrepreneurial Intention.

4.3 Test for Normal Distribution

In order to test for a normal distribution, constructs were tested for skewness and kurtosis - they refer to the shape of the distribution. Values for Skewness and Kurtosis are zero when the distribution is exactly normal (Coakes, 2005). This implies that if there is no skew, or if the variable is normally distributed, a value of zero will appear. If there exists a negative value, data is negatively skewed; if there is a positive value, data are positively skewed. With Kurtosis, positive values indicate data that is peaked (leptokurtic) and negative values indicate that the distribution is flatter (platykurctic) (Acton, Miller, Maltby, & Fullerton, 2009; Coakes, 2005).

Table 3 - Skewness and Kurtosis tests

	Mean	St. Deviation	Skewness	Kurtosis
EI[2] End	4.5576	1.3112	-0.141	-0.777
EI Start	3.7071	1.4863	-0.315	-0.629
A End	4.6083	1.2829	-0.409	-0.550
A Start	4.6583	1.1184	-0.271	-0.259
PBC End	3.7369	1.0058	-0.091	-0.650
PBC Start	2.9929	1.0773	-0.561	-0.264
SN End	4.6571	1.3115	-0.056	-0.605
SN Start	4.6905	1.3415	-0.236	-0.264
CTX End	5.0615	1.1160	-0.809	1.009
CTX Start	4.6571	1.1196	-0.023	-0.205
K End	4.6587	1.0524	-0.130	-0.699
K Start	3.5603	1.4158	-0.054	-0.841

[2] Where: **A**- Attitude towards the behavior; **PBC** – Perceived Behavioral Control; **SN –** Social Norms; **CTX** – Context; **K-**Knowledge; **EI –**Entrepreneurial Intention.

Leech, Barrett, and Morgan (2011) tell us a common guideline: If skewness is greater than +1.0 or less than -1.0, the distribution is markedly skewed and non-parametric tests should be used. However, the authors argue that some tests, like the ANOVA and t-tests are very robust, which means more than +1/-1 will not affect the results much. Lorz (2011) argues that -2 to +2 is indeed deemed acceptable for parametric tests, assuming a normal distribution, because virtually, all distributions of real data are skewed, so what really is important is how much is the data skewed. A similar range is adopted for the Kurtosis test.

Table 3 shows that the data for the skewness test concerns a normal distribution, for its range is within -0.809 to -0.023. The Kurtosis test tells us that data covers a range from -0.841 to 1.009 which is also acceptable for parametric tests and that also show us, again, we are dealing with a normal distribution.

4.4 Test for Multicollinearity

In addition, tests for multicollinearity were performed, before attempting to regress independent variables on the dependent variable. In this case, there are two ways to measure collinearity: tolerance and variance inflation factor (VIF). The first informs us the variance of the correlation between variables (varying between 0 and 1), where 0 indicates a strong relation between examined variables. When tolerance is low, there exists the possibility of multicollinearity (Bryman, 2011) The second measure, VIF, is interpreted by checking which values are higher, which in turn indicates a strong relationship between variables. However, there are no formal values to indicate multicollinearity, a VIF value greater than 10 is acceptable and some state than anything above 2.5 may be a matter of concern. In sum, high tolerance values and a low VIF are good indicators of multicollinearity not being present (Lorz, 2011). In table 4, we find out that, for the most part, tolerance and VIF values are acceptable, and it is safe to assume there is not any presence of multicollinearity.

Table 4 - Multicollinearity statistics

Coefficients(a)							
Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	0.01	0.043		0.244	0.808		
Social Norms	0.14	0.05	0.142	2.786	0.006	0.674	1.483
Context	0.042	0.04	0.046	1.046	0.297	0.894	1.118
Perceived Behavioral Control	0.102	0.062	0.102	1.64	0.103	0.458	2.183
Attitude	0.599	0.053	0.589	11.261	0	0.645	1.551
Knowledge	0.131	0.053	0.145	2.453	0.015	0.508	1.969

a. Dependent Variable: Entrepreneurial Intention.

4.5 Test for Reliability

It is useful, when using factor analysis to validate a questionnaire, to check the reliability of the scale. Reliability means that a scale should reflect, in a consistent way, the construct that it is measuring (Field, 2013). "*The reliability of a measure refers to its consistency"(Acton et al., 2009, p. 77)*. As such, reliability is very important when connected with multiple item scales, which are present in this study; it concerns the scales and it items used, in order to understand if the items that make one scale up are internally consistent or not. A very common way to check internal reliability is using Cronbach's alpha. For this test, the rule lies in the fact that the result should be above 0.8. Furthermore, it is suggested that if several factors exist, the formula should be applied separately: when the questionnaire has subscales, Cronbach's alpha should be applied separately - it is normal to calculate reliability for each dimension rather than for the measure as a whole (Acton et al., 2009; Field, 2013).

Table 5 - Cronbach's alpha

Constructs	Items	Cronbach's alpha
a) Attitude towards the behavior (Liñan et al., 2009)	6	0.851
b) Perceived Behavioral Control (Liñan et al., 2009)	6	0.916
c) Social Norms (Liñan et al., 2009)	3	0.925
d) Institutional Context	6	0.919
e) Knowledge	9	0.966
f) Entrepreneurial Intention (Liñan *et al.,* 2009)	6	0.953

For this study, the scales used are based on Liñan et al. *(*2009), in order to guarantee validity when using the theory of planned behavior constructs. The list of all items is available in appendice 7.2. Exceptions are made to the knowledge and institutional context constructs, which were developed specifically for this research. Since this study uses multiple-item scales for each construct, there are quite a few of them. Internal reliability is checked for each dimension. As one can see, in table 5, the coefficients for all scales are above 0.8, with a minimum of 0,851 (attitude towards the behavior), which is deemed acceptable and it can be safely assumed that these are internally consistent scales.

4.6 Factor Analysis

Factor Analysis refers to a data reduction technique in statistics that allows for simplification of the correctional relationship between a number of continuous variables: it provides an opportunity of simplifying the relationships and identifying within them what factors underlie such relationships. The final objective is to reduce data dimension without a significant loss of information (Acton et al., 2009). It is also a suitable method for examining construct validity (Lorz, 2011). In this study, the extraction method will be used – determining factors underlying the relationship between variables, the most common being Principal Component Analysis (Acton et al., 2009).

There are some conditions necessary for factor analysis and principal components analysis: there needs to exist relationships between the variables. For that reason, the correlation matrix was obtained, indicating correlations between the variables: higher correlations indicate they will probably be in the same factor, and lower correlations will not be in the same factor (Leech et al., 2011).

Table 6 - KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0,940
Bartlett's Test of Sphericity	Approx. Chi-Square	13351,763
	df	630
	Sig.	0,000

Following the matrix, the Kaiser-Meyer and Olkin test and Bartlett's test of sphericity were also obtained and are displayed in table 6. A KMO value close to 1, such as displayed, indicates that the patterns of correlations are relatively compact and, as such, factor analysis should yield reliable factors. Particularly, values above 0.9 are considered very good (Field, 2013). Bartlett's test of Sphericity's common rule is that a value below 0,05 for Sig. indicates that the null hypothesis is rejected, meaning that variables are correlated (Leech et al., 2011).

Secondly, the communalities were analyzed. Communalities inform us how much of the variance in each original variable is explained by extracted factors: one item's relation to another item. In sum, communalities represent the relationship between the variable and all other variables. The higher the values in the extraction column, the better; lower values may indicate that the variables should be dropped from analysis (Leech et al., 2011). Communalities values for this research were all above 0,493, the highest value being 0,895. One can conclude all extraction values are fairly high and acceptable.

Following this step, an extraction method is used, the most common being called "Principal Component Analysis". This allows one to determine the factors underlying the relationship between a number of variables (Acton et al., 2009). Looking at table 7, the Total Variance Explained, one obtains the information on which factors to extract. This table is shortened in order to better visualize the components; all items with eigenvalues superior to 1 are also displayed and also the remaining component is displayed so we can observe the total variance accumulated. Both are found to be in bold text.

Table 7 - Total variance explained

Total Variance Explained									
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**14.284**	39.677	39.677	14.284	39.677	39.677	7.973	22.147	22.147
2	**5.544**	15.401	55.078	5.544	15.401	55.078	4.972	13.811	35.958
3	**3.782**	10.505	65.583	3.782	10.505	65.583	4.481	12.448	48.406
4	**1.493**	4.148	69.731	1.493	4.148	69.731	4.225	11.735	60.142
5	**1.376**	3.822	73.553	1.376	3.822	73.553	3.258	9.051	69.193
6	**1.003**	2.787	76.34	1.003	2.787	76.34	2.573	7.147	76.34
7	0.723	2.008	78.348						
8	0.653	1.814	80.161						
9	0.604	1.678	81.84						
10	0.531	1.474	83.314						
11	0.514	1.427	84.741						
12	0.487	1.353	86.093						
13	0.425	1.179	87.273						
14	0.397	1.102	88.375						
…	…	…	…						
36	0.057	0.157	**100**						

Eigenvalues are more significant when they are superior to 1 because they represent the amount of variance explained by each component. We can see that six factors have an eigenvalue over 1. The first component or factor explains a bigger percentage of variance than any other factors that follow – 14,284

total eigenvalue and 36,677 per cent of variance. The next factor explains the biggest percentage of the variance not explained by the first factor and so forth.

Finally, rotation is implemented in order to transform the coefficients of the principal components in a clearer structure which is easier to interpret. It is necessary when extraction techniques imply that there are two or more factors (Acton et al., 2009). In this case, there are six, as one can observe in table 8.

Table 8 - Rotated Component Matrix

Rotated Component Matrix,a

	Component					
	1	2	3	4	5	6
A.1				,645		
A.2				,792		
A.3				,740		
A.4				,765		
A.5				,701		
A.6				,575		
PBC.1					,694	
PBC.2					,650	
PBC.3					,702	
PBC.4					,715	
PBC.5	**,585**				**,583**	
PBC.6					,588	
SN.1						,838
SN.2						,838
SN.3						,846
CTX.1			,801			
CTX.2			,772			
CTX.3			,842			
CTX.4			,894			
CTX.5			,857			
CTX.6			,852			
K.1	,811					
K.2	,857					
K.3	,888					
K.4	,897					
K.5	,865					
K.6	,811					
K.7	,810					
K.8	,821					
K.9	,838					
EI.1		,696				
EI.2		,751				
EI.3		,805				
EI.4		,807				
EI.5		,784				
EI.6		,817				

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization

a. Rotation converged in 7 iterations

Table 8 shows the Rotated Component Matrix. Only one item has strong loadings on two factors. Practically all items associate with only one factor. This matrix is crucial for understanding the results of the analysis. Item PBC.5 is different; this is because the description of the item is "I know how to develop an entrepreneurial project", which also relates to know-how or knowledge, labeled **K** in the matrix, which is linked to factor 1. That is the reason why both factor 1 and 5 present high loadings for item PBC.5. This factor analysis has proven desirable in the sense that researchers only want one factor predicting each item: all variables loading on one factor only and low on other factors. Furthermore, principal components analysis and rotation are proven to provide researchers with a reasonable good depiction of variable relationships (Acton et al*.,* 2009; Leech *et al.,* 2011).

4.7 Testing for Hypothesis

4.7.1 Hypothesis 1 – An entrepreneurship higher education course positively influences attitude toward the behavior, subjective norms, perceived behavioral control, entrepreneurial knowledge and perceptions of the institutional context

In order to test the impact of an entrepreneurship higher education program on students' attitudes, social norms, perceived behavioral control, entrepreneurial intention, institutional context and entrepreneurial knowledge, a paired samples t-test was executed and interpreted. This type of test is used with matched pairs, when the researcher needs to repeat the measurement of responses from the same individuals. This allows for comparison of two scores (Acton et al., 2009). Questionnaires were delivered to students prior to exposure to entrepreneurship classes and by the end of the semester, questionnaires were delivered again.

While Oosterbeek *et al.* (2010) use a difference in difference framework in order to assess the impact of an entrepreneurship program among students, the absence of a substantial control group called for a simpler methodology. As such, means for each construct were obtained and deducted, in order to display mean differences from the initial questionnaire (start) to the second (end). In table 9, one can see the differences in a meticulous way. Standard deviation, t-statistic, degrees of freedom and p-values are also displayed.

Table 9 - T-test for paired samples

Paired Samples t-test

	Mean	Std. Deviation	t	df	p-value
EI End-Start	0.8505	1.1056	9.130	138	0.000
A End-Start	-0.0500	0.9690	-0.610	139	0.543
PBC End-Start	0.7440	1.0925	8.058	139	0.000
CTX End-Start	0.4068	1.0234	4.542	129	0.000
K End-Start	1.0948	1.2376	10.502	139	0.000
SN End-Start	-0.0333	1.4127	-0.0500	139	0.781

Investigating table 9, one can say that after taking the entrepreneurship program, students had reported higher entrepreneurial intention, higher perceived behavioural control, higher knowledge and higher perception of the entrepreneurial context. On the other hand, attitude and social norms were statistically insignificant. Taking these results into account, hypothesis h1c, h1d h1e and h1f are supported and hypothesis h1a and h1b are rejected.

4.7.2 Hypothesis 2-5: Testing entrepreneurial intention

In order to test the subsequent hypothesis, a multiple linear regression analysis was conducted. This is done in order to understand which constructs explain entrepreneurial intention. In other words, multiple regression allows for establishment of which variables explain variance (not shared with other independent variables) in the dependent variable that is unique – entrepreneurial intention (Acton et al., 2009). When one has a considerable amount of variables that may be accurate predictors, a stepwise hierarchical regression can be used (Leech et al., 2011). This happens at the current study.

This analysis had entrepreneurial intention as the dependent variable: model 1 used independent and control variables at the start of the semester and correlated them with entrepreneurial intention at the beginning of the semester. On the other hand, model 2 utilized the independent and control variables at the beginning and end of the semester and related them with entrepreneurial intention at the end of the semester. In the first step, regressed variables included control variables age and gender, as well as type of lecturer and type of learning. Step 2 featured the inclusion of the theory of planned behavior constructs: attitude towards the behavior, perceived behavioral control and social norms, along with the institutional context and knowledge constructs developed here. Regarding model 2, entrepreneurial intention values are those from the second round of data. This model includes all three steps with control variables, theory of planned behavior variables and the remaining constructs.

On another note, operationalization of the variables type of lecturer and type of learning was very specific. For type of learning, this meant attributing to each teacher a traditional or innovative learning method, following the literature and teacher's answers about pedagogy, topics and evaluation. For type of lecturer, there was the need of simplification: if a teacher had created his/her own business and went through that experience, they were considered entrepreneurs *de facto*. This decision was made because classification between academic and entrepreneur for a higher education lecturer seemed too vague and problematic – an academic is a teacher in a higher education institution, regardless of having or not professional experience outside the university.

Table 10 - Multiple Regression

Multiple Regression					
	Model 1 (EI start)		Model 2 (EI end)		
	Step 1	Step 2	Step 1	Step 2	Step 3
Step 1					
Age	0.19	-0.011	0.091	0.037	-0.062
Gender	0.84	0.004	0.136	0.090	-0.002
Type of lecturer	0.226 *	0.092	0.145	0.053	-0.041
Type of Method	0.136	0.046	0.162	0.071	-0.040
Step 2					
Attitude Start		0.588***		0.480***	-0.014
PBC Start		0.097		0.178	0.160 *
Social Norms Start		0.153 *		0.018	0.036
Inst. Context Start		0.103		-0.043	-0.043
Knowledge Start		0.098		0.052	0.024
Step 3					
Attitude End					0.659 ***
PBC End					0.099
Social Norms End					0.107
Inst. Context End					0.029
Knowledge End					0.037
Adjusted R^2	0.096	0.671	0.089	0.391	0.733
Δ Adjusted R^2		0.575		0.302	0.342

*p≤0.05 **p≤0.01 ***p≤0.001

Table 10 displays the results of the multiple regression. This will help explain the relationship between the constructs and entrepreneurial intention. In model 1, step 1 one can see that type of Lecturer is the most important variable explaining entrepreneurial intention. However, the inclusion the remaining elements of the conceptual model change this situation. Here, attitude towards the behavior and social norms at the beginning of the program explain entrepreneurial intention the most. One can also observe that the adjusted R squared values in step 1 barely explain entrepreneurial intention, whereas with the inclusion of the conceptual model R squared values change to 67.1%.

Over on model 2, not many significant changes occur. Attitude maintains an important place helping explain entrepreneurial intention. However, in Step 3, perceived behavioral control at the start of the semester as well as attitude at the end of the semester are the most important variables predicting entrepreneurial intention. The adjusted R^2 value indicates that this conceptual model explains (73.3%) of the variance, indicating a large effect (Bryman & Cramer, 2011; Leech et al., 2011). This means that only hypothesis h2a and h2c is supported, and the remaining (h2b h3, h4, h5a and h5b) are rejected.

In addition, it was decided to test a dummy variable, in this case, students' expectations before an entrepreneurship program. This was tested with entrepreneurial intention at Tstart and the remaining control variables, as one can see on table 11. What was found was that students' expectations also help explain, to a great extent, the variance in entrepreneurial intentions.

Table 11 - Coefficients of control variables

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,587	,379		-1,547	,124
	Age	-,005	,016	-,022	-,282	,778
	Gender	,184	,161	,088	1,138	,257
	Type of lecturer	,297	,201	,147	1,479	,142
	Type of learning	,381	,207	,182	1,846	,067
	Expectations	,648	,161	,316	4,030	,000
a. Dependent Variable: IntEmprStart						

4.8 Discussion

It is common in the literature to find entrepreneurship education studies that assess its impact and reporting positive findings (Athayde, 2009; Fayolle et al., 2006; Küttim et al., 2014; Matlay, 2008; Olomi & Sinyamule, 2009; Peterman & Kennedy, 2003; Souitaris et al., 2007). However, one also finds studies concluding that entrepreneurship has a negative impact (Oosterbeek et al., 2010; von Graevenitz et al., 2010) or an insignificant impact (Lorz, 2011) on entrepreneurial intention. This study brings positive results: it was found that entrepreneurial intention, perceived behavioural control, entrepreneurial knowledge and institutional awareness were all higher after an entrepreneurship education program. The differences of attitudes and social norms were not statistically significant when compared at the beginning and at the end of the program. Programs that were analyzed in this study aimed at, most of all, entrepreneurial awareness education, with concern for attitudes, motivation and mindset. Also, the program was compulsory, which may influence answers (Oosterbeek et al., 2010; von Graevenitz et al., 2010). This is because compulsory programs might attract students who are not specifically interested in entrepreneurship. Overall, it can be seen that the program positively influenced students' entrepreneurial intentions.

Entrepreneurial intentions of students were higher, thus in compliance with the literature – Athayde, (2009), Fayolle et al., (2006) and Matlay (2008) reported positive intentions taking into account the participation in an entrepreneurship program. However, mixed or negative results have been appearing (Lorz, 2011; Oosterbeek et al., 2010) and so the lack of a control group cannot be ignored, for it may have impacted this study.

Perceived behavioural control was also higher, which means that students felt entrepreneurial related tasks were easier to perform; they felt more competent. This is in line with Peterman and Kennedy (2003) and Athayde (2009) conclusions, in which perceptions of feasibility and desirability were higher among students. In sum, being exposed to an entrepreneurship program made students change their perceptions of entrepreneurship, making them feel more inclined towards it (higher intentions) and feel more competent about entrepreneurial related tasks such as "I know how to develop an entrepreneurial project" or "I know the details that concern starting a new firm" (perceived behavioral control).

Attitudes and social norms were statistically insignificant. While social norms have been shown to be the weakest construct in the theory of planned behavior (Armitage & Conner, 2001). This weak predictive power may explain the insignificant changes between the beginning and the end of the program. In addition, the fact that these are students with an average age of 22 may indicate that they are not

pressured to start a venture by their family, friends or peers because they simply have not thought about it or because they feel too young or too uncertain to take on such a task. The attitude construct is harder to explain; while the programs were concerned with entrepreneurial awareness and attitude development, students did not increase their attitudes at all. This may be due to the class methods, topic coverage (that will be covered in the next section) that did not get students' attention or interest.

When it comes to knowledge, the construct that was added, it is rather simple to explain. Students have taken a course on entrepreneurship and now have more knowledge about the skills and competencies inherent to it. Teachers mostly used business plan development which required that students worked around a project with value propositions, marketing analysis, financial analysis, among other things. It is natural for this construct to have the higher differences from beginning to end, showing that the classes were very much around skill acquisition strategies (Garavan & O'Cinneide, 1994b).

Students also showed higher perceptions of the institutional context, that is they found the university to be more entrepreneurial, perceiving it as more supportive and with strong connections with incubators. While the university context was not subject to change to our knowledge, it may have to do with students' awareness of the environment around them. They may now know something more about venture capital societies, incubators and overall university initiatives and support mechanisms for potential and current entrepreneurs.

Also, the results of the multiple regressions were very interesting. It was found that attitude and perceived behavioral control were the only constructs in the theory of planned behavior that accounted for explanation of the variance in entrepreneurial intention (73,3%). This result was expected because other studies reported the same results (Lorz, 2011) Ajzen (1991, p. 188) underlines that *"the relative importance of attitude, subjective norm, and perceived behavioral control in the prediction of intention is expected to vary across behaviors and situations."*

In line with Fini, Grimaldi, Marzocchi, and Sobrero (2009), the institutional context does not explain entrepreneurial intention. University support was not relevant explaining entrepreneurial intentions. Intentions are very much a state of mind, and it may be possible that the institutional context does explain entrepreneurial intention at later stages, such as recognizing opportunities and finding support mechanisms, when one is already decided to pursue this intention and then find that is not the time or the place (or vice-versa) (Fini et al., 2009). Lüthje and Franke (2003) found that engineering students entrepreneurial intentions were indeed explained by the institutional context. While both samples concerned students, cultural and university contexts are very different, which explains also variations in both results.

Knowledge also does not explain entrepreneurial intention. This may be due to the fact that while students gain more knowledge, that does not make them want to start businesses, merely granting them knowledge on the subject. This is in line with Liñán et al. (2011); they found that knowledge has no direct impact on intention, but an indirect effect on the antecedents of entrepreneurial intention, like feasibility. Findings here contradict Roxas (2013) on the entrepreneurial knowledge-entrepreneurial intention relationships. This may be due to the fact the construct tested here was based on teachers' course contents or simple because students do not find knowing more about entrepreneurship sufficient to advance into an entrepreneurial project. It is also important to highlight that the Portuguese society is very adverse to risk as people feel threatened by ambiguous or unknown situations and these beliefs may have impacted this study (Hofstede, 2014). As one knows, entrepreneurship is very complex and volitional and unexpected in nature (Neck & Greene, 2011).

More specifically, it was found that the course methods and the course teacher did not explain entrepreneurial intentions at all. Course methods were noted to be very similar between each other and

this may explain the results. Teachers had pretty much the same pedagogies, course contents and evaluations with slight variations. There was not any course where the pedagogy struck at extremely innovative or extremely traditional between those analyzed statistically. In addition, classes were also focused in entrepreneurial awareness education. Developing attitudes, motivation in students was a priority. And while methods do not explain entrepreneurial intention at all, they may contribute to a better organized course and this choice may indeed impact students at the end of the course. The importance of type of lecturer in the beginning but not in the end shows that students may be more prone for entrepreneurial intentions when their teacher has a great amount of experience as an entrepreneur, but this is not important at the end of the course. We believe this is because is not so much the profile of the teacher that is important but the methods, contents, evaluation and the way the classes are delivered.

Interestingly enough, we found that students' expectations were very significant explaining entrepreneurial intention. This finding poses an interesting question: should all entrepreneurship higher education courses be mandatory or optional? Research on compulsory and voluntary courses is recommended for further research (Oosterbeek et al., 2010) as many differences may arise within students. We argue that this finding alone is not enough to draw specific conclusions but students who are really interested in entrepreneurship or an entrepreneurship career are probably more prone to having higher entrepreneurial intentions. In Portugal, courses are found to be mandatory in some majors, like business, but are also open to be taken optionally by other students. Universities should discuss if having mandatory entrepreneurship courses is adequate if their aim is to increase students' entrepreneurial intentions through this kind of entrepreneurship education.

4.9. Case Studies

In this section, the interviews will be examined and discussed. There will be brief descriptions of teachers' answers which include their background, their objectives, their choice of methods and contents, evaluation and finally, their thoughts on entrepreneurship education. Afterwards, a comparison of the results and analysis will follow.

4.9.1 Teacher A

The first teacher interviewed majored in chemistry and, after that, took an MBA in business which was associated with her firm creation experience and 10 years of experience in the technology transfer area by being involved in the development of three venture capital firms. In addition, this teacher received a Ph.D. in Chemistry. She has some publications indexed in the ISI database and also a few articles about entrepreneurship, however not indexed.

Teacher A currently teaches entrepreneurship and project management, but also entrepreneurship and innovation in the first and second semester, respectively. She started teaching in 2010 mainly because the entrepreneur career, although attractive, was very risky and an all times preoccupation - she prefers teaching, which is more stable. Her generic objectives are to give to the students a notion of what it is like to be an entrepreneur. Since she has two different entrepreneurship units with different background students, a different approach is used for each discipline – because different students have different perceptions and ideas prior to the discipline. In the first semester, she mainly focuses on the business plan and in the second semester she focuses on students' skills and idea generation. Here, the design thinking process and project development have more focus.

Regarding pedagogy, in the first semester, the class is more traditionally oriented; expositive lectures are the norm, along with the business plan and its development. Also, brief entrepreneurship films are shown to the students. In the second semester, classes are more dynamic: guest speakers, a lot of films about the

design thinking process and project development, case studies and a lot less expositive lecture. She thinks that group projects are especially important, since they bring a lot of flexibility into the class.

About the topics that are chosen to be covered we find idea generation, marketing, financial analysis and project management methodologies to be the main blocks that constitute the program. When it comes to the second semester, idea generation and design thinking process are more important. There are also classes centered on negotiation models and communication skills – "pitch classes". She adds that in the second semester entrepreneurship theories are not taught because the students lose interest. She identifies that idea and opportunity generation are crucial, along with a few marketing and financial topics. She also points that the lack of budget for student field trips and simulation licenses are a difficulty, because she would like to bring that dynamism to the class. Concerning evaluation, in the first semester two exams are undertaken. In the second, students are evaluated on their oral participation, individual work, group work and presentation. She found that students were very lost when they do not have to study for exams and a lot of liberty with the syllabus makes them feel a little lost, because they are used to have all the information available.

Teacher A felt that entrepreneurship was difficult to teach at first, because she did not find an appropriate manual or program. She maintains that it is interesting to have groups of teachers sharing experiences and exchange teachers would also be a good idea. Since entrepreneurship is a very interdisciplinary topic, there should be some education to help expose information to students. She finds that teaching entrepreneurship is very complex if one wishes to change a student's mindset – experience as an entrepreneur is important to this teacher. She believes that an academic will have a harder time changing mindsets. She feels that it is relevant the existence of curricular programs where there exists a possibility of having an entrepreneurship degree as an academic area – for researching entrepreneurship, not teaching. Also, she finds one semester to be enough to teach entrepreneurship to college students and feels very strongly about including entrepreneurship in every common core curriculum.

4.9.2 Teacher B

The second teacher, hereby Teacher B, has majored in Marketing Management and also has a master's degree in Innovation and Technology Management, with an entrepreneurship-based Thesis. Teacher B started a Ph.D. in Tourism, in which the investigation centers again on entrepreneurship. While it was not been completed, teacher B has been teaching in the university for 12 years, parallel to working with companies and consultancy work - experience related to firm creation projects and applications. She often teaches firm management, marketing management, introduction to marketing and entrepreneurship. Teacher B has a few articles published in the Scopus database, not on ISI, particularly in marketing and entrepreneurship.

This lecturer has been teaching entrepreneurship for 5 years now. Since her dissertation focused on entrepreneurship and she had professional experience in firm creation, she was invited to teach entrepreneurship. She currently teaches a subject called Bioentrepreneurship, which is oriented for life sciences students mainly, and another in which she teaches to the whole economics and business department. The main goal of Teacher B is to have students dwell into the business nomenclature, namely, to make them understand that entrepreneurship is much more than a business plan and have a perception of entrepreneurship and the efforts it implies. To make them understand it is an alternative career and teaching them the basics are her core objectives.

Methodology-wise, Teacher B uses discussion as the main method with a few slides. The rest of the semester is arranged as the students have doubts concerning the project. She wishes she had more time to have guest speakers, analyse case studies and show a few films because she only has 2 hours a week. Regarding topics covered, the first part of the program syllabus has to do with innovation and to be an

entrepreneur along with entrepreneurship models and process and theoretical debates. The idea of an alternative career is also present. Afterwards, the challenge is to have an innovative idea and build the business plan for it. This is constituted by topics like idea and opportunity generation and also finance, marketing, human resources and management tools topics. She believes overcoming obstacles and dealing with real examples, not academic case studies, is the best way for students to learn. Teacher B had a few students that implemented their business plan ideas - she states she does not know if this is the case because of the course, but believes it had some impact.

Evaluation is split in half: 50% for an exam and another 50% for the business plan. She feels the exam is not the best way to evaluate students in this particular subject. Difficulty wise, Teacher B recognizes it would be important to change the syllabus and feels that time is her biggest constraint. Sometimes she needs to adapt and often feels lost. She is not sure if this is the best method to teach entrepreneurship, she knows it has both cons and pros.

Regarding teaching, Teacher B believes that whether a person has or not professional experience with entrepreneurship depends on the class objectives. If one wants to change student's minds and urge them to follow an entrepreneur career it is necessary to have experience - a pure academic cannot give a real perspective because he does not have the practical notions and the real context to compare and to elucidate students. When asked about teacher training courses she believes it is a great idea – teachers do not share much, and so networking would be great. Teacher B highlights group teaching because it would be an easier and better way to teach entrepreneurship. This is the case because methodology may not include business plans; she does not know or is sure of the best method for teaching.

4.9.3 Teacher C

The third teacher, or Teacher C, has a telecommunications engineering background. His Ph.D. is in Electrotechnical Engineering. Professionally, Teacher C helped with the creation of some firms; he does not consider himself a formal entrepreneur, but he does have knowledge in the area. He mostly teaches entrepreneurship and project management. Academically, he has a few publications following the topic of his Ph.D. but none in entrepreneurship *per se*. Teacher C started teaching around 7 years ago, with reasons being having a Ph.D. scholarship, doing a few entrepreneurship courses and had been involved with a few firms as an advisor. He was then invited by the faculty.

In his classes, Teacher C is happy when students identify good ideas, a good market behind the idea and a value proposition that is worth to be taken one step further. He also stresses that he wants his students to be familiar with the market and its demands. His third main objective is to raise awareness for financial education, since students have poor notion of costs and investments – *"we are going to do this in my house, with my computer, therefore, no costs for us."* With the classes, Teacher C follows an idea filter process: students have four or five ideas, and check the viability. Afterwards, they identify the idea, the value proposition and market penetration. This is followed by the business plan steps. This teacher underlines that the literature available does not apply to the Portuguese specific case, since it is not a country where venture capital is availability. Other initiatives include inviting guest speakers and "Having coffee with an entrepreneur", which encourages the contact with real life entrepreneurs, as suggested.

Regarding topics, Teacher C chooses to cover idea generation – which has the longest timeshare, 2 weeks – marketing, finance, incentive accessibility and helpfulness – what incubators offer, for example. Teacher C also covers risk and exit strategies. He believes market interaction and exit strategies to be the most important topics.

Concerning evaluation, students do a test, weekly projects and a presentation. Teacher C finds the subject to be quite fragmented since it is held by four teachers with the same background. Not many students have

created their own company; teacher C firmly believes there is no proximity between firms and students - the relationship between firms and students should be strengthened, in order to show students good practices and promote contact with reality. He adds that the actual financial tools are not the best to teach entrepreneurship to students.

He feels that any teacher can teach basic concepts, but there are some details that can be complemented: equilibrium is better when teaching entrepreneurship. It is important for someone to have had the professional experience, not necessarily entrepreneurship, but management. It is different to say this is like I have explained you because I have seen/experienced it than to say because it is written in the book.

He believes that the creation of training initiatives for teachers is not that relevant, but rather the problem with entrepreneurship is within the Portuguese society – risk and failure aversion is problematic. There exists social pressure on the individual to have a job, something safe. Bank funding is more conservative and it does not exist without warranties. Someone who tries and fails is, therefore, financially stuck, figuratively speaking, for the rest of his/her life. Finally, one should not give entrepreneurship the hope of a guaranteed job. Teacher C also agrees that an entrepreneurship option should exist in every technological major. Since the main topics are similar to management, he feels that a specialization in entrepreneurship should exist, but not a Ph.D. because he does not see it as a requirement to teach. He also feels that concepts of intra-entrepreneurship should be taught.

4.9.4 Teacher D

Teacher D has majored in Sociology of the Organizations and has a Master in Management, with a Marketing specialization. She is enrolled in a Ph.D. in Marketing and Strategy. She's been involved with a number of firms and creation of start-ups. Also, she has her own firm since 2000. Academically, she has not published much due to being busy finishing her doctoral program.

Teacher D has been teaching entrepreneurship for five years. She also teaches business strategy and marketing. She was initially invited to teach entrepreneurship when she was enrolled in her master's degree, to be part of a research project. Usually, teacher D teaches to management students, but also biology, health sciences and other areas – technological courses. Her generic goals are to work with student's attitudes towards entrepreneurship. She does not want students to start frenetically creating firms, but teaches them to be open to entrepreneurship and have a more positive attitude inherent to it: *"The objective is for them to be more entrepreneurs, and less business tycoons".* Changing their mindset is also important – the students often think in a very structured and analytic way, which makes them less creative, she adds. She wants more receptivity and determination when creating something. In sum, Teacher D wants her students to be educated in how to work for themselves.

During classes, students have creativity sessions, where they generate ideas, and brainstorm. After that, they have a more crucial phase, where they analyze and validate the market, away from the classroom – they talk with different people, interact with associations and focus groups, who give them generic insights about their ideas. Afterwards, they deliberate a strategy for their business. This includes how to organize it, what kind of resources they need, what kind of people to hire and what financial needs they have to make the project a success – mainly the business plan structure. Also, the students can opt to implement new ideas for established companies (intra-entrepreneurship logic). Finally, students pitch their project where investors and other experts are present. Other methods include lectures with entrepreneurs, who give the students their thoughts on the entrepreneurial process and talk about their experiences. Teacher D tries to demystify the entrepreneur as someone who is not reachable, but rather a role model, someone who is indeed approachable and one could learn a lot from.

Lessons are usually divided by three parts– one month for idea generation, one month for validation and one month for elaboration of the strategy. Classes are planned in the following way: in the first part she introduces a few topics and gives some information for each main topic; these include creativity, market research, competitive strategy, analysis of competition, logistics, finance, human resources and operations management. There is a lot of focus in marketing and finance: how to search for funding and financial analysis of the project. In addition, 40% of the evaluation is for the project, another 40% is reserved for colleagues, teacher and guests evaluations and 20% for project's oral presentation, or pitch. Her students are using class projects to create their own firms, something she is happy about, but is not her main objective.

Teacher D was comfortable when she started teaching entrepreneurship; she finds that there are helpful manuals. She does recognize that changing attitudes, stimulating behaviors and giving students technical competencies prove to be very difficult in only one semester. It is a very short time for so many objectives – often needs to pick the topics she thinks are the most helpful for her students. She believes it is easier to teach entrepreneurship when someone combines academic experience with professional experience. One can overcome this by inviting guest speakers that are experienced entrepreneurs, or making them tutors, mentors or role models for their students. Teacher D agrees that even an experienced entrepreneur might not have academic background to teach students accordingly. Having the best of both worlds is, therefore, ideal. The two things are not incompatible.

When asked about teacher training needs, she agrees that everything that can help prepare teachers in this area is very welcome. Exchanging experiences and good practices is very important; though each case is different, there are always things to be learned that can and should be shared with the community to help enhance their performance as a teacher, she says. Furthermore, she argues that she does not know if more PhD courses in entrepreneurship will help create more entrepreneurs. However, there is not much scientific knowledge in this field, so she believes more scientific training and research in this area is very important for the development and dissemination of knowledge. She finds interesting teaching entrepreneurship to a secondary and primary level – this is because she believes we are all born creative people and if we stimulate it, this will amplify our vision and problem resolution. It is also interesting to teach teenagers some financial literacy and the idea of networking. Entrepreneurship involves so many things, teacher D says, that a lot of them can be explored through one's personal path: the characteristics do not make an entrepreneur, it is quite the contrary.

4.9.5 Teacher E

The fifth teacher, Teacher E, has an academic background in Management. He also has a Master's degree in Management with a specialization in marketing and business strategy. Currently, he is enrolled in a Ph.D. in Marketing and Strategy, with research focused on entrepreneurship. Teacher E has also been a marketing, business strategy and internationalization consultant; additionally, he has been involved with real estate. He was invited to teach in 2005, so he has been teaching for nine years now – international marketing, business strategy, fashion business management, and, of course, entrepreneurship. He does not have anything published as of the interview date, due to being busy finishing his PhD, teaching and with his real estate businesses.

Most of his students originate from management courses, international relations, economics, engineering, marketing and also communication and fashion design. One of his objectives is to conceptually ease the process of firm creation to the students, although he argues that it is not something that one can only learn conceptually – *"you cannot teach how to drive without knowing how to do it first"*, he adds. So the main goal is to recreate some proximity to the entrepreneurial reality, and also giving students the tools they need, in order to interact with the phenomena and complexity that is the creation of a firm. He means to

guarantee the minimal competencies for the students to help themselves when they deal with the firm creation process.

Concerning classes, Teacher E describes his method as recreation of the entrepreneurial process in the classroom. This process involves opportunity recognition, idea generation, opportunity assessment and it includes planning, coordination and resource integration – planning of the whole business plan. The rest, he says, comes naturally in the classroom discussions with the students. There is also a little bit of theory. Similar to Teacher D, there is one month for idea generation, one month for validation and one month for elaboration of the strategy since they share the same syllabus and classroom methodology. In terms of topics, Teacher E covers idea generation, marketing and finance. In addition, students acquire communication and negotiation skills throughout the semester. Teacher E argues that the most important topic for him to teach is marketing, and he cannot teach everything that he wishes. Evaluation concerns the pitch model, Teacher E explains. There are three criteria, which is 40% for the project/business plan, 20% for the pitch presentation and 40% is the co-evaluation of the teacher, colleagues and experts. He feels that students are indeed motivated but has not had any feedback on students who have used their class work for a real entrepreneurial project.

With class preparation, Teacher E felt that the biggest difficulty is the selection of the most relevant topics, taking into account the limited hours of the classes. He mentioned the dynamic nature of entrepreneurship, as an eclectic area of knowledge with multiple approaches, which requires that the teacher has a multidisciplinary knowledge of the contents he teaches. He believes that one of the possible solutions would be a transversal approach undertaken by multiple expert teachers. He adds that entrepreneurship should be mandatory for all university courses, but could be optional for other courses that do not have the management roots that other students have. Students need to be conscious about the difficulties they face within the entrepreneurial process and have the competencies necessary to deal with it.

Having the experience of being an entrepreneur has some advantages but it is not crucial to teach – while it could be helpful bringing a real world connection to the classroom, it is more important to motivate and involve students in this complex and dynamic reality, and if academics connect themselves to the practical world they do not lose anything, and vice-versa. Concerning teacher's training initiatives; Teacher E feels that it is fundamental. "Where does entrepreneurship end and management starts?", he asks. The phenomenon of new firm creation is ever evolving and individual competencies are constantly challenged. Teacher training is important because of the complex phenomenon of entrepreneurship. In this sense, it is interesting to have research experts that explain, update and understand the entrepreneurship ever-evolving phenomenon and its adequate operationalization. Additionally, entrepreneurship has very close conceptual links to other relevant areas like innovation and intra-entrepreneurship, and also it has external implications like employment, economic growth, personal and professional accomplishment and others.

Teacher E remarks that the creation of more doctoral programs in this area is especially relevant by same reasons mentioned for the training initiatives, and, furthermore, says that the existence of master's degrees with a business specialization (technological entrepreneurship, fashion entrepreneurship, agro industrial entrepreneurship) would be very interesting mainly because of the idiosyncratic nature of businesses: there are so many details that need to be covered and some models, theories and frameworks are, for the most part, generic. He underlines that there is a certain obsession with generalization, when there should be clearly an emphasis on specialization in a certain context.

4.9.6 Teacher F

Teacher F is an environment engineer (minor in innovation), with a master's degree in technology management. Moreover, he has a PhD in engineering and industrial management, within the area of entrepreneurship and its economic impact. He also collaborated with some companies, but he says it was

mainly informal. In a more academic scenario, he has a few publications indexed in the ISI database, mostly covering entrepreneurship with other colleagues. Teacher F has been teaching for three years: he currently teaches Marketing and also Strategy and Entrepreneurship. He teaches entrepreneurship to two classes: one with business students and other for voluntary students from all the university. The first course's goals are to make students use the tools they have been learning in order to develop a project in which they either have an innovative idea or create a new firm. This is taught by four teachers of different backgrounds. With the other subject, the main goal is to try and teach them how to disseminate and select business idea. Here, target students lack the business knowledge that the previous have: teacher F tries to help them think differently and to prepare them for any business project they might encounter.

There are two sessions a week, one theoretical and one practical. Classes are usually structured this way: two hours for theory, a guest speaker and after that, the teacher gives them objectives for the next class. In the practice session, they work on their objectives have mandatory presentations. In the other subject, sessions have three hours, so he chooses to cover theory first, then an exercise and finally an objective for the following session. "*It is remarkably more academic"*, he says, because students do not have the same business background. Concerning the topics, what is taught is primarily divided in four areas of the syllabus: legal issues; marketing –developing the idea, designing a marketing plan; strategy – strategic objectives, exit strategies; and finance – financial plan, how to get funding, risk and sensibility analysis. Topics like operation management are ignored because students already had them in their course, but they can still develop this if they so desire. Communication and negotiation skills are also covered. When he taught to engineering students, intellectual property and patents occupied a greater deal of time. Each topic has more or less the same time along the semester.

Evaluation usually involves a grade for the project (business plan) and presentations, along with intra-group evaluations. There is also a test. Teacher F feels that students they do not leave the teacher-student dynamic in their presentations, and so he feels he should give more emphasis to communication skills. When it comes to results, he knows of two projects that worked out and another two students that developed a successful project outside of the class.

He tries to search for different approaches for teaching the class and always looks for something more practical. This is because he tells them at the beginning of the semester: *"I will teach you entrepreneurship, but I have never owned a business*". So he tries to motivate them, especially business students because they are more familiar with this subject. He believs the way one teaches entrepreneurship is the biggest challenge, but articulation with other teachers is only challenging from a bureaucratic point of view, because he feels it has worked out very well. He understands that a person with more experience may teach entrepreneurship in a different way. However, the approach he uses puts a lot into perspective and allows for debating of a lot of phenomenon in entrepreneurship – he does not see this as only negative. Giving examples is indeed more complicated. Additionally, he tries to demystify the idea of entrepreneurship as a very easy thing to accomplish which is very present in the Portuguese environment, so he tries to pull students into reality. In sum, there are no recipes for success.

Teacher training initiatives are interesting for Teacher F in any area, he believes, since he has been part of one before. Sharing experiences is always good and making teachers think about the way the class is taught is a useful component. But for training teachers, he says, a doctoral program is not necessary. These are good for researching. He feels doctoral programs in management with a specialization in entrepreneurship are more relevant, but with a subject and a guest speaker to give some perspectives on entrepreneurship education, not an entire doctoral program in the area. Portugal is a small country for multiple PhD courses in entrepreneurship.

4.9.7 Teacher G

Teacher G received her college degree in International Relations and has a Master's Degree in European Studies. In addition, she received an MBA in Business Management. Shortly after, she became an assistant professor and accumulated her faculty work with her business work. She then received her Ph.D. in Marketing, with a specialization in Management. Currently, her full-time job is being a university professor. She usually teaches Strategy, Marketing or Entrepreneurship and has a few articles published, though they do not concern entrepreneurship research. She has been teaching since 2008. Her students are normally from business, engineering, science courses, or from other areas that choose entrepreneurship optionally.

While teaching entrepreneurship, her aims are transforming a business idea into a business plan, and, more importantly, helping students enhance their entrepreneurial attitudes. She highlights that focus is not on business creation per se, but on attitudinal aspects of entrepreneurship. Most students do not create their own business, so Teacher G wishes to create an entrepreneurial mindset in her students, while developing their attitudes towards entrepreneurship – this includes identifying opportunities and developing an implementation project where students create the whole business or develop an innovative idea.

This subject is taught at three different master degrees and as such, it has different rhythms to work with – the business plan is elaborated and may suffer changes, depending on student's learning needs and dynamics. Typically, lessons include expository lectures which may include films, texts, case studies, and presentations about the theme of the previous class. Usually, guest speakers are featured, mainly to talk about the firm creation process, difficulties and experiences Depending on the classes, lessons may be more or less expository (when students have distinct backgrounds or are not familiar with business topics). Topics included in the lessons follow the business plan dynamic: idea generation, market evaluation, industry evaluation, recourses allocation, team management, network exploration, business design and development. "*I thought about encouraging students to create their own business for real, in order to teach how to register a company or a brand",* Teacher G explains. The longest topic to teach is idea generation and she believes both idea generation and opportunity identification are extremely important.

Evaluation consists of a test and the business plan - 40 percent of the evaluation is for the test, 10 percent of individual performance, presentations and critical evaluation and another 40 percent for the group work. She has been getting a positive feedback so far, though wishes she could include other topics like finance. To fight that, she has been thinking of inviting potential venture capital investors, business angels. Also, legal issues are something Teacher G would like to explore further. Some students of hers have also accomplished their class projects in real life.

Teaching entrepreneurship at first was relatively easy, Teacher G remarks. This was because of her experience with marketing and strategy. There were, however, some struggles with the financial part of her syllabus; she asks her colleagues from accounting to teach a lesson centered on the financial assessment of projects. When asked if teachers need to have professional experience to teach entrepreneurship, Teacher G knows academics who are extraordinarily entrepreneurial and managers who are not entrepreneurial at all: "*The context in which one works is less important than their attitude towards what they do and how they do it*", she observes. Someone who has daily experience with businesses probably is more aware than someone who does it indirectly. However, universities are like businesses, they can be more or less entrepreneurial; someone can be defined as a pure academic, they can be extremely entrepreneurial in their workplace – universities have courses, products and develop projects altogether. Teacher G argues that professional experience in a firm may help with teaching and course creation, but the world is not black and white.

Teacher training initiatives are extremely important and interesting. One learns a lot when interacting with others, taking into account their experience. In addition, she believes that including entrepreneurship lessons in doctoral programs may be interesting, as well the inclusion of entrepreneurship as a transversal subject to every major, with the objective of developing an entrepreneurial mindset in students, short termed. There are a lot of courses in Portugal that lack job offers and so this could be done to show students alternative careers for their future. However, she does not know if the proliferation of doctoral programs in entrepreneurship will help train more teachers for entrepreneurship subjects or help create sophisticated entrepreneurs. She believes entrepreneurship is often served as a miraculous solution to unemployment, but the most important thing is to develop entrepreneurial attitudes, whether one is a high school teacher, a manager or a student: *"We all have to be more entrepreneurial, so training is essential".*

4.9.8 Teacher H

The next teacher, or Teacher H, has a background in management: his bachelor, Master and Ph.D degrees were in Business Management, the latter being within the general area of entrepreneurship. He has a lot of articles, in which all of them are about entrepreneurship, and half is indexed in the ISI database. One can find him teaching marketing, data analysis or entrepreneurship. He does not have any experience with business firm creation or working in a firm. He started teaching in entrepreneurship 2005: his students are from business, marketing, health sciences, biotechnology and engineering. His main goals include changing attitudes, not so much knowledge. He teaches attitudinal change and wants his students to be more prone to taking risks, more autonomous or with a higher need for achievement.

His methods include the use of case studies, in which students choose one to study and present and then have to write another themselves about an entrepreneur's history, experiences and obstacles. Also introduced are communications skills, which are enhance through a storytelling activity – this is because Teacher H believes "*a good entrepreneur is a good storyteller"*. Another activity he does is to encourage his students to go outside and make real money, in which they choose what kind of business they want to have going. This is within a framework with the following dimensions: Profit, Innovation, Dynamism, Opportunity, Creativity, Autonomy and Risk. Furthermore lessons include a mixture of themes, with a short exposition time. Afterwards, there are creativity sessions in group. Teacher H highlights the need for fun and dynamic classes, because it is the most efficient way he finds to make his students interested.

Topics covered in this class include mainly creativity, in which idea generation is explored, marketing, which is a very important part and networks. Teacher H does not cover financial topics or human resources. He strongly feels that the development of a business plan is not necessary – it does not challenge students, it does not cause them discomfort or proper results. Here, entrepreneurial behavior and attitudes are the focus. Overall, marketing and creativity are the most important themes he teaches.

Evaluation concerns the creativity activities, storytelling, the two cases and the "make real money" activity. The second case study has the biggest weight, since it requires more time and effort. Student feedback is very positive. Teacher H worries about the students' diversion, since it brings better learning and motivation to the table. However some colleagues do not agree with Teacher's H methods and identify it as nonsense. He knows it is something different, but it works, and so he has to deal with the liability of newness, as he calls it. He keeps experimenting and changing things is his entrepreneurship classes to see how it works better.

Teacher H believes a teacher does not have to be an entrepreneur, whether it is entrepreneurship or any other activity. He compares it to football – you do not need to be a player in order to manage a team. People who study entrepreneurship will know more about it, however, making contact with reality, and experienced entrepreneurs is important, so it does not become an abstract reality. That's why he asks students to develop a real life case study for the class. He feels it is very helpful to include entrepreneurs in

the learning process. Taking into account teacher learning initiatives, he does not know if they are essential. Entrepreneurship has a lot of particularities, but it is not different from other areas in which having insight into what others do is extremely important. He suggests an association of entrepreneurship teachers, which may be more convenient.

On entrepreneurship doctorates, Teacher H feels that for him it was fundamental. It is extremely important for someone who teaches and/or researches to have the opportunity to deepen their knowledge on the subject. While it is extremely popular, people still have a superficial knowledge of entrepreneurship, so it would be very good if there were more people trained on entrepreneurship. Nevertheless, in Portugal, there is not much room for new teacher or professions; there are not any research centers, so thinking of entrepreneurship doctorates in Portugal could be restrictive.

4.9.9 Teacher I

The final teacher interviewed, Teacher I, has a background in Economics, and an MBA in Management and is enrolled in a Doctorate's degree in corporate social responsibility. She usually teaches for students enrolled in either marketing or economics master's degrees; namely financials for entrepreneurs, financial accounting, auditing or business case analysis. Professionally, she has worked as an auditor and a consultant, and currently works as a consultant for the faculty. She has been connected to entrepreneurs by way of being a company advisor. She does not have anything published around the topic of entrepreneurship.

Teacher I started teaching entrepreneurship because she was working in a study center. When a training project for an international contest arose, her teaching areas changed, and Teacher I was assigned entrepreneurship and business case analysis. Her main goal for her entrepreneurship lessons involve helping design and develop a business plan, *"with very practical lessons*", she adds. Students grab their best idea and build the business plan for it accordingly. Lessons include one hour and a half for theory to discuss a theme and another hour and a half to work on that component of the business plan. In the following class, students present what they have worked on and then the theoretical parts of that lesson follow. Common methods include presentation of films, parts of the entrepreneurial process and communication techniques, along with short expositive lectures. In the end, there are always guest speakers who share their entrepreneurial knowledge.

Topics taught to students include idea generation, studying the market and the industry, business models, financials, risk analysis and also communication techniques. Everything is balanced: one class for each theme. The most important topics for this teacher are idea generation and finance topics. Evaluation encompasses a test, the business plan, student participation and presentations, with a ponderation of 20% plus 40%, or 30% plus 70%, as she decides. She often gets positive feedback from her students: they enjoy the classes. Also, some students have gone from class to develop real life projects.

She did not have many difficulties; however, the need for preparation happened with lessons that dealt with study cases. She does not believe in purely academic teachers, due to the fact that entrepreneurship requires that people understand real life struggles. Professional experience is very important in any teacher – she herself feels a lot that she teaches has roots in her professional career. Without it, her classes would not be as rich as they are. Moreover, it is important to enrich classes with guest speakers so as to have some contact entrepreneurship in some way, whether it is for students or teachers.

Knowledge sharing and interaction between teachers is highly important. The more a teacher is involved with entrepreneurship programs, the better. In management related areas, she does not believe in merely theoretical learning, it only makes sense when one does not have access to books or other materials. She strongly believes that practical experience is important – more important than training initiatives is putting

teachers in entrepreneurship programs, doing business plans. About doctorate programs in entrepreneurship, this teacher believes that are worth it, because they pave the way for entrepreneurial knowledge. Since it is a very fashionable theme right now, entrepreneurship suffers from uninteresting projects. So entrepreneurship education is imperative to create public awareness of what it is and what it takes. "*Instead of answering to your boss, you start managing suppliers, clients and employees. It is very complicated"*, Teacher I underlines. She concludes by saying that PhD courses are essential to enhance the academic part of entrepreneurship since there are plentiful things to study.

4.10 Discussion

Followed by the case studies description, a discussion is here included along with tables with the information on all teachers summarized. It can be observed in table 12 that most entrepreneurship teachers have backgrounds that are very distinct from one another. There are teachers who have studied business administration or economics, others who have degrees in engineering, and even teachers with backgrounds as diverse as chemistry, international relations, sociology or marketing. While in their PhD courses, most have followed different directions of research. Those whose thesis concerns entrepreneurship are highlighted in bold. Some of these shifts have to do with either their professional experience or their masters' degrees: The majority of the teachers hold masters in management or have MBAs in management. This includes teachers A, B, D, E, F, G, and H.

It was noted that most teachers have experience in consultancy, participating in firms' creation process or being entrepreneurs themselves. Teacher E and G also have experience with family businesses. Teacher F has some experience, but he mentions it is more informal and his professional path was mainly within the faculty. This involvement, which is usually before joining their doctorate's program, seems to be one of the first steps towards being invited or starting to teach entrepreneurship. An exception is notably teacher H whose professional experience has been strictly in the faculty. Most teachers started their academia jobs by joining research projects and, later, being invited to teach the subject. This includes teachers C, D, F, G and I. Teachers B and D were invited because of their knowledge and experience with the business world. Paths to teaching entrepreneurship seemed somewhat similar, with slight differences here and there, naturally.

Concerning publications most teachers reported having "a few" articles centered around entrepreneurship. Articles indexed in ISI were reported by some teachers, but usually in other areas like teacher C and G, or where all publications were about entrepreneurship, with more or less half of them indexed, like teachers A, E and H. Teachers B, D, E and I were still involved in their doctorates and did not publish anything much. Most entrepreneurship teachers said they also teach marketing, management subjects, strategy or project management. Teacher I also has taught accountability and other subjects around finance.

Table 12 - Overview of teachers' background

Teachers	A	B	C	D	E	F	G	H	I
Background	Chemistry	Marketing	Telecommunications Engineering	Sociology	Business Admnistration	Environmental Engineering	International Relations	Business Admnistration	Economics
Doctorate	Chemistry	**Tourism (in progress)**	Eletrotechnic Engineering	**Marketing and Strategy (in progress)**	**Marketing and Strategy (in progress)**	**Management and Industrial Engineering**	Marketing	**Entrepreneurship**	Corporate social reponsability (in progress)
Experience	Entrepreneur - 2 businesses; 10 years technology transfer	Consultancy: venture creation support	Helped founding a few businesses, but only formally involved	Entrepreneur; also works in consultancy - new venture creation	Entrepreneur: family business in real estate. Marketing and strategy consultancy.	Some experience working with firms: informal collaboration	Family Business accumulated with faculty work for a while	No experience outside the university	Worked as a consultant and auditor. Firm advisor
Started teaching	Started 4 years ago, because it was more stable than being an entrepreneur	Started 7 years ago, because she had experience with firms before	Started 7 years ago, was involved with incubators and the PhD. The faculty needed a teacher	Started 5 years ago, invited to join a research project and later to teach	Invited 9 years ago to join teachers with practical experience in the business world	Started teaching three years ago. Was invited in the end of the PhD to join a research project and then started teaching.	Started six years ago. Created the entrepreneurship subject itself	Started teaching 9 years ago	Started teaching 10 years ago: accountability and finance and only after that entrepreneurship
Teaching Areas	Entrepreneurship; Project Management; Entrepreneurship and Innovation	Entrepreneurship; Marketing; Organisation management	Entrepreneurship; Project Management and Entrepreneurship	Entrepreneurship; Marketing; Business Strategy	Entrepreneurship; Business Strategy, International Marketing; Marketing and fashion businesses	Entrepreneurship; Marketing; Strategy	Entrepreneurship; Marketing; Strategy	Entrepreneurship; Marketing, Data analysis	Entrepreneurship; Marketing; Financials for entrepreneurs; Accountability

Background

Profiles are very similar here; it seems most teachers start by teaching other subjects like business management or marketing and then move forward to entrepreneurship. They usually teach students with various backgrounds. It is common to find classes filled with students from different scientific areas like health sciences and social sciences. Also, teachers may teach two classes; one more oriented for business-type students and other more generically oriented, that students may take it optionally. This is the case for teachers B, D, F G, and H. Interestingly, teacher D has optometry students and teacher E has fashion design students. Following this information, a lot of teachers said they feel the need to adapt classes to each target audiences. One can find changes in the way the evaluation is done and the methods of the classes with different audiences.

Table 13 – Teachers' objectives in entrepreneurship education

Teachers	Objectives in Entrepreneurship education
A	Notion of what being an entrepreneur is; perceptions of needs and idea development; attitude development
B	Perception of entrepreneurship as an alternative career; it is not something effortless. What it is like to manage marketing, human resources and finance
C	Students identify good ideas and opportunities; notion of the market and its needs; transmit financial awareness
D	Being more open minded towards entrepreneurship; creation of an entrepreneurial mindset and stimulating attitudes towards entrepreneurship
E	Facilitate venture creation process (conceptually). Giving students tools and minimum competencies to deal with entrepreneurship. Understanding it as a complex phenomenon and how to interact with it
F	Giving students tools to work with. Generating ideas. Preparing them for a real life project. Teaching students to think differently about entrepreneurship
G	Enhance student's attitudes towards entrepreneurship. Entrepreneurial mindset. Transforming ideas into projects
H	Attitudinal change: Students are more willing to take risks, are more autonomous or have bigger need for achievement.
I	Helping the development of a business plan. Transforming ideas into businesses

It is noteworthy to mention that authors like Fayolle and Gailly (2008) highlight that the variety of audiences in entrepreneurship education programs includes students with different aspirations and characteristics which can be problematic when designing the course implementation. Understanding of the audience is particularly important.

Most teachers said their main focus when teaching entrepreneurship is not that students go outside and start creating businesses. Rather, it is creating entrepreneurial awareness, enhancing attitudes towards entrepreneurship, creating an entrepreneurial mindset, where they are more open minded. Creating financial awareness and show entrepreneurship as an alternative career is also very important. Teacher C and F would like their students to be able to identify good ideas and

opportunities; Teacher H was even more practical: students are more willing to take risks, are more autonomous. Teacher I reported that helping with the business plan was one of her main objectives, along with students being capable of transforming ideas into action. It was found that mostly, teachers seemed to categorize their classes with entrepreneurial awareness education (Kirby, 2004; Liñán et al., 2011; Mwasalwiba, 2010). The development of attitudes and entrepreneurial awareness, along with the notion of what entrepreneurship is very important for the interviewees, more so than tangible new venture creation. Liñán et al. (2011) recommend the inclusion of entrepreneurial awareness aspects in entrepreneurship training programs.

There is here a consensus on the fact that entrepreneurship education is a way to promote entrepreneurship by developing and promoting attitudes, beliefs and strengthening awareness of its economical and societal benefits. We feel these objectives should be in harmony with their course contents, pedagogic methods and evaluation as they pave the way for achieving this kind of entrepreneurial awareness. In addition, we believe this should be adapted to each kind of audience teachers may have. If they find business students in their audience, the chance they have developed business plans is very high; so these objectives should be flexible enough to reflect the needs of each class. In this sense, classes should not have too many students in order to easily assess students' perceptions, ideas and learning needs more specifically and facilitate the teaching process.

Table 14 - Teachers' pedagogic choices

	Teachers								
Methods	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Lectures	X	X	X	X	X	X	X	X	X
Videos	X	X					X		X
Guest speakers	X	X	X	X	X	X	X	X	X
Case Studies	X	X					X	X	
Exercises				X	X	X		X	
Study Visits									
Presentations	X	X	X	X	X	X	X		X
Creativity sessions				X				X	
Business Simulations					X	X			
Outside Activities				X	X			X	
Group Work	X	X	X	X	X	X	X	X	X
Business Plan Development	X	X	X	X	X	X	X		X
Games									

All teachers use a combination of methods. In fact, all of them use 5 to 8 methods– no teacher uses one method exclusively. The most popular teaching methods seem to be lectures, guest speakers, business plan development, group work and presentations. Although most teachers said their method was intended to be very practical and dynamic, lectures are used by everyone, which is more traditional. Some reported spending 30 to 40 minutes, others an hour exposing the information. Even with shorter times, teachers find useful to start the class by discussing that day's topic of choice. Also very present is the business plan development in the form of group work. This method defines most of these teachers' classes (exception made to teacher H), for many strategically divide their semester lessons by the main themes of the business plan, like idea generation, marketing, finance. This is also done by letting the groups work on their assignments in class and then presenting their business plan chapters – teacher C, F and I, for example. In this sense, presentations are also almost inseparable from the projects. Having students present their work is both desirable and helpful to develop their communication skills. Teachers A, D and E also dedicate some classes working on the students' pitch and this is also a form of evaluation and presentation of students' semester work.

The choice of guest speakers proves to be an absolute hit. The role model presence that is brought to the class or the experiences shared by real entrepreneurs is very popular. Common methods are also showing videos and exploring case studies. Both methods were highlighted because of their flexibility in bringing some reality into the class. Teacher H finds them particularly helpful. Other methods are real life simulations: the students go outside and talk to real investors, or students go outside and try to make real money. This is the closest to real venture set up methods that were found. Teacher G has also reported thinking about following this method. No teachers mentioned the use of games and competitions or organizing study visits. In fact, most of them shared that time management was very hard, and left them to choose which topics and methods were more important to teach. These time constraints may be the reason or simply that they are unpopular.

These results are similar to Mwasalwiba (2010) and Bennett (2006) findings, where lectures and group work are also two of the most used methods in entrepreneurship education and all teachers used lectures, case studies, team projects and exercises. These are more passive, or traditionally oriented: Bennett (2006) explains these methods are commonly used in skilled-based programs which aim to teach students business mechanics and are less concerned with entrepreneurial attitudes. We find traditional methods like lectures are still relevant because they are easy to accomplish and do not require much investment (Fiet, 2001a, 2001b) or because teachers feel more comfortable doing them that other methods (Macosko et al., 2009). Bennett (2006)

Some authors argue that for the development of entrepreneurial attitudes, active methods should be used, such as role plays, simulations, brainstorming, team projects and participative discussions – several authors share this view (Carayannis et al., 2003; Fiet, 2001a; Garavan & O'Cinneide, 1994a; Heinonen & Poikkijoki, 2006; Macosko et al., 2009). What we find is that these kinds of methods are not absent from these results, seeming to take a more definitive role: most teachers reported wanting to try different things and adapting their methods. We can foresee that while different methods may be tried once in a while lectures and business plan methodologies will keep being the main methods for teaching. We may argue that teachers do not yet feel prepared to use completely different pedagogies because they are used to more classical methods and classes that have a lecture component always present in the Portuguese system. That is why most classes follow a business or economic pedagogic approach. Nonetheless, while there is no consensus over what constitutes the best approaches, it is recommended teachers should move forward using a "learning by doing" approach and carefully choose techniques and modalities depending mainly on objectives, contents and constraints imposed by their institutional context Fayolle and Gailly (2008) Here, a university view of entrepreneurship education can play a very important role and it may or may not allow for more investment and dedication to entrepreneurship education.

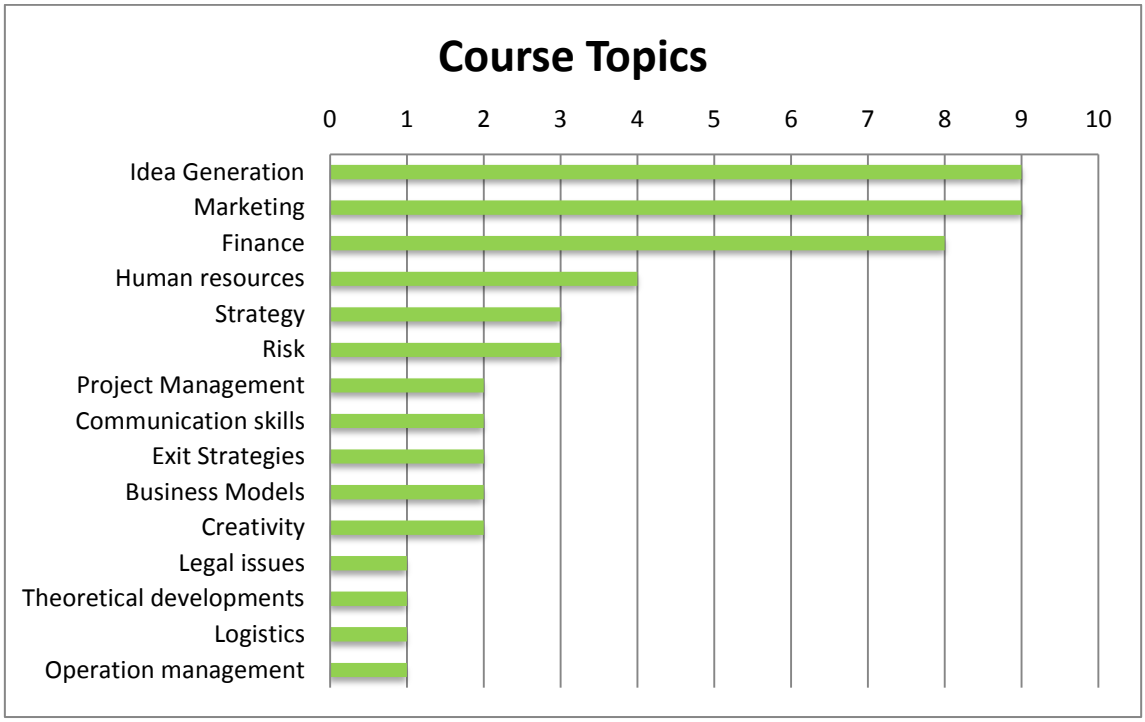

Figure 8- Teachers' topic coverage

Looking at the table, one understands that the dominant topics in the courses are idea generation and marketing. These topics are present throughout every teacher's syllabus. Mostly, idea generation is the first thing that teachers mention: recognizing opportunities, filtering ideas and reaching a consensus are usually the first things to be taught. In addition, most teachers were specially detailed in their marketing topics, mentioning market analysis, competition analysis, the industry and market research. Finance topics and financial analysis are also present in most teachers' courses with one exception. Teachers think financial awareness is important for students, especially those without business backgrounds, unaware of basic principles. Here, some teachers address risk management. Also, some teachers focus on business strategy, business models, managing human resources and creativity sessions. Communication and negotiation skills are mentioned to be learned by presenting or pitching their projects. Less common are topics like logistics, operations management or even legal issues, which were barely mentioned. Growth management and small business management, which are topics found in the literature were not mentioned at all.

While slightly diverse, it was found that most teachers followed three main topics: idea generation, marketing and finance. Afterwards, they adapt their contents towards what they understand it may be interesting and important to teach. Mwasalwiba (2010) found that finance, marketing and idea generation were the most common course contents, in line with our results. This is in harmony with the literature, as Matlay et al. (2006) and Bennett (2006) also reported wide variations in course content. Fayolle and Gailly (2008) highlight it is helpful to cover recognizing opportunities, market analysis, identifying and dealing with risks and also getting funding: connecting with venture capital agencies and business angels. We stress the need to give students information on funding their projects and creating financial awareness in them. Giving students an understanding of how things are done in their local context is very important. Here, adaptation for each audience is essential because business students have different awareness of financial and marketing tools, which other students from life or exact sciences may not have. Furthermore, a student who is very good at using marketing, financial or operations tools that are commonly used can only take him/her so far in his/her entrepreneurship process; we find that, in consonance with attitude development and mindset creation objectives,

teachers should adapt their contents to their aims in entrepreneurial education. Someone who is truly interested in pursuing an entrepreneurial career can easily find the tools he/she might need but may struggle with recognizing an opportunity. Some teachers are progressively making these adaptations, but we feel a lot can still be developed.

In addition, many teachers complained about time constraints; these may reside in the fact that programs are often long or with too many topics to cover; here, the focus on the essential things to be taught is important. Chances are students will probably remember essential things over long detailed topics of operations management, for example. Choosing or changing one approach over another is helpful so teachers can "learn by doing", as reported above and build an understanding about what works better with each class or audiences.

Table 15 - Evaluation methods

Evaluation	A	B	C	D	E	F	G	H	I
Exam/ Test	x	x	x			X	x		x
Business Plan	x	x	x	x	x	X	x		x
Individual Project	x							x	
Group Project	x							x	
Presentations	x		x	x	x	X	x	x	x
Pitch				x	x				
Class participation	x						x		x
Real venture set up								x	

On evaluation, the most popular teaching method is the business plan, in the form of a group project, usually. Here, the two things are distinguished because some teachers ask their students to develop more than one group project. This is followed by presentations: these could be presentations of students' group projects or, in teacher's H case, a storytelling activity. Having an exam or a test delivered to students are equally popular with teachers. However, evaluation shows more differences between them. There are always combinations of methods – not just the business plan, or just the exam. Some teachers like to highlight class participation and students' individual performance. Teachers D and E also evaluate students' pitch performance. Other things like individual projects, setting up real ventures and storytelling were specific to a teacher H's choice of evaluation, and are not popular as other methods, because these are not activities other teachers do.

In line with our results, Mentoor and Friedrich (2007) found common evaluation forms to be tests, examinations, assignments and the business plan. Another interesting thing is that the business plan evaluation could be done in weekly assignments, like Teacher C does, or with weekly presentations of each theme – the case of teacher F and G. A lot of teachers still use exams – but some mentioned they would not do it with less time constraints. Teachers also like to assess individual performance: Fayolle et al. (2006) recommend evaluating project management, team work or creative capacity and highlight that it is possible to evaluate knowledge or skills acquired, students' interest, awareness and intention. While intention is the most common way to assess the impact of entrepreneurship education, we feel evaluating students' interest or awareness is a very interesting way to do it because it is in harmony with most educators' aims with entrepreneurial education. If one wishes to develop attitudes or create awareness, he/she should find a way to assess if this was done accordingly by the end of the course.

Table 16 - Teachers' personal views

Teachers Thoughts:			
Teacher	**On teaching**	**On Training**	**On PhD's**
A	It can be easier if you are an entrepreneur	Relevant	Yes
B	It can be easier if you are an entrepreneur	Relevant	Not sure
C	Equilibrium of both academic and professional experience	Not relevant	Not necessary
D	Equilibrium of both academic and professional experience	Relevant	Not necessary
E	Equilibrium of both academic and professional experience	Relevant	Yes
F	It can be easier if you are an entrepreneur	Relevant	Not necessary
G	A teacher does not have to be an entrepreneur	Relevant	Not necessary
H	A teacher does not have to be an entrepreneur	Not sure if essential	Yes
I	A teacher should have professional experience	Relevant	Yes

In line the European Comission (2013:5) statement: *"Teachers cannot teach how to be entrepreneurial without themselves being entrepreneurial*", teachers were asked if a specific teacher with or without entrepreneurial experience would make a difference. There were many different answers, however most agreed on equilibrium between the two profiles: being able to teach basic concepts and transmit entrepreneurial competencies along with some professional experience in that area, to help motivate students. Teachers A, B, C, D, E and F agree with this perspective it is easier to teach entrepreneurship if you have a bit of both worlds. Teachers G and H understand that having professional experience does not influence being a better teacher. What matters is how dedicated and motivated you are, and what you know about entrepreneurship to transmit to students. Teacher I strongly believes professional experience should be mandatory because entrepreneurship demands real life knowledge. It also helpful to distinguish here between entrepreneurial experience and professional experience; here, the focus is on the first, because teaching with or without professional experience is a different debate. All teachers highlighted that guest speakers are very useful to form a bridge from the classroom to entrepreneurship reality. Teacher C in particular recommended strengthening the bonds between local ventures and students. We feel that teaching entrepreneurship is no different from other topics; one just needs to find the right approaches to deal with it effectively. It is not so much the type of teacher that is crucial, but his/her choices in what content is delivered and what investment they wish to make on entrepreneurship education. The effort a teacher puts on entrepreneurship education is much more important, in this study's view, than their academic experience. And while this experience may be helpful, a teacher who is determined enough will eventually seek to invite entrepreneurs or other experts to cover the gap between experience and theoretical knowledge.

"Initial and further teacher training is of the highest importance" (European Commission, 2009:8). When asked about teacher training initiatives which are strongly supported by European organizations (European Commission, 2006; European Commission, 2009; European Commission, 2013; European Commission, 2012; OECD, 2009) most teachers agreed they were very interesting and important. They highlight that sharing experiences, knowledge and teaching methods is both helpful and insightful. This is because most teachers are not sure of what the best teaching approach is, like Bennett (2006)'s results. The recommendation here is to encourage dialogue between teachers for the same purposes:

information, experiences and best practices. This can very much help teachers explore different pedagogies and finding out what works better in their classes. This is because, in a time of economic crisis and scarce investment, teacher specific training can be more expensive and universities may discard this option. Furthermore, while training is an interesting thing to consider because teachers consider certain topics to be difficult to teach, no one guarantees it will make entrepreneurship education generally available and effective as the European Commission (2011) states.

Finally, teachers were inquired about the relevance of creating more PhD programs in entrepreneurship. The European Commission (2008:7) highlights "*there are currently too few professors of entrepreneurship. There is a need to graduate enough PhD students in entrepreneurship who can become teachers".* It was decided to check what teachers thought about that. They disagree most on the creation of entrepreneurship PhD programs. While some consider them relevant, they add that only for further investigating the phenomenon and research purposes. Teachers believe creating PhD programs for creating more entrepreneurship educators is neither necessary nor viable. Some strongly believe Portugal is a small country for a bigger portfolio of PhD programs and conclude not having many of those programs is sufficient. Our view is that a research centre or entrepreneurship departments are an interesting way to develop scientific research in entrepreneurship. Since this is a rather big investment for a small country as Portugal, research projects are also a suitable alternative. The creation of PhD programs, in our view, does not make sense when its ultimate goal is the creation of more teachers, but it is rather a local adaptation of entrepreneurship education needs to each country that is more rational and feasible. A bigger teacher ratio will not necessarily bring more effectiveness in entrepreneurship education but it is the role that the teacher chooses to play that determines what the students will receive in terms of contents, objectives and pedagogies.

Chapter V: Conclusion

The aim of this dissertation was to analyze the impact of entrepreneurship education and the different pedagogic methods and tools used with higher education students. In this sense, students' entrepreneurial intentions were researched in a context of an entrepreneurship higher education program and the role of the teacher in entrepreneurship education was investigated: What are their objectives? How do they implement it? This was done by testing students in the beginning and the end of the entrepreneurship course, with a post-ante design using the theory of planned behavior as a basic structure. Also, 9 entrepreneurship teachers in higher education institutions were interviewed.

At student level, it was found that entrepreneurial intentions were higher after taking an entrepreneurship course, along with their perceived behavioural control. The course also allowed them to have more knowledge about entrepreneurship and be more aware of the institutional context around them. Furthermore, the nature of entrepreneurial intentions was explained by attitudes toward the behaviour and perceived behavioral control. Additionally, it was found that expectations before an entrepreneurship program greatly explain entrepreneurial intention.

At teacher level, it was found that teachers were practicing entrepreneurial awareness education, focusing very much on attitudinal concepts of entrepreneurship and personal development and not at all on venture creation outcomes. Transmitting knowledge about firms, self-employment and entrepreneurship as a whole is the main concern. Moreover, it was found teachers had very different backgrounds, but their choice of methods and contents was somewhat similar, along with evaluation methods. They usually use a variety of methods, topics and evaluations for their classes. They believe entrepreneurship can be taught but disagree when discussing if the teacher should have entrepreneurial experience or not. They mostly disagree on the need of PhD creation and emphasize the need of teacher training initiatives.

This study contributes to the literature of entrepreneurial intentions through the conceptual use of the theory of planned behavior since it was found out that only attitude towards the behavior and perceived behavioral control explain variance in entrepreneurial intention. The remaining construct (subjective norms), along with exogenous constructs that were added failed to explain entrepreneurial intention. This is not a surprising find because subjective norms are shown to be weaker in predicting entrepreneurial intentions (Armitage & Conner, 2001). No relationship was found between teaching methods and entrepreneurial intentions, but the type of lecturer was shown to be important at the start of a course towards entrepreneurial intentions, along with students' expectations. Nevertheless this was a brand new contribution to the field and more testing should be done to empirically validate this assumption. In addition, the link between entrepreneurial intentions and entrepreneurial education is reinforced, since students felt more inclined towards entrepreneurship and more capable of performing related tasks. This is in accordance with the literatures' findings and thus provides additional strength to the idea that entrepreneurship education can foster students' intentions. Nonetheless, the lack of a control group and a bigger sample cannot be ignored; along with the statistically insignificant attitude towards the behavior – this could be due to the fact that students did not perceive entrepreneurship as an advantageous/attractive career or because they spent more time learning about the entrepreneurial process and did not feel more inclined towards entrepreneurship.

Moreover, this study addresses teacher's choice of methods, course content, evaluation and personal views on entrepreneurship education which is absolutely relevant for the Portuguese research on this matter. The latest research was Redford (2006)'s study, in which business plans and lectures were one the most popular teaching methods. Looking now, not much has changed; these are the most popular methods still. However, this most relevant contribution is the insight of entrepreneurship education

teachers. Their role in the classroom is extremely important: their aims and views for entrepreneurial education determine how they teach the class and how students, who are at the receiving end, perceive entrepreneurship after taking the course. In a world where entrepreneurship education is extremely popular and every day new studies arise concerning the best methods or practices, teachers are the ones who are responsible for what is taught to students and in this case, how they perceive entrepreneurship as self-employment, as a complex phenomenon or simply as an example to be a person more prone to risk taking and autonomy. We found that there is indeed a consensus towards the main objectives on entrepreneurship education and while there are different conceptions on how to deliver it, we may say teachers are very much in agreement that entrepreneurship can be taught and it should be done in entrepreneurial awareness and attitudes in mind. However, we believe that entrepreneurship education and the way it is delivered still borrows from management and economic classes, in their format, and its contents are still oriented towards venture creation, despite it not being a main objective of the courses. The need for exchanging information among teachers is crucial, so they can find about different approaches, methods and contents to teach. We find that the learning by doing is the best approach for an area that is not consensual regarding to best educational approaches. Teachers should have the sensibility to test and to understand the needs of their audiences, implementing different methods at different learning needs whether there are different learning levels such as licenciates, masters or doctoral degrees or students with diverse backgrounds.

An important contribution of this study was therefore the relationship between students' entrepreneurial intentions and teachers' background and his/her choice of methods. This was absolutely new in the literature and gave us a special insight within teachers' minds and views on entrepreneurship education. Entrepreneurial intentions are very important in entrepreneurship education and as a way of measuring its impact. This relationship is crucial because teachers and universities are the engine behind what is delivered to students in higher education contexts. Defining clearly the objectives for entrepreneurial education and the means to achieve them should be given more attention - this is especially important. We found that, in this specific case, educators are more concerned with attitude development and not so much on entrepreneurial intentions *per se*. Since this is the case, why are we still using lectures, teaching students about business plans, evaluating them by theoretical tests and focusing less on attitude development? and Is there a gap between what is taught and what is being measured? If raising entrepreneurial intentions is not the aim, why are we measuring entrepreneurial education's impact with it? Should not there be better tools to assess entrepreneurial attitudes in students? And if we are still focused on economic benefits of entrepreneurship and wanting to develop entrepreneurial intention why are course objectives oriented towards attitudes? These are answers for the near future, however we may infer that students who are indeed interested in pursuing entrepreneurial careers should have different course methods and contents from those who want to know more about the phenomena alone. And this is a problem when courses are mandatory and attract students who are not interested at all. If on the other hand, we should focus on attitude development and entrepreneurial awareness, should we focus on different ways to teach the subject or simply call it financial, marketing and idea generation awareness for students?

This study also has implications for policy makers: the dissemination of entrepreneurship education programs does not mean students will start creating ventures or raise their entrepreneurial intentions. It does mean they can become more knowledgeable of the entrepreneurial environment and of a career alternative. In this line of thought, teacher training should be encouraged but not forced; effectiveness of entrepreneurship education is yet to be proven to be dependable on teacher training as it is claimed by the European Commission (2011). Sharing practices, experiences and difficulties, however is a welcomed way of learning for teachers. Moreover, entrepreneurship education should be adapted locally, for different countries have different needs and views on how it should be implemented. We find this obsession with implementing entrepreneurship education practices by policy makers to be blatant in several entrepreneurship reports; this is a cause for concern because as one knows, quantity does

not mean quality. Efforts should concentrate on effectiveness and efficiency and not on mandatory training or PhD program creation.

5.1 Limitations

In this research, the lack of a larger control group is the biggest limitation. This would have given a basis of comparison and would probably have produced results that would help explain the results of the first hypothesis when explaining entrepreneurial intentions and find out more about the impact of the entrepreneurship program. Furthermore, a bigger sample of students would be recommended to check if any variations stand out. It was not possible to take any university on university comparisons due to very small samples of some of them. This was a very clear limitation of this study and something intended for research while collecting data.

In regards to teacher interview, only 9 teachers were asked questions about their practices and views of entrepreneurship education. While their methods are very similar, this provides a small picture of the Portuguese context, for more differences could arise.

5.2 Directions for further research

It would be particularly interesting to compare students who choose to take entrepreneurship courses voluntary and those who take it compulsory. The results would be very interesting in terms of differences within entrepreneurial intentions. Also, longitudinal research would be very insightful to check the true impact of entrepreneurship education programs. Theory of planned behavior findings are disappointing and so more testing of the theory with different exogenous influences would be rather interesting, especially with different student samples, with different majors or backgrounds. In addition, students' perceptions of teaching methods could be an interesting find; this study only accounted for their attitudes, intentions are perceptions.

Another interesting direction for further research was to compare different students with different teachers among different universities and see what results would be produced. This logic could also be applied with cross-country analysis of entrepreneurship education. In terms of local context, research teachers' practices among various universities and collecting this information would produce a rather rich research for the Portuguese environment since this information is not available.

Furthermore, research on the impact of different entrepreneurship courses in terms of their duration and further comparison would help assess if only one semester, in this study's case, is enough or not. Finally, we suggest testing if different methods and different teachers can indeed impact students' entrepreneurial intentions in order to better understand our findings and advance contributions to the literature.

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Appendices

7.1. Appendice I – Students' questionnaire

Este questionário procura analisar, junto dos alunos do Ensino Superior Português, o seu grau de intenção empreendedora. Este questionário será respondido no início e no final do semestre lectivo, tendo-se optado por analisar as respostas de forma emparelhada. Deste modo, o sistema solicita o seu número de aluno, tendo apenas como objectivo poder relacionar os dois momentos de resposta. Todos os dados são confidenciais e não são analisados individualmente.
Agradecemos a sua disponibilidade.
Ao terminar não se esqueça de carregar no botão "Submeter"

***1. Nº de aluno**

***2. Idade**

***3. Género**

- Masculino
- Feminino

***4. Identifique qual a Universidade/Politécnico em que está a efectuar os seus estudos.**

***5. Qual o grau de estudos que está a frequentar?**

- Licenciatura
- Pós-graduação
- Mestrado
- Doutoramento

***6. Qual o ano que está a frequentar?**

***7. Qual a área científica do curso que frequenta?**

- Ciências da vida e da saúde
- Ciências exactas e da engenharia
- Ciências naturais do ambiente
- Ciências sociais e humanidades

***8. Qual o curso?**

***9. Qual o seu estatuto de estudante?**

- Trabalhador estudante
- Estudante ordinário

***10. Tem experiência profissional prévia?**

- Nenhuma
- Estágio
- Part-time
- Full-time, há menos de um ano
- Full-time, há mais de um ano
- Outro

Outro (especifique)

11. Se sim, avalie a sua experiencia de trabalho:

- Positiva
- Negativa
- Sem opinião

***12. Está a frequentar a UC de empreendedorismo?**

- Sim
- Não

13. Se respondeu sim na questão anterior, quais as suas expectativas?

- Não tenho expectativas precisas
- Tenho um interesse geral e quero aprender mais sobre empreendedorismo, pois pode ajudar-me a decidir sobre o meu futuro profissional;
- Consigo imaginar-me empreendedor e quero saber mais sobre as habilidades e competências necessárias;
- Estou determinado a começar o meu próprio negócio e quero aprender as habilidades e competências necessárias;

*14. Indique o seu nível de concordância com as seguintes afirmações.

	1 (discordo totalmente)	2	3	4	5	6	7 (concordo totalmente)
Ser um empreendedor implica mais vantagens que desvantagens para mim							
Uma carreira como empreendedor é atraente para mim							
Se eu tivesse uma oportunidade e recursos suficientes, gostaria de criar uma empresa							
Se tivesse várias alternativas, preferia ser empreendedor							
Ser empreendedor é a opção mais indicada para o meu futuro profissional							
Eu preferia ser dono do meu próprio negócio do que ganhar um grande salário sendo trabalhador por conta de outrem							

***15. Indique em que medida concorda ou discorda das seguintes afirmações:**

	1 (discordo totalmente)	2	3	4	5	6	7 (concordo totalmente)
Criar uma empresa e mantê-la em funcionamento seria fácil para mim	○	○	○	○	○	○	○
Estou preparado para criar um negócio viável	○	○	○	○	○	○	○
Eu consigo controlar o processo de criação de uma nova empresa	○	○	○	○	○	○	○
Eu conheço os detalhes práticos necessários para criar uma empresa	○	○	○	○	○	○	○
Eu sei como desenvolver um projeto empreendedor	○	○	○	○	○	○	○
Se eu tentasse criar uma empresa, teria uma alta probabilidade de sucesso	○	○	○	○	○	○	○

***16. Indique em que medida concorda ou discorda das seguintes afirmações:**

	1 (discordo totalmente)	2	3	4	5	6	7 (concordo totalmente)
A família mais próxima acharia positivo se seguisse uma carreira de empreendedor	○	○	○	○	○	○	○
Os amigos mais próximos achariam positivo se seguisse uma carreira de empreendedor	○	○	○	○	○	○	○
Outras pessoas importantes para mim achariam positivo se seguisse uma carreira de empreendedor	○	○	○	○	○	○	○

17. Indique em que medida concorda ou discorda das seguintes afirmações:

	1 (discordo totalmente)	2	3	4	5	6	7 (concordo totalmente)
A universidade tem fortes ligações com a(s) incubadora(s) da região	○	○	○	○	○	○	○
A universidade tem fortes ligações com redes de business angels e sociedades de capital de risco	○	○	○	○	○	○	○
A universidade promove concursos de empreendedorismo e programas de mentoring	○	○	○	○	○	○	○
A universidade estimula e apoia o desenvolvimento de habilidades e atitudes empreendedoras	○	○	○	○	○	○	○
A universidade incentiva os indivíduos a tornarem-se empreendedores	○	○	○	○	○	○	○
A universidade oferece apoio aos indivíduos/grupos para passarem de ideias empreendedoras à acção	○	○	○	○	○	○	○

***18. Indique em que medida concorda ou discorda das seguintes afirmações:**

	1 (discordo totalmente)	2	3	4	5	6	7 (concordo totalmente)
Consigo definir uma proposta de valor	○	○	○	○	○	○	○
Sei realizar a análise de mercado e da concorrência	○	○	○	○	○	○	○
Sei fazer a segmentação de clientes	○	○	○	○	○	○	○
Sei realizar o posicionamento de produto/serviço	○	○	○	○	○	○	○
Sei definir estratégias e planos de comunicação	○	○	○	○	○	○	○
Sei utilizar ferramentas de gestão de projectos	○	○	○	○	○	○	○
Sei como integrar e gerir equipas de trabalho	○	○	○	○	○	○	○
Sei como efectuar uma negociação	○	○	○	○	○	○	○
Sei realizar a avaliação económica e financeira de um projecto	○	○	○	○	○	○	○

***19. Indique em que medida concorda ou discorda das seguintes afirmações:**

	1 (discordo totalmente)	2	3	4	5	6	7 (concordo totalmente)
Estou pronto para fazer qualquer coisa para me tornar um empreendedor							
O meu objetivo profissional é tornar-me empreendedor							
Irei fazer todos os esforços possíveis para criar e gerir a minha própria empresa							
Estou determinado a criar uma empresa no futuro							
Pensei muito seriamente em criar uma empresa							
Tenciono firmemente criar uma empresa em algum momento futuro							

7.2. Appendice II – Constructs and Items

Construct	Item
A.1	Being an entrepreneur implies more advantages than disadvantages to me
A.2	A career as entrepreneur is attractive for me
A.3	If I had the opportunity and resources, I would like to start a business
A.4	Among various options, I'd rather be an entrepreneur
A.5	Being na entrepreneur is the best option for my future
A.6	I'd rather run my own business than earning a great salary working for someone
PBC.1	Starting a firm and keeping it working would be easy for me
PBC.2	I am prepared to start a viable business
PBC.3	I can control the creation process of a new business
PBC.4	I know the practical details necessary to cereate a firm
PBC.5	I know how to develop na entrpreneurial project
PBC.6	If I tried to run a business, I'd have high chances of success
SN.1	My closest family would find it positive if I followed an entrepreneurial careeer
SN.2	My closest friends would find it positive if I followed an entrepreneurial careeer
SN.3	Other important people would find it positive if I followed an entrepreneurial careeer
CTX.1	The university has strong affiliation with local incubators
CTX.2	The university has strong affiliation with business angels and venture capital societies
CTX.3	The university promotes entreprreneurship competitions and mentoring programmes
CTX.4	The university promotes and supports the development of entrepreneurial skills and attitudes
CTX.5	The university encourages students to become entrepreneurs
CTX.6	The university supports indiviudals/groups to go from idea to action
K.1	I can develop a value proposition
K.2	I know how to analyze the market and the competition
K.3	I know how to segment clients
K.4	I know how to place my product/service
K.5	I can develop strategies and communication plans
K.6	I can use project management tools
K.7	I know how to manage working teams
K.8	I know what to do in a negotiation
K.9	I know how to analyse a project from a financial/economical perspective
EI.1	I am ready to do anything to become an entrepreneur
EI.2	My professional goal is to become an entrepreneur
EI.3	I will make any effort necessry to create and run my own business
EI.4	I am determined to create a firm in the future
EI.5	I have very seriously thought about creating a firm
EI.6	I have the intention to start a business in the future