

Evaluating the quality of entrepreneurial education analysing its ability to increase entrepreneurial attitude and intent of students

Cristiano Ciappei

Department of Management
University of Florence (Italy)
email: cristiano.ciappei@unifi.it

Maria Carmen Laudano

Department of Management
University of Florence (Italy)
email: maricalaudano@gmail.com

Lamberto Zollo

Department of Management
University of Florence (Italy)
email: lamberto.zollo@unifi.it

Riccardo Rialti

Department of Management
University of Pisa (Italy)
email: riccardo.rialti@unifi.it (Corresponding Author)

Abstract

Purpose. The aim of this paper is to evaluate the quality of an entrepreneurial university by analysing the capability of its academic programs to increase students' propensity to become entrepreneurs.

Methodology. The empirical evidences are based on the results of a survey conducted between students of the University of Florence. A regression analysis in a sample of 261 students to confirm the model has been chosen as principal methodology.

Findings. The analysis underlines how students' perceptions of entrepreneurial university's courses impact on students' entrepreneurial attitude and intent. Moreover, from the regression it emerges how students' innate risk-taking propensity has a strong impact on entrepreneurial attitude and on their intent to become entrepreneurs.

Practical implications. The most relevant contribution of this research is to provide a model to monitor quality of entrepreneurial university's programs using an entrepreneurial intention model.

Originality/value. The originality of the research lies in the innovative approach to measure entrepreneurial universities' quality. In fact, the proposed approach integrates psychological factors with the contextual role of entrepreneurial university.

Keywords

education quality; entrepreneurial education; education quality; entrepreneurial attitude; entrepreneurial intent; quality service

1. Introduction

Entrepreneurship may be considered one of the most relevant topic in economic literature (Shane and Venkataraman, 2000). Traditionally, prevalent literature has investigated entrepreneurship as factor influencing regional development trough job creation (Fayolle, 2008), as a crucial driver in the growth of GDP (Gartner, 1990), as a phenomenon related with innovation (Audretsch and Link, 2012), and as an individual response to unemployment (Tipu, 2012). Hence, entrepreneurship has been considered as a universal phenomenon fundamental for societies' perpetual regeneration (McDougall and Oviatt, 2003). Moreover, scholars, historically, have also explored which are the principal characteristics of entrepreneurs. Analytical capability, creativity, practical intelligence, risk taking propension, and specific personality traits have been identified as common elements shaping the entrepreneurial mind-set (Franke and Lüthje, 2004).

In this thriving context, moving from the consideration that some aspects of entrepreneurship can be thought or at least trained (Drucker, 1958), literature attention is progressively shifting from the analysis of the economic relevance of entrepreneurship toward identifying the importance of entrepreneurial education (Kuratko, 2005; Fayolle, 2008). Due to this progressive shifting, a growing number of scholars is exploring the role of entrepreneurial universities in the stimulating the creation of new entrepreneurial ventures (Clark, 2001; Etzkowitz, 2003; Veciana et al., 2005). In particular, entrepreneurial universities are being observed by scholars and governmental institutions in order to verify their effectiveness in helping students succeed and thrive in labor markets by promoting a set of core competencies and transversal skills (European Commission, 2012; Guerrero and Urbano, 2012).

Despite the growing attention in respect of the potentialities of entrepreneurial universities, in any case, some possibilities for future researches still exist in this stream of literature. In particular, albeit some researches have started to explored how to evaluate the quality of entrepreneurial university service (House, 1978; Lindsay, 1982), to the authors best knowledge there's a scarcity of empirical studies evaluating quality of entrepreneurial universities' programs by observing the ability of their programs to increase entrepreneurial attitude and intent of students.

Starting from this conceptual background, the purpose of this research is to develop a model to evaluate the quality of entrepreneurial university service by considering the capability of academic programs to increase students' entrepreneurial attitude and intent. The proposed model, which can be used as a benchmark to assess the areas of intervention, is based on a regression model. The model observes three principal macro-classes of variables:

- a) students' entrepreneurial attitude and intent (Liñán et al., 2011; Thompson, 2009);
- b) students' perception of environmental factors (Lüthje and Franke, 2003; Franke and Lüthje, 2004);
- c) some personality traits, in particular risk-taking propensity, need of achievement, locus of control and need for independence (Eisenberger et al., 2005; Goldberg, 1999; Lumpkin, 1988).

The model has been tested using a sample of 261 master-level students from the university of Florence. Some relevant insights regarding the importance of specific academic programs in increasing entrepreneurial attitude have emerged from the test.

The paper is structured as follows. Firstly, the authors have explored the importance of entrepreneurial education and of evaluating entrepreneurial university. Secondly, the principal hypotheses have been conceptualized from existing literature. Thirdly, the proposed model based on the hypothesis has been tested. Finally, in the conclusive sections, some insights about the effectiveness of the model have been summarized.

2. Conceptual background: Evaluating entrepreneurial education

The availability of instruments to evaluate quality of entrepreneurial education is fundamental for deans of entrepreneurial universities in order to constantly improve the services offered by their institution (Altbach et al., 2009; Rothaermel et al., 2007; Yusuf and Jain, 2010). In fact, since high quality offered services may be related with a greater number of applicants, high quality entrepreneurial universities may allow an entrepreneurial university to better compete for public and private financing (Etzkowitz et al., 2000). Moreover, if the entrepreneurial university is able to help students starting their own venture, entrepreneurial university may be able to foster economic growth as hypothesized in triple helix model (Clark, 2001; Etzkowitz et al., 2000).

Despite the importance of evaluating the quality of entrepreneurial education provided by entrepreneurial university, in any case, there a scarcity of methods focused on analyzing quality of this kind of service based on the analysis of impact of entrepreneurial universities' programs on students' entrepreneurial attitude. For this reason, the aim of this research is to propose a new model to be obtain a reassuring value to be used for comparison between institution by entrepreneurial universities' deans.

In this section, after a review of existing literature about entrepreneurial education and entrepreneurial university, the need of quality indicators for the evaluation of entrepreneurial education programs and entrepreneurial universities will be explored. In the following section, then, the hypothesis underlying the model will be explained moving from the conceptual framework delineated in the second section and from the psychological characteristics usually identifying successful entrepreneurs.

2.1. The need of quality indicators for the evaluation of entrepreneurial education programs and entrepreneurial universities

Traditional entrepreneurship literature considers as potential entrepreneurs only those persons with natural predisposition toward entrepreneurship (Cunningham and Lischeron, 1991). Hence, only *natural-born* entrepreneurs were identified as persons potentially able to start their own ventures (Kuratko, 2005). As a consequence, following this stream of literature, a discipline such as entrepreneurship cannot be taught (Thompson, 2009). However, in the last decades this concept is abruptly losing consensus; in fact, an ever-growing number of authors are embracing Drucker's (1958) idea that some aspects of entrepreneurship can be taught (Kuratko, 2005). In particular, scholars have recently demonstrated that it may be possible to stimulate latent entrepreneurial intention in students (Kuratko, 2005; Fayolle, 2013). As proof, in the USA alone, more than 2,000 entrepreneurship-related academic programs have been activated (Kuratko, 2005). Multiple reasons may be identified behind this growing interest of literature toward entrepreneurial education. First, entrepreneurial education has been identified as instrumental in helping students starting their own venture (Thompson, 2009; Veciana et al., 2005). Second, entrepreneurial education has been deemed related with greater success rate of start-ups (Lüthje and Franke, 2003). Third, entrepreneurial education has been considered fundamental to implement successful internationalization and expansion processes (Rialti et al., 2016). Fourth, public investments in entrepreneurial education, since entrepreneurial education is related with increases in the number of firms, have been considered related with economic growth (Etzkowitz, 2003; Etzkowitz et al., 2000).

In this thriving context, a lot of attention has been given to institutions that are delegated to the education of future potential entrepreneurs. In particular, the concept of entrepreneurial university, which may be defined as a university that offers specific entrepreneurship-related

programs (Clark, 2001), is progressively acquiring academic dignity (see Rothaermel et al., 2007).

2.2. *The evaluation of quality of entrepreneurial university programs*

A quality service may be defined as a service capable of ensuring certain qualitative standards to all the interested customers and stakeholders (Prause et al., 2013). Moreover, a service may be considered a quality service if it is able to satisfy previous expectations of customers and stakeholders while respecting internal efficiency (Caruana, 2002).

Due to the increasing attention of customers and stakeholders toward final quality of products and services, and also due to the increasing attention of managers at internal efficiency, a lot of attention is being paid in recent time toward increasing quality levels of services (Antony, 2004; Prause et al., 2013). In particular, nowadays both public and private owned organizations are recently trying to implement TQM and Six-Sigma approaches in their processes (Antony, 2004; 2006). In the majority of case, the application of excellence models has been very positive in terms of return on investment in quality.

For what matters evaluation of university service quality, many theoretical contributions have tried to “adapt” the economic concept of efficiency to education (O'Donoghue, 1971). In particular, scholars have tried to introduce analytical frameworks to evaluate in a managerial fashion the efficiency of universities' services (O'Donoghue, 1971; Lindsay, 1982). Three principal kinds of methodologies have been prevalently used to evaluate academic education (Lindsay, 1982). The first is based on the construction of simple ratios (output / input) which are configured as productivity indicators applied to each level of aggregation, i.e. by department, course of study, faculty and university (Biggeri and Bini, 2001). Moreover, in this stream of research, it possible to observe for the first time the development of performance indicators (PI) which include, in terms of teaching, measures of unit costs per student, dropout rates, graduation rates, and research performance measures (Johnes, 1992). A second category consists of studies using regression analysis in order to identify and describe the relationship between the resources employed and the results obtained. In particular, these studies involved primary and secondary school education (Hanushek, 1986), nevertheless, there are many examples of application in the university (Freire and Da Silva, 1975). Finally, for the last group of studies, the analysis for the evaluation of the degree of efficiency achieved in the performance of the training process is developed using the concept of production frontier (Lindsay, 1982). The principal final results of this evaluation systems are scores that have been used to develop rating and ranking of business schools and entrepreneurial universities (House, 1978).

Despite the growing attention to quality and also the new importance of the concept of entrepreneurial university, to our best knowledge no model to measure quality of academic services has emerged as prevalent (Freire and Da Silva, 1975; Lindsay, 1982). A principal motivation may be identified as the cause of the scarce attention received by measurement of quality of entrepreneurial university service. In fact, since education belongs to the category of experience services for which is not possible to define *a priori* a quality standard (Gori and Vittadini, 1999), it is not possible to use traditional methods to monitor quality of education service worldwide. In particular, traditional methods may be provide a too simplistic and imperfect result, principally because they do not consider psychological effect on students properly (Lindsay, 1982).

Notwithstanding the lower interest in entrepreneurial university quality assessment in literature, nowadays assessing the quality of an entrepreneurial university has become an increasingly compelling necessity in order to get quality education and quality entrepreneurship. This is not to transform universities into companies, compromising their mission with excessive boost to business but, it is necessary to introduce principles of

competitiveness, effectiveness and open system capabilities. In effect, experience shows that putting in place a mechanism of analysis pushes the system towards more high quality levels (Kwak and Anbari, 2006; Kumi and Morrow, 2006). Moreover, putting in place a mechanism of analysis could be instrumental for continuous improvement (Ciappei et al., 2006). In addition, the quality control system helps to identify the management system of responsibility. So, even if there are multiple points of view in the evaluation of the training activities, one aspect might have the right to organize all the others: it is the effectiveness for customers, in this case students (Kumi and Morrow, 2006).

Since one of the principal objective of entrepreneurial education may be considered stimulating latent characteristics of students, the production of quality young entrepreneurs is one of the principal objective of the universities. So, at disaggregated level, this makes possible to evaluate quality of academic service analysing how psychological characteristics of students are affected by the formation process (Gori and Vittadini, 1999; Smith and Street, 2005).

Moving from this consideration, in this paper the effectiveness of a university context, the entrepreneurial universities' quality, will be assessed by analysing the ability of the university to develop the entrepreneurial attitude and intent. As already hypothesized, this can be done because the goal of a entrepreneurial university is to provide to each student an entrepreneurial "mindset" so that they may be able to confront with real-word economic problems (Lüthje and Franke, 2003).

In the next section the principal considered variables will be explained.

3. A literature review on the role of entrepreneurial education in influencing entrepreneurial intent and attitude

Modern entrepreneurship education research clearly argues that entrepreneurial attitude, and in general entrepreneurship, is associated with a proactive personality (Crant, 1996; Gartner 1990; Thompson, 2009). Numerous normative and descriptive studies have supported various sets of typical personality characteristics of entrepreneurs (Carland et al., 1984). Among this factors, the principal identified by scholars are psychological variables, personal traits, individual skills, and social network (Heinonen and Poikkijoki, 2006; Shane et al., 2003). Among the psychological variables that affect entrepreneurial behaviour, risk-taking propensity, need of achievement, need for independence and locus of control will be examined in the present research. In fact, within this stream of research, these variables have been traditionally recognized as important proactive attributes fostering entrepreneurship (Crant, 1996; Lüthje and Franke, 2003).

Moreover, Traditional literature supports these theories; for example, Knight (1921), building on the seminal definition of entrepreneur (Cantillon, ed. orig. 1775; 1931), identifies risk-taking propensity as one of the main personality traits of the entrepreneur. In addition, Rotter (1966) highlights that entrepreneurs are characterized by the higher internal locus of control with respect to non-entrepreneurs; specifically, an individual with high scores of internal locus of control believes in being responsible for what happens to him/her and to be able to control and influence his/her destiny. However, Jackson (1974) stresses that an individual high in need for achievement (nAch) as one who "maintains high standards" and "aspires to accomplish difficult tasks" (p.6).

Hence, the following hypotheses are proposed:

- H1: Risk-taking propensity positively influences students' entrepreneurial attitude.
- H2a: Internal control positively influences students' entrepreneurial attitude.
- H2b: Powerful others positively influences students' entrepreneurial attitude.

- H2c: Chance positively influences students' entrepreneurial attitude.
- H3: Need of achievement positively influences students' entrepreneurial attitude.
- H4: Need for independence positively influences students' entrepreneurial attitude.

Moreover, since entrepreneurial education researchers have widely investigated key factors affecting entrepreneurial intent (Autio et al., 2001; Liñán et al., 2011), moving from Ajzen's theory of planned behaviour and Autio's model of intention, this research considers in the proposed model to measure entrepreneurial intent the attitude toward entrepreneurship and the perception of the university environment (Schwarz et al. 2009).

Considering this factor is crucial. In fact, in the entrepreneurship literature it is generally accepted that entrepreneurial intention plays a key role in the decision to start a business either in the short or long term, depending on different circumstances (Autio et al., 2001; Krueger and Brazeal, 1994; Krueger et al., 2000; Thompson, 2009). Education role, then, is to extract the entrepreneurial potential from students and to stimulate them during their university experience (Krueger and Brazeal, 1994).

In this context, a first analysis of factors influencing entrepreneurial intent can be carried out by referring to the general Theory of Planned Behaviour, formulated by Ajzen and Fishbein (1980). According to this theory, entrepreneurial intent depends on three main factors: perceived behavioural control, subjective norms, and personal attitude. The latter factor acquires particular significance in our research. In particular, we take as a reference Lüthje and Franke (2003) that found that entrepreneurial attitude strongly influences students' intent to start a new business. Hence, we propose the following hypothesis:

- H5: Entrepreneurial attitude positively influences students' entrepreneurial intent.

Anyway, since the focus of the present research is assessing education quality using a psychological scale, one more hypothesis about the impact of universities is needed. Due to this reason, hence, the authors will focus also on the importance of university in influencing entrepreneurial attitude and intent, thanks to the provision of entrepreneurial initiation, development, and active support (Lüthje and Franke, 2003; Franke and Lüthje, 2004; Souitaris et al., 2007). Hence, we propose the following sixth hypothesis:

- H6a: The university environment has a positive impact on students' entrepreneurial attitude.
- H6b: The university environment has a positive impact on students' entrepreneurial intent.

4. Methodology

4.1. Measures

In order to collect the necessary data for this research, the first step was the development of a questionnaire, containing 50 items. We employed validated scales used in previous studies to measure the constructs analysed in this research. We have made the back-translation (Douglas and Craig, 2007) of related questions to compare our Italian translation with the original English set. Students' Risk Taking Propensity was assessed using the International Personality Item Pool – IPIP – (Goldberg, 1999), in particular we used the 10 items related to the Risk-Taking scale. Students' Need of Achievement was measured through the widely used scale called "nAch"; it consists of 5 items validated by Eisenberger et al. (2005). Students' Locus of Control was assessed using the traditional scale of Levenson (1974); we

used the abbreviated form of Lumpkin (1988), consisting of 9 items classified according to three dimensions, namely Internal Control, Powerful Others, and Chance Opportunity. Students' Entrepreneurial Attitude was measured using Lüthje and Franke's scale (2003), a widely cited instrument for assessing university entrepreneurship programmes (Souitaris et al., 2007); it consists of 3 items but in our regression analysis we used only 2 items which showed a reliability coefficient of 0.6. Students' Entrepreneurial Intent was assessed using the recent scale of Thompson (2009), consisting of 6 items, which has been frequently used in assessing students' start-up intentions (Liñán et al., 2011). Students' Need of Independence was measured using Franke and Lüthje's scale (2004), consisting of three items. Finally, students' perception of the university environment was assessed using Franke and Lüthje's scale (2004) which consists of 6 items divided into three dimensions: Initiation, Development, and Active Support, which represent the university's ability in fostering students a positive entrepreneurial context. All the items were rated on a five-point Likert-type scale from not at all important (1) to extremely important (5). This version of the scale is shown in Table 1.

Table 1. Scale

No.	Items	Latent variable	References
1	Gender	Control variable	---
2	Age	Control variable	---
3	Home town	Control variable	---
4	Curriculum Master Business Administration	Control variable	---
5	At least one of your parents was/is an entrepreneur?	Control variable	---
6	Are you currently an entrepreneur?	Control variable	---
7	If you said yes, what line of business?	Control variable	---
8	Intend to set up a company in the future	Entrepr. intent	Thompson (2009); Liñán et al. (2011)
9	If you said yes, what line of business?		
10	Would never make a high risk investment (R)	Risk-taking	Goldberg (1999)
11	Never search for business start-up opportunities (R)	Entrepr. intent	Thompson (2009); Liñán et al. (2011)
12	Stick to the rules (R)	Risk-taking	Goldberg (1999)
13	Are saving money to start a business	Entrepr. intent	Thompson (2009); Liñán et al. (2011)
14	When I make plans, I am almost certain to make them work	Loc (ic)	Lumpkin (1988)
15	Have no plans to launch your own business (R)	Entrepr. intent	Thompson (2009); Liñán et al. (2011)
16		Need for indep.	Franke and Lüthje (2004)
17	Do not read books on how to set up a firm (R)	Entrepr. intent	Thompson (2009); Liñán et al. (2011)
18	I try to perform better than my co-workers	Need of achiev.	Eisenberger et al. (2005)
19	Seek danger	Risk-taking	Goldberg (1999)
20	Spend time learning about starting a firm	Entrepr. intent	Thompson (2009); Liñán et al. (2011)
21	Enjoy being reckless	Risk-taking	Goldberg (1999)
22	When I get what I want, it's usually because I worked hard for it	Loc (ic)	Lumpkin (1988)

23	People like myself have very little chance of protecting our personal interests where they conflict with those of strong pressure groups	Loc (po)	Lumpkin (1988)
24	I have often found that what is going to happen will happen	Loc (co)	Lumpkin (1988)
25	Know how to get around the rules	Risk-taking	Goldberg (1999)
26	My life is determined by my own actions	Loc (ic)	Lumpkin (1988)
27	I try very hard to improve on my past performance at work	Need of achiev.	Eisenberger et al. (2005)
28	Am willing to try anything once	Risk-taking	Goldberg (1999)
29	Getting what I want requires pleasing those people above me	Loc (po)	Lumpkin (1988)
30	I do my best work when my job assignments are fairly difficult	Need of achiev.	Eisenberger et al. (2005)
31	When I get what I want, it's actually because I'm lucky	Loc (co)	Lumpkin (1988),
32		Need for indep.	Franke and Lüthje (2004)
33	Seek adventure	Risk-taking	Goldberg (1999)
34	My life is chiefly controlled by powerful others	Loc (po)	Lumpkin (1988),
35	I take moderate risks and stick my neck out to get ahead at work	Need of achiev.	Eisenberger et al. (2005)
36	To a great extent, my life is controlled by accidental happenings	Loc (po)	Lumpkin (1988),
37	Avoid dangerous situations (R)	Risk-taking	Goldberg (1999)
38		Need for indep.	Franke and Lüthje (2004)
39	Would never go hang-gliding or bungee-jumping (R)	Risk-taking	Goldberg (1999)
40	I am pleased when I can take on added job responsibilities	Need of achiev.	Eisenberger et al. (2005)
41	Take risks	Risk-taking	Goldberg (1999)
42	The creative atmosphere inspires us to develop ideas for new businesses	University	Franke and Lüthje (2004)
43	The courses foster the social and leadership skills needed by entrepreneurs	University	Franke and Lüthje (2004)
44	I'd rather be my own boss than have a secure job	Entrepr. attitude	Lüthje and Franke (2003)
45	The courses provide students with the knowledge required to start a new company	University	Franke and Lüthje (2004)
46	You can only make big money if you are self-employed	Entrepr. attitude	Lüthje and Franke (2003)
47	My university supports building multi-disciplinary student teams	University	Franke and Lüthje (2004)
48	I'd rather found a new company than be the manager of an existing one	Entrepr. attitude	Lüthje and Franke (2003)
49	The university actively promotes the process of founding a new company	University	Franke and Lüthje (2004)
50	The university provides a strong network of new venture investors	University	Franke and Lüthje (2004)

Abbreviation:

- Loc: Locus of Control a) ic: internal control; b) po: powerful others; c) co: chance opportunity

- Need of indep.: Need of independence

- Need of achiev. : Need of achievement

4.2. Sample selection, data collection, and factor analyses

The population consisted of Master of Business Administration students of University of Florence. Due to the fact that University of Florence business school MBA program include entrepreneurship courses, and since the aforementioned university have a business incubator, the business school of the University of Florence may be considered an entrepreneurial university (European Commission, 2012). The decision to focus exclusively on the master degree students is a novelty in this stream of research. The surveys were distributed in the period from February to June 2016, thanks to the collaboration of the University of Florence. The e-mail containing the questionnaire included a cover letter which briefly explained the purpose of this research. To achieve a sufficiently high number of respondents we also proceeded with the spread of the link on social networking site, such as Facebook, and the distribution of paper questionnaires in students' more frequented places. The final number of usable questionnaires was 261, implying a response rate of 43.5%. In order to guarantee students' anonymity, no personal identifying information was requested from the respondents and furthermore, students' participation was voluntary. The collected data were analyzed by using SPSS (Field, 2013). A summary of the sample characteristics is illustrated in Table 2.

Table 2. Sample Characteristics

<i>Variable</i>	<i>Frequency</i>	<i>Valid Percent</i>
<i>Gender</i>		
<i>Male</i>	115	44,1%
<i>Female</i>	146	55,9%
<i>Age</i>		
<i>18-20</i>	1	0,4%
<i>21-23</i>	63	24,1%
<i>24-26</i>	143	54,8%
<i>27-30</i>	38	14,6%
<i>31-35</i>	13	5,0%
<i>Over 35</i>	3	1,1%
<i>Tuscan Province</i>		
<i>Arezzo</i>	25	9,6%
<i>Florence</i>	116	44,4%
<i>Grosseto</i>	4	1,5%
<i>Livorno</i>	4	1,5%
<i>Lucca</i>	4	1,5%
<i>Massa Carrara</i>	0	0%
<i>Pisa</i>	0	0%
<i>Pistoia</i>	22	8,4%
<i>Prato</i>	48	18,4%
<i>Siena</i>	2	0,8%
<i>Other</i>	36	13,8%
<i>MBA Curriculum</i>		
<i>Marketing</i>	36	13,8%
<i>Management</i>	84	32,2%
<i>Human Resource Management</i>	3	1,1%
<i>Accounting</i>	39	14,9%
<i>Finance and Risk Management</i>	5	1,9%
<i>Economics</i>	39	14,9%
<i>Design of sustainable tourism systems</i>	18	6,9%
<i>Development Economics</i>	21	8,0%
<i>Statistics</i>	5	1,9%
<i>Other</i>	11	4,2%

Final data analysis was completed on a sample of 146 women (55.9%) and 115 men (44.1%). The majority of the students were in the age range of 24-26 (54.8%), came from Florence (44.4%), and attended the MBA curriculum of General Management (32.2%), which indicates not only a greater number of students in such a course of study but also of a greater students' interests in the theme of this research. However, in the questionnaire there are also other two control variables: the majority of the students' parents were not self-employed (62.5%) and almost all students were not currently self-employed (96.0%).

In Table 3, means, standard deviations, and the Cronbach alpha reliability for the relevant variables in this study are provided. The scales used in the present research show good reliability coefficients, ranging from 0.60 to 0.88.

Table 3. Scales descriptive statistics

	<i>Mean</i>	<i>SD</i>	<i>α</i>
<i>Risk-taking propensity</i>	2.52	0.64	0.79
<i>Need for independence</i>	3.87	0.76	0.64
<i>Need of achievement</i>	3.64	0.66	0.69
<i>Locus of control</i>	3.00	0.47	0.62
<i>Entrepreneurial attitude</i>	2.28	0.73	0.60
<i>Entrepreneurial intent</i>	1.14	0.37	0.88
<i>University</i>	2.35	0.80	0.84

The results of the correlation analysis of scale items are illustrated in Table 4. The bivariate correlation analysis indicated that significant and high Pearson r values are related to relationships between risk-taking propensity and entrepreneurial attitude ($r = 0.348$), risk-taking propensity and entrepreneurial intent ($r = 0.445$), and entrepreneurial attitude and entrepreneurial intent ($r = 0.533$).

Table 4. Correlation matrix of latent dimensions

	1	2	3	4	5	6	7
Risk Propension	1						
Need for independence	0.335**	1					
Need of achievement	0.189**	0.432**	1				
Locus of control	0.304**	0.241**	0.559**	1			
Entrepreneurial attitude	0.348**	0.222**	0.233**	0.214**	1		
Entrepreneurial Intent	0.445**	0.246**	0.360**	0.276**	0.533**	1	
University	0.129*	0.108	0.209**	0.167**	0.180**	0.273**	1

Note: ** $p < 0.01$

* $p < 0.05$

4.3. Regression analysis

An OLS (Ordinary Least Square) regression analysis was conducted to test the hypothesis suggested in this study. Regression analyses confirm the hypothesized relationships:

- each personality traits (independent variables) positively influence the entrepreneurial attitude (dependent variable), thus confirming Hypotheses 1- 4;
- entrepreneurial attitude strongly and positively influences entrepreneurial intent, thus supporting Hypothesis 5;
- students' perception of university positively influences entrepreneurial attitude, thus confirming Hypothesis 6a;

- students' perception of university positively students' intention to become entrepreneur, thus supporting Hypothesis 6b.

These results are summarized in Table 5. We performed also a simultaneous multiple regression between the different personality traits and entrepreneurial attitude: maintain significance only Risk-taking propensity and Need of achievement (respectively $p < 0.01$ e $p < 0.10$) while Need for independence and Locus of control fail to have an independent impact, probably due to the relatively high correlations among the traits (Table 6). For this reason, in the following hierarchical regression we consider only Risk-taking propensity and Need of achievement, including in the model also "University" in order to verify whether such a variable increases the accuracy of Entrepreneurial attitude prediction (Table 7). Finally, we conducted another hierarchical regression analysis for predicting Entrepreneurial intent (Table 8).

Table 5. Results of linear regression analysis

Dependent variable	Independent variables	β standardized	p-value	R^2	Adjusted R^2	F
<i>Entrepreneurial Attitude</i>	<i>Risk-taking propensity</i>	0.348	.000	0.121	0.118	35.521
	<i>Need of achievement</i>	0.233	.000	0.054	0.050	14.761
	<i>Need for independence</i>	0.211	.001	0.045	0.041	12.051
	<i>Locus of control</i>	0.214	.001	0.046	0.042	12.383
	<i>University</i>	0.185	.003	0.034	0.030	9.111
<i>Entrepreneurial Intent</i>	<i>Entrepreneurial attitude</i>	0.533	.000	0.284	0.281	102.298
	<i>University</i>	0.273	.000	0.074	0.071	20.695

Table 6. Results of hierarchical regression analysis of personality traits for predicting entrepreneurial attitude

Dependent variables	β standardized				p-value			
	Step 1	Step 2	Step 3	Step 4	Step 1	Step 2	Step 3	Step 4
<i>Risk-taking</i>	0.348	0.315	0.304	0.296	.000	.000	.000	.000
<i>Need of achievement</i>		0.173	0.157	0.137		.003	.015	0.069
<i>Need for independence</i>			0.041	0.044			.537	.513
<i>Locus of Control</i>				0.037				.608
R^2	0.121	0.150	0.151	0.152				
Adjusted R^2	0.118	0.143	0.141	0.139				
F	35.521	22.658	15.196	11.430				

Table 7. Results of hierarchical regression analysis between risk-taking propensity, need of achievement and entrepreneurial attitude

Dependent variables	β standardized			p-value		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
<i>Risk-taking propensity</i>	0.348	0.315	0.305	.000	.000	.000
<i>Need of achievement</i>		0.173	0.151		.003	.011
<i>University</i>			0.114			.054
R²	0.121	0.150	0.162			
Adjusted R²	0.118	0.143	0.152			

Table 8. Results of hierarchical regression analysis between risk-taking propensity, need of achievement and entrepreneurial attitude

Dependent variables	β standardized		p-value	
	Step 1	Step 2	Step 1	Step 2
<i>Entrepreneurial attitude</i>	0.533	0.500	.000	.000
<i>University</i>		0.180		.001
R²	0.284	0.315		
Adjusted R²	0.281	0.310		
F	102.298	59.175		

5. Results

In regards of the proposed hypotheses, the highest significant influence refers to the relationship between students' entrepreneurial attitude and intent. As students' attitude refers to the 'entrepreneurial potential' (Krueger and Brazeal, 1994) of future entrepreneurs, this result was almost expected. Moreover, in our analysis the risk-taking propensity assumes a significant role as the main predictor of students' entrepreneurial attitude (Crant, 1996). In addition, since decision-making inevitably implies risks, the third variable that significantly influences students' entrepreneurial attitude refers to their need of achievement. In particular, this is caused by the fact that need of achievement motivates an individual to succeed in competition and to excel in entrepreneurial challenges. Such relationships stress the importance of students' ambition, courage, and opportunity-driven inclination, which define typical entrepreneurial behaviour.

Interestingly, the contextual variable expressed by the students' perception of university environment positively influences students' attitude and intent. Due to this reason, since we achieved results that can be compared with the best practices, we can assume that the model can be used for benchmarking effectiveness of entrepreneurial universities, specifically the quality of the service.

As the purpose of entrepreneurial universities is 'making entrepreneurs' (Lüthje and Franke, 2003), it is possible evaluate their effectiveness not only based on the number of entrepreneurs counted among their postgraduate students but also on the development of the students' entrepreneurial attitude and intent. In particular, we compared our empirical results with previous research (Franke and Lüthje, 2004; Lüthje and Franke, 2003) concerning

students' entrepreneurial intent in both European universities, such as Munich and Vienna, and the paradigmatic excellence of the MIT (table 9). We found that entrepreneurial attitudes among the University of Florence students are much lower than those of their counterparts in the European and American universities, while such a difference becomes less in respect to entrepreneurial intent. Hence, Italian students' entrepreneurial intentions are less ambitious compared to their European and American counterparts. Intriguingly, the Italian students' perception of the university environment was similar to that of the MIT students.

An important issue for the possible improvement of entrepreneurial universities' effectiveness in gain an entrepreneurial mind-set could be to establish operative and practical workshops, in order to support entrepreneurship programmes with practitioners and managers able to involve students in real entrepreneurial decision making processes. Particularly, from our empirical analysis it emerges that the main goal of entrepreneurship teaching refers to strengthening students' character in order to increase capacities to accomplish tasks, to deal with challenges of life or better work through the risks, difficulties, and uncertainties in unpredictable scenarios, thus fostering their self-efficacy.

Table 9. Comparison with different geographical contexts

University	Risk-taking			Need of Achievement			Need for Indipendence			Locus of control		
	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n
<i>Florence</i>	2.52	0.64	261	3.64	0.66	261	3.87	0.76	261	3.00	0.47	261
<i>MIT*</i>	3.62	0.78	147	---	---	---	3.93	0.59	147	3.74	0.65	147
<i>Vienna*</i>	3.40	0.75	466	---	---	---	3.87	0.62	466	---	---	---
<i>Munich*</i>	3.41	0.79	311	---	---	---	3.63	0.64	311	3.59	0.61	311

University	Entrepreneurial attitude			Entrepreneurial intent			University	
	Mean	SD	n	Mean	SD	n	Mean	SD
<i>Florence</i>	2.28	0.73	261	1.14	0.37	261	2.35	0.80
<i>MIT*</i>	3.15	0.66	143	2.46	0.97	147	2.53	0.92
<i>Vienna*</i>	---	---	---	2.74	0.84	408	---	---
<i>Munich*</i>	3.01	0.69	310	2.84	0.75	295	3.36	0.88

* Source: Frank and Lüthje (2004)

6. Limitations and future researches

As we have shown, this benchmark model is useful and significant so it can also be used by other entrepreneurial universities and business schools; its constant use would allow those who manage a entrepreneurial university to correct ongoing their academic programs, thereby increasing the quality and effectiveness of the university service and, consequently, their competitiveness.

However, our paper suffers from some limitations, in fact we assess entrepreneurship intent only in one entrepreneurial university.

In addition to this, there cannot be an ex-post validation, like for example a check of how many postgraduate students effectively become entrepreneurs.

It should be appropriate to consider a new longitudinal comparative study, based on several entrepreneurial universities with different positions in world rankings, which analyse the entrepreneurial success rate between entrepreneurial universities with high scores and entrepreneurial universities with low scores. Such a research would verify that entrepreneurial university with higher scores in the proposed model are capable of generate a greater number of postgraduate students who became successful entrepreneurs.

References

- Ajzen, I. and Fishbein, M. (1980). *“Understanding Attitudes and Predicting Social Behavior”*. Prentice-Hall, Upple Saddle River (NJ).
- Altbach, P. G., Reisberg, L. and Rumbley L. E. (2009). *“Trends in Global Higher Education: Tracking an Academic Revolution”*. Sense Publishing, Rotterdam.
- Antony, J. (2004). “Six Sigma in the UK service organisations: results from a pilot survey”. *Managerial Auditing Journal*, 19(8), 1006-1013.
- Antony, J. (2006). “Six sigma for service processes”. *Business Process Management Journal*, 12(2), 234-248.
- Audretsch, D.B. and Link, A.N. (2012). “Entrepreneurship and innovation”. *Journal of Technology Transfer*, 37(1), 1–17.
- Autio, E., H. Keeley, R., Klofsten, M., Parker, G. and Hay, M. (2001). “Entrepreneurial intent among students in Scandinavia and in the USA”. *Enterprise and Innovation Management Studies*, 2(2), 145-160.
- Biggeri, L., and Bini, M. (2001). “Evaluation at university and state level in Italy: need for a system of evaluation and indicators”. *Tertiary education and management*, 7(2), 149-162.
- Carland, J. W., Hoy, F., Boulton, W. R., and Carland, J. A. C. (1984). “Differentiating entrepreneurs from small business owners: A conceptualization”. *Academy of management review*, 9(2), 354-359.
- Caruana, A. (2002). “Service loyalty: The effects of service quality and the mediating role of customer satisfaction”. *European Journal of Marketing*, 36(7/8), 811-828.
- Clark, B. (2001). “The entrepreneurial university: New foundations for collegiality, autonomy, and achievement”. *Higher Education Management*, 13(2), 9-131.
- Ciappei, C., Citti, P., Bacci, N., and Campatelli, G. (2006). *“La metodologia Sei Sigma nei servizi”*. Firenze University Press, Florence.
- Crant, J. M. (1996). “The proactive personality scale as a predictor of entrepreneurial intentions”. *Journal of Small Business Management*, 34(3), 42-49.
- Cunningham, J. B., and Lischeron, J. (1991). “Defining entrepreneurship”. *Journal of Small Business Management*, 29(1), 45–61.
- Douglas, S. P., and Craig, C. S. (2007), “Collaborative and iterative translation: An alternative approach to back translation”. *Journal of International Marketing*, 15(1), 30-43.
- Drucker, P.F. (1958). “Business objectives and survival needs: notes on a discipline of business enterprise”, *The Journal of Business*, 31(2), 81–90.
- Eisenberger, R., Jones, J. R., Stinglhamber, F., Shanock, L., and Randall, A. T. (2005). “Flow experiences at work: For high need achievers alone?”. *Journal of Organizational Behavior*, 26(7), 755-775.
- Etzkowitz, H., Webster, A., Gebhardt, C. and Terra, B. R. C. (2000), “The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm”. *Research Policy*, 29(2), 313-330.

- Etzkowitz, H. (2003), "Research groups as 'quasi-firms': the invention of the entrepreneurial university". *Research Policy*, 32(1),109-121.
- European Commission. (2012). A guiding Framework for Entrepreneurial University. Retrieved on 27th June 2016 from: <https://www.oecd.org/site/cfecpr/guiding-framework.htm>.
- Fayolle, A. (2008). "Entrepreneurship education at a crossroads: towards a more mature teaching field". *Journal of Enterprising Culture*, 16(4), 325–337.
- Fayolle, A. (2013). "Personal views on the future of entrepreneurship education". *Entrepreneurship & Regional Development*, 25(7–8), 692–701.
- Field, A. (2013). "*Discovering statistics using IBM SPSS statistics*". Sage, Thousand Oaks (CA).
- Franke, N. and Lüthje, C. (2004), "Entrepreneurial intentions of business students-A benchmarking study". *International Journal of Innovation and Technology Management*, 1(3), 269-288.
- Freire, M. E. D. S., and Da Silva, J. F. (1975). "The application of production functions to the higher education system- some examples from Portuguese universities". *Higher Education*, 4(4): 447-460.
- Gartner, W. B. (1990). "What are we talking about when we talk about entrepreneurship?", *Journal of Business Venturing*, 5(1), 15-28.
- Goldberg, L. R. (1999). "International Personality Item Pool: A Scientific Collaboratory for the Development of Advanced Measures of Personality and Other Individual Differences". Retrieved on 27th June 2016 from: <http://ipip.ori.org>
- Gori, E., and G. Vittadini. (1999), "La valutazione dell'efficienza ed efficacia dei servizi alla persona. Impostazione e metodi. Qualità e valutazione nei servizi di pubblica utilità". *ETAS*, 121-241.
- Guerrero, M., and Urbano, D. (2012). "The development of an entrepreneurial university". *The Journal of Technology Transfer*, 37(1), 43-74.
- Hanushek, E. A. (1986). "The economics of schooling: Production and efficiency in public schools", *Journal of economic literature*, 24(3): 1141-1177.
- House, E. R. (1978). "Assumptions underlying evaluation models". *Educational researcher*, 7(3), 4-12.
- Jackson, D. N. (1974). "*Personality research form manual*". Research Psychologists Press, London (ON).
- Johnes, G. (1992). "Performance indicators in higher education: a survey of recent work". *Oxford Review of Economic Policy*, 8(2), 19-34.
- Krueger, N. F. and Brazeal, D. V. (1994). "Entrepreneurial potential and potential entrepreneurs". *Entrepreneurship Theory and Practice*, 18, 91-91.
- Krueger, N. F., Reilly, M. D. and Carsrud, A. L. (2000). "Competing models of entrepreneurial intentions". *Journal of Business Venturing*, 15(5), 411-432.
- Kumi, S., and Morrow, J. (2006). "Improving self-service the six sigma way at Newcastle University Library". *Program*, 40(2), 123-136.
- Kuratko, D. F. (2005). "The emergence of entrepreneurship education: Development, trends, and challenges". *Entrepreneurship theory and practice*, 29(5), 577-598.
- Kwak, Y. H., and Anbari, F. T. (2006). "Benefits, obstacles, and future of six sigma approach". *Technovation*, 26(5), 708-715.
- Levenson, H. (1974). "Activism and powerful others: Distinctions within the concept of internal-external control". *Journal of Personality Assessment*, 38(4), 377-383.
- Liñán, F., Urbano, D. and Guerrero, M. (2011). "Regional variations in entrepreneurial cognitions: Start-up intentions of university students in Spain". *Entrepreneurship and Regional Development*, 23(3/4), 187-215.

- Lindsay, A. W. (1982). "Institutional performance in higher education: the efficiency dimension." *Review of Educational Research*, 52(2), 175-199.
- Lumpkin, J. R. (1988). "Establishing the validity of an abbreviated locus of control scale: Is a brief Levenson's scales any better?" *Psychological Reports*, 63(2): 519-523.
- Lüthje, C. and Franke, N. (2003). "The 'making' of an entrepreneur: testing a model of entrepreneurial intent among engineering students at MIT". *R&D Management*, 33(2): 135-147.
- McDougall, P. P., and Oviatt, B. M. (2003). "Some fundamental issues in international entrepreneurship". *Entrepreneurship Theory & Practice*, 18, 27.
- O'Donoghue, M. (1971). "Economic dimensions in education". *Transaction Publishers*, Piscataway (NJ).
- Prause, G., Mendez, M. M., and Garcia-Agreda, S. (2013). Attitudinal loyalty and trust in entrepreneurship: building new relationships. *International Entrepreneurship and Management Journal*, 9(4), 531-540.
- Rialti, R., Pellegrini, M. M., Caputo, A., & Dabic, M. (2016). "Entrepreneurial education and internationalisation of firms in transition economies: a conceptual framework from the case of Croatia". *World Review of Entrepreneurship, Management and Sustainable Development*, in press.
- Rothaermel, F. T., Agung, S. D. and Jiang, L. (2007). "University entrepreneurship: a taxonomy of the literature". *Industrial and Corporate Change*, 16(4), 691-791.
- Schwarz, E. J., Wdowiak, M. A., Almer-Jarz, D. A., and Breiteneker, R. J. (2009). "The effects of attitudes and perceived environment conditions on students' entrepreneurial intent: An Austrian perspective". *Education+ Training*, 51(4), 272-291.
- Shane, S. and Venkataraman, S. (2000). "The promise of entrepreneurship as a field of research". *Academy of Management Review*, 25(1), 217-226.
- Smith, P. C., and Street, A. (2005). "Measuring the efficiency of public services: the limits of analysis". *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 168(2), 401-417.
- Souitaris, V., Zerbinati, S. and Al-Laham, A. (2007). "Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources". *Journal of Business Venturing*, 22(4), 566-591.
- Thompson, J.L. (2004). "The facets of the entrepreneur: identifying entrepreneurial potential". *Management Decision*, 42(2), 243-258.
- Thompson, E. R. (2009), "Individual entrepreneurial intent: Construct clarification and development of an internationally reliable metric". *Entrepreneurship Theory and Practice*, 33(3), 669-694.
- Veciana, J. M., Aponte, M., & Urbano, D. (2005). "University students' attitudes towards entrepreneurship: A two countries comparison". *International Entrepreneurship and Management Journal*, 1(2), 165-182.