XXIII SEMEAD
Seminários em Administração

novembro de 2020
ISSN 2177-3866

Does the University Ecosystem Stimulate Entrepreneurial Intention?

MATHEUS LEITE DE CAMPOS
UNIVERSIDADE ESTADUAL DE CAMPINAS (UNICAMP)

GUSTAVO HERMÍNIO SALATI MARCONDES DE MORAES
UNIVERSIDADE ESTADUAL DE CAMPINAS (UNICAMP)

ANA CAROLINA SPATTI
UNIVERSIDADE ESTADUAL DE CAMPINAS (UNICAMP)

Agradecimento à orgão de fomento:
The authors ackowledge CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior) support for funding this research (grant number: 001).

DOES THE UNIVERSITY ECOSYSTEM STIMULATE ENTREPRENEURIAL INTENTION?

1. INTRODUCTION

Entrepreneurship is a multivariate phenomenon. On the one hand, it relates to the generation of economic value through the exploitation of opportunities in the form of goods and services (Eckhardt & Shane, 2003). On the other, it is responsible for spawning innovation (Shumpeter, 1934) and new businesses (Gartner, 1985). However, this understanding is tied to the notion of entrepreneurship as a generator of economic results and doesn't fully explain all of its outcomes. Even in scenarios where profit is not the end goal, entrepreneurship has the capacity of connecting individuals, exploring new ways of doing things and setting new paradigms. Thus, one could say it is closely related to making sense of the surrounding environment and changing the *status quo* (Watson, 2013). Although no consensual definition of entrepreneurship exists, it is safe to assume that novelty and change are integral parts of it (Shumpeter, 1934), and as change occurs, we feel it's transformational impact on the economic, social, institutional and cultural structures (Rindova, Barry, & Ketchen, 2009).

Following along these lines, entrepreneurial ecosystems (EEc) are formed when a given set of elements connect to make multidimensional exchanges between them, such as people, resources, technologies, knowledge, information and many more (Acs, Stam, Audretsch, & O'Connor, 2017). As a result, EEcs become arrangements capable of efficiently bearing the fruits of entrepreneurship. Given that among these we find products of innovation and economic gains, it is not a stretch to understand why past cases of successful EEcs (arguably the most famous being the Silicon Valley) have caught the attention of many national governments eager to develop their own. And among the several factors explaining the success of EEcs we find universities (World Economic Forum et al., 2013).

In recent decades, universities went through a paradigm shift (Etzkowitz & Klofsten, 2005; Rothaermel, Agung, & Jiang, 2007). Beyond teaching and researching, these institutions now play a significant role in producing new ideas and generating commercially exploitable knowledge, as well as of serving as hub for innovation (Duruflé, Hellmann, & Wilson, 2018). The establishment of technology transfer offices (TTOs) as supporters of spin-off creation and facilitators of research commercialization (Siegel, Veugelers, & Wright, 2007) is one possible sign of the entrepreneurial times universities find themselves in.

Though embedded in larger EEcs, universities form their own ecosystems, with specific sets of actors and factors for producing entrepreneurial activity (Isemberg, 2010). In this respect, the undergraduate student is surrounded by many elements available for the development of entrepreneurial activity. Mentoring, classes, actual business opportunities and many other resources become more or less available depending on the arrangements of the specific university ecosystem (UE). However, we cannot assume that every student will feel equally motivated to pursue an entrepreneurial career. Likewise, we cannot state that every UE will drive student's entrepreneurial intention (EI) the same way. Thus, how the UE influences student's EI becomes a relevant topic of inquiry.

2. RESEARCH PROBLEM AND OBJECTIVE

The literature has already explored the effects of the UE on student's EI on several occasions. Althought the majority of results point to a positive influence (e.g. Abualbasal & Badran, 2019), this is not consensual. Therefore, despite being safe to say that the UE is, indeed, an influencer of entrepreneurial action and an important predictor of EI, this phenomenon behaves differently between ecosystems and the full extent of the UE's ability to affect student's entrepreneurial

behavior still presents some gaps (Matt & Schaeffer, 2018; D. Watson & Hall, 2015). Furthermore, investigations on this subject have focused on localized contexts, such as specific UEs or relatively small countries. In terms of geographical setting, most studies focus on the European scenario (see Fuster, Padilla-Meléndez, Lockett, & Del-Águila-Obra, 2018; Velt, Torkkeli, & Saarenketo, 2018), while some deal with the Asian context (see Ratang, Blesia, Goldstein, Ick, & Hutajulu, 2016; Shih & Huang, 2017). However, the developing countries scenario, with special emphasis on the Latin American background, is still underexplored (Fischer, Moraes, & Schaeffer, 2019).

With this in mind, the goal of this research is to explore the impact of regional entrepreneurship supportive university ecosystems of a developing country – Brazil – on student's entrepreneurship related behavioral characteristics: entrepreneurial intention and entrepreneurial characteristics (EC). In order to achieve this, we developed a comprehensive model which fits different contexts and reflect their specific characteristics. Therefore, this objective statement unfolds into the following research questions: (I) how does the university ecosystem impacts student's entrepreneurial intention and (II) how does it impacts student's entrepreneurial characteristics?

3. THEORETICAL DISCUSSION

Literature presents the term "anchor tenants" to refer to key actors within an EEc which stimulates active growth and innovation, a role often fulfilled by universities (Colombelli, Paolucci, & Ughetto, 2019). This is partially explained by their capacity to generate insights for future research problems (Audretsch and Link 2017) and the crucial part they play on the creation of high-tech ventures, often being the determinant factor for the technological development of a certain geographical area (Ghio, Guerini, & Rossi-Lamastra, 2019).

On the specific case of the Brazilian higher education context, empirical evidence attests to the importance major universities - particularly federal or state-managed, which are responsible for the bulk of research production (Alves, Quelhas, Silva, & Lameira, 2015) - play in structuring successful ecosystems (Schaeffer, Fischer, & Queiroz, 2018), therefore supporting the notion of acting as anchor tenants. Moreover, according to Brasil Junior's (2019) ranking of entrepreneurial universities, from the 123 ranked institutions, only 6 (4%) Higher Education Institutions (HEIs) were private, thus revealing how much public institutions contribute to the country's entrepreneurial scenario.

Every university possesses elements which will shape the way it produces entrepreneurial activity. Faculty (see Moraes, Fischer, Campos, & Schaeffer, 2020), staff, departments, TTOs etc. are all unique to each institution, which helps to create an identity for the university, one that will deeply affect its reputation among researchers, companies and the general public. Moreover, the policies governing both the internal environment of each institution, as well as the higher education system as a whole, will also affect the way entrepreneurial activity is produced. Furthermore, universities interact with organizations outside of its walls in order to produce commercially exploitable opportunities, which will also shape the way it deals with business ventures (Rothaermel et al., 2007). This notion lends support for the term "university ecosystem".

The definition of UE used in this paper follows along the lines of Miller & Acs (2017), Morris, Shirokova, & Tsukanova (2017) and Rothaermel et al. (2007): an arrangement of elements, pertaining to the sphere of universities and the higher education system in general, which interact with each other and the external environment to produce entrepreneurial activity.

Regarding the manner in which the UE stimulates the entrepreneurship related behavior of students, four specific dimensions must be taken into consideration: (1) perceived educational support (PES); (2) perceived concept development support (PCD); (3) perceived business development support (PBD); and (4) perceived entrepreneurial characteristics development support (ECD).

PES is focused on the traditional role of the university of conveying knowledge and skills to students and providing them with the necessary information for starting an entrepreneurial career (Mustafa, Hernandez, Mahon, & Chee, 2016; Saeed, Yousafzai, Yani-De-Soriano, & Muffatto, 2015). This concept materializes in many forms, spanning from traditional theoretically-based classes to workshops and several other kinds of active interventions dedicated to teaching students the knowledge related to entrepreneurship as a field of both study and practice. PCD, on the other hand, has to do with the transformation of said knowledge into viable business options (Mustafa et al., 2016; Saeed et al., 2015). In this respect, workshops, networking activities with role models from the business world, entrepreneurship related events and the like can have a positive effect.

PBD, by its turn, takes actual venture creation into account by developing financial arrangements for students and supporting businesses from day one (Saeed et al., 2015). It is at this stage that the elements of a UE, such as business incubators (Trivedi, 2016) and funding will pool together to form actual businesses and, in many cases, direct academic spin-offs. According to the literature, these first three dimensions, not only give students an insight into the entrepreneurial routine, but also help promote a shift in mentality, which will ultimately affect their subsequent behavior (Mustafa et al. 2016).

Lastly, the fourth dimension of UE support is ECD, which relates to the development of characteristics related to the entrepreneurial mindset (see Morris, Kuratko, & Cornwall, 2013). By looking at UE using these four dimensions, we take a more analytical approach to the effect of the university on supporting entrepreneurship related behavioral characteristics, thus linking this phenomenon to the way students develop their entrepreneurial self.

3.1. Entrepreneurial intention

Several studies highlight the positive influence that the university and its efforts exert on student's entrepreneurial behavior (Abualbasal & Badran, 2019; Ferrandiz, Fidel, & Conchado, 2018; Morris et al., 2017). A positive environmental influence empowers students to take action and start their businesses, thus becoming full-fledged entrepreneurs (Trivedi, 2016). Nonetheless, there is a strong tendency for research to concentrate on one particular element of the UE, which is entrepreneurial education (EEd).

However, some empirical evidence exists of the contrary effects of the UE on EI, such as discouragement stemming from an increase in risk perception originated from the university's EEd efforts (Barral, Ribeiro, & Canever, 2018; Laguía González, Jaén, Topa, & Moriano, 2019; Nabi, Walmsley, Liñán, Akhtar, & Neame, 2018). This evidence appears less frequently in literature and authors, such as Ahmed, Chandran, & Klobas (2017), have attributed this to exogenous and/or contextual factors. Therefore, the more supportive an UE, the more likely students will engage in entrepreneurial activities (Saeed et al., 2015). So much so that by enhancing institutional and organizational factors and their enablers, academic entrepreneurship as a hole improves significantly (Davari, Emami, Ramadani, & Taherkhani, 2018). In this instance, an entrepreneurship supportive university ecosystem becomes a powerful antecedent to entrepreneurial intention (Laguía González et al., 2019). Hence, our first hypothesis is as follows:

H1: An entrepreneurship supportive university ecosystem has a positive influence on undergraduate student's entrepreneurial intention.

3.2. Entrepreneurial characteristics

It's not enough for a person to know the "tools of the trade". One must acquire an entrepreneurial mindset in order to become a successful entrepreneur (Morris, Kuratko and Cornwall 2013). University "provides an excellent environment for individuals to develop the capabilities others are born with" (Gieure, Benavides-Espinosa, & Roig-Dobón, 2019, p. 1614). That is to say EEd has the double task of teaching entrepreneurship related tools and skills, but also of providing students with the correct framework from which to build their behavior upon (Kuratko & Morris, 2018).

There is much empirical evidence on the positive effects EEd courses or programs have played in teaching skills and instilling the entrepreneurial mindset on students (Abualbasal & Badran, 2019; Ferrandiz et al., 2018). The way students understand entrepreneurship positively affects their intention and the manner in which they behave towards having their own business (Testa & Frascheri, 2015). Therefore, the manner in which EEd is delivered significantly affects the way students assimilate entrepreneurship-related knowledge and ultimately affect their intention (Shahab, Chengang, Arbizu, & Haider, 2019).

Morris, Webb, Fu & Singhal (2013) have shown that different forms (scripts) of teaching entrepreneurship lead to the development of different competencies. Lucas & Cooper (2004), who tested the impact of a one-week entrepreneurship event at the Cambridge-MIT Institute, discovered that the proposed structured intervention had an enhancing effect on student's self-efficacy. Thursby, Fuller & Thursby (2009), by their turn, found that students who undertook a given technology entrepreneurship program were much more aware of their entrepreneurial capabilities than those of the control group, thus seeing themselves as more capable of performing on technology-intensive environments. Therefore, in face of the important role the university plays in constructing student's entrepreneurial mindset and characteristics, our second hypothesis is as follows:

H2: An entrepreneurship supportive university ecosystem has a positive influence on undergraduate student's entrepreneurial characteristics.

Entrepreneurial characteristics can be defined as a conjunction of elements, pertaining to the subject, which affects his or her behavior. There is a set of eight personal traits commonly associated to entrepreneurs: self-efficacy, risk-taking, planning, opportunity recognition, persistency, sociability, innovation and leadership (Moraes, Iizuka, & Pedro, 2018). Entrepreneurial characteristics are in line with the entrepreneurial mindset and have a significant influence on individual's intention to engage in entrepreneurial activity (Saeed et al., 2015).

Empirical evidence exists of the positive relation between entrepreneurial characteristics and EI (Liguori, Bendickson, & McDowell, 2018; Rosique-Blasco, Madrid-Guijarro, & García-Pérez-de-Lema, 2018). Lüthje & Franke (2003) have found that risk taking propensity and internal locus of control are indirectly linked to the entrepreneurial intent, for these are component factors of attitudes toward entrepreneurship. Moreover, Mustafa et al. (2016) found that a proactive personality, another personal characteristic, is positively related to entrepreneurial intention beyond the effects of the environment. Therefore, our third hypothesis is as follows.

H3: Entrepreneurial Characteristics has a positive influence on undergraduate student's Entrepreneurial Intention.

4. METHODOLOGY

The research was developed with the use of multivariate data analysis. According to suggestions from Hair, Hult, Ringle, & Sarstedt (2017), we opted for Partial Least Squares-Structural Equation Modeling (PLS-SEM), as to identify degrees of prediction and explanation of presented constructs. Furthermore, the developed research model contains reflective and formative indicators, and one hierarchical latent variable, which is another reason to use PLS-SEM (Chin & Newsted, 1999; J. F. Hair et al., 2017). On the following sections, we explain the hierarchical model construction and the sample aspect.

4.1. Conceptual model

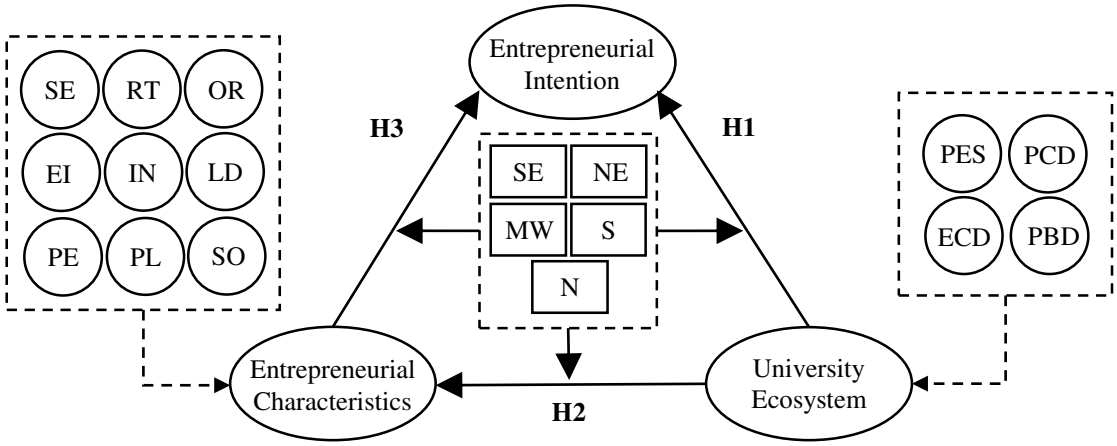
The model presents two hierarchical latent variables, where UE and EC are second order constructs (or High Order Constructs - HOCs) constituted by first order constructs (or Low Order Constructs - LOCs) (Hair, Sarstedt, Ringle & Gudergan, 2018). In this case, relations between the HOCs and the LOCs do not specify dependence, but hierarchy (Becker, Klein, & Wetzels, 2012; Sarstedt et al., 2019), since the HOC does not exist without the LOCs.

Due to the conceptualization and operationalization of the hierarchical model, our research model is classified as one of hierarchical latent variables of a reflexive-formative type (Becker et al., 2012; Chin & Newsted, 1999; Sarstedt et al., 2019). The LOCs constructs are reflexive, while the HOCs constructs are formatives and it fully mediates the influence of the LOCs in the entrepreneurial intention.

Model parameters were estimated by the two-stage approach (Becker et al., 2012; Joseph F. Hair et al., 2018; Sarstedt et al., 2019). On the first stage, the latent variable scores of LOCs were obtained in a model that did not consider the HOC. On the second stage, the latent variable scores obtained in the first stage were used as indicators for the HOCs constructs. The two-stage approach has the advantage of estimating a more parsimonious model, since there is no need to represent LOCs (Joseph F. Hair et al., 2018; Sarstedt et al., 2019), besides being more adequate when the researcher's interest lies only on the relationships between the HOCs (Becker et al., 2012; Sarstedt et al., 2019), which is the case of our model.

Therefore, in our approach, PES, PCD, PBS and ECD are LOCs of the University Ecosystem HOC. Self-efficacy (SE), risk-taking (RT), planning (PL), opportunity recognition (OR), persistency (PE), sociability (SO), innovation (IN) and leadership (LD) are LOCs for the Entrepreneurial Characteristics HOC. The final schematic diagram of the proposed model is presented on Figure 1.

Figure 1. Proposed conceptual model



Note: SE: self-efficacy; RT: risk-taking; OR: opportunity recognition; EI: entrepreneurial intention; LD: leadership; PE: persistency; PL: planning; SO: sociability; ECD: perceived entrepreneurial characteristics development support; PCD: perceived concept development support; PBD: perceived business development support; PES: perceived educational support.

Source: authors' elaboration.

The proposed conceptual model states that the UE influences both the EI of students as well as their EC. Furthermore, EI is also affected by EC, while all of these relations are affected by the regional context to which every university on the sample pertains. Table 1 presents a summarized explanation of the constructs employed on the conceptual model.

Table 1. Latent variables' description

Variable	Description	References
University Ecosystem	An arrangement of elements, pertaining to the sphere of universities and the higher education system in general, which interact with each other and the external environment to produce entrepreneurial activity, in other words, economic development through the commercialization of universities' inventions	Rothaermel et al. (2007), Moraes et al. (2018), Mustafa et al. (2016), Laguía González et al. (2019)
Entrepreneurial Intention	Conscious decision of engaging on a self-owned business venture and planning to do so in the future	Thompson (2009), Mustafa et al. (2016), Moraes et al. (2018)
Entrepreneurial Characteristics	A set of eight personal traits: self-efficacy, risk-taking, planning, opportunity recognition, persistency, sociability, innovation and leadership.	Schmidt & Bohnenberger (2009), Boyd & Vozikis (1994), Saeed et al. (2015), Krakauer et al. (2018), Filion (1994)

Source: authors' elaboration.

The concept of UE used by this research, as already mentioned, goes beyond infrastructure and faculty. It encompasses every action the university performs within its three core functions: education, research and outreach activities (Moraes et al. 2018). Such actions are comprised of courses, training programs, services, workshops, conferences and other similar initiatives (Laguía González et al. 2019).

4.2. Sample

Regarding data collection, undertaken between July and December of 2019, we conducted a single cross-section survey of universities across Brazil's five macro-regions: South (S), Southeast (SE), Midwest (MW), Northeast (NE) and North (N). Differences regarding macro-regional educational contexts were only tested as a control group (thus, we present no hypothesis regarding differences between the Brazilian macro-regions). The universities were selected using the Brasil Júnior (2019) Entrepreneurial Universities Ranking (EUR). We limited the samples to public universities of state or federal management, thus avoiding comparisons with the private context, which could wield in variations to the results.

In order to estimate sample size and statistical power, the G*Power 3.1 software was utilized (as recommended by Faul, Erdfelder, Buchner, & Lang, 2009). The largest number of predictors (arrows that reach a latent variable) is 8. Considering eight predictors, a statistical power of 0.8, a significance level of 5% and an average effect size ($f^2 = 0.15$, which is equivalent to $r^2 = 13\%$), minimum sample size required is 109 valid questionnaires. In order to maintain consistency of results, this minimum was kept for each macro-region. The result of the data gathering procedure is presented in Table 2.

Table 2. Sample aspect

Macro-region	Higher Education Institution	Acronym	EUR rank*	Total valid samples	%	
N	Universidade do Estado do Amazonas	UEA	54th/3rd	144	14.2%	14.2%
NE	Universidade Federal de Campina Grande	UFCG	95th/27th	222	21.9%	21.9%
MW	Universidade de Brasília	UNB	8th/1st	194	19.2%	19.2%
SE	Universidade Estadual de Campinas	UNICAMP	2nd/2nd	191	18.9%	27.3%
	Universidade de São Paulo	USP	1st/1st	85	8.4%	
S	Universidade Tecnológica Federal do Paraná	UTFPR	30th/13th	96	9.5%	17.4
	Universidade Federal do Rio Grande do Sul	UFRGS	4th/1st	80	7.9%	
			TOTAL:	**1.012**	**100%**	**100%**

*Entrepreneurship University Ranking (EUR) 2019. First number refers to the university's overall position. Second number refers to the university's position within its macro region.

Source: research data.

In order to apply the survey, we first contacted the heads of each university's Business Administration departments. We explained our research and thus acquired permission to carry on the intervention with their students. For each university, a key-faculty member was appointed to serve as our focal point, along with a post-graduation student who would be responsible for field work. With the teams set and after a briefing with the post-graduation student, we proceeded to apply the questionnaires and compile the results. The support we received from the universities granted that we were able to sample the five Brazilian macro-regions without having to resort to online questionnaires, which have a tendency to present lower response rates (Lefever, Dal, & Matthíasdóttir, 2007).

5. ANALYSIS OF RESULTS

The analysis of results is composed of three steps: evaluation of: (I) measurement scales, (II) measurement model and (III) structural model.

Regarding the indicators used in the questionnaire, some were created by the researchers, while other were drawn from the literature. Therefore, it is necessary to confirm if the selected items do provide sufficient measurement for the proposed constructs. Therefore, Confirmatory Factor Analysis (CFA) was conducted as to evaluate the psychometric properties of constructs, thus adding to the validity and reliability of results. Therefore, all measures were tested in the same model and restricted to load on their respective factor (Brady & Cronin Jr, 2001).

First, we kept al measures with factor loads equal to 0.7 or above and excluded those bellow 0.4 (as recommended by Hair et al., 2017). For measures scoring within this threshold, our decision involved checking the impact on average variance extraction (AVE) and in composite reliability (CR). If excluding a measure resulted in negative impacts on both of these indicators, then it was removed from the final model. Thus, the SE1, SE5, RT1, IN3, LD1, PE2 and SO3 indicators were excluded. The results of CFA and descriptive analyses can be seen on Table 3.

Table 3. Standardized CFA path loadings and descriptive statistics

Question	Std. Path Loading	Mean	Std. dev.	Critical ratio	P-value
(SE2)	0.766	0.765	0.023	33.742	0.000
(SE3)	0.749	0.748	0.026	29.013	0.000
(SE4)	0.848	0.846	0.014	58.628	0.000
(SE6)	0.552	0.550	0.044	12.494	0.000
(RT2)	0.740	0.739	0.034	21.791	0.000
(RT3)	0.635	0.634	0.044	14.344	0.000
(RT4)	0.771	0.767	0.031	24.637	0.000
(OR1)	0.838	0.837	0.014	57.845	0.000
(OR2)	0.531	0.532	0.034	15.594	0.000
(OR3)	0.773	0.774	0.035	22.165	0.000
(OR4)	0.867	0.867	0.010	88.999	0.000
(EI1)	0.788	0.788	0.017	46.183	0.000
(EI2)	0.817	0.817	0.015	53.79	0.000
(EI3)	0.871	0.871	0.011	77.795	0.000
(EI4)	0.870	0.870	0.010	85.755	0.000
(EI5)	0.860	0.859	0.011	76.738	0.000
(IN1)	0.739	0.733	0.042	17.612	0.000
(IN2)	0.709	0.711	0.039	18.358	0.000
(IN4)	0.720	0.718	0.047	15.185	0.000
(LD2)	0.719	0.717	0.033	21.618	0.000
(LD3)	0.774	0.773	0.033	23.521	0.000
(LD4)	0.727	0.728	0.036	20.366	0.000
(LD5)	0.667	0.664	0.04	16.674	0.000
(PE1)	0.718	0.716	0.031	23.497	0.000
(PE3)	0.804	0.802	0.023	34.675	0.000
(PE4)	0.654	0.654	0.035	18.512	0.000
(PL1)	0.701	0.702	0.035	20.094	0.000
(PL2)	0.759	0.759	0.030	25.476	0.000
(PL3)	0.708	0.701	0.034	21.018	0.000
(PL4)	0.718	0.715	0.033	21.556	0.000
(SO1)	0.654	0.651	0.053	12.425	0.000
(SO2)	0.723	0.720	0.040	18.168	0.000
(SO4)	0.824	0.821	0.029	28.285	0.000
(ECD1)	0.711	0.710	0.025	28.714	0.000
(ECD2)	0.699	0.700	0.024	28.931	0.000
(ECD3)	0.720	0.719	0.023	31.862	0.000
(ECD4)	0.737	0.735	0.022	33..99	0.000
(ECD5)	0.791	0.790	0.015	52.907	0.000
(ECD6)	0.750	0.749	0.018	41.324	0.000
(ECD7)	0.652	0.652	0.025	26.001	0.000
(ECD8)	0.662	0.660	0.030	22.144	0.000
(ECD9)	0.757	0.757	0.021	35.760	0.000
(PCD1)	0.850	0.849	0.021	40.826	0.000
(PCD2)	0.874	0.872	0.021	41.143	0.000
(PCD3)	0.883	0.882	0.016	53.544	0.000
(PCD4)	0.816	0.814	0.028	29.338	0.000
(PBD1)	0.818	0.816	0.037	22.046	0.000
(PBD2)	0.761	0.761	0.047	16.146	0.000
(PBD3)	0.885	0.882	0.021	42.581	0.000
(PES1)	0.762	0.743	0.05	15.324	0.000
(PES2)	0.836	0.825	0.030	27.799	0.000
(PES3)	0.650	0.647	0.055	11.853	0.000
(PES4)	0.625	0.623	0.058	10.751	0.000
(PES5)	0.735	0.735	0.052	14.046	0.000
(PES6)	0.731	0.733	0.054	13.529	0.000

SE: self-efficacy; RT: risk-taking;
OR: opportunity recognition;
EI: entrepreneurial intention;
IN: innovation; LD: leadership;
PE: persistency; PL: planning; SO: sociability;
ECD: perceived entrep. charac. development support;
PCD: perceived concept development support;
PBD: perceived business development support;
PES: perceived educational support;

Source: research data.

Evaluation of the measurement model was done into two parts: first stage and second stage analysis. Initially, convergent and discriminant validity, indicator reliability and internal

consistency were estimated. Convergent validity of the model is also assessed by means of the AVE, which should score above 0.5, and internal consistency measures, which is gauged by the Cronbach's alpha (Hair, Ringle, & Sarstedt, 2011). Moreover, CR was checked for each construct (all scoring above 0.7). Finally, regarding discriminant validity, all indicators are within the acceptable threshold (above 0.7) and can be found in Table 4.

Table 4. Evaluation of the measurement model

Indicators	SE	RT	OR	EI	IN	LD	PE	PL	SO	ECD	PCD	PBD	PES
SE	**0.737**												
RT	0.317	**0.718**											
OR	0.612	0.406	**0.764**										
EI	0.349	0.347	0.593	**0.842**									
IN	0.427	0.425	0.442	0.298	**0.723**								
L	0.435	0.325	0.396	0.175	0.287	**0.723**							
PE	0.455	0.415	0.590	0.409	0.438	0.497	**0.728**						
PL	0.297	0.313	0.385	0.187	0.329	0.445	0.546	**0.722**					
SO	0.343	0.310	0.358	0.205	0.267	0.352	0.363	0.274	**0.737**				
ECD	0.225	0.159	0.282	0.187	0.125	0.269	0.265	0.225	0.234	**0.721**			
PCD	0.058	0.047	0.099	0.040	0.033	0.122	0.080	0.130	0.091	0.596	**0.856**		
PBD	0.063	0.032	0.049	-0.036	-0.004	0.157	0.127	0.114	0.100	0.553	0.630	**0.823**	
PES	0.110	0.021	0.087	0.012	0.021	0.071	0.063	0.119	0.097	0.515	0.690	0.573	**0.726**
Cronbach's Alpha	0.722	0.530	0.756	0.897	0.546	0.696	0.558	0.696	0.589	0.884	0.879	0.761	0.826
Composite Reliability	0.823	0.760	0.845	0.924	0.766	0.814	0.771	0.813	0.779	0.907	0.916	0.863	0.869
Average Variance Extracted	0.543	0.515	0.583	0.708	0.522	0.523	0.530	0.521	0.543	0.520	0.733	0.677	0.528

Note: SE: self-efficacy; RT: risk-taking; OR: opportunity recognition; EI: entrepreneurial intention; LD: leadership; PE: persistency; PL: planning; SO: sociability; ECD: perceived entrepreneurial characteristics development support; PCD: perceived concept development support; PBD: perceived business development support; PES: perceived educational support.

Source: research data.

We conducted second stage model analysis by adding the first stage constructs as new variables to the dataset (as recommended by Hair et al. 2018; Sarstedt et al. 2019). Thus, second stage model takes into account one reflexive construct (EI) and two formative ones (EC and UE). With this, the EI construct was evaluated using the same aforementioned criteria and found all indicators to be within parameters: Cronbach's alpha of 0.898, CR of 0.924 and AVE of 0.710.

Collinearity was assessed using the variance inflation factor (VIF) for each subpart of the model and remained within the established parameters. The significance of indicators, by its turn, was gauged by the Student's t-distribution, which measures the significance of path coefficients. Table 5 presents the value of coefficients between constructs and their respective Student's t (or T statistics) scores.

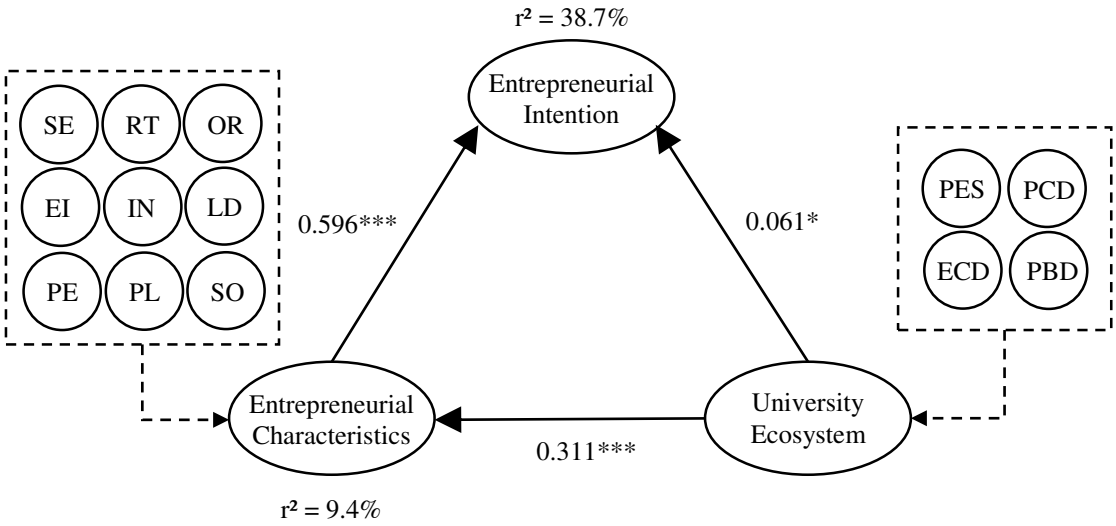
Table 5. Coefficients of the Structural Model – Between Constructs

Path	Sample Mean	Standard Deviation	T-Statistics	P-Values
University Ecosystem → Entrepreneurial Characteristics	0.317	0.036	8.599	0.000
University Ecosystem → Entrepreneurial Intention	0.064	0.030	2.205	0.028
Entrepreneurial Characteristics → Entrepreneurial Intention	0.603	0.025	24.327	0.000

Source: research data.

As can be seen, every T value is above 1.96 (Efron & Tibshiranit, 1994; Hair et al., 2017), thus supporting hypotheses 1, 2 and 3. Calculations also showed that the EI construct presented an r^2 of 0.382 (high effect), and the EC construct presented a r^2 of 0.097 (medium effect). Besides using r^2 to evaluate predictive precision, Q^2, which is an indicator of predictive relevance, was also calculated and it results values above zero (Hair et al., 2017). The complete model resulting from our empirical approach is presented in Figure 2.

Figure 2. Complete empirical model



Note: SE: self-efficacy; RT: risk-taking; OR: opportunity recognition; EI: entrepreneurial intention; LD: leadership; PE: persistency; PL: planning; SO: sociability; ECD: perceived entrepreneurial characteristics development support; PCD: perceived concept development support; PBD: perceived business development support; PES: perceived educational support.

Source: research data.

Consistent with the literature on the topic, the complete empirical model test revealed a positive influence of the UE on student's EI. Furthermore, we found that student's do recognize that the university stimulates the development of a self-owned business, their planning capacity, leadership skills, creativity and planning capacity. However, the other aspects of the UE – PES, PCD and PBD – provide a negative influence on EI, represented by the lack of entrepreneurship subjects and other types of programs. This can be an indicative of too few efforts set in place for encouraging entrepreneurship. As a reflex, student's feel the university underutilizes its resources for putting them into contact with the business world.

Despite the results, these are not consistent throughout the macro-regions. This allows us to conclude that, even though belonging to the same country, the many Brazilian UEs are not homogenous, thus changing from region to region. The conceptual model results also pointed to a second, much stronger influence stemming from the UE towards EC. Although fairly consistent between all macro-regions, the r^2 for the EC construct was relatively low, meaning that this construct is only partially explained by our model, thus receiving influences from the greater entrepreneurial ecosystem within which universities are embedded. Therefore, the analytical model doesn't allow us to state which LOC most contributes with this influence.

Another important find of our research is that EC presents a much stronger influence on EI than UE, which means that student's intention to become entrepreneurs stems much more from their

own characteristics than from the university and its ecosystem. LOC results indicators reveal that risk-taking and opportunity recognition are the prevalent entrepreneurial traits among students, followed by innovation, persistency and sociability. This suggests that students see themselves as persistent individuals, willing to venture and assume a portion of risk in order to make their ideas come to fruition.

6. CONCLUSION

The notion that the university ecosystem is an important factor for stimulating student entrepreneurship is a well-known and studied concept, which found confirmation on our study. The main contribution of this research is to provide a country-wide level analysis of this subject on a developing nation context, thus filling a gap in the literature (Alves, Fischer, Schaeffer, & Queiroz, 2019; Fischer, Moraes, & Schaeffer, 2019; Vodă & Florea, 2019). In this respect, we offer new insights.

In summary, by means of a robust conceptual model and a sample of 1,012 respondents, we have confirmed that the Brazilian university ecosystem influences student's entrepreneurship related behavioral characteristics. Additionally, we've found that said ecosystem has a greater impact on the formation of student's entrepreneurial characteristics than on their entrepreneurial intention. Moreover, from both direct influencers of intention, entrepreneurial characteristics prevails over the university ecosystem.

By using the regions as control group, we were able to identify some variations which indicate that there are other factors coming from the greater entrepreneurial ecosystem in which the university is embedded (as pointed by Wright, Siegel, & Mustar, 2017), also lending favorable arguments for the notion put forth by Gaddefors & Anderson (2017, p. 273) that entrepreneurship is "an event in a flow of changing circumstances", therefore susceptible to changing contexts.

Another find is that Brazilian students consider themselves able to become entrepreneurs, sensitive to new business opportunities and capable of assuming risks beyond safety. They find themselves sociable, persistent and innovative, which are good characteristics for pushing through barriers and forming strong business networks. Furthermore, whereas the r^2 for the entrepreneurial intention construct also varied in the control group, this could also be an indication that students from different university and entrepreneurial ecosystems have different intentions of becoming entrepreneurs.

Knowing about the effect of the university ecosystem on student's entrepreneurial intention and characteristics, our study provides basis for questioning the current model adopted by Brazilian public universities. Far from stating that these are not conducive of entrepreneurial action, we question the effectiveness by which this happens. Our evidences point to the possibility that the stimuli for helping students start their own business is either underexplored or ineffective at all. If it is the former, changes in the entrepreneurship supportive arrangements of the university ecosystem would suffice to better influence student's entrepreneurial intention. However, if it is the latter, then perhaps the university should concentrate its efforts on reinforcing the entrepreneurial characteristics of students, something we found it to perform better at. By doing this, it could redirect its entrepreneurial support mechanisms towards students whose intention arise from their own entrepreneurial characteristics, thus increasing the likelihood of engaging entrepreneurial intention.

Undoubtedly, in order to make such an assertion, we would have to address some limitation of this research. First, we obtained our regional results by means of a select number of higher education institutions. Brazil is a continent-sized country with many different local contexts

and not all states participated on the sample. Therefore, we can expect that a more accurate picture of regional variations could be obtained by broadening the sample. Second, indicators only represent perceptions of Business Administration students, a known bias of this research. Results could benefit from data collection from other courses and universities, thus contributing to the robustness of our findings, especially in terms of the effectiveness of different entrepreneurship push mechanisms. Moreover, we only collected data from public universities. Perhaps the private scenario could yield different results. Third, we could benefit from a better understanding of the regional entrepreneurial ecosystems in which the universities are embedded, which could help explain the differences in student's entrepreneurial intention in more depth and also shed light on the effects the university ecosystem exerts isolated from contextual factors. Therefore, an avenue for future research would be to qualify these many contexts in terms of their barriers and enablers and better fit universities within them, thus providing a much more accurate picture of the reach of university ecosystems.

REFERENCES

Abualbasal, A. M., & Badran, R. E. (2019). Student's attitude towards entrepreneurship at Princess Sumaya University for Technology. In *Journal of Entrepreneurship Education* (Vol. 22).

Acs, Z. J., Stam, E., Audretsch, D. B., & O'Connor, A. (2017). The lineages of the entrepreneurial ecosystem approach. *Small Business Economics*, *49*(1), 1–10. https://doi.org/10.1007/s11187-017-9864-8

Ahmed, T., Chandran, V. G. R., & Klobas, J. (2017). Specialized entrepreneurship education: does it really matter? Fresh evidence from Pakistan. *International Journal of Entrepreneurial Behaviour and Research*, *23*(1), 4–19. https://doi.org/10.1108/IJEBR-01-2016-0005

Alves, A. C., Fischer, B., Schaeffer, P. R., & Queiroz, S. (2019). Determinants of student entrepreneurship: An assessment on higher education institutions in Brazil. *Innovation & Management Review*, *16*(2), 96–117. https://doi.org/10.1108/INMR-02-2018-0002

Alves, A. da S., Quelhas, O. L. G., Silva, M. H. T. Da, & Lameira, V. de J. (2015). On the role of university in the promotion of innovation: Exploratory evidences from a university-industry cooperation experience in Brazil. *International Journal of Innovation and Learning*, *17*(1), 1–18.

Barral, M. R. M., Ribeiro, F. G., & Canever, M. D. (2018). Influence of the university environment in the entrepreneurial intention in public and private universities. *RAUSP Management Journal*, *53*(1), 122–133. https://doi.org/10.1016/j.rauspm.2017.12.009

Becker, J.-M., Klein, K., & Wetzels, M. (2012). Hierarchical Latent Variable Models in PLS-SEM: Guidelines for Using Reflective-Formative Type Models. *Long Range Planning*, *45*(5–6), 359–394.

Boyd, N. G., & Vozikis, G. S. (1994). The Influence of Self-Efficacy on the Development of Entrepreneurial Intentions and Actions. *Entrepreneurship Theory and Practice*, *18*(4), 63–77. https://doi.org/10.1177/104225879401800404

Brady, M. K., & Cronin Jr, J. J. (2001). Some new thoughts on conceptualizing perceived service quality: a hierarchical approach. *Journal of Marketing*, *65*(3), 34–49. https://doi.org/https://doi.org/10.1509/jmkg.65.3.34.18334

Brasil Júnior. (2019). Ranking de Universidades Empreendedoras. Retrieved November 9,

2019, from https://universidadesempreendedoras.org/ranking/

Chin, W. W., & Newsted, P. R. (1999). Structural equation modeling analysis with small samples using partial least squares. *Statistical Strategies for Small Sample Research*, *1*(1), 307–341.

Colombelli, A., Paolucci, E., & Ughetto, E. (2019). Hierarchical and relational governance and the life cycle of entrepreneurial ecosystems. *Small Business Economics*, *52*(2), 505–521. https://doi.org/10.1007/s11187-017-9957-4

Davari, A., Emami, A., Ramadani, V., & Taherkhani, S. (2018). Factors influencing academic entrepreneurship: a case-based study. *Journal of Science and Technology Policy Management*, *9*(3), 284–295. https://doi.org/10.1108/JSTPM-01-2018-0007

Duruflé, G., Hellmann, T., & Wilson, K. (2018). Catalysing entrepreneurship in and around universities. *Oxford Review of Economic Policy*, *34*(4), 615–636. https://doi.org/10.1093/oxrep/gry015

Eckhardt, J. T., & Shane, S. A. (2003). Opportunities and Entrepreneurship. In *Journal of Management* (Vol. 29).

Efron, B., & Tibshiranit, R. J. (1994). *An introduction to the bootstrap*. Chapman & Hall/CRC.

Etzkowitz, H., & Klofsten, M. (2005). The innovating region: toward a theory of knowledge-based regional development. *R&D Management*, *35*(3), 243–255.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160.

Ferrandiz, J., Fidel, P., & Conchado, A. (2018). Promoting entrepreneurial intention through a higher education program integrated in an entrepreneurship ecosystem. *International Journal of Innovation Science*. https://doi.org/10.1108/IJIS-09-2017-0089

Filion, L. J. (n.d.). *Entrepreurship and Management: Differing but Complementary Processes. ENTREPRENEURSHIP AND MANAGEMENT: DIFFERING BUT COMPLEMENTARY PROCESSES*. Retrieved from https://www.researchgate.net/publication/265320781

Fischer, B. B., Moraes, G. H. S. M. de, & Schaeffer, P. R. (2019). Universities' institutional settings and academic entrepreneurship: Notes from a developing country. *Technological Forecasting and Social Change*, *147*, 243–252. https://doi.org/10.1016/j.techfore.2019.07.009

Fischer, B. B., Schaeffer, P. R., Vonortas, N. S., & Queiroz, S. (2018). Quality comes first: university-industry collaboration as a source of academic entrepreneurship in a developing country. *Journal of Technology Transfer*, *43*(2), 263–284. https://doi.org/10.1007/s10961-017-9568-x

Fuster, E., Padilla-Meléndez, A., Lockett, N., & Del-Águila-Obra, A. R. (2018). The emerging role of university spin-off companies in developing regional entrepreneurial university ecosystems: The case of Andalusia. *Technological Forecasting and Social Change*, *141*, 219–231. https://doi.org/10.1016/j.techfore.2018.10.020

Gartner, W. B. (1985). A Conceptual Framework for Describing the Phenomenon of New Venture Creation. *Academy of Management Review*, *10*(4), 696–706.

Ghio, N., Guerini, M., & Rossi-Lamastra, C. (2019). The creation of high-tech ventures in

entrepreneurial ecosystems: exploring the interactions among university knowledge, cooperative banks, and individual attitudes. *Small Business Economics*, *52*(2), 523–543. https://doi.org/10.1007/s11187-017-9958-3

Gieure, C., Benavides-Espinosa, M. del M., & Roig-Dobón, S. (2019). Entrepreneurial intentions in an international university environment. *International Journal of Entrepreneurial Behaviour and Research*, *25*(8), 1605–1620. https://doi.org/10.1108/IJEBR-12-2018-0810

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Thousand Oaks: Sage.

Hair, Joseph F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2018). *Advanced Issues in Partial Least Squares Structural Equation Modeling*. Thousand Oaks: Sage.

Isemberg, D. J. (2010). The big idea: How to start an entrepreneurial revolution. *Harvard Business Review*, 12. https://doi.org/10.1353/abr.2012.0147

Joseph A. Shumpeter. (1934). *The theory of economic development*. Cambridge, MA: Harvard University Press.

Krakauer, P. V. de C., de Moraes, G. H. S. M., Coda, R., & Berne, D. de F. (2018). Brazilian women's entrepreneurial profile and intention. *International Journal of Gender and Entrepreneurship*, *10*(4), 361–380. https://doi.org/10.1108/IJGE-04-2018-0032

Kuratko, D. F., & Morris, M. H. (2018). Examining the Future Trajectory of Entrepreneurship. *Journal of Small Business Management*, *56*(1), 11–23. https://doi.org/10.1111/jsbm.12364

Laguía González, A., Jaén, I., Topa, G., & Moriano, J. (2019). University environment and entrepreneurial intention: the mediating role of the components of the theory of planned behaviour. *Revista de Psicologia Social*, *34*(1), 137–167. https://doi.org/10.1080/02134748.2018.1542789

Lefever, S., Dal, M., & Matthíasdóttir, Á. (2007). Online data collection in academic research: Advantages and limitations. *British Journal of Educational Technology*, *38*(4), 574–582. https://doi.org/10.1111/j.1467-8535.2006.00638.x

Liguori, E. W., Bendickson, J. S., & McDowell, W. C. (2018). Revisiting entrepreneurial intentions: a social cognitive career theory approach. *International Entrepreneurship and Management Journal*, *14*(1), 67–78. https://doi.org/10.1007/s11365-017-0462-7

Lucas, W. A., & Cooper, S. Y. (2004). *Enhancing self-efficacy to enable entrepreneurship: The case of CMI's Connections*. Retrieved from http://ssrn.com/abstract=568383

Lüthje, C., & Franke, N. (2003). The "making" of an entrepreneur: testing a model of entrepreneurial intent among engineering students at MIT. *R&D Management*, *33*(2), 135–147.

Matt, M., & Schaeffer, V. (2018). Building Entrepreneurial Ecosystems Conducive to Student Entrepreneurship: New Challenges for Universities. *Journal of Innovation Economics*, *25*(1), 9. https://doi.org/10.3917/jie.025.0009

Miller, D. J., & Acs, Z. J. (2017). The campus as entrepreneurial ecosystem: the University of Chicago. *Small Business Economics*, *49*(1), 75–95. https://doi.org/10.1007/s11187-017-9868-4

Moraes, G. H. S. M. de, Fischer, B. B., Campos, M. L., & Schaeffer, P. R. (2020). University Ecosystems and the Commitment of Faculty Members to Support Entrepreneurial Activity.

Brazilian Administration Review.

Moraes, G. H. S. M. de, Iizuka, E. S., & Pedro, M. (2018). Effects of Entrepreneurial Characteristics and University Environment on Entrepreneurial Intention. *Revista de Administração Contemporânea*, *22*(2), 226–248. https://doi.org/10.1590/1982-7849rac2018170133

Morris, M. H., Kuratko, D. F., & Cornwall, J. R. (2013). *Entrepreneurship Programs and the Modern University*. EDWARD ELGAR PUBLISHING LTD.

Morris, M. H., Shirokova, G., & Tsukanova, T. (2017). Student entrepreneurship and the university ecosystem: A multi-country empirical exploration. *European Journal of International Management*, *11*(1), 65–85. https://doi.org/10.1504/EJIM.2017.081251

Morris, M. H., Webb, J. W., Fu, J., & Singhal, S. (2013). A competency-based perspective on entrepreneurship education: Conceptual and empirical insights. *Journal of Small Business Management*, *51*(3), 352–369. https://doi.org/10.1111/jsbm.12023

Mustafa, M. J., Hernandez, E., Mahon, C., & Chee, L. K. (2016). Entrepreneurial intentions of university students in an emerging economy: The influence of university support and proactive personality on students' entrepreneurial intention. *Journal of Entrepreneurship in Emerging Economies*, *8*(2), 162–179. https://doi.org/10.1108/JEEE-10-2015-0058

Nabi, G., Walmsley, A., Liñán, F., Akhtar, I., & Neame, C. (2018). Does entrepreneurship education in the first year of higher education develop entrepreneurial intentions? The role of learning and inspiration. *Studies in Higher Education*, *43*(3), 452–467. https://doi.org/10.1080/03075079.2016.1177716

Ratang, W., Blesia, J. U., Goldstein, B. L., Ick, M., & Hutajulu, H. (2016). Using the Action Research Process to Design Entrepreneurship Education at Cenderawasih University. *Procedia - Social and Behavioral Sciences*, *228*, 462–469. https://doi.org/10.1016/j.sbspro.2016.07.071

Rindova, V., Barry, D., & Ketchen, D. J. (2009). Introduction to Special Topic Forum: Entrepreneuring as Emancipation. In *Source: The Academy of Management Review* (Vol. 34). Retrieved from https://www.jstor.org/stable/27760015

Rosique-Blasco, M., Madrid-Guijarro, A., & García-Pérez-de-Lema, D. (2018). The effects of personal abilities and self-efficacy on entrepreneurial intentions. *International Entrepreneurship and Management Journal*, *14*(4), 1025–1052. https://doi.org/10.1007/s11365-017-0469-0

Rothaermel, F. T., Agung, S. D., & Jiang, L. (2007). University entrepreneurship: A taxonomy of the literature. *Industrial and Corporate Change*, *16*(4), 691–791. https://doi.org/10.1093/icc/dtm023

Saeed, S., Yousafzai, S. Y., Yani-De-Soriano, M., & Muffatto, M. (2015). The Role of Perceived University Support in the Formation of Students' Entrepreneurial Intention. *Journal of Small Business Management*, *53*(4), 1127–1145. https://doi.org/10.1111/jsbm.12090

Sarstedt, M., Ringle, C. M., Cheah, J. H., Ting, H., Moisescu, O. I., & Radomir, L. (2019). Structural model robustness checks in PLS-SEM. *Tourism Economics*.

Schaeffer, P. R., Fischer, B., & Queiroz, S. (2018). Beyond education: The role of research universities in innovation ecosystems. *Foresight and STI Governance*, *12*(2), 50–61. https://doi.org/10.17323/2500-2597.2018.2.50.61

Schmidt, S., & Bohnenberger, M. C. (2009). Perfil Empreendedor e Desempenho Organizacional. *Revista de Administração Contempo*, *13*(3), 450–467. Retrieved from http://www.anpad.org.br/rac

Shahab, Y., Chengang, Y., Arbizu, A. D., & Haider, M. J. (2019). Entrepreneurial self-efficacy and intention: do entrepreneurial creativity and education matter? *International Journal of Entrepreneurial Behaviour and Research*, *25*(2), 259–280. https://doi.org/10.1108/IJEBR-12-2017-0522

Shih, T., & Huang, Y. Y. (2017). A case study on technology entrepreneurship education at a Taiwanese research university. *Asia Pacific Management Review*, *22*, 202–211. https://doi.org/10.1016/j.apmrv.2017.07.009

Siegel, D. S., Veugelers, R., & Wright, M. (2007, December). Technology transfer offices and commercialization of university intellectual property: Performance and policy implications. *Oxford Review of Economic Policy*, Vol. 23, pp. 640–660. https://doi.org/10.1093/oxrep/grm036

Testa, S., & Frascheri, S. (2015). Learning by failing: What we can learn from un-successful entrepreneurship education. *International Journal of Management Education*. https://doi.org/10.1016/j.ijme.2014.11.001

Thompson, E. R. (2009). Individual entrepreneurial intention: construct clarification and development of an internationally reliable metric. *Enterp. Theory Pract.*, *33*, 669–694.

Thursby, M. C., Fuller, A. W., & Thursby, J. (2009). An Integrated Approach to Educating Professionals for Careers in Innovation. *Academy of Management Learning & Education*, *8*(3), 389–405.

Trivedi, R. (2016). Does university play significant role in shaping entrepreneurial intention? A cross-country comparative analysis. *Journal of Small Business and Enterprise Development*, *23*(3), 790–811. https://doi.org/10.1108/JSBED-10-2015-0149

Velt, H., Torkkeli, L., & Saarenketo, S. (2018). The entrepreneurial ecosystem and born globals: the Estonian context. *Journal of Enterprising Communities*, *12*(2), 117–138. https://doi.org/10.1108/JEC-08-2017-0056

Vodă, A., & Florea, N. (2019). Impact of Personality Traits and Entrepreneurship Education on Entrepreneurial Intentions of Business and Engineering Students. *Sustainability*, *11*(4), 1192. https://doi.org/10.3390/su11041192

Watson, D., & Hall, L. (2015). Addressing the Elephant in the Room: Are Universities Committed to the Third Stream Agenda. *International Journal of Academic Research in Management*, *4*(2), 2296–1747.

Watson, T. J. (2013). Entrepreneurial action and the Euro-American social science tradition: Pragmatism, realism and looking beyond "the entrepreneur." *Entrepreneurship and Regional Development*, *25*(1–2), 16–33. https://doi.org/10.1080/08985626.2012.754267

World Economic Forum, Foster, G., Shimizu Project Leaders, C., Ciesinski, S., Davila, A., Zahoor Hassan, S., … World Economic Forum. (2013). *Entrepreneurial Ecosystems Around the Globe and Company Growth Dynamics*.

Wright, M., Siegel, D. S., & Mustar, P. (2017). An emerging ecosystem for student start-ups. *Journal of Technology Transfer*, *42*(4), 909–922. https://doi.org/10.1007/s10961-017-9558-z