



**Entrepreneurial Intentions and Behavior among
University students**

The case of the Instituto Superior Técnico

Tiago Alexandre Alves Octício

Paper

November 2012

1. INTRODUCTION

The present paper assesses entrepreneurial intentions among university students at Instituto Superior Técnico.

In the context of a shift from the “managed economy” towards an “entrepreneurial society” (Audretsch, 2001) it is essential to develop entrepreneurial capital, comprising a number of different legal, institutional and social factors and gain social acceptance of entrepreneurial behavior from individuals who are willing to lead and take the risk of creating new businesses. This stresses the emergence of research on entrepreneurial intentions, as well as on entrepreneurship education at the university level, that can stimulate students’ intentions and behaviors towards entrepreneurship.

The positive role of universities in the development of students’ entrepreneurial intentions and behavior, has been studied and confirmed by several studies (Hannon, 2005, Lüthje & Franke, 2003, Autio et al, 1997, Reitan, 1997). The model of entrepreneurial intentions developed by Lüthje & Franke (2003), explains how intentions are a direct consequence of students’ attitude towards entrepreneurship and the existence of contextual barriers and support factors at the university. The authors focus particularly on personality traits and recommend that the role of universities in generating entrepreneurial intentions and behavior should be approached in further research work.

The present analysis uses primary data (by designing and applying a survey) to assess the factors influencing entrepreneurial intentions and behavior among students, as well as the role played by the university in fostering entrepreneurial activities.

While the analysis identifies the background and control conditions regarding the entrepreneurial context at the university; the study also focus on students’ perceptions about the existent conditions for entrepreneurship offered by the university, which allows us to discuss both perspectives (university and students).

This study can bring a potential contribution in terms of entrepreneurship policies and strategies at the organizational (university) level, as well as with regard to awareness of tertiary students about the development of new business ideas and entrepreneurship. Moreover, the set of descriptive statistics presented and discussed can be important for subsequent analyses attempting to follow a more deductive approach on the topic of entrepreneurial intentions among higher education students and university strategies towards entrepreneurship.

2. RESEARCH BACKGROUND

2.1. Entrepreneurship: main theoretical approaches

Gartner (1988) believes that entrepreneurship can be defined as the creation of new organizations. Later in another study carried out by that author in

1990, we identified two lines of thought about the meaning of entrepreneurship. One that focuses its definition on themes related to the characteristics of entrepreneurship, i.e., entrepreneur, innovation, growth, risk, uniqueness, etc. The other discusses issues related to the results of entrepreneurship in terms of value creation. The development of entrepreneurship has been treated by several authors, Cantillon, Jean-Baptiste Say, Knight, Leibenstein and Schumpeter.

Entrepreneur is the term that is found in the literature, which comes from the exactly same word in French. This term was introduced in the economic literature by Cantillon to identify the person who had the responsibility to a particular project (Nueno, 1995).

Collins & Moore (1970) distinguish between the founders of new businesses and people who have business functions in companies created by others. In this sense entrepreneurs by definition are new business founders (Davids, 1963; Mescon & Montanari, 1981). To Draheim (1972) and Howell (1972) the entrepreneur is the person and entrepreneurs are a small group of people who founded a new company. Begley & Boyd (1986) define the entrepreneur as a person who founded his own company.

According to Rodrigues (1989), Schumpeter was the fundamental theoretical basis for the definition of corporate function and the concept of

entrepreneur, introducing a qualitative distinction between the figure of the entrepreneur, the business owner and the manager. Sousa (1990) considers that the conception of Schumpeter, the entrepreneur (or company) is very abstract, based on relevant characteristics and therefore difficult to find in nature "in pure form", one might ask who it is, or who it can be, really, the entrepreneur. The universe of the entrepreneur, since its genesis, is associated with its own behavior and the factors that influence their decision making. Thus becoming worthwhile an analysis on the main conceptions and models of existing entrepreneurial intentions.

2.2. Main models of entrepreneurial intentions

According to the literature on this subject, one can find a number of investigations that are intended to develop an explanatory model based on the analysis of entrepreneurial intentions.

The Theory of Planned Behaviour (Ajzen & Fishbein, 1980; Ajzen, 1987; Ajzen, 1991), states that any behavior requires some planning, the act of creating a new business can be predicted according to the intention adopted by a given individual. The model developed by Ajzen (1991) comprises three independent variables, which precede the formation of the intention and that in turn predict behavior. The first variable is the attitude toward the behavior, i.e., to determine the opportune moment for a particular behavior. The second variable corresponds to subjective norms, which

means the very perception that an individual has on the surrounding community, perception of individual control, leading the individual to also have a certain behavior. The perception of control reflects the experience, impediments and obstacles faced by the individual previously. The more favorable is the attitude and subjective norm and the greater the perception of individual control, the stronger should be the intention to perform a particular behavior.

The Shapero's model of entrepreneurial intention (1982) indicates that the decision to significantly change the course of our life, for example in creating a business, it's triggered by a specific event or a sudden change in the established routine. Thus, the choice of the individual will depend then of three elements. The first element, the perception of desirability, the second element is the propensity to act, and finally the third element is the perception of viability. Shapero suggested that the intention to create a business derives from perceptions of desirability and feasibility, as well as opportunities related to a propensity to act.

The Davidsson's Model (1995) has as its main objective to identify and test the factors that influence entrepreneurial intention in the context of a future career choice, considering a sample of the general population in six regions of Sweden. So in this way the first determinant of entrepreneurial intention is to create personal conviction in their own company. The conviction is influenced by

more general attitudes and entrepreneurial attitudes. Moreover, these two groups of attitudes will be influenced by the general characteristics. It should be noted that the situation with regard to employment, along with the conviction, will be the cause of entrepreneurial intention.

In Autio, Keeley, & Klofsten Ulfstedt's model base (1997) entrepreneurial intention is examined in the context of a future career choice, with a sample of college students. Thus, in this model, a set of personal background of the entrepreneur will influence the attitudes and image of entrepreneurship, which, in turn, will also influence the entrepreneurial conviction, and the variables representing the social context, along with entrepreneurial conviction, will be the cause of entrepreneurial intention.

2.3. Entrepreneurs intentions among college students: research propositions

According Lüthje & Franke (2003), a survey of MIT students in the areas of electronics and computer engineering, mechanical science and engineering department and in the mechanical department, attitudes act as the link between personality traits in general and specific business behavior. Thus, it is assumed that the characteristics of the individual influence the intention to become an entrepreneur through its effect on the attitude. With the heterogeneity presented in different investigations, it is relevant to consider a bigger distinction that Lüthje & Franke (2003) did for the different areas of

engineering within MIT. Thus, it is important to differentiate within the engineering, a wider range of study areas in relation to possible differences in attitudes and profile of students in each course in relation to entrepreneurship. This leads to consider the following assumptions:

Proposition 1: There are differences between various engineering courses, as regards the attitude of students towards entrepreneurship.

Proposition 2: Students of an engineering course with management skills demonstrate a positive attitude towards entrepreneurship, more than students in other fields of engineering.

In the literature there is strong empirical evidence that shows that entrepreneurs are descended in part from families in which some of its members, especially parents, have been or are still entrepreneurs or self-employed (Collins & Moore, 1970; Cooper & Dumkelberg, 1984; Jacobowitz & Vidler, 1982; Shapero & Sokol, 1982; Wit & van Widen, 1989; Davidsson, 1995, Rubio Lopez et al, 1999). Thus, it is expected that students with parents or close family members which have been involved in entrepreneurial activities, have a greater likelihood of becoming entrepreneurs in the future (Hisrich, 1990; Kets de Vries, 1996; Grant, 1996), i.e., one can consider that family entrepreneur background can function as a very important factor in entrepreneurial intention.

Proposition 3: An engineering student with a family entrepreneur history, demonstrate an intention towards entrepreneurship greater than the engineering student without familial entrepreneurs.

According to study results presented by Peterman & Kennedy (2003), showing that people with low experience in entrepreneurial environments record, after greater involvement in business programs, significant and positive changes in their perceptions about creating a business. The positive role of universities in the corporate development and intentions to explore the factors that influence entrepreneurial behavior of students are confirmed by several studies (Autio et al, 1997, Duijn 2005, Fayolle et al 2005, Gibb 1994, Hannan et al 2004, Hannon 2005, Franke & Lüthje 2003, Reitan 1997). Currently, it is increasingly supported the idea that entrepreneurship can be learned and that the coincidence of circumstances largely determines who starts a new business. So it becomes important to educational institutions know which skills to develop in educating future entrepreneurs and enterprising people (Venesaar et al, 2006). According to the authors, it reflects whether the knowledge provided in the university and the teaching methods of this knowledge are adequate and effective to develop entrepreneurial behavior in students and create in them the intention to develop a business activity. The research results of Venesaar et al (2006) suggest the need to increase the role of universities in

the development of students' behavior in entrepreneurship by providing them knowledge about entrepreneurship, generating a business idea, looking and searching for business opportunities, as well as practical knowledge about the process of starting a business (Venesaar, KOLBRE & Pilistre, 2006).

Proposition 4: Regardless of their attitude towards entrepreneurship, the more involved the student feels, the stronger their intention to become an entrepreneur.

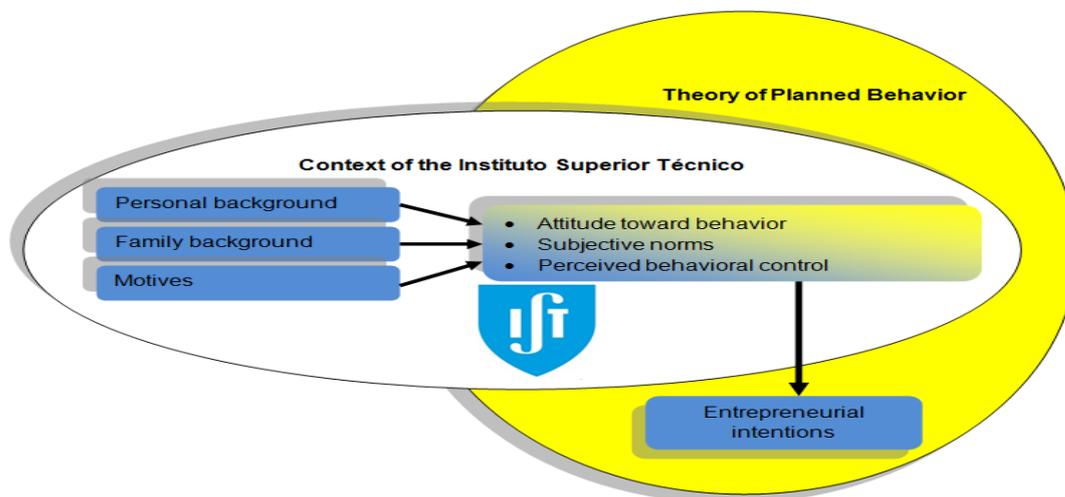
3. DATA AND METHODOLOGY

Data collection for empirical analysis was conducted among the students of the Instituto Superior Técnico, from different

areas of engineering, in first and fifth year strands, during the semester (January 2012 to June 2012). The analysis of this study focuses on entrepreneurship, entrepreneurial behavior and intentions of students.

Based on the literature discussed, the decision was taken to follow the theoretical fundamentals (Ajzen, 2002, Ajzen & Fishbein, 1975) on the Theory of Planned Behavior. According to this theory, intention to show a specific type of behavior is influenced by a number of factors, such as attitude toward the behavior, subjective norms, and perceived behavioral control. To develop a more systematic framework of the study was prepared the following layout.

Figure 1 - Systematic research layout.



The study conducted to elaboration of its own questionnaire that was made available to respondents electronically, specifically, was sent an e-mail, through the platform of surveys of Institutional Studies and Planning Office (AEP) at Instituto Superior

Técnico, with a brief explanation about the scope of the questionnaire and a link to the questions.

The sample was carefully selected for the courses representing the Instituto Superior

Técnico, in particular, Environmental Engineering (EAmbi), Biological Engineering (EBiol), Civil Engineering (EC), Electrical and Computer Engineering (EEC), Physics Engineering (EFT), Industrial Engineering and Management (EGI), Information Systems and Computer Engineering (EIC), Mechanical Engineering (EMec) and Chemistry Engineering (EQ), students enrolled in the first and fifth year, 2nd semester 2011/2012. The final sample totaled a set of 2971 students, of which 722 were considered valid responses (all questions answered), with a response rate of 24.3%, and for questions regarding the university context were validated 665 responses (22,4%).

4. RESULTS

The general tendency of most students is to get employed shortly after the studies, while the equivalent of 18.9 percentage points of them want to leave the employee career within five years. Most of these "temporary employees" intends to found his own company and the other party intends to take any existing company, as successor. Regarding the choice immediately after the degree, it appears that intentions are not very different, ranging to a maximum of 15 percentage points, namely the difference between the intentional employed environmental engineering and industrial engineering and management, respectively with 65% and 80% of intentions. Regarding the intended Founders, there is a slightly higher variable, with 12 percentage points of students separating biological engineering and

industrial engineering and management (5%) from students with greater founder intention, those of information systems and computer engineering (17%).

Throughout the course students showed an increase of 20 percentage points, on average, about employee intentions immediately after finishing studies. On the other hand showed a short decrease of 2 percentage points about intentional founders, and a average decrease of 18 percentage points in the undecided.

The intentions five years after the degree show that students, although decrease the intentions as employees grow it in relation to be founders relatively to graduation, yet still prefer the option as career employee.

On average total, one can note that approximately three-quarters of students can be classified as non-founders and 25% as intentional founders. The percentage of non-founders is higher in chemical engineering and biological engineering. Intentional founders are especially numerous in civil engineering and physics engineering. First year students of chemical engineering and environmental engineering and biological engineering finalists are the most representative in the non-founders class. Regarding to intentional founders, last year students in civil engineering and physics engineering are the ones with highest percentage. Students who have already created their own business are in greater proportion the biological engineering and civil engineering finalists.

Most intentional founders in engineering are attracted to technology and innovation. The data shows that more than three quarters of intentional founders already had some business idea. On the other hand, indicates 17.4% did nothing yet. Access to capital funding is the most important aspect that prevents intentional founders of starting their own company. The second most important reason is the economic environment and the third, the financial risk. The workload seems to be the high barrier which less scares students at Instituto Superior Técnico. It shows that, on average, students plan to invest a little more than half average working time on your business planning. Students of industrial engineering and management plan to invest more than three quarters of their time on their business planning. One can found that students in biological engineering and industrial engineering and management are over those who want to share the creation of your business, on average.

According Siegen et al (2011), the entrepreneurship index calculation becomes important to quantify the strength of enterprising students. The analysis shows that most entrepreneurial force felt among engineering students can be found in physics engineering students, followed by students of industrial engineering and management. The lowest rate of entrepreneurship is from biological engineering students. Particularly about the courses, the finalists in physical engineering, information systems and computer engineering and industrial

engineering and management have the greater entrepreneurial force.

One can verify the existence of students who are already active founders, so to be easier to understand a growth factor was built. The civil engineering students are those who have a higher growth factor (8.33) in the next five years, the most curious thing happens with the two courses below the overall average, biological engineering (0.83) and information systems and computer engineering (0.91), who wouldn't wish to expand their business in the next five years.

More than three quarters of students are not able to continue a family business. On average, 13% of total students come from father only, 5% mother only and 6% of both. The mechanical engineering students are those who are more likely to carry on family business, with father's provenance to dominate the chances of succession. On their average intentions, the overwhelming majority wants to be an employee, and only 7% intend to continue the family business, taking over their family enterprise after studies. Interestingly, the percentage of students with family business background who want to found their own company after graduating is almost double the share of family successors. In respect to the successors of family business, intentions are clearly of concern since they are reduced (5%) and in fewer in number after the degree.

It became interesting the role of the university in the context of entrepreneurial

intentions and activities developed for the students. It verifies that "entrepreneurship in general" lectures are the most frequent, as well as innovation and technological entrepreneurship. However, students show a more intense demand for innovation, business coaching programs and business plans. To assess the quality of offerings at Instituto Superior Técnico, students were questioned according to their satisfaction observing a satisfactory overall. From the standpoint of the university offers students attended, they increased their understanding of the attitudes, values and motivation of entrepreneurs and this is where they show greater agreement. From the entrepreneur standpoint, the university environment more favorable for students can be found in physics engineering and electrical and computer engineering. Environments less conducive to entrepreneurial intentions seem to exist in environmental engineering and civil engineering.

5. CONCLUSIONS

According literature review, one can see that definition of entrepreneurship is vast, not getting a clear and unanimous agreement on the concept. Similarly, several researchers have different views on the individual, while entrepreneur. Research claims that education, particularly higher education, can affect attitudes, entrepreneurship behavior and their entrepreneurial self-efficiency.

This dissertation analyzed the role of the Instituto Superior Técnico, as engineering

university, reference in Portugal, on business development and the intentions of exploring the factors that influence entrepreneurial behavior of students. Identifying family's business background and the entrepreneurial motivation of the students, with special emphasis on the context of the university, observing and analyzing university activities according to entrepreneurial education offers.

In engineering courses at Instituto Superior Técnico, the percentage of students with no intention to founding their own company is 74%, while the highest rates are observed in students of chemical engineering and biological engineering. Intentional founders are strongly represented in civil engineering and physics engineering. The percentage of non-founders is higher for first-year students of chemical engineering, followed by environmental engineering fifth year and also biological engineering fifth year. More than three quarters of intentional founders already had some business idea, most of which in the area of technology and innovation. On the other hand, indicate that 17.4% did nothing yet. The global access to financial capital is the most significant barrier to start a company, followed by the economic environment and financial risk. Perceived barriers are higher for students in chemical engineering, both at general or in particular. In order to meet the first research proposition, proposition 1: *There are differences between various engineering courses, as regards the attitude of students towards entrepreneurship*, and we can confirm the

proposition described above with previous significant differences between the courses.

The entrepreneurial energy is felt in particular by fifth year physics engineering students, also followed by fifth year information systems and computer engineering and industrial engineering and management students. Inversely, we can see how the proposition 2: *Students of an engineering course with management skills demonstrate a positive attitude towards entrepreneurship, more than students in other fields of engineering*, it's not verified.

One can observe that around 1% of all students in the sample are already active founders, they founded their company with two partners, on average, and have a majority share in the business. The civil engineering students are those with higher growth factor in the next five years, however the most curious fact happens with information systems and computer engineering and biological engineering, which in five years do not intend to expand their business, with a growth factor less than one.

In order to prove that proposition 3: *An engineering student with a family entrepreneur history, demonstrate an intention towards entrepreneurship greater than the engineering student without familial entrepreneurs*, it turns out to be true, stating that the intentions of the founders with family business background are higher than those from all students after degree (12 versus 10 percentage points)

and five years after degree (43 vs. 27 percentage points, respectively).

About the university context from Lüthje and Franke (2003) point of view, successful research universities seem to promote entrepreneurial activities among students. The findings of the study conducted by Autio et al. (1997) show career preferences and corporate beliefs are influenced by the image of entrepreneurship as an alternative career and support received in the university environment. Whitlock and Masters (1996) claim that four years after finishing the business courses, students' interest in pursuing their intention to self-employment seems to dissipate.

In order to achieve the veracity of the proposition 4: *Regardless of their attitude towards entrepreneurship, the more involved the student feels, the stronger their intention to become an entrepreneur*, at Instituto Superior Técnico, students agree regarding the crucial role in routing and promoting entrepreneurial intentions in the involvement of the university environment. It becomes evident that the offerings of IST should be extended, as shown by the preferences of the students, offering each course what is most desired by them. Regarding the quality of the existing offers, students classified as satisfactory, in average. A more constant evaluation, as well as a bigger and more interested participation by the students, can help improve the quality and understanding of the existing supply. At Instituto Superior Técnico, the university more favorable environment for students can be found in

physics engineering and electrical and computer engineering.

Through this study and presented results, one can intend to create a base and an incentive for further studies that may become, relevantly, supplement this research and reach new conclusions. It is beyond expected, the results obtained and the respective analysis facilitate and contribute to decision making regarding future paths for the educational institution and public policies in the area of entrepreneurship incentives. As well, this study might serve as a possible contribution of Instituto Superior Técnico to international projects, such as GUESSS.

6. BIBLIOGRAPHICAL REFERENCES

- AJZEN, I. & FISHBEIN, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- AJZEN, I. & MADDEN, T.J. (1986). Prediction of goaldirected behavior: attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology*, 22, 5, 453–474.
- AJZEN, I. (1987). *Attitudes, traits and actions: Dispositional prediction of behavior in social psychology*. *Advances in experimental Social Psychology*, 20, 1-63.
- AJZEN, I. (1991). Theory of planned behavior. *Organizational behavior and human Decision Process*, 50,179-211.
- AJZEN, I. (2002). Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior. *Journal of Applied Social Psychology*, 32 (1), 1-20.
- AUDRETSCH, D. (2001). The Dynamic Role of Small Firms: Evidence from the U.S.. *The International Bank for Reconstruction and Development*. The World Bank. Washington.
- AUTIO, E, KEELEY, R. H., KLOFSTEN, M. & ULFSTEDT, T. (1997). Entrepreneurial intent among students. Testing an intent in Asia, Scandinavia and USA. In *Frontiers of Entrepreneurship Research*, Proceedings of the 17th Annual Babson College Entrepreneurship Research Conference.
- BEGLEY, T. M. & BOYD, D. P. (1986). Psychological Characteristics Associated with Entrepreneurial Performance. In *Frontiers of Entrepreneurship Research*, Proceedings of the 6th Annual Babson College Entrepreneurship Research Conference, Massachusetts, 146-165.
- COLLINS, O. F. & MOORE, D. G. (1970). *The Organization Makers*. New York: Appleton-Century-Crofts.
- COOPER, A. C. & DUNKELBERG, W. C. (1984). Entrepreneurship and paths to business ownership. Paper 846, Krannert Graduate School of Management, Perdue University.
- DAVIDS, L. E. (1963). *Characteristics of small business founders in Texas and Georgia*. Washington, D. C.: Small Business Administration.
- DAVIDSSON, P. (1995). Determinants of entrepreneurial intentions. *Paper prepared for the RENT IX Workshops*, 23-24.
- DAVIDSSON, P. (1995). Determinants of entrepreneurial intentions. Paper apresentado na conferência Rent IX, Piacenza, Italia, 23-24 de Novembro.
- DRAHEIM, K. P. (1972). *Factors influencing the rate of formation of technical companies*. In *Technical Entrepreneurship: A Symposium*. Milwaukee: Center for Venture Management, 3-27.

- GARTNER, W. B. (1988). "Who is an entrepreneur?" Is the wrong question. *American Journal of Small Business*, 12(4), 11-32.
- HANNON, P.D. 2005. The Journey from Student to Entrepreneur. A Review of the Existing Research into Graduate Entrepreneurship. Paper presented at the IntEnt2005 Conference, University of Surrey, UK.
- HOWELL, R. P. (1972). Comparative profiles. Entrepreneurs versus the hired executive: San Francisco Peninsula semiconductor industry. In *Technical Entrepreneurship: A Symposium*, Milwaukee: Center for Venture Management, 47-62.
- JACOBOWITZ, A. & VIDLER, D. C. (1982). Characteristics of Entrepreneurs: Implications for Vocational Guidance. *The Vocational Guidance Quarterly*, 30, 252-257.
- LÜTHJE, C. & FRANKE, N. (2003). The 'making' of an entrepreneur: *Testing a model of entrepreneurial intent among engineering students at MIT*.
- MESCON, T. & MONTANARY, J. (1981). The personalities of independent and franchise entrepreneurs: An empirical analysis of concepts. *Journal of Enterprise Management*, 3 (2), 149-159.
- NUENO (1995). *Emprendiendo – El arte de crear empresas y sus artistas*. Bilbao: Ediciones Deusto S. A.
- PETERMAN N. E. & KENNEDY J. (2003) Enterprise Education: *Influencing Students' Perceptions of Entrepreneurship*, 1042-2587.
- REITAN, B. 1997. Where Do We Learn that Entrepreneurship is Feasible, Desirable and/or Profitable. *A Look at the Process Leading to Entrepreneurial Potential*. <http://www.usasbe.org/knowledge/proceedings/1997/P009Reitan.pdf> (10.08.2006).
- RODRIGUES, M. L. (1989). Mulheres empresárias - *Resultados de uma investigação empírica sobre as mulheres empresárias em Portugal*. Provas de Aptidão Pedagógica e Capacidade Científica, Instituto Superior de Ciências do trabalho e da Empresa (ISCTE), Dezembro, Lisboa, Portugal.
- RUBIO LOPÉZ, E. A., CORDÓN POZO, E. & AGOTE MARTÍN, A. L. (1999). Actitudes hacia la creación de empresas: Un modelo explicativo. *Revista Europea de Dirección y Economía de la Empresa*, 8 (3), 37-52.
- SCHUMPETER, J. A. (1934). *The theory of economics development*. Cambridge: Harvard University Press.
- SCHUMPETER, J. A. (1942). *Capitalism, socialism, and democracy*. New York, NY: Harper and Brothers.
- SHAPERO, A. & SOKOL, L. (1982). The Social dimensions of entrepreneurship. In *Encyclopedia of Entrepreneurship*, 72-90, Englewood Cliffs, NJ: Prentice-Hall Inc.

SHAPERO, A. (1982). The Social dimensions of entrepreneurship. In *Encyclopedia of Entrepreneurship*, 72-90, Englewood Cliffs, NJ: Prentice-Hall Inc.

SIEGER, P., FUEGLISTALLER, U. & ZELLWEGER, T. (2011). Entrepreneurial Intentions and Activities of Students across the World. *International report of the Global University Entrepreneurial Spirit Students' Survey project (GUESSS 2011)*.

VENESAAR, U., KOLBRE, E. & PILISTE, T. (2006). Students' Attitudes and Intentions toward Entrepreneurship at Tallinn University of Technology. *TUTWPE*, 154.

WIT, G. & VAN WINDEN (1989). An empirical analysis of self-employment in the Netherlands. *Small Business Economics*, 1, 263-272.