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BAR – Brazilian Administration Review
Vol. 18, No. 3, Art. 1, e190088, 2021
https://doi.org/10.1590/1807-7692bar2021190088

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Research Article

Entrepreneurship Education and its Influence on Higher Education Students' Entrepreneurial Intentions and Motivation in Portugal

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Received 06 July 2019. This paper was with the authors for one revision. Accepted 14 July 2021.
First published online 02 August 2021.
Editors-in-chief: Carlo Gabriel Porto Bellini (Universidade Federal da Paraíba, João Pessoa, PB, Brazil); Ivan Lapuente Garrido (Universidade do Vale do Rio dos Sinos, Porto Alegre, RS, Brazil)
Associate Editor: Priscila Rezende da Costa (Universidade Nove de Julho, São Paulo, SP, Brazil)
Reviewers: Three anonymous reviewers
Editorial assistants: Kler Godoy and Simone Rafael (ANPAD, Maringá, PR, Brazil)

ABSTRACT

The present study has as main objective to evaluate the students' perception of the entrepreneurial education level of higher education institutions (HEIs) and its impact on their entrepreneurial motivations to become an entrepreneur and their entrepreneurial intention. Finally, we intend to measure to what extent the effect of entrepreneurial education is direct or indirect in their entrepreneurial intention, evaluating the role of entrepreneurial motivation of students in this relationship. A sample of 966 students from different HEIs in Portugal was surveyed using the HEInnovate Self-Assessment, student entrepreneurial motivations scale (based on the Society for Associated Researchers on International Entrepreneurship – SARIE), and an adapted version of the Carland entrepreneurship index. Our results point indirect effects of the entrepreneurial universities on entrepreneurial intention by the entrepreneurial motivations of the students to become an entrepreneur. This study showed the importance of analyzing, fostering, and investing in entrepreneurial education in the HEIs to achieve a more entrepreneurial level, due to the interesting positive direct and indirect impact on the entrepreneurial motivations and entrepreneurial intention of the students.

Keywords: entrepreneurial education; innovative higher education institutions (HEI); students' entrepreneurial intention; students' entrepreneurial motivations

JEL Code: M13

INTRODUCTION

Entrepreneurship education has become essential to respond to an increasingly competitive local and global market. Thus, assuming that each individual can be proactive and develop entrepreneurial behaviors as long as the environment provides favorable stimuli, entrepreneurship education must be seen as a viable path. The teaching-learning process will provide young people with the knowledge and skills to facilitate their integration into the job market.

Given the importance of entrepreneurship education, this study explores higher education students' perceptions of entrepreneurship education in Portugal, the influence of entrepreneurship education on students' entrepreneurial intentions and motivation, as well as the association between their entrepreneurial intention and entrepreneurial motivation.

ENTREPRENEURSHIP AND HIGHER EDUCATION INSTITUTIONS (HEIS)

A nation's prosperity and dynamism depend largely upon the competitive capacity of its organizations and this, in turn, relies on the capabilities of their entrepreneurs and managers (Cuervo, Ribeiro, & Roig, 2007). The entrepreneurial function involves the discovery, assessment, and exploitation of new opportunities, that is, the creation of new organizations or organizational strategies and the exploration of new markets with innovative products and inputs for new economic activities (Reynolds, 2005; Shane; Venkataraman, 2000).

Universities have an increasingly important role because of their impact on knowledge and on the entrepreneurial economy (Audrescht, 2009). The main activities of universities are knowledge transfer (teaching) and knowledge creation (research). However, universities have had to adapt to the environmental conditions and to assert their role within the economy, generating new ideas and looking toward future trends (Ratten, 2017), which lead to the creation of entrepreneurial universities (Guerrero, Urbano, Fayolle, Klofsten, & Mian, 2016).

Entrepreneurship is a key driving force of a nation's economic development (Liu, Lin, Zhao, & Zhao, 2019). The literature highlights the role of education in the diffusion of entrepreneurship to build up a more entrepreneurial society (Baptista, Carvalho, Mónico, & Parreira, 2019). Entrepreneurship education has proven to play an important role in the prosperity of any university, economy, or region (Baptista et al., 2019; Volkmann, 2004). Entrepreneurship education in HEIs intends to develop students' entrepreneurial competencies, motivations, and intentions (Wang, Yueh, & Wen, 2019). Students who receive an entrepreneurship education are more likely to have higher entrepreneurial intention than those who did not receive it (Gerba, 2012; Volkmann, 2004; Zarate-Hoyos & Larios-Meoño, 2015). Thus, universities, more than just generating knowledge and human resources, increasingly occupy an entrepreneurial role in the business sector by creating innovative small businesses and becoming a stakeholder in socio-

economic development (Ivanova & Leydesdorff, 2014), which confirms their key role in entrepreneurship.

To Minola, Domina, and Meoli (2016), entrepreneurial universities emerged as a new archetype of an education institution that seeks to create and transfer knowledge, contributing to the development of local economies and empowering individuals. Pinheiro and Stensaker (2013) state that the entrepreneurial university/academia, being an organizational archetype, is characterized by the adoption of new structural arrangements that aim at greater internal collaboration (coupling) and foster external partnerships (bridging).

The entrepreneurial university is a fundamental concept, not only for the teaching and research part of it, but also for the mission of getting involved in socio-economic development. The great advantage of universities is their ability to produce students with innovative ideas, talents, and skills. Students not only represent the new generations of professionals but also can become entrepreneurs, contributing to job creation and economic growth (Ranga & Etzkowitz, 2013).

Wang, Yueh, and Wen (2019) stress the importance of entrepreneurship education in HEIs to develop students' entrepreneurial intention and competencies. Empirical studies have shown a significant association between entrepreneurship education and entrepreneurial intentions (Hattab, 2014; Hussain & Norashidah, 2015; Ibrahim, Bakar, Asimiran, Mohamed, & Zakaria, 2015). Entrepreneurial intention is a desire to do productive activities effectively, directing individuals to use relevant concepts of new business (Mahendra, Djatmika, & Hermawan, 2017). Through the students' involvement in experiential learning (Robinson, Neergaard, Tanggaard, & Krueger, 2016), the meaning of action, reflections, and experience are developed (Hagg & Kurczewska, 2016). Basardien, Friedrich, and Twum-Darko (2016) argued that entrepreneurship education improves students' achievement orientation.

Liu, Lin, Zhao and Zhao (2019) conducted a study in a sample of 327 college students in China. They intended to analyze the effects of college students' entrepreneurship education and self-efficacy on their entrepreneurial intention. The results showed that entrepreneurship education had a positive effect on their entrepreneurial intention. Athayde (2009) also found a positive influence of education programs on the students' entrepreneurial potential, demonstrating the need to evaluate the relationship between these constructs.

Innovative HEIs need entrepreneurship education to promote entrepreneurial competencies and entrepreneurial intention in their students. According to the theory of planned behavior (Ajzen, 2005), an individual behavioral intention is influenced by his or her attitude, subjective norms, and perceived behavioral control toward performing the behavior, so entrepreneurial intention can be trained and developed through entrepreneurship education. Although Ogbari, et al., (2018) believe that the number of entrepreneurship education programs is increasing, their impact is under-researched and studies have shown an unclear picture of the impact of entrepreneurship education. With the creation of the HEInnovate model, a self-assessment tool for HEIs, it is now possible to explore the entrepreneurial and innovative potential of HEIs. The HEInnovate was created in 2015 by the European Commission, inspired in UBForum 2011. This interesting model highlights the key role of universities in teaching entrepreneurship,

showing the incredible impact of entrepreneurship education and training on students (Global Entrepreneurship Monitor [GEM], 2004; 2016; 2017). The European Commission challenges HEIs to answer the following question: How innovative is your HEI? HEInnovate has the simple purpose of helping HEIs identify their current situation and potential areas for action in seven broad areas, under which are the statements for self-assessment. In this study, we decided to use these seven dimensions, which are a group of aggregate statements for each self-assessment dimension. According to HEInnovate (www.heinnovate.eu retrieved on September 8, 2020), these seven dimensions are essential for a HEI to be considered an innovative institution:

1. Leadership and governance. These are crucial characteristics to develop an entrepreneurial and innovative culture in HEIs. To consolidate the entrepreneurial agenda of HEIs, some factors need to be considered. Entrepreneurship must be a major part of the HEI's strategy, and the HEI should be a driving force for entrepreneurship and innovation in regional, social, and community development.
2. Organizational capacity: Funding, people, and incentives. The organizational capacity of a HEI drives its ability to deliver its strategy effectively. For this purpose, HEIs should have the capacity and culture to build new relationships and synergies across the institution, and their entrepreneurial objectives should be supported by a wide range of sustainable funding and investment sources.
3. Entrepreneurial teaching and learning. This dimension involves developing innovative teaching methods and stimulating entrepreneurial mindsets. It is not only learning about entrepreneurship and innovation but also getting exposed to entrepreneurial experiences and acquiring skills and competencies to develop entrepreneurial mindsets.
4. Preparing and supporting entrepreneurs. An innovative HEI should help students, graduates, and staff to start a business as a career option and to reflect on their objectives, aspirations, and intentions. The HEI should also contribute to finding team members for the new businesses and getting access to financing and effective networks.
5. Knowledge exchange and collaboration. This dimension is really important for organizational innovation, advancement of teaching and research, and local development. Among other things, HEIs should be committed to collaboration and knowledge exchange with the industry, the public sector, and society, as well as have strong links with incubators, science parks, and other external initiatives.
6. The Internationalized institution. The design and delivery of education, research, and knowledge exchange should have an international or global dimension and work as a vehicle for change and improvement. Internationalization introduces alternative ways of thinking, challenges traditional teaching methods, and opens our governance and management to external stakeholders.
7. Measuring impact. Finally, the HEI should be capable of measuring and understanding the impact of changes they bring about in their institution. Since impact measurement in HEI remains underdeveloped, this section wants to identify the areas where an institution might measure the impact of its activity. (HEInnovate, 2017)

Since the organizational, economic scenario is a never-ending story, universities could be the source of innovative ideas and projects. To do so, it will be necessary to create a culture of entrepreneurship, which encourages and supports students to become entrepreneurs. Education can help develop an entrepreneurial personality, which brings us to the fundamental question: accept this is fundamental to develop the education for entrepreneurship, where HEIs play a determinant role in promoting the entrepreneurial spirit.

MOTIVATIONS TO BECOME AN ENTREPRENEUR

Knowing the factors that motivate an individual/student to become an entrepreneur is essential for individuals to adopt entrepreneurial behaviors (Farhangmehr, Gonçalves, & Sarmento, 2016; Kuratko, 2005; Storen, 2014). The identification of entrepreneurial motivations also creates the opportunity to improve policies and programs to support and promote entrepreneurship (Hessels, Van Gelderen, & Thurnik, 2008). Motivation depends on an individual's ambition, internal motives, and values (Driessen & Zwart, 2007), thus it is important to identify what 'triggers' entrepreneurship. A great deal of knowledge and capabilities are worthless without motivation.

The need for realization is one of the most studied theories, and it is based on McClelland's human motivation theory (1961). According to this theory, the drive for achievement is reflected in the ambitious people who start new organizations. This type of motivation helps create a business-level entrepreneurial activity. According to Pereira (2011) and Parreira and colleagues (Parreira, Pereira, & Brito, 2011), the acquisition of knowledge may motivate students to start their own business. Individuals participate in entrepreneurial activities for several reasons such as the need to explore a perceived business opportunity, which GEM calls an 'entrepreneurial opportunity' (GEM, 2004), prestige, need to be accepted and recognized, to earn status in society, family, and the will to learn. Shanker and Astrachan (1996) also highlight family businesses, which seem to be major sources of job creation in the labor markets.

Motivation is a product of the individual's expectancy that a certain effort will lead to the intended action (Vroom, 1964, as cited in Sánchez & Atienza-Sahuquillo, 2017). Several authors (e.g., Mónico et al., 2018; Naffziger, Hornsby, & Kuratko, 1994) believe that the process that leads to entrepreneurial intention and behavior is also partly described by entrepreneurial motivation. It is primordial to improve the motivations at the entrepreneur level, so that policies can be adapted and effective programs can be created to support and promote entrepreneurship (Hessels et al., 2008).

According to Parreira et al. (2015), both researchers and academics need to identify an individual' motivation to become an entrepreneur, rather than only identifying the typical personality traits of entrepreneurs.

In Portugal, a study with higher education students (Parreira, Pereira, & Brito, 2011) showed that the most common reasons for becoming an entrepreneur were 'to continue to learn,' 'entrepreneurship makes sense for life,' 'give security to the family,' and 'be innovative and aware of new technologies.' This same study conducted a principal component analysis and concluded that the main motivations were associated with four factors: family security, prestige, independence and material assets, and the realization and implementation of an opportunity. Later, Parreira, et. al., (2011) created the 'Students' entrepreneurial motivations scale: Motivations to become an entrepreneur,' composed of four factors: 'familial and societal achievement, resources and income, prestige, and learning and development'.

Given that the literature on entrepreneurship focuses mainly on the variables 'motivations to become an entrepreneur' and 'entrepreneurial intention', students will not only have to receive entrepreneurship education (so that they can pursue a career in this field), but also demonstrate the intention and the motivation to become entrepreneurs.

ENTREPRENEURIAL INTENTION

Entrepreneurial intention is the desire of individuals to become entrepreneurs, the drive to take risks and seize opportunities (Parreira et al., 2011). Santos, Caetano, and Curral (2010) define entrepreneurial intention as an individual's disposition to engage in entrepreneurial actions.

From Krueger's and Brazeal's (1994) perspective, entrepreneurial intention should come before the real entrepreneurial behavior. Without the intention, it is harder to develop and stimulate the entrepreneurial behavior in individuals. For the same authors, entrepreneurial intention stands on three pillars: perceived feasibility, propensity to act, and perceived desirability.

Carland, Carland, and Hoy (1992) showed that entrepreneurship is an individual drive toward entrepreneurial behavior. Later, Carland, Carland, and Ensley (2001) argued that entrepreneurship is composed of four elements, namely cognition, preference for innovation, risk-taking propensity, and strategic posture, and that these elements combined produce a drive to create entrepreneurial ventures. Thus, they created an instrument to measure the individual's proclivity to entrepreneurship in these four factors, resulting in the entrepreneurial intention.

For Baum, Frese, Baron, and Katz (2007), the process to become an entrepreneur is strongly influenced by the individual's characteristics because they are the agents of decisions and actions. Gerry, Marques, and Nogueira (2008) point out the following characteristics as predictors of entrepreneurial intention: the need for self-achievement, initiative, creativity, self-confidence, the 'locus of control,' the propensity for risk-taking, desire for independence and autonomy, and persistence.

Today, the role of HEIs in promoting the entrepreneurial spirit of their students, teachers, and researchers is increasingly evident. Four psychological dimensions separate individuals in terms of building their entrepreneurial intention (Santos, Caetano, & Curral, 2010): (a) psychological competencies, (b) entrepreneurial motivations, (c) management competencies, and (d) social competencies. In each competence, there are also subdimensions: economic motivation, vision, desire for independence, leadership capacity, resource mobilization capacity, entrepreneurial self-efficacy, communication and persuasion capacity, network development capacity, innovation capacity, emotional intelligence, and resilience. Santos et. al., (2010) identified distinctive traits of individuals with entrepreneurial intention, such as emotional intelligence (i.e., the ability to react appropriately to the emotions of others as well as manage one's own), resilience (the ability to stay focused on a goal and the process for achieving it), and innovation capacity (new and dissimilar ideas of entrepreneurs).

Educational level has a strong influence on an individual's entrepreneurial attitude and intention, and education can contribute to creating an entrepreneurial personality (Ribeiro, Gonçalves, & Sousa, 2014). In this way, it is not only important to measure the entrepreneurial intention but also to create mechanisms capable of fostering and developing entrepreneurial mindsets, highlighting the role of HEIs as promoters of entrepreneurship among students. Galloway and Kelly (2009) argue that urgency of entrepreneurial intent, access to entrepreneurial role models, and desire for economic autonomy are also good predictors.

According to Panc (2015), the complex and accurate measurement of entrepreneurial intention requires a flexible methodology that could investigate the complex constructs inherent to entrepreneurial intention. After comparison with the dimensions identified by Arthur, Day, McNelly and Edens (2003), Panc (2015) proposed the following dimensions that should be considered when measuring entrepreneurial intention: (a) problem solving (ability to effectively collect, understand, and analyze technical and professional information); (b) organizing and planning (ability to organize his/her and others activities and to make plans in a structured manner); (c) influencing others (ability to convince others based on his/her convictions and to assume group coordination); (d) consideration/awareness of others (the individual takes into account the implications and impact of his/her decisions and actions); (e) communication (ability to transmit oral and written information in a clear and effective way); (f drive (ability to maintain a high energy level and performance standards); and (g) stress tolerance (ability to remain efficient in several scenarios).

To sum up, several authors refer to similar dimensions or characteristics of entrepreneurial intention, which can be organized into three broader categories: social capacities, characteristics of the individual, and characteristics of the environment. The category of social capacities includes leadership, communication, persuasion, planning, power, and capacities. The category of the characteristics of the individual includes emotional intelligence, the desire for independence/autonomy, creativity, motivation/drive, and the ability to cope with stress. Finally, the category of the characteristics of the environment includes aspects such as education and access to entrepreneurial role models. It is not only important to identify and measure entrepreneurial intention, but also to encourage and foster it. HEIs play a key role given their influence and their capacity to create and develop young entrepreneurs.

Entrepreneurial motivation and entrepreneurial intention seem to be two good predictors of a future entrepreneurial career, but what is the relationship between them? Will this motivation increase entrepreneurial intention? Or will entrepreneurial intention increase entrepreneurial motivation? And what is the influence of entrepreneurship education in HEIs on students' entrepreneurial intention and motivation to become entrepreneurs? In this study, we will further explore these relationships to better understand them.

METHOD

Sample

A snowball sampling method was used. Students were selected from the University of Coimbra (n = 790), Portugal, but also from other Portuguese higher HEIs (n = 176): Universidade Autónoma de Lisboa, University of Beira Interior, University of Aveiro, University of Évora, University of Lisbon, University of Minho, University of Porto, Universidade Nova de Lisboa, Universidade Portucalense, Universidade Católica Portuguesa – Campus Porto, Escola Superior Agrária de Coimbra, Estoril Higher Institute for Tourism and Hotel Studies, Polytechnic Institute of Coimbra, Polytechnic Institute of Lisbon, Polytechnic Institute of Leiria, Higher Institute of Accounting and Administration, Instituto Superior Técnico, University Institute of Lisbon, and Instituto Superior de Engenharia do Porto. In this sample, 72.6% were female students (701) and 27.4% were male students (265). More than 877 (90.8%) students are single or divorced, and 85 (8.8%) are married or in non-marital relationships. In what concerns nationality, 91.9% are Europeans, 1.8% are Africans, 6.1% are South-Americans, and 0.2% are Asians. The majority are university students (95%), 22.8% of whom are working students. Regarding the program, 30.4% are undergraduate students, 53.3% are integrated master students, 9.8% are non-integrated master students, 5.9% are Ph.D. students, and 0.5% are postgraduate students.

Table 1.

Characterization of the sample (n = 966 students)

	Total sample			
	M	SD	n	%
Age	23.82	6.725	966	100
Gender				
Male			701	27.4
Female			265	72.6
Marital status				
Single/Divorced			877	90.8
Married/Non-marital relationship			85	8.8
Nationality				
European			888	91.9
African			17	1.8
South-American			59	6.1
Asian			2	0.2
Education Institution				
University			918	95.0
Polytechnic institution			45	4.7
Other			3	0.3
Type of program				
Undergraduate			294	30.4
Integrated master			515	53.3
Master			95	9.8
PhD			57	5.9
Postgraduate			5	0.5
Year of program				
1			112	11.6
2			210	21.7
3			309	32.0
4			149	15.4
5			186	19.3

Continues

Table 1 (continued)

Student status		
Full-time student	746	77.2
Working student	220	22.8

Data analysis

Data were analyzed using IBM SPSS and AMOS (IBM Corp, 2013). Missing values were replaced through the series mean method. An exploratory factor analysis (EFA) was performed using PCA, with VARIMAX rotation (Kaiser's normalization), given that independent factors were expected. Confirmatory factor analysis (CFA) was carried out using AMOS, with the maximum likelihood estimation method. The skewness and kurtosis values were used to test the normality of the variables. Skewness and kurtosis values indicate a normal distribution, $Sk < 1.5$ and $|Ku_{univariate}| < 2$.

Goodness of fit was analyzed using NFI (normed fit index, good fit > .80, Schumacker & Lomax, 2016), SRMR (standardized root mean square residual; good fit < .08; Brown, 2015), TLI (Tucker-Lewis index, good fit > .90, Brown, 2015), CFI (comparative fit index, good fit > .90, Bentler, 1990; Bentler & Dudgeon, 1996), and RMSEA (root mean square error of approximation < .05, acceptable fit < .08; Kline 2011; Schumacker & Lomax, 2016).

Modification indices (MI) were used to determine how the fit of the model could be improved (Bollen, 1989), and we considered freeing the parameters with higher MI on each factor. We followed Arbuckle (2013) and set statistical significance at $p < .001$ to analyze the MI. The bootstrap method was used to test the statistical significance of indirect effects (mediation model) based on 2,000 bootstrap samples.

Internal consistency was assessed by Cronbach's alpha coefficient, both for the global scale and its dimensions. We followed Nunnally and Bernstein (1994), who consider internal consistency coefficients higher than .60 as acceptable reliability indicators. Composite reliability and average variance extracted (AVE) for each factor were calculated as described in Fornell and Larcker (1981). Pearson's correlations were used to determine the associations between factors. Effect sizes were classified according to Cohen (1988). A significance level of $\alpha = .05$ for Type I error was set for all the analyses.

Instruments

The questionnaire used in this study included the following measurement instruments: HEInnovate self-assessment scale; Carland entrepreneurship index; scale of personal motivations and factors that facilitate entrepreneurship; and sociodemographic questionnaire (higher education institution, program, gender, age, nationality, marital status).

Scale of personal motivations and factors that facilitate entrepreneurship

A 15-item questionnaire about motivations to become an entrepreneur and facilitating factors regarding entrepreneurship (Parreira et al., 2011) was used. This questionnaire consists of four dimensions: F1 — 'Family and societal achievement motivations' (3 items; e.g., 'give security to my family'); F2 — 'Resources and income motivations' (4 items; e.g., 'desire to have high profits'); F3 — 'Prestige motivations' (4 items; e.g., 'raise my position in society'), and F4 — 'Learning and development motivations' (4 items; e.g., 'be innovative and well-informed about new technologies'). Respondents rated each item on a 5-point Likert scale measuring the degree of importance of the motivations to become entrepreneurs (from 1 — 'Not at all important' to 5 — 'Very important').

The CFA showed a good fit (NFI = .871) and an acceptable fit (CFI = .885, TLI = .851, and RMSEA = .083). The scale also showed discriminant validity and reliability: AVE ≥ .50 (Bagozzi & Yi, 1988) and CR ≥ .70 (Hair, Anderson, Tatham, & Black, 2008). Cronbach's alpha coefficients were greater than .70, indicating an acceptable internal consistency.

Carland entrepreneurship index

This scale includes an adapted version of the 33-item Carland entrepreneurship index (Carland, Carland, & Hoy, 1992). Instead of using a binary scale with antagonistic perspectives, we chose a Likert scale (from 1 — 'Not at all important' to 5 — 'Very important') that assesses students' entrepreneurial intention. An EFA was performed because the original Carland entrepreneurship index was adapted, with 50% of the randomly selected sample. Previously, we checked the requirements for a reliable interpretation of PCA. The ratio of individuals/items was 14.24, pointing to a reliable use of PCA. The Kaiser-Meyer-Olkin (KMO) was greater than .70 (KMO = .859), showing sampling adequacy. The Bartlett's test of sphericity was $X^2(465) = 2942.75$, $p < .001$, showing that the correlation matrix differs from the identity matrix. For eigenvalue > 1, two factors were extracted: F1 — 'Judging-Perceiving' (18 items; e.g., 'I am responsible for thinking and planning the business') and F2 — 'Thinking-Feeling' (4 items; e.g., 'I consider myself an imaginative person'). CFA of this two-factor solution, with the second part of the randomly selected sample, revealed a good fit considering NFI = .822 and an acceptable fit for CFI = .845, TLI = .851, SRMR = .063, and RMSEA = .074. The scale had high reliability (α = .89), composite reliability (CR = .91), and AVE = .30 (α = .88, CR = .88, AVE = .28 for 'Judging-Perceiving'; α = .76, CR = .76, AVE = .38 for 'Thinking-Feeling').

HEInnovate

The HEInnovate self-assessment scale was used for students to assess the entrepreneurial level of their universities. The tool included 37 items across seven dimensions. Students assessed their university using a scale ranging from 1 ('totally disagree') to 5 ('totally agree'). The seven dimensions of this scale are: F1 — 'Leadership and governance' (5 items; e.g., 'entrepreneurship is an important part of my university's strategy'); F2 — 'Organizational capacity' (5 items; e.g., 'business goals are supported by a wide range of sustainable financing and investment sources');

F3 – 'Entrepreneurial teaching and learning' (5 items; e.g., 'the university offers several formal learning opportunities to develop entrepreneurial skills'); F4 – 'Preparing and supporting entrepreneurs' (6 items; e.g., 'the university emphasizes the value of entrepreneurship'); F5 – 'Knowledge exchange and collaboration' (5 items; e.g., 'the university is committed to collaborating and sharing knowledge with the industry, the public sector, and society'); F6 – The internationalized institution (5 items; e.g., 'internationalization is an important part of the university's entrepreneurial agenda'); and F7 – 'Measuring impact' (6 items; e.g., 'the university regularly assesses the impact of its entrepreneurial agenda').

CFA was performed to test the fit of the seven-factor solution. This solution revealed a good fit: NFI = .924, CFI = .953, TLI = .947, SRMR = .033, and RMSEA = .057. The scale presented high reliability (Nunnally & Bernstein, 1978), composite reliability (CR ≥. 70), and AVE ≥ .50, α = .98, CR = .99, AVE = .71; α = .93, CR = .92, AVE = .70 for 'Leadership and governance'; α = .90, CR = .88, AVE = .60 for 'Organizational capacity'; α = .93, CR = .93, AVE = .72 for 'Entrepreneurial teaching and learning'; α = .95, CR = .94, AVE = .74 for Preparing and supporting entrepreneurs; α = .94, CR = .94, AVE = .75 for 'Knowledge exchange and collaboration'; α = .92, CR = .92, AVE = .68 for 'The internationalized institution'; and α = .95, CR = .95, AVE = .78 for 'Measuring impact'.

RESULTS

Table 2 shows the internal consistency values, the means, standard deviations, and the correlations between personal motivations and factors that facilitate entrepreneurship, the Carland entrepreneurship index, and the HEInnovate scale, along with their respective factors.

Regarding the scale of personal motivations and factors that facilitate entrepreneurship, the mean of the answers was M = 3.56 (SD = .52), indicating that, overall, the students' mean scores are close to option 4 = 'agree,' indicating a level of motivation to become entrepreneurs above the intermediate point of the scale. The factor with the highest mean score was F4 – 'Learning and development motivations', followed by F1 – 'Family and societal achievement motivations', the F3 – 'Prestige motivations', and, finally, F2 – 'Resources and income motivations'. The Carland entrepreneurship index indicated the students' entrepreneurial intention (mean score closer to 4 = 'important'), showing the highest mean for F2 – 'Thinking-Feeling'. Finally, in the HEInnovate self-assessment scale, we can observe a mean of M = 2.95 (SD = .78), which means that students considered their university as moderately entrepreneurial. The highest score on this scale was in F6 – 'The internationalized institution', and the lowest score was found in F4 – 'Preparing and supporting entrepreneurs'.

Table 2 also contains the correlation matrix. We found a moderate association (.30 ≤ r < .50; Cohen, 1988) between the scale of personal motivations and factors that facilitate entrepreneurship and the Carland entrepreneurship index. The relations between the remaining global scores were weak (.10 ≤ r < .30; Cohen, 1988).

Table 2.

Scale of personal motivations and factors that facilitate entrepreneurship, Carland entrepreneurship index, and HEInnovate self-assessment scale: Descriptive statistics (M, SD), Cronbach's alpha (between brackets), and intercorrelation matrix

	M	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Entrepreneurial motivations to become an entrepreneur:																		
Scale of personal motivations and factors that facilitate entrepreneurship- Global scale (1)	3.56	.52	.79	.58**	.75**	.75**	.52**	.36**	.37**	.20**	.23**	.24**	.23**	.23**	.23**	.19**	.12**	.19**
F1- Family and societal achievement motivations (2)	4.12	.80		.85	.24**	.29**	.13**	.18**	.17**	.15**	.09**	.10**	.09**	.83**	.06	.07*	.11**	.07*
F2- Resources and income motivations (3)	2.88	.80			.67	.40**	.29**	.16**	.19**	.04	.15**	.17**	.15**	.16**	.19**	.12**	.01	.12**
F3- Prestige motivations (4)	3.25	.91				.78	.12**	.31**	.32**	.16**	.13**	.10**	.10**	.11**	.12**	.10**	.10**	.13**
F4- Learning and development motivations (5)	4.13	.61					.63	.30**	.30**	.21**	.27**	.29**	.29**	.27**	.25**	.25**	.12**	.19**
Students' entrepreneurial intention:																		
Carland Entrepreneurship Index - Global scale (6)	3.80	.48						.87	.97**	.59**	.14**	.13**	.13**	.08*	.10**	.12**	.19**	.13**
F1- Judging and perceiving intention (7)	3.76	.51							.86	.40**	.17**	.16**	.17**	.12**	.14**	.14**	.15**	.15**
F2- Thinking and feeling (8)	3.91	.70								.78	.07*	.07*	.03	.02	.02	.05	.19**	.07*
Entrepreneurial education HEInnovate- Global scale (9)	2.95	.78									.98	.88**	.90**	.92**	.92**	.90**	.71**	.89**
F1- Leadership and Governance (10)	2.86	.93										.93	.84**	.82**	.81**	.73**	.51**	.71**
F2- Organizational Capacity (11)	2.90	.91											.90	.86**	.83**	.76**	.51**	.74**
F3-Entrepreneurial Teaching and Learning (12)	2.87	.93												.93	.87**	.80**	.53**	.75**
F4-Preparing and Supporting Entrepreneurs (13)	2.73	.89													.93	.81**	.51**	.79**

Continues

Table 2 (continued)

F5- Knowledge Exchange and Collaboration (14)	3.08	.88	.92	.69**	.76**	
F6- The Internationalized Institution (15)	3.45	.89		.91	.64**	
F7- Measuring Impact (16)	2.83	.84			.1	

Note. ** significant correlation at 0.01 (2-tailed); * significant correlation at 0.05 (2-tailed).

The structural model of the 'influence of the perceived entrepreneurship of the academies on students' motivations to become an entrepreneur and their entrepreneurial intention' allows us to test the effect of the entrepreneurial level of the HEIs perceived by their students (HEInnovate scale) on their entrepreneurial motivations (F1 – 'Family and societal achievement motivations', F2 – 'Resources and income motivations', F3 – Prestige motivations, and F4 – 'Learning and development motivations') and their entrepreneurial intention (Carland index factors: F1 – 'Judging-Perceiving' and F2 – 'Thinking-Feeling').

The test of the quality of the adjustment of several models indicated a mediation model as a better fit. We also assessed the correlation of the measurement errors corresponding to the higher modification indices, concluding that they indicated local adjustment problems (see Figure 1, e1 and e2, e2 and e3, e5 and e6, e6 and e7, e10 and e11). The NFI index obtained – with a value of NFI = .966 – indicated a good fit of the model (Schumacker & Lomax, 2016). The CFI was .973, surpassing the value of .90 proposed in the literature (Bentler & Dudgeon, 1996). The SRMR = .046 indicates a good fit. Concerning the RMSEA, we found the .063 value (90CI of .056 to .071), considered as an acceptable fit indicator (Schumacker & Lomax, 2012), as well as the CMIN/DF obtained, CMIN/57 = 4.82, $p < .001$. Generally, the fit results allow considering that we are facing a model with a good fit.

We found that entrepreneurial education (HEInnovate scale) has no direct effect on students' entrepreneurial intention (R^2 = 0.0% of explained variance, $\beta = .01$, $p > .80$) and a direct effect of R^2 = 9% ($\beta = .30$, $p < .001$) on the motivations to become entrepreneurs. However, the entrepreneurial education scale showed a mediated effect (indirect effect) of $\beta = .162$ (SE = .029) on students' entrepreneurial intention (R^2 = 29%, corresponding to the indirect effect of entrepreneurship in HEI $\beta = .162$ + direct effect of motivations to become entrepreneurs $\beta = .540$). Based on the bootstrap method, the indirect effect was significant ($p = .001$). The random partition of the sample into two subsamples showed stability of the structural model, preserving the significance of the indirect effect of the HEI ($\beta = .173$ in subsample 1, $\beta = .143$ in subsample 2, $p = .001$). According to the mediation model presented in Figure 1, the HEI can only influence students' entrepreneurial intention through motivations to become entrepreneurs.

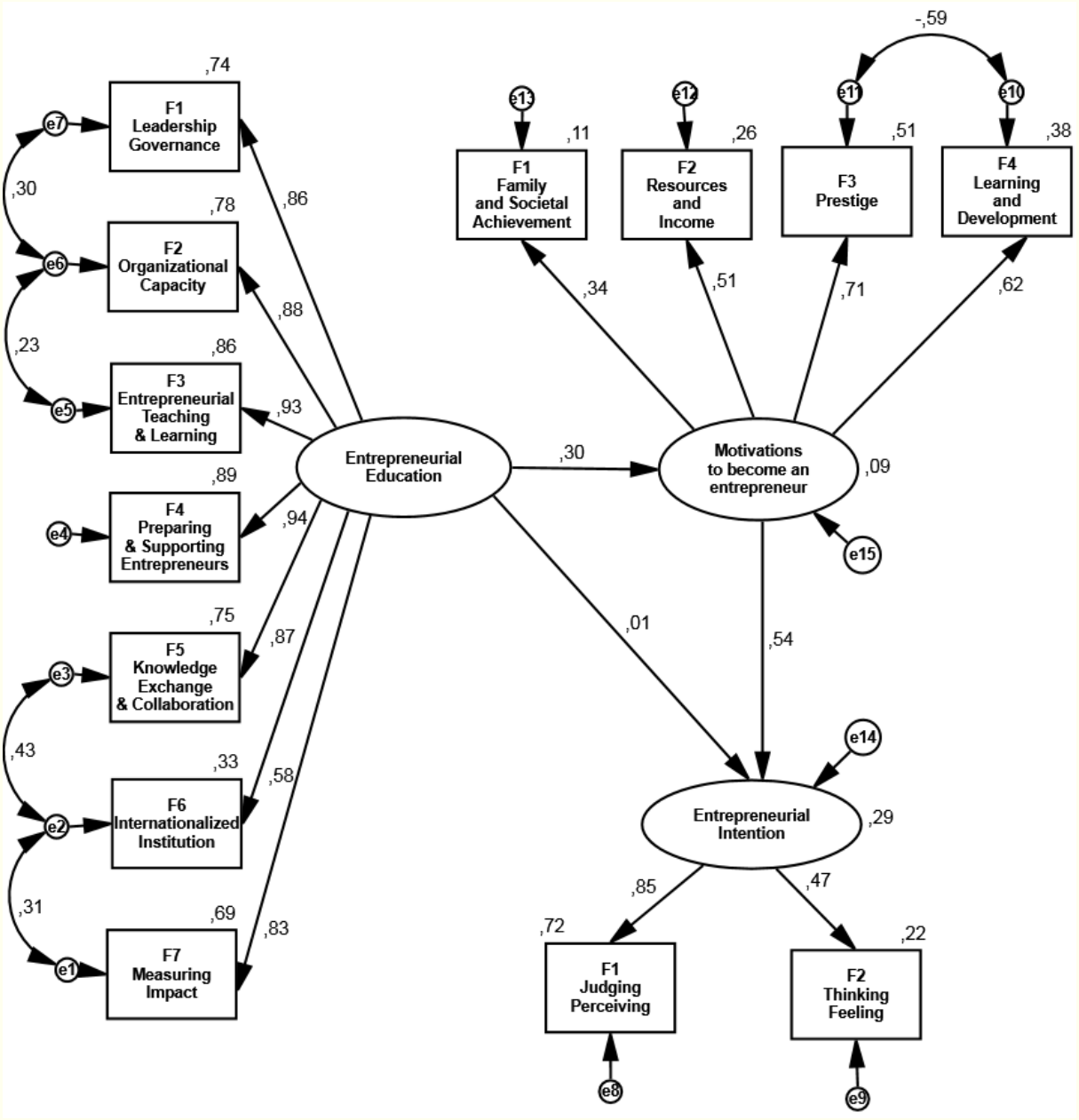

Figure 3. Influence of the perceived entrepreneurial education of the academies on students' motivations to become entrepreneurs and their entrepreneurial intention: Standardized regression coefficients and proportion of explained variance of the estimated structural model

DISCUSSION

This study showed that students perceive their academies as being moderately entrepreneurial, which does not meet the GEM classification for Portugal or Europe (GEM, 2016; 2017), where they are classified with significantly higher scores. However, these results may indicate that the academies are still transitioning between the classical archetype of teaching and research and the

new archetype of entrepreneurial academies that foster and develop entrepreneurial activities. This new archetype was proposed by authors such as Guerrero, Urbano, Fayolle, Klofsten and Mian (2016) and Minola et al. (2016). Thus, the answer to our question can be that students perceive the level of entrepreneurship in their academies as being satisfactory. The question arises as to whether students' perception is related to lack of information, non-involvement in entrepreneurial activities, or the weak dissemination of internal and external activities at the level of entrepreneurship by the academies. Another possibility is that the mindset of HEI professors is still attached to the classic archetype, thus affecting its development.

The results of the means obtained relate to the perception of how innovative their HEI are and how they promote entrepreneurship education, which presented a mean close to the intermediate position of the scale (value 3). The results on the motivations to become entrepreneurs and the results of students' entrepreneurial intention showed a mean close to value 4 of the measurement scale.

Regarding how direct or indirect the effect of entrepreneurial education in entrepreneurial intention was (mediated by motivations to become entrepreneurs), the results showed entrepreneurial motivation as a mediating variable. This mediation model has been supported in the literature by the studies of Khalili, Tojari, and Rezaei (2014), Farhangmehr, Gonçalves and Sarmento (2016), Jakubiak and Buchta (2016), Mahendra, Djatmika and Hermawan (2017), Rengiah and Sentosa (2016), among others. Entrepreneurship education increases the levels of motivation, namely by enhancing learning skills and resources essential to carry out entrepreneurial tasks. In its turn, high levels of entrepreneurial motivation in students create more favorable conditions for a more entrepreneurial intention.

The role of education may not influence students' entrepreneurial intentions due to a lack of motivation or personal characteristics inconsistent with the desire to become entrepreneurs. Motivation to learn and resilience are key. This psychological mechanism manages motivation. Entrepreneurial motivation is considered the energy that encourages the individual to perform activities that meet the needs. Thus, it is expected that students with entrepreneurship education exhibit high motivation (Mahendra, Djatmika, & Hermawan, 2017). Entrepreneurship motivation creates the opportunity to launch new projects, create self-employment opportunities, and/or expand existing businesses (Mónico et al., 2018; Parreira, Santos, Carvalho, & Mónico, 2017). Entrepreneurial motivation is self-encouragement supported by internal or external factors that allow for the growth of entrepreneurial intentions.

Without motivation, one cannot achieve entrepreneurial intention. In this sense, the presence of entrepreneurs in the family has a positive influence on the motivations of family and societal achievement, constituting a motivational model for the entrepreneurial potential of their descendants (Carvalho, Mónico, Silva, & Parreira, 2019). The family can play a key role in motivating entrepreneurship and developing entrepreneurial potential (Almeida & Teixeira, 2014; Altinay, Madanoglu, Daniele, & Lashley, 2012; Carvalho et al., 2019; Mueller, 2006; Shanker & Astrachan, 1996; Zellweger, Sieger, & Halter, 2011).

The studies carried out by Parreira et al. (2011) in a sample of 6,532 students from the areas of health, management, technology, and social sciences from 17 Portuguese higher education institutions focused on personal traits and motivational factors. Findings showed five types of students in terms of entrepreneurial intent: the 'idealists' representing 37% of the students, the 'skeptics' representing 13%, the 'established in life' representing 18%, and the group of the 'disillusioned' who represented 32%, showing that only 55% were motivated to and focused on entrepreneurship.

Hence, academies can develop quality programs in entrepreneurship, but they may not directly affect the development of entrepreneurial intentions for several reasons. Olokundun et al. (2018) highlight the importance of the pedagogical approach implemented in the innovative HEI. Many academies follow traditional methods when teaching entrepreneurship at universities. They favor the use of theoretical approaches, which are less effective in motivation, although there is the possibility of experiencing entrepreneurship through more active methods. First, it is necessary to trigger the 'motivations' to affect entrepreneurial intention positively, so it is necessary to follow active methods.

The study conducted by Mahendra, et al., (2017), "The Effect of Entrepreneurship Education on Entrepreneurial Intention Mediated by Motivation", showed an indirect effect of entrepreneurial education on entrepreneurial intention. The study was conducted with students of the Faculty of Economics, State University of Malang-Indonesia, with 230 students proportionate randomly selected from a sample of 540 students enrolled in entrepreneurial programs. The results revealed that entrepreneurial intention is indirectly affected by entrepreneurship education, meaning that students' entrepreneurial motivation and attitude are two important mediating variables.

Therefore, the results of our research can be explained – entrepreneurship education can have an indirect positive influence on entrepreneurial intentions. To better sustain this indirect effect, we must attend to other aspects not considered in this research that could interfere – the personality traits. Parreira, et al, (2011) consider that entrepreneurial behavior has been associated with personality traits, although there is no consensus in the literature. Although these traits have a high degree of stability and lasting over time and may show a proclivity to act (Rauch & Frese, 2007), they are considered non-cognitive peripheral variables that can facilitate or hinder behavioral action. On the one hand, there are "proactive personalities" (Parreira, et al., 2011, p. 82) with a willingness to initiate a behavior, easily identifying and acting on new opportunities (Rauch & Frese, 2007), and being proactive may be a predictor of the intention to create. On the other hand, we may also be facing personal traits that go in the opposite direction.

Note that entrepreneurial education based on innovative HEIs may come up against the profile of personal traits, constituting an obstacle and, thus, not creating entrepreneurial intentions in students. We also point out that, in this research, we did not contemplate the variable 'personal traits' and its effect was not controlled (it was not the objective of this study), which may explain an indirect effect of the innovative HEI on entrepreneurial intention.

We can affirm that a high level of entrepreneurship and entrepreneurial activities in the academies can lead to greater motivation in students to learn and develop motivations, which, in

turn, in the long run, could lead to a greater interest in entrepreneurial activities and generate a positive impact on the entrepreneurial intention.

To improve entrepreneurial behavior, the individual must have the intention (Krueger & Brazeal, 1994). These authors point out that the motivation to become an entrepreneur can be a precursor of entrepreneurial intention, meaning that the motivations to become an entrepreneur influence entrepreneurial intention. Ipiranga, Freitas, and Paiva (2010) argue that the relationship between government and academies creates the path and fosters the emergence and development of entrepreneurial academies. In light of the triple helix theory (e.g., Etzkowitz & Zhou, 2017; Ivanova & Leydesdorff, 2014; Leydesdorff & Etzkowitz, 1996; Ranga & Etzkowitz, 2013; Redford, 2013), the relationship between the three spheres — namely between government, industry, and institutions of knowledge — can lead to a positive development of entrepreneurship, which, in turn, has become an important factor in the current world economy (Sousa, Mónico, Castilho, & Parreira, 2018).

Entrepreneurial intention is the starting point for students and constitutes a valuable, determining factor for academies that consider themselves innovative. They should make every effort to promote students' entrepreneurial intention so it can be disseminated and accepted among university students (Mahendra, et al., 2017).

LIMITATIONS OF THE STUDY

This study has some limitations, so further studies should be conducted in the future. The main limitation of the study was the convenience sample used. Future studies should use varied and, if possible, multiple samples from different countries, depending on the geographical area targeted by the study. Another limitation relates to the focus of the study, limited to the reality of the HEI. The industries and government were not included. Future research should include these three stakeholders (academia, government, and industry) to understand better the role of each one and their joint work in entrepreneurship.

This cross-sectional study does not allow truly evaluating students' entrepreneurship profile. It is necessary to carry out longitudinal and cohort studies. For instance, a study that compares two samples, one before the European crisis and the other after, would be extremely useful for a better understanding of the variables that affect students' perceptions of entrepreneurship, or even a study with the same objectives but taking into account the COVID-19 pandemic.

Future research

Despite the new findings obtained in this study, some important questions remain unanswered. This study took into account the students' perceptions, so we suggest conducting research that compares students' perceptions of the entrepreneurial activities carried out by academies and their influence on entrepreneurial intention. Also, it would be important to carry out studies that

focus on the effect of personal traits on the relationship between entrepreneurial education and entrepreneurial intention to become an entrepreneur.

In addition, we are aware that the percentages of influence on the structural mediation model are not as high as expected. However, this study can be a starting point to test this taxonomy and bring it as close as possible to reality. We have also to consider the variables of personality and intrinsic motivations since these variables were not studied in this work but can affect students' perceptions.

CONCLUSIONS

The main objective of this study was to evaluate students' perception of the entrepreneurial level of HEI and its impact on their entrepreneurial motivations and entrepreneurial potential. We also intended to assess the influence of students' entrepreneurial motivations to become entrepreneurs on their entrepreneurial potential. The results showed that entrepreneurial motivation is a mediating variable that mediates education in entrepreneurship and entrepreneurial intention.

Entrepreneurial intention is an important variable for entrepreneurship, either as an entrepreneur in his/her own business or as an intra-entrepreneur. Entrepreneurship education in higher education intends to develop students' entrepreneurial competencies and intention to be entrepreneurs. HEI must be proactive in creating entrepreneurship programs that fall under the concept of innovative HEI, offering an environment aligned with the possibility of developing entrepreneurial skills. This study revealed that entrepreneurial intention is not directly affected by entrepreneurship education. It appears that the contribution of entrepreneurship education can enhance students' motivation, which plays an important role as a mediation variable between entrepreneurship education and entrepreneurial intention. More entrepreneurial education generates more entrepreneurial motivation, and more motivation to be an entrepreneur generates more entrepreneurial intention. Despite this result, it is necessary to continue studying the factors influencing students' willingness to innovate, improving their entrepreneurial performance (Liu et al., 2019).

If we intend to create a more entrepreneurial society for economic, cultural, and social sustainability, university students should be provided with an entrepreneurial education that directly promotes their motivations to be entrepreneurs and, indirectly, their entrepreneurial intention, generating value for society.

Implications for practice

Our research revealed that entrepreneurship education plays a very important role in students' entrepreneurial motivations, indirectly affecting entrepreneurial intention. It is important to model the students' profile by providing stimulating programs where active participation is required. Given the technological advances with increasing digitization and shorter life cycles that characterize the continuum of change, entrepreneurial education will be paramount for the new

professional profile. This professional should adapt to the increasingly demanding and changing contexts to provide effective and efficient responses to new challenges creatively and innovatively.

This study demonstrated the importance of investing in entrepreneurial education in the academies. In Portugal, Poliempreende (http://www.poliempreende.com retrieved on September 8, 2020) is an excellent competition that promotes and stimulates entrepreneurial education. It should be extended to other HEI.

The new entrepreneurial university archetype seems to be taking shape. This development will be useful not only for students who will transition from the academia to the job market but also to local economies. Given the current economic situation, it should be stressed that new businesses and entrepreneurial intentions are valuable to all stakeholders. This is also why companies, government, and knowledge institutions should encourage and facilitate entrepreneurial initiatives. It is known that entrepreneurship greatly impacts economic growth.

We believe that this study will help academia better understand students' perceptions of the level of competencies of their academies in entrepreneurial education. This work also shows how these perceptions are reflected in their entrepreneurial motivations and the intention to adopt entrepreneurial actions and become entrepreneurs. Since entrepreneurial education has an indirect effect on students' entrepreneurial intention, it is necessary to intervene in students' entrepreneurial motivations for a positive and significant effect on their entrepreneurial intention.

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