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Entrepreneurship in Higher Education: The Effect of Academy, Motivation, Resources, Incentives, and Self-Efficacy in the Entrepreneurship Potential

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Abstract

Entrepreneurship in higher education is a current and relevant topic. The objective of this study is to analyze to what extent the entrepreneurial potential of polytechnic higher education students can be predicted from entrepreneurial motivations, opportunities, and resources to undertake, incentives to entrepreneurship, and self-perception of student efficacy, controlling for academic preparation and desire to undertake. Body—Research methods: Through the analysis of the reasons that encourage higher education students to undertake, a survey was carried out to 6532 students of Portuguese Polytechnic Institutes, who answered to the following measures: scale of opportunities and resources to undertake, scale of entrepreneurial motivations, scale of incentives to entrepreneurship, entrepreneurial potential, academic preparation to undertake, and desire to undertake. Conclusion—Key results: Hierarchical multiple regression analysis showed that academic preparation to undertake explained $R^2 = 5\%$ of entrepreneurial potential, followed by motivations to undertake ($\Delta R^2 = 11.5\%$), opportunities and resources to undertake ($\Delta R^2 = 1.4\%$), incentives to undertake ($\Delta R^2 = 0.7\%$), and self-efficacy ($\Delta R^2 = 3.6\%$). The results are discussed taking into account the models of entrepreneurship and the importance of the academic preparation to undertake.

Keywords: entrepreneurship in higher education, entrepreneurial potential, entrepreneurial motivations, opportunities and resources to undertake, incentives for entrepreneurship

1. Introduction

Entrepreneurship can be seen today as the engine for economic growth and one of the most important factors of competitiveness. In a world of constant change, this process is associated with the individuals' ability to adapt successfully to the constant transformations in society. Therefore, it is imperative to promote and enhance entrepreneurship and foster an "entrepreneurial culture" in society with a view to achieving social, economic, technological, and organizational development [1, 2].

Everyone can be an entrepreneur, as long as the context provides the necessary stimuli; education is an example par excellence of one way of achieving this goal, while leveraging business and job creation. The teaching-learning process allows combining the acquisition of knowledge and skills, which are of utmost importance for the active integration of young people into society [3]. Hence, the role and importance of entrepreneurship in the academic arena becomes essential in terms of groundwork for skills development, a process that can best prepare students for the job market. To corroborate this statement, the European Commission believes that the increased investment in entrepreneurship must be carried out preferably through education, namely entrepreneurship education, which may contribute to increasing the levels of innovation and economic growth of a nation or country (Comissão das Comunidades [4]). Although structural conditions play a key role in the moment to undertake, individuals' perception of themselves and their skills is equally important [5].

In this study, we analyzed the role of the predictor variables *entrepreneurial motivations* (scale validated by Parreira et al. [6]), *opportunities and resources to undertake* (scale validated by Parreira et al. [7]), *incentives for entrepreneurship* (scale validated by Parreira et al. [8]), and *self-efficacy* [9] on students' *entrepreneurial potential*, while controlling for the *academic preparation* and *desire to undertake* variables.

In order to provide a framework for this research, a literature review was performed on the concepts and factors associated with the topic. Afterward, data were collected using questionnaires that were designed and validated by the research team for this purpose. Data were analyzed and processed, and the results were interpreted based on the perspectives found in the literature review and the model underlying the Poliempreende project. This study describes these steps, the study limitations, and proposals for future research.

2. Development

2.1. Entrepreneurship

According to Sarkar [10], entrepreneurship is not a recent phenomenon, although it has been used in different contexts throughout history. Nevertheless, the literature suggests that its popularity has been revived, emerging as a "sudden discovery" for economic development, especially in times of crisis. The term *entrepreneur* derives from the French words *entre* (between) and *prendre* (to take), and means being in the market between the supplier and

the consumer. In other words, the entrepreneur acts as an “intermediary,” as someone who facilitates the exchange process between the supplier and the market. According to Saraiva [11], entrepreneurship “corresponds to an articulated set of cultural aspects, attitudes, methodologies, stimuli mechanisms, and environments that aim to promote an integrated implementation of cycles of dream, design, implementation, and acceleration of new organizational realities, creating added value” (op. cit., p. 34).

In the twentieth century, this concept changed profoundly when Schumpeter [12] rejected the prevailing terminological definition and argued that the entrepreneur should be the driving force of the economic system, simultaneously playing the role of leader and agent of innovation. In this sense, entrepreneurship can be defined as an innovative act that leads to a new capacity to create wealth [13], or the creation of a new organization [14]. There are many definitions of entrepreneurship in the literature, but the definition of its constitutive elements is not consensual. However, several authors have proposed different definitions with elements in common. These elements will be described later on.

The entrepreneurship movement expanded the most in the 1980s [1], particularly in some countries. In fact, in countries where the academy invested in entrepreneurship education, the increasingly recognized value of entrepreneurship as an engine for development and fight against unemployment has led to an increase in the number of jobs available and the reduction of unemployment rates [1, 15]. According to these authors, these results suggest that entrepreneurs are the real drivers of the market economy. As previously mentioned, if entrepreneurship is considered as the discovery, exploration, and evaluation of opportunities to create goods and services, by creating conditions for the development of an entrepreneurial culture, we are supporting the economic, social, and/or technological development and growth of societies. Therefore, entrepreneurship is very likely to have a positive impact on value creation, as a powerful engine for economic and social development, in which the entrepreneur plays a crucial role [2]. The agents of entrepreneurship are able to take risks and transform ambiguous situations into business opportunities in order to achieve success [16, 17]. Entrepreneurs can then be seen as individuals with the ability to take risks by facing ambiguous situations from an optimistic perspective, seeing them as an opportunity or possibility for business or value creation, who are capable of designing and implementing projects, and encouraging those who collaborate with them, with an attitude of constant challenge and desire to overcome indifference.

2.2. Education in higher education and incentives

According to Volkmann [18], entrepreneurship education began in American universities. The Harvard Business School was the first institution to design and implement a program in this area in 1947. Since then, several business schools and universities have started to offer entrepreneurship education and promoting academic paths in this area based on the premise that entrepreneurship can be taught and learned [19]. In this respect, Gerba [20] sees entrepreneurship education as an educational program that aims to provide students with knowledge, skills, and motivation to boost business success. It is also seen as a means to develop entrepreneurial intentions by raising students’ interest for entrepreneurship. In this way,

education on this topic has become increasingly relevant, and some authors even believe that entrepreneurship education goes beyond the mere training for the creation of a new business. For example, Ramayah et al. [21] consider that entrepreneurship allows individuals to learn to be innovative, to have the ability to integrate experiences, to easily improve knowledge, attitudes, and behaviors, which, in turn, will help them to create, innovate, and evaluate business opportunities. In addition, according to the Commission of the European Communities [22], entrepreneurship education has clear benefits, helping students to become more creative and self-confident in their tasks and to act in a socially responsible way toward success.

According to Testas and Moreira [19], there are few entrepreneurs in Portugal, which means that the educational system needs to be restructured to respond to the current crisis and high level of unemployment. According to Duarte and Esperança [17], entrepreneurship in Portuguese higher education faces some barriers, both in relation to students and teachers/researchers: students lack entrepreneurial skills and motivation to undertake and have difficulty in obtaining financial support; teachers and researchers face a clearly weak link between academic/teaching environment, the business world, and the real market needs, as well as difficulties in obtaining funding for projects with the consequent lack of motivation and little investment in this area. Therefore, the financial and governmental support is insufficient to promote entrepreneurship, and the incentives are still poorly and ineffectively managed. In this way, opportunities to support valuable projects are often lost, with an impact on economy and society. As previously said, in the fulfillment of their role to train students, higher education institutions should empower and motivate them for entrepreneurial initiatives, stimulating the creation of companies that simultaneously generate jobs and develop the economy [2, 23].

2.3. Entrepreneurial motivations

Many authors believe that there are motivational factors that guide the individual to undertake, making the entrepreneurial process clearer and more understandable [24–26]. Motivation helps to describe the process that impels individuals to engage in entrepreneurial behaviors (Hornsby & Kuratko, [27]). In addition, it is essential to identify the entrepreneurial motivations so that policy-makers, within their sphere of influence, can suggest more effective programs to support and promote a successful entrepreneurship [28]. Entrepreneurial motivations have been widely discussed, largely due to the wide range of influencing factors. In recent years, several authors have been investigating the influences of the environment and the characteristics of the opportunities to create businesses. In addition to these factors, individuals' characteristics and specificities should be taken into account given their key role in decision-making [29]. Therefore, understanding what motivates individuals to undertake, as well as identifying entrepreneurs' typical personality traits, is important for both researchers and academics [1].

The need for achievement is one of the most extensively studied motivator and is derived from McClelland's human motivation theory [30]. The achievement drive translates into the individual's ambition to start new businesses and guide their growth. This motivator helps to understand the entrepreneurial activity [30, 31] and may be associated with knowledge acquisition, motivating students to create their businesses based on their own analyses [2]. A study on the characteristics of entrepreneurs found higher scores in the need for independence

among entrepreneurs than among the general population [32]. This motivator is also found among academic communities [14, 33], although it characterizes most entrepreneurs rather than being restricted to these communities [31]. Another motivator for most entrepreneurs is the accomplishment of a business opportunity as a real possibility, with an effective potential for achievement [2]. According to Shane and Venkataraman [34], opportunities allow introducing new services, goods, and organizing methods into the market in a profitable way. This is why opportunity is seen as one of the best motivators that guide entrepreneurial behaviors. Although the need for admiration and recognition is a human trait, we live in a “harmfully” competitive society, where recognition and acceptance from others become a necessity early in life [35]. Notoriety and social status can also motivate most entrepreneurs to establish their own businesses [2]. Finally, the family’s role is also a motivator to undertake to the extent that family plays a key social and economic role in business creation and development. Family businesses are among the main sources of job creation in market economies [36].

2.4. Environmental influences

The influence of the environment in entrepreneurial behaviors has been extensively investigated. Several studies have provided relevant information to create favorable conditions for the development of entrepreneurship ([37]; Taylor, [38]). According to these authors, the environment consists of a set of exogenous factors that create conditions for the development of entrepreneurial activities. Thus, institutions, regulations, laws, policies, knowledge, and networks influence the entrepreneurial activity. According to Kuratko and Hodgetts [39], the environment consists of external opportunities that influence the organization. Entrepreneurship, as a social dynamic process, results from the interaction between entrepreneur, team, opportunity, idea, and available resources [40].

According to Gartner [41], the discussion about the environment should refer to the availability of resources, the existence of skilled labor force, the accessibility of suppliers, markets, and customers, the governmental influences, the purchasing power, the conditions of the implementation area, and the level of industrialization. In addition to the environment, other authors emphasize the importance of culture as a factor capable of promoting or restricting entrepreneurial behaviors. Therefore, the environmental analysis should encompass economic, infrastructural, and political aspects [37]. According to Nayab [42], the major environmental influences are cultural and social variables, such as governmental and economic policies, and resource availability. Social and cultural influences relate to social organization, the social attitudes toward the business and its beginning [43], and the beliefs that have an impact on individuals’ behaviors and attitudes [2]. Demographic changes and changes resulting from more consumerist lifestyles are also environmental influences, with an emphasis on social networks since they influence individuals’ entrepreneurial behaviors [2, 44].

Carsud and Johnson [44] advocate that, with regard to the governmental influences expressed in the State ideologies, there is a tendency for more liberal governments to have a more positive perspective of entrepreneurship as a strategic and development area of society. However, these policies tend to be unstable and temporary, which can encourage or discourage entrepreneurship.

Therefore, other types of support are necessary, such as more funding, less bureaucracy, and the creation of infrastructures to facilitate entrepreneurship.

The economic factors that influence entrepreneurship encompass the organization of the economy, the purchasing power, and the levels of confidence in the economy of a given society. Although the economic development of a society impacts the creation of opportunities, these tend to emerge in times of recession [1, 2].

Despite this, resource availability is regarded as another important factor, namely the availability of financial, human, material, and physical resources; human resources allow for business accomplishment and the creation of a reliable team, while material and physical resources influence the productive processes [2]. According to these authors, Portuguese entrepreneurs highlight eight environmental factors: profit expectation, predisposition to seek incentives, easy supply, easy creation of structure, taking advantage of other companies' lack of success, easy identification of customers, family support and easy creation of a business, and, finally, easy identification and understanding of the competition. In parallel, it is important to understand these environmental influences and factors to raise awareness about entrepreneurship, and, consequently, boost the economy.

2.5. Self-efficacy

Self-efficacy can be defined as a personality trait that is easily associated with various desirable characteristics in the modern world, such as the motivation to learn or persistence, rather than a professional goal or performance [45–47]. Its analysis can provide important guidance and self-knowledge tools since perceived self-efficacy is positively correlated with an individual's success in specific activities [48]. According to Bandura [49, 50], self-efficacy beliefs are among the factors that comprise the psychological mechanisms governing motivation. In fact, this author was a pioneer in the conceptual definition of self-efficacy and proposed a "Social Learning Theory," which suggests that learning happens through behavioral modeling. Self-efficacy enables individuals to shape their perceptions about their own ability to perform a certain task successfully (or not). According to Bandura [5], perceived self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. According to this theory, individuals' self-efficacy can influence their feelings, thoughts, behaviors, or motivation in a given activity or situation.

Bandura [5, 50, 51] argues that self-efficacy is a dynamic construct that changes as new information and experiences are acquired. The author proposes four sources that may affect the level of perceived self-efficacy. The first source relates *performance outcomes*, suggesting that people's perception of their capabilities tend to improve if their prior experience provided them with positive information. The second source—*vicarious experiences*—relates to the possibility of the individual observing others experiencing situations of success and/or failure. According to Bandura [5], seeing similar people succeed through personal effort raises the observers' belief that they too have the skills to perform and succeed in comparable situations. The third source of influence on the individual's self-efficacy is *verbal persuasion*, which suggests that a person can influence the level of self-efficacy of another person by providing verbal information about the task and the person's ability to perform it. Finally, the fourth

source of influence is *physiological feedback (emotional arousal)*, through which people experience sensations from their body and the way they perceive this emotional arousal influences their beliefs of efficacy; thus, individuals are more likely to experience success if they do not feel anxious about a social object or situation. According to Marakas et al. [52], two assumptions are particularly important in Bandura's proposal [50]: self-efficacy is a strong predictor of task performance, and all the definitions of the construct refer to how people perceive their capabilities to successfully perform a specific task.

In this way, self-efficacy and self-perception can be considered essential in entrepreneurship since individuals with higher self-efficacy are able to invest more effort and persist longer than those with low self-efficacy [49].

3. Method

3.1. Sample

The sample is composed of students from 17 Portuguese higher education polytechnic institutions that integrate the Poliempreende project. The sample was divided by polytechnic institute, study area (health, management, technology, and social sciences), and degree year, as well as by gender, student status, marital status, and the existence of entrepreneurs in the family. A total of 40 questionnaires were applied to each degree year of each of the above-mentioned areas. The final sample included 6532 students with a mean age of 22 years (minimum age of 17 and maximum age of 59 years), and was mostly composed of female students (64%). **Table 1** describes the sample in detail.

3.2. Instruments

Data were collected using a self-administered questionnaire entitled *Personal Motivations and Facilitating Factors of Entrepreneurship*. The questionnaire was designed by a team of five experts from different areas [2] based on scales about the reasons for creating a business, the social and environmental influences, and the support for business creation. These scales took into account the work done by the Society for Associated Researchers on International Entrepreneurship (SARIE) to which several renowned theorists contributed (e.g., [53]; Baumal, [54]), as well as McClelland's achievement motivators [30], the work of Pereira [31] on entrepreneurs' social representations, and the relevant issues arising from the reality of the institutions or the Poliempreende project.

3.2.1. Scale of opportunities and resources to undertake

The scale was composed of 22 items rated on a 5-point Likert scale (1—of little importance to 5—very important). Respondents rated each item based on the degree of importance that they assigned to the opportunities and resources to undertake. An exploratory factor analysis (EFA) was performed with half of the sample (randomly divided), from which four factors emerged: *resource availability, business stability, economic and political instability, and business*

	Total (N = 6532)			
	<i>n</i>	%	<i>M</i>	<i>SD</i>
<i>Gender</i>				
Male	2252	34.5		
Female	4194	64.2		
No answer	86	1.3		
Age (years)			22.28	5.34
<i>Degree area</i>				
Health	1816	27.8		
Technology	1647	25.2		
Social sciences	1336	20.5		
Management	1500	23.0		
No answer	233	3.6		
<i>Degree year</i>				
1st year	2055	31.5		
2nd year	2218	34.0		
3rd year	1706	26.1		
4th year	462	7.1		
No answer	91	1.4		
<i>Student status</i>				
Students	5359	82.0		
Working students	1077	16.5		
No answer	96	1.5		
<i>Marital status</i>				
Single	5836	89.3		
Divorced	89	1.4		
Married	409	6.3		
Co-habiting	108	1.7		
No answer	90	1.4		
<i>Polytechnic Institute (PI)</i>				
PI Beja	469	7.2		
PI Bragança	255	3.9		
PI Castelo Branco	387	5.9		
PI Cávado e Vale do Ave	322	4.9		
PI Coimbra	513	7.9		
PI Guarda	463	7.1		

	Total (N = 6532)			
	n	%	M	SD
PI Leiria	492	7.5		
PI Lisboa	276	4.2		
PI Portalegre	150	2.3		
PI Porto	448	6.9		
PI Santarém	500	7.7		
PI Setúbal	405	6.2		
PI Viana Castelo	477	7.3		
PI Viseu	549	8.4		
PI Tomar	187	2.9		
ESEnfC	185	2.8		
EST-UAlgarve	454	7.0		

Table 1. Sociodemographic characteristics of the sample.

opportunities, which are responsible for 60.37% of total variance. A confirmatory factor analysis (CFA) was performed with the other half of the sample, which showed good indices of fit, namely normed fit index (NFI) = .949 [55] and standardized root mean square residual (SRMR) = .045 [56], and acceptable indices of fit, namely tucker-lewis index (TLI) = .945 [56], comparative fit index (CFI) = .954 [57], and root mean square of approximation (RMSEA) = .050 [55, 58], thus confirming the dimensional structure previously found in the principal component analysis (PCA). Cronbach’s alpha coefficient showed an excellent reliability, $\alpha = .903$, since it is greater than .80 [59].

3.2.2. Scale of entrepreneurial motivations

The scale was composed of 17 items measured on a 5-point Likert scale (1—of little importance to 5—very important). Respondents rated each item based on the degree of importance that they assigned to the motivations to undertake. An EFA was performed with half of the sample (randomly divided), from which four factors emerged: *motivation—family and social achievement*, *motivation—resources and income*, *motivation—prestige*, and *motivation—learning and development*. A CFA was performed with the other half of the sample, which showed good indices of fit (NFI = .906, CFI = .911, TLI = .887, and RMSEA = .070). The scale showed discriminant validity and reliability. In both samples, Cronbach’s alpha coefficients were greater than .70, indicating an adequate internal consistency.

3.2.3. Scale of incentives to entrepreneurship

The final version of this scale was composed of 15 items measured on a 5-point Likert scale (1—of little importance to 5—very important). Respondents rated each item based on the degree of importance that they assigned to the incentives to create a business.

An EFA was performed with half of the sample (randomly divided), from which two factors emerged: *financial and governmental incentives*, and *educational and consultancy incentives*, which account for 58.87% of the variance.

The CFA performed with the other half of the sample confirmed the two-factor structure obtained, showing good indices of fit (NFI = .888, SRMR = .049, CFI = .890, TLI = .868, and RMSEA = .06). In both samples, Cronbach's alpha coefficients were greater than .85, indicating a good internal consistency.

3.2.4. Composite scores

Three composite scores were derived for this research: *entrepreneurial potential*, *academic preparation to undertake*, and *desire to undertake*. All three composites were rated on a scale from 1 to 5, in which 1 is of little importance and 5 is very Important.

The composite score for the *entrepreneurial potential* resulted from the score sum obtained in the following items: *I find entrepreneurship attractive*; *As an entrepreneur I would achieve my life goals*, and *As an entrepreneur I would feel satisfied with my job*. The composite score for *academic preparation to undertake*, was obtained through the following items: *My degree prepares me to be self-employed (autonomous)*, and *My degree prepares me to create my own business*. Finally, the composite score for the *desire to undertake* was calculated based on the following items: *My desire to be self-employed (autonomous)* and *My desire to create my own business*.

All scores showed a Cronbach's alpha coefficient greater than .80, thus revealing a good internal consistency (Nunnally, [60]): $\alpha = .819$ in *entrepreneurial potential*, $\alpha = .841$ in *academic preparation*, and $\alpha = .861$ in *desire to undertake*.

3.2.5. Self-efficacy

Finally, self-efficacy was measured based on the mean scores of the following items to assess the self-efficacy dimension of the Self-Concept Clinical Inventory [9], measured on a 5-point Likert scale (from 1—strongly disagree to 5—strongly agree): *I am capable of assuming responsibility for something until the end, even though it may have unpleasant consequences*; *Generally speaking, I usually face my problems and solve them*; *When I have an idea that seems to be good, I like to put make it work*; *As a rule, I am persistent in solving my problems*; *I consider myself competent in what I do*; *I like to succeed in the things I undertake*; and *I always find energy to overcome my problems*. PCA indicated the unidimensionality of the self-efficacy measure: *eigenvalue* = 3.28, 18.25% of explained variance, with $s > .653$, for an adequate sample, *kaiser-meyer-olkin measure of sampling adequacy* (KMO) = .864, Bartlett's test with $X^2(21) = 11585.38$, $p < .001$. It showed a Cronbach's alpha coefficient of $\alpha = .809$, indicating a good internal consistency (Nunnally [60]).

3.3. Procedures

The questionnaires were distributed and applied to the students of the higher education polytechnic institutes by the Poliemprende project coordinators, who were also responsible for collecting them after completion in their respective institution. All ethical principles of a research study were complied with the researchers explained the study purposes, participants gave their informed consent, and anonymity was ensured at all times.

4. Results

In the scale of entrepreneurial motivations, the highest scores were obtained in the factors *motivation—family and social achievement* ($M = 4.11$, $SD = .69$) and *motivation—learning and development* ($M = 4.01$, $SD = .59$). In relation to the scale of opportunities and resources to undertake, the highest mean scores were obtained in the factors *resource availability* ($M = 3.86$, $SD = .68$) and *business stability* ($M = 3.82$, $SD = .59$). In the scale of incentives to entrepreneurship, the factors *financial and governmental incentives* ($M = 3.94$, $SD = .69$) and *educational and consultancy incentives* obtained the same mean score ($M = 3.94$, $SD = .68$).

The *entrepreneurial potential* score showed the higher mean score ($M = 11.17$), standing above the midpoint of the score (9 points). Taking into account that the reference values are the same, students' *entrepreneurial potential* is higher than their *desire to undertake*, $t(6429) = 146.12$, $p < .001$. The *academic preparation to undertake* score, composed of two items, showed a mean score above the midpoint of the score (5.6). The same is not true for the *desire to undertake* score, whose mean score is significantly below the mid-point of the score. These results are presented in **Table 2**.

The *entrepreneurial potential* has only a moderate correlation (values between .30 and .50) with the factor *motivation—learning and development* from the scale of entrepreneurial motivations ($r = .36$). Most of the correlations between the *entrepreneurial potential* and the remaining factors are low (values between .10 and .30). Therefore, in the scale of entrepreneurial motivations, the factors *motivation—family and social achievement* ($r = .21$), *motivation—resources and income* ($r = .18$), and *motivation—prestige* ($r = .17$) show a low correlation with the *entrepreneurial potential*. In this scale, *motivation—learning and development* is the only factor that shows no correlation with the *entrepreneurial potential*. In the scale of opportunities and resources to undertake, the factors *resource availability* ($r = .27$), *business stability* ($r = .29$), and *business opportunities* ($r = .12$) show a low correlation with the *entrepreneurial potential*. In this scale, *economic and political instability* is the only factor that shows no correlation ($r = .08$) with the *entrepreneurial potential*. Finally, in the scale of incentives to Entrepreneurship, both factors have a low correlation with the *entrepreneurial potential*: the first factor, *financial and governmental incentives*, shows a correlation of $r = .27$, and the second factor, *education and consultancy incentives*, shows a correlation of $r = .26$. The *academic preparation* also shows a low correlation with the *entrepreneurial potential* ($r = .22$). These results are shown in **Table 3**.

Based on the results obtained in Model 1, the *academic preparation* explained 4.7% ($R^2 = .047$) of the *entrepreneurial potential*. From Model 1 to Model 2, the delta is equal to .115, which means that students' *entrepreneurial motivations* increased by 11.5% the predictive ability of the *entrepreneurial potential*. In Model 3 ($R^2 = .175$), the introduction of predictors related to *opportunities and resources to undertake* only increased by 1.4% ($\Delta R^2 = .014$) the explained variance of the *entrepreneurial potential*. In Model 4 ($R^2 = .182$), the introduction of the *incentives to entrepreneurship* only increased the *entrepreneurial potential* by 0.7% ($\Delta R^2 = .007$). Finally, the introduction of the *self-efficacy* measure, in Model 5, contributed to a 3.6% increase ($\Delta R^2 = .036$) of the variance in the *entrepreneurial potential* in relation to the previous models. In total, all of the predictors accounted for 21.8% of the *entrepreneurial potential*. These results are shown in **Table 4**.

	Reference values	Min.	Max.	M	SD
Entrepreneurial motivations					
F1. Family and social achievement	1-5	1	5	4.11	0.69
F2. Resources and income	1-5	1	5	3.26	0.81
F3. Prestige	1-5	1	5	3.45	0.82
F4. Learning and development	1-5	1	5	4.01	0.59
Total scale	1-5	1	5	3.75	0.55
Opportunities and resources to undertake					
F1. Resource availability	1-5	1	5	3.86	0.68
F2. Business stability	1-5	1	5	3.82	0.59
F3. Economic and political instability	1-5	1	5	2.96	1.06
F4. Economic and political instability	1-5	1	5	3.28	0.95
Total scale	1-5	1	5	3.67	0.54
Incentives to entrepreneurship					
F1. Financial and governmental incentives	1-5	1	5	3.94	0.69
F2. Educational and consultancy incentives	1-5	1	5	3.94	0.68
Total scale	1-5	1	5	3.93	0.64
Academic preparation to undertake	2-10	2	10	6.11	1.97
Entrepreneurial potential	3-15	3	15	11.17	2.11
Desire to undertake	2-10	2	10	6.63	2.71
Self-efficacy	1-5	1	5	4.04	0.52

Table 2. Reference values, minimum, maximum, and standard deviations for the measures under analysis.

Model 1 shows that the *academic preparation* significantly predicts the *entrepreneurial potential* ($\beta = .217$). In Model 2, after the introduction of variables from the scale of entrepreneurial motivations, the *academic preparation* ($\beta = .149$) and *motivation—learning and development* ($\beta = .303$) were the most predictive variables of the *entrepreneurial potential*. In Model 3, after the introduction of the variables from the scale of opportunities and resources to undertake, the predictive variables were *academic preparation* ($\beta = .147$), *motivation—learning and development* ($\beta = .253$) from the scale of entrepreneurial motivations, and the variable *business stability* from the scale inserted in this model ($\beta = .115$). After the introduction of the scale of incentives to entrepreneurship to Model 4, the predictive variables of the *entrepreneurial potential* were the *academic preparation* ($\beta = .151$), and *motivation—learning and development* ($\beta = .239$) from the scale of entrepreneurial motivations. In this model, the predictive variable of the scale of incentives to entrepreneurship, although with a low predictive value, was the *financial and governmental incentives* ($\beta = .076$). Finally, after the introduction of the *self-efficacy* to Model 5, the *academic preparation* ($\beta = .135$), *motivation—learning and development* ($\beta = .181$) from the scale of entrepreneurial motivations, and the variable *self-efficacy* ($\beta = .216$) inserted in this model were the most predictive variables of the *entrepreneurial potential*.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Entrepreneurial motivations: Family and social achievement(1)	1	.45**	.46**	.44**	.79**	.36**	.40**	.11**	.21**	.41**	.34**	.33**	.36**	.12**	.21**	.18**	.29**
Resources and income (2)		1	.57**	.27**	.78**	.29**	.33**	.23**	.29**	.39**	.25**	.19**	.25**	.15**	.18**	.15**	.12**
Prestige (3)			1	.29**	.79**	.27**	.29**	.16**	.25**	.33**	.22**	.19**	.23**	.13**	.17**	.13**	.16**
Learning and development (4)				1	.61**	.49**	.45**	.07**	.16**	.47**	.39**	.42**	.43**	.18**	.36**	.28**	.41**
Global scale(5)					1	.45**	.48**	.19**	.31**	.52**	.39**	.36**	.41**	.18**	.29**	.23**	.31**
Opportunities and resources to undertake Resource availability (6)						1	.67**	.15**	.27**	.82**	.53**	.54**	.57**	.09**	.27**	.12**	.29**
Business stability (7)							1	.22**	.39**	.89**	.57**	.56**	.61**	.12**	.29**	.17**	.31**
Economic and political instability(8)								1	.42**	.50**	.21**	.17**	.21**	.02	.08**	.02	.04**
Business opportunities (9)									1	.57**	.26**	.22**	.27**	.10**	.12**	.07**	.11**
Global scale (10)										1	.59**	.57**	.63**	.12**	.29**	.15**	.30**
Incentives to entrepreneurship Financial and governmental incentives (11)											1	.69**	.97**	.06**	.27**	.12**	.32**
Educational and consultancy incentives (12)												1	.84**	.07**	.26**	.10**	.33**
Global scale (13)													1	.06**	.28**	.12**	.35**
Academic preparation to undertake (14)														1	.22**	.42**	.14**
Entrepreneurial potential (15)															1	.35**	.36**
Desire to undertake (16)																1	.23**
Self-efficacy (17)																	1

** $p < .001$.

Table 3. Intercorrelation matrix for the measures under analysis.

<i>Predictor variables</i>					<i>Dependent variable: entrepreneurial potential</i>			
	<i>r</i>	<i>R</i> ²	ΔR^2	<i>F(df1, df2)</i>	<i>b</i>	<i>EP</i>	β	<i>t</i>
<i>Model 1</i>	.217	.047	—	317.76 (1, 64)				
Academic preparation to undertake					.233	.013	.217	17.83***
<i>Model 2</i>	.402	.162	.115	219.74 (4, 64)				
Academic preparation for entrepreneur					.160	.013	.149	12.74***
Entrepreneurial motivations—Family and social achievement					.093	.043	.030	2.15*
Entrepreneurial motivations—Resources and income					.132	.038	.050	3.51***
Entrepreneurial motivations—Prestige					.060	.037	.023	1.59*
Entrepreneurial motivations—Learning and development					1.08	.046	.303	23.42***
<i>Model 3</i>	.419	.175	.014	26.36 (4, 64)				
Academic preparation to undertake					.158	.012	.147	12.69***
Entrepreneurial motivations—Family and social achievement					.019	.044	.006	0.44*
Entrepreneurial motivations—Resources and income					.074	.038	.028	1.94*
Entrepreneurial motivations—Prestige					.049	.037	.019	1.33*
Entrepreneurial motivations—Learning and development					.905	.050	.253	17.98***
Opportunities and resources to undertake—Resource availability					.100	.050	.032	2.01*
Opportunities and resources to undertake—Business stability					.406	.058	.115	6.95***
Opportunities and resources to undertake—Economic and political instability					.031	.025	.016	1.23*
Opportunities and resources to undertake—Business opportunities					-.016	.030	-.007	-.54*
<i>Model 4</i>	.427	.182	.007	26.48 (2, 64)				
Academic preparation to undertake					.162	.012	.151	13.04***
Entrepreneurial motivations—Family and social achievement					-.011	.044	-.004	-.249*

<i>Predictor variables</i>					<i>Dependent variable: entrepreneurial potential</i>			
	<i>r</i>	<i>R²</i>	ΔR^2	<i>F(df1, df2)</i>	<i>b</i>	<i>EP</i>	β	<i>t</i>
Entrepreneurial motivations— Resources and income					.080	.038	.031	2.09*
Entrepreneurial motivations—Prestige					.054	.037	.021	1.45*
Entrepreneurial motivations— Learning and development					.856	.051	.239	16.88***
Opportunities and resources to undertake—Resource availability					.015	.051	.005	.29*
Opportunities and resources to undertake—Business stability					.270	.061	.077	4.42***
Opportunities and resources to undertake—Economic and political instability					.013	.025	.007	.53*
Opportunities and resources to undertake—Business opportunities					-.018	.030	-.008	-.61*
Incentives to entrepreneurship— Financial and governmental incentives					.232	.051	.076	4.54***
Incentives to entrepreneurship— Educational and consultancy incentives					.136	.052	.044	2.64**
<i>Model 5</i>	.467	.218	.036					
Academic preparation to undertake					.145	.012	.135	11.91***
Entrepreneurial motivations— Family and social achievement					-.081	.043	-.027	1.89*
Entrepreneurial motivations— Resources and income					.126	.037	.048	3.38**
Entrepreneurial motivations—Prestige					.042	.036	.016	1.15*
Entrepreneurial motivations— Learning and development					.647	.051	.181	12.69***
Resource availability					.015	.050	.005	.29*
Business stability					.232	.060	.066	3.88***
Economic and political instability					.026	.025	.013	1.07*
Business opportunities					-.020	.029	-.009	-.68*
Incentives to entrepreneurship— Financial and governmental incentives					.165	.050	.054	3.31**

<i>Predictor variables</i>					<i>Dependent variable: entrepreneurial potential</i>			
	<i>r</i>	<i>R</i> ²	ΔR^2	<i>F(df1, df2)</i>	<i>b</i>	<i>EP</i>	β	<i>t</i>
Incentives to entrepreneurship— Educational and consultancy incentives					.071	.051	.023	1.39*
Self-efficacy					.878	.051	.216	17.22***

* $p \leq .05$
** $p \leq .01$
*** $p < .001$.

Table 4. Hierarchical regression analysis of the expected entrepreneurial potential based on the motivations related to family and social achievement, resources and income, prestige, learning and development, resource availability, business stability, economic and political instability, business opportunities, financial and governmental incentives, and educational and consultancy incentives.

5. Discussion

The literature review conducted on the topic underlying this study highlighted the importance of entrepreneurship as an engine for a country's economic, social, and technological growth and development. According to the results obtained, Portuguese polytechnic higher education students believe that *academic preparation* is essential to undertake. Taking into account that *academic preparation* explained approximately 5% of the *entrepreneurial potential* and that it remained significant in all hierarchical regression models, even in the presence of other significant predictors, we believe that this students' academic preparation to undertake should be further explored. Universities and polytechnics must intervene and prepare students for entrepreneurship, regardless of their training area [19]. Although 5% of explained variance of the *entrepreneurial potential* based on academic preparation may seem a low percentage, we believe the opposite in comparison with the percentage of variance explained by *self-efficacy*, which was around 3%. Nevertheless, *self-efficacy* is also an equally important predictor, since it is an individual's self-perception that helps him/her in the decision to undertake or not. Individuals with higher self-efficacy are able to invest more effort and persist longer in a task than those with low self-efficacy [61].

According to Parreira et al. [6], entrepreneurial motivations are important to undertake. The results of this study show that the main driving factor for entrepreneurship seems to be students' motivation for learning and development, rather than a desire for prestige or notoriety. As already pointed out in McClelland's human motivation theory [30], individuals feel the need to develop themselves to satisfy their various needs, such as the need for fulfillment, independence, and business opportunities. With respect to environmental influences and based on the results obtained [7], individuals tend to seek or create a stable business. This is probably due to the fact that entrepreneurship, as a dynamic social process, results from the interaction between entrepreneur, team, opportunity, idea, and available resources [40]. In addition, governmental and economic policies, resource availability, and the culture of

the moment in which individuals intend to undertake influence their perception of entrepreneurship as a positive or negative process. With regard to incentives [8], the surveyed students value financial and governmental incentives the most. In fact, although educational and consultancy incentives are essential for students to become familiar with entrepreneurship, they seem to assign greater importance to financial incentives. With regard to correlations, the results on the *entrepreneurial potential* should be highlighted. This predictor was only moderately correlated with the variable *motivation—learning and development*. Such evidence shows that the more educated students are about entrepreneurship, the greater is their *entrepreneurial potential*. To this end, students should be trained and informed about this topic so that entrepreneurship is no longer seen as an unknown and foreign idea coming from abroad. To a lower extent, the *entrepreneurial potential* was also correlated with several variables of the three scales used in this study. Among these correlations, the most significant variables were related to the environmental influences and incentives for entrepreneurship. The results obtained in this study corroborate the need to take into account the availability of resources, the existence of a skilled labor force, the accessibility of suppliers, markets and customers, the governmental influences, and the purchasing power [41]. Among the variables related to environmental influences and opportunities and resources to undertake, *resource availability* and *business stability* showed a low correlation with the *entrepreneurial potential*, as well as both variables related to the incentives for entrepreneurship—*financial and governmental incentives* and *educational and consultancy incentives*.

To enhance these results, we need to focus again on the key relationship between higher education institutions, the state, and students. According to Parreira et al. [6], the academia occupies, for various reasons, a privileged position to encourage, promote, motivate, and develop students' entrepreneurial skills, contributing to the general development of society and sustaining the Triple Helix model [62–68]. The authors of this model assign a key role to the academia in the creation of knowledge-based societies. In recent years, the academia has become part of the social, business, and economic development, thus asserting itself as an *Entrepreneurial University*, with an emphasis on the triangulation of strategies that support the needs of the industry and public sectors. This *Entrepreneurial University* is able to offer responses supported by the academia and based on governmental policies aimed at the development of such entrepreneurial skills.

Individuals who are more educated and trained on this specific area and have more financial and governmental support are more likely to undertake following their desire to “take risks.” In addition, if they have more resources at their disposal, individuals will feel more stable toward their business and will be more likely to undertake based on their income. In this way, these individuals will be seen as someone of trust and prestige. At the same time, self-efficacy seems to play a key role in entrepreneurship. According to the results obtained, this measure is moderately correlated with several variables such as learning and development, business stability, financial, governmental, educational and consultancy incentives, and entrepreneurial potential. As previously mentioned, these results suggest that individuals who are more educated and prepared on this topic will search for new learning experiences in this area and have a greater ability to undertake. Self-efficacy [57] tends to drive individuals in their decision to undertake. A greater self-perception brings a greater entrepreneurial

potential to the extent that the entrepreneurship process is strongly associated with the characteristics of the individual, who is the main agent of decision-making and the main responsible for performing the associated tasks [69]. Individuals will also experience greater stability in their business. Furthermore, the level of incentives offered by the State and Educational Institutions will make individuals feel more comfortable to learn and invest, which will, consequently, lead to a higher perceived self-efficacy.

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References

- [1] Parreira PM, Pereira FC, Arreguy-Sena C, Gomes AM, Marques SC, Melo RC, Oliveira DC, Fonseca C, Carvalho C, Mónico LS. Representações sociais do empreendedorismo: o papel da formação na aquisição de competências empreendedoras. *Revista Ibero-Americana de Saúde e Envelhecimento*. 2015;1(3):18-21
- [2] Parreira PM, Pereira FC, Brito NV. *Empreendedorismo e motivações empresariais no ensino superior*. Lisboa: Edições Sílabo; 2011
- [3] Ávila DFL. *Empreendedorismo e (des)envolvimento local: O propósito de uma intervenção educativa em rede* (Unpublished master's dissertation). Portugal: Universidade de Coimbra; 2015
- [4] Comissão das Comunidades Europeias Aplicar o Programa Comunitário de Lisboa: Promover o espírito empreendedor através do ensino e da aprendizagem. In: Retrieved from 2006. <http://eur-lex.europa.eu/legal-content/PT/TXT/?uri=CELEX%3A52006DC0033>
- [5] Bandura A. Self-efficacy. In: Ramachaudran VS, editor. *Encyclopedia of Human Behavior*. Vol. 4. New York: Academic Press; 1994. pp. 71-81
- [6] Parreira PM, Silva SD, Carvalho C, Mónico LS. (submitted). *Empreendedorismo no ensino superior: Estudo psicométrico da Escala de Motivações Empreendedoras*. *Análise Psicológica*
- [7] Parreira PM, Santos AS, Carvalho C, Mónico LS. *Empreendedorismo no ensino superior: Estudo psicométrico da escala Oportunidades e Recursos para Empreender*. *Revista Psicologia: Organizações e Trabalho*. 2017;17(4):1-11. DOI: 10.17652/rpot/2017.4.13736

- [8] Parreira PM, Ribeiro AS, Mónico LS, Carvalho C. (submitted). Empreendedorismo no ensino superior: Estudo psicométrico da Escala dos Incentivos ao Empreendedorismo. Referência
- [9] Vaz-Serra A. O «Inventário clínico de Auto-Conceito». *Psiquiatria Clínica*. 1986;7(2):67-84
- [10] Sarkar S. Empreendedorismo e inovação. 3ª ed. Lisboa: Escolar Editora; 2014
- [11] Saraiva PM. Empreendedorismo: Do Conceito à Aplicação, da Ideia ao Negócio, da Tecnologia ao Valor. 3ª ed. Coimbra: Imprensa da Universidade de Coimbra; 2015
- [12] Schumpeter J. The creative response in economic history. *The Journal of Economic History*. 1947;7(2):149-159
- [13] Drucker PF. Long-range planning: Challenge to management science. *Management Science*. 1959;5(3):238-249
- [14] Gartner W. Is there an elephant in entrepreneurship? Blind assumptions in theory development. *Entrepreneurship. Theory and Practice*. 2001;25(4):27-39
- [15] Audretsch DB, Fritsch M. Growth regimes over time and space. *Regional Studies*. 2002;36(2):113-124
- [16] Bucha AI. Empreendedorismo, aprender a saber ser empreendedor (1ªed.). Lisboa: Editora RH; 2009
- [17] Duarte C, Esperança JP. Empreendedorismo e Planeamento Financeiro: Transformar oportunidades em negócios. Criar micro, pequenas e médias empresas. 1ª ed. Lisboa: Edições Sílabo; 2012
- [18] Volkmann C. Entrepreneurial studies in higher education. *Higher Education in Europe*. 2004;29(2):177-185
- [19] Testas CP, Moreira FR. O empreendedorismo no ensino superior. *Gestão e Desenvolvimento*. 2014;22:139-163
- [20] Gerba DT. The context of entrepreneurship education in Ethiopian universities. *Management Research Review*. 2012;35(3/4):225-244
- [21] Ramayah T, Ahmad NH, Fei TH. Entrepreneur education: Does prior experience matter? *Journal of Entrepreneurship Education*. 2012;15:65-81
- [22] Commission of the European Communities. Aplicar o Programa Comunitário de Lisboa: Promover o espírito empreendedor através do ensino e da aprendizagem [electronic]. 2006. Available: <http://eur-lex.europa.eu/legal-content/PT/TXT/?uri=CELEX%3A52006DC0033>
- [23] Ribeiro MI, Fernandes A, Cabo P, Matos A. Intenção empreendedora dos alunos do ensino superior agrário português: o caso da região do Alto Trás-os-Montes. In: *Comunicaciones del 12º Congreso de Economía de Castilla y León*. Junta de: Castilla y León; 2010

- [24] Farhangmehr M, Gonçalves P, Sarmiento M. Predicting entrepreneurial motivation among university students: The role of entrepreneurship education. *Education + Training*. 2016;**58**(7/8):861-881
- [25] Kuratko D. The emergence of entrepreneurship education: Development, trends, and challenges. *Entrepreneurship Theory and Practice*. 2005;**29**(5):577-598
- [26] Storen L. Entrepreneurship in higher education: Impacts on graduates entrepreneurial intentions, activity and learning outcome. *Education + Training*. 2014;**56**(8/9):795-813
- [27] Hornsby JS, Naffziger DW, Kuratko DF, Montagno RV. An interactive model of the corporate entrepreneurship process. *Entrepreneurship Theory and Practice*. 1993;**17**(2):29-37
- [28] Hessels J, Gelderen M, Thurik R. Entrepreneurial aspirations, motivations, and their drivers. *Small Business Economics*. 2008;**31**:323-339
- [29] Shane S, Locke EA, Collins CJ. Entrepreneurial motivations. *Human Resource Management Review*. 2003;**13**:257-279
- [30] McClelland DC. *The Achieving Society*. New York: Free Press; 1961
- [31] Pereira FC. (2001). *A representação social do empresário, fatores de criação de empresas*, Edições Sílabo
- [32] Hornaday JA, Aboud J. Characteristics of successful entrepreneurs. *Personal Psychology*. 1971;**24**:141-153
- [33] Shane S, Kolvereid L, Westhead P. An exploratory examination of the reasons leading to new firm formation across country and gender. *Journal of Business Venturing*. 1991;**6**:431-446
- [34] Shane S, Venkataraman S. The promise of entrepreneurship as a field of research. *Academy of Management*. 2000;**25**(1):217-226
- [35] Lin N. Social networks and status attainment. *Annual Review of Sociology*. 1999;**25**:467-487
- [36] Shanker MC, Astrachan J. Myths and realities: Family businesses' contribution to the US economy. *Family Business Review*. 1996;**9**(2):107-123
- [37] Borges W, Mondo T, Machado H. A influência do meio sobre o empreendedorismo a partir das dimensões normativa, regulativa e cognitiva. *Pretexto*. 2016;**17**(2):66-80
- [38] Taylor J. What makes a region entrepreneurial?: A review of the literature. Center for economic development, Maxine Goodman Levin College of Urban Affairs. Cleveland State University, 2006. pp. 1-21
- [39] Kuratko D, Hodgetts R. *Entrepreneurship: A Contemporary Approach*. 5th ed. Orlando: Harcourt; 2001
- [40] Timmons J, Zacharakis A, Spinelli S. Business plans that work: A guide for small business (2004). *Choice Reviews Online*. 2004;**42**(04):42-2309
- [41] Gartner W. A conceptual framework for describing the phenomenon of new venture creation. *Academy of Management Review*. 1975;**10**(4):596-708

- [42] Nayab N. Understanding Timmons Model of Entrepreneurship. New York: Brighthub; 2011
- [43] Shapero A. (1984). The entrepreneurial event. Em C. Kent (Orgs.), *The Environment for Entrepreneurship*. Lexington, Mass: Lexington Books, D.C. Heath and Company. pp. 21-40
- [44] Carsud A, Johnson R. Entrepreneurship: A social psychological perspective. *Entrepreneurship & Regional Development*. 1989;**1**(1):21-32
- [45] Brinkerhoff J. Effects of a long-duration, professional development academy on technology skills, computer self-efficacy and technology integration beliefs and practices. *Journal of Research on Technology in Education*. 2006;**39**(1):22-43. DOI: 10.1080/15391523.2006.10782471
- [46] Colquitt JA, LePine JA, Noe RA. Toward an integrative theory of training motivation: A meta-analytic path analysis of 20 years of research. *Journal of Applied Psychology*. 2000;**85**:678-707
- [47] Salanova M, Grau R, Cifre E, Llorens S. Computer training, frequency of usage and burnout: The moderating role of computer self-efficacy. *Computers in Human Behavior*. 2000;**16**:575-590
- [48] Meneses PPM, Abbad GS. Construção e validação de um instrumento para avaliar auto-eficácia em situações de treinamento, desenvolvimento e educação de pessoas. *Psicologia: Reflexão e Crítica*. 2010;**23**(1):141-150
- [49] Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*. 1977;**84**(2):191-215. DOI: 10.1037/0033-295X.84.2.191
- [50] Bandura A. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs: Prentice-Hall; 1986
- [51] Bandura A. Human Agency in Social Cognitive Theory. *American Psychologist*. 1989;**44**(9): 1175-1184
- [52] Marakas GM, Mun YY, Johnson RD. The multilevel and multifaceted character of computer self-efficacy: Toward clarification of the construct and an integrative framework for research. *Information Systems Research*. 1998;**9**(2):126-163
- [53] Aldrich HE, Rosen B, Woodward W. The impact of social network on business findings and profit in a longitudinal study. In: Churchill NC et al., editors. *Frontiers of Entrepreneurship Research*. Wellesley, MA: Babson College; 1987. pp. 154-168
- [54] Shapero A, Sokol L. The social dimensions of entrepreneurship. *Encyclopedia of Entrepreneurship*. 1982;**2**:72-90
- [55] Schumacker RE, Lomax RG. *A beginner's Guide to Structural Equation Modeling*. 3rd ed. Mahwah, N.J: Lawrence Erlbaum Associates; 2010
- [56] Brown TA. *Confirmatory Factor Analysis for Applied Research*. 2nd ed. New York: Guilford Press; 2015

- [57] Bentler P. Quantitative methods in psychology: Comparative fit indexes in structural models. *Psychological Bulletin*. 1990;**107**:238-246
- [58] Kline R. Principles and Practice of Structural Equation Modeling. (3rd ed.) ed. New York: The Guilford Press; 2011
- [59] Nunnally JC. Psychometric Theory. New York: McGraw-Hill Inc.; 1978
- [60] Nunnally J. Psychometric theory. 2ª ed. New York: McGraw-Hill, 1978
- [61] Bandura A. Pensamiento y acción: Fundamentos sociales. Barcelona: Martinez Rocca; 1987
- [62] Etzkowitz H, Leydesdorff L. The triple helix–university–industry–government relations: A laboratory for knowledge-based economic development. *European Association for the Study of Science and Technology Review*. 1995;**14**(1):14-19
- [63] Etzkowitz H, Leydesdorff L. Universities in the Global Economy: A Triple Helix of University–Industry–Government Relations. London: Cassell Academic; 1997
- [64] Etzkowitz H, Leydesdorff L. The dynamics of innovation: From National Systems and “Mode 2” to a Triple Helix of university industry–government relations. *Research Policy*. 2000;**29**:109-123
- [65] Etzkowitz H, Gulbrandsen M, Levitt J. Public Venture Capital: Government Funding Sources for Technology Entrepreneurs. New York: Harcourt-Brace; 2000
- [66] Etzkowitz H. Forthcoming. The Second Academic Revolution: MIT and the Rise of Entrepreneurial Science. London: Gordon & Breach; 2001
- [67] Leydesdorff L, Etzkowitz H. Emergence of a triple helix of University-Industry-Government Relations. *Science and Public Policy*. 1996;**23**:279-286
- [68] Leydesdorff L, Etzkowitz H. The triple helix as a model for innovation studies. *Science and Public Policy*. 1998;**25**(3):195-203. DOI: [org/10.1093/spp/25.3.195](https://doi.org/10.1093/spp/25.3.195)
- [69] Santos SC, Caetano A, Curral L. Atitude dos estudantes universitários face ao empreendedorismo: Como identificar o potencial empreendedor? *Revista Portuguesa e Brasileira de Gestão*. 2010;**9**(4):2-14