

UNIVERSIDADE ESTADUAL DE CAMPINAS Faculdade de Ciências Aplicadas



ANNE KATHLEEN LOPES DA ROCHA

O AMBIENTE UNIVERSITÁRIO É UMA FONTE DE COMPORTAMENTO EMPREENDEDOR? UMA ANÁLISE REGIONAL EM UM PAÍS EM DESENVOLVIMENTO

IS UNIVERSITY ENVIRONMENT A SOURCE OF ENTREPRENEURIAL BEHAVIOR? A REGIONAL ANALYSIS IN A DEVELOPING COUNTRY

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ABSTRACT

This research focused on evaluating how the supportive university environment for entrepreneurship influences entrepreneurial characteristics and entrepreneurial intention of Business Administration Students enrolled at Amazonas and São Paulo State Universities, as well as analyzing the differences in Amazonas and São Paulo educational contexts. A quantitative methodology was used, in specific the multivariate data analysis with the techniques Confirmatory Factor Analysis (CFA) and Partial Least Squares Structural Equation Modeling (PLS-SEM). Gathered sample has 420 answers from undergraduate students. Results demonstrate that the university environment positively influences the entrepreneurial behavior and intention, but they also indicate the need of a stronger connection with market sector, in order to provide contact with financial and potential clients, as well as a broader range of courses, projects and lectures. Furthermore, Amazonas and São Paulo educational contexts presented a significant difference in the relationship between entrepreneurial characteristics and entrepreneurial intention, whereas a higher influence was found in Amazonas, which demonstrates São Paulo's student lack of propensity to endeavor. Therefore, this study findings can be appropriated by universities managers and policymakers.

Keywords: University environment, Entrepreneurial intention, Entrepreneurial characteristics, Undergraduate students, Business Administration students, Brazil.

RESUMO

O objetivo desta pesquisa foi avaliar como o ambiente universitário de suporte ao empreendedorismo influencia as características empreendedoras e a intenção empreendedora de alunos de Administração, matriculados nas Universidades Estaduais do Amazonas e de São Paulo, bem como analisar as diferenças existentes nos contextos educacionais de Amazonas e São Paulo. A metodologia foi quantitativa, utilizando análise multivariada de dados com as técnicas de Análise Fatorial Confirmatória (AFC) e Modelagem de Equações Estruturais, com Mínimos Quadrados Parciais (MEE-MQP). A amostra coletada foi de 420 universitários. Os resultados comprovam que o ambiente universitário influencia positivamente no comportamento e na intenção empreendedora, porém, indicam a necessidade de uma ligação mais intensa com o mercado, para proporcionar contato com meios financeiros e potenciais clientes, além de uma maior oferta de cursos, projetos e palestras. Além disso, os contextos educacionais do Amazonas e de São Paulo apresentaram uma diferença significativa no relacionamento entre as características empreendedoras e a intenção empreendedora, com influência mais intensa no Amazonas, o que demonstra a falta de propensão dos estudantes paulistas a empreender. Assim, os resultados desse estudo podem ser apropriados por reitores de universidades e formuladores de políticas educacionais.

Palavras-chave: Ambiente universitário, Intenção empreendedora, Características empreendedoras, Estudantes de graduação, Estudantes de Administração, Brasil.

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1. INTRODUCTION

Entrepreneurship is perceived as a method of human action. It is capable to change the way it's lived, worked and played, and transform the courses of the careers built, the shapes of the communities and the evolution of the socio-political and economic systems; where market participants, driving prices, output and input quantities and qualities work towards the value consistent with economic equilibrium. Entrepreneurship becomes even more than a specific set of attributes; it comes to be a widespread driver of social change that encompasses pedagogy, policies and practices (Kirzner, 1997; Sarasvathy & Venkataraman, 2011). Likewise, Davidsson (2016, p. 629) defines entrepreneurship as "the (attempted) creation of new economic activity", which is a more representative definition of the phenomenon and how scholars have been characterizing it over time.

As a research field, this phenomenon unfolds into psychological, organizational, institutional, and economic lenses (Urbano, Aparicio, & Audretsch, 2019). Lopes and Lima (2019) categorized entrepreneurship's comprehensions into: (i) entrepreneurship as a result generator (related to the creation of new businesses, values, products, markets and/or artefacts), (ii) entrepreneurship as a process (regarding the phases to endeavor), (iii) entrepreneurship as the link between individual and opportunity (considering how individuals relate to environment); and (iv) entrepreneurship as actions (regarding the dynamics between internal and external environments, as well as its transformation process concerning the entrepreneurship actors' relation with its local community).

Entrepreneurship has different facets that, in some level, interconnects actors, organizations, institutions and processes that formally and informally coalesce within the local entrepreneurial environment, shaping into an entrepreneurial ecosystem (Mason & Brown, 2014). Isenberg (2011) states that each entrepreneurial ecosystem emerges under a unique set of conditions and circumstances, mostly established by six domains: a conducive culture, enabling policies and leadership, availability of appropriate finance, quality human capital (Educational Institutions and Labor), venture friendly markets for products, and institutional supports.

In this context, university, as an Educational Institution, plays an important role as a disseminating organization and a knowledge-producer, through its training and educational programs; as well as its participation in partnerships, networks and other relationships with public and private organizations (Guerrero & Urbano, 2012; Moraes, Iizuka, & Pedro, 2018). The university influences, both directly and indirectly, the perceptions that students may have on entrepreneurship (Fayolle & Liñán, 2014).

Although university can produce a conducive environment for entrepreneurship (Moraes et al., 2018), individuals may also drive to entrepreneurship because of behavioral characteristics, such as self-confidence, risk-taking ability, need of achievement and locus of control (Turker & Selcuk, 2009). These researches find that on top of context, these behavioral aspects are determinant to entrepreneurship (Caliendo & Kritikos, 2011); thus, they favor entrepreneurship because it enables the entrepreneur to pick himself up after failures, and to continue innovating, renewing, and venturing forth even after having achieved success (Lautenschläger & Haase, 2011; Danny Miller, 2015).

Likewise, the entrepreneurial intention plays a crucial factor in this manner. According to Liñán (2004), entrepreneurial intention can be perceived as the previous and determinant element towards performing entrepreneurial behaviors. In other words, it is the predisposition or motivation to become an entrepreneur (Krakauer, Moraes, Coda, & Berne, 2018). There are a sort of entrepreneurial intention models, like Shapero and Sokol's Theory of the Entrepreneurial Event (1982) and Ajzen's Theory of Planned Behavior (1991), that represent a solid starting point for the analysis of entrepreneurial behavior, which is influenced by different set of variables, such as entrepreneurship education, context and institutions (Fayolle & Liñán, 2014).

Literature contains a set of studies linking entrepreneurial intention and education (Asimakopoulos, Hernández, & Peña Miguel, 2019; Liñán & Fayolle, 2015), entrepreneurial intention and behavioral characteristics (Moraes et al., 2018; Vodă & Florea, 2019), as well as entrepreneurial education and behavioral characteristics (Saeed, Yousafzai, Yani-De-Soriano, & Muffatto, 2015; Stamboulis & Barlas, 2014). However, the methodological robustness of previous studies linking entrepreneurial education and entrepreneurial attitude, intention or action is open to criticism, thus the need for more robust research that uses control groups, random experimental approach or has previous and subsequent measurements (Bignotti & Le Roux, 2016; Landström & Harirchi, 2018; Lopes & Lima, 2019). Additionally, only a few researches have had a specific group of study for analysis (Krakauer et al., 2018; Wibowo, Purwana, Wibowo, & Saptono, 2019), such as undergraduate students from specific states of a developing country. Hence, fundamental gaps remain regarding the measurement of

entrepreneurial characteristics and its relation with entrepreneurial intention on entrepreneurial education (Alves, Fischer, Schaeffer, & Queiroz, 2019; Atiya, Bilal, Abulhamid, & Shoaib, 2019; Kusmintarti, Thoyib, Ashar, & Maskie, 2014), the role of students in an entrepreneurial context (Hayter, Lubynsky, & Maroulis, 2017; Matt & Schaeffer, 2018), as well as the ability of universities to set the appropriate conditions for academic entrepreneurship in developing countries (Fischer, Moraes, & Schaeffer, 2019; Fischer, Schaeffer, & Queiroz, 2019).

Based on the arguments above, there is an opportunity, relatively untested, to evaluate whether the university environment influences behavioral aspects related to entrepreneurship. Secondly, this research field claims for further investigation considering particular research objects and regional comparisons (Landström & Harirchi, 2018). Since Brazil is an interesting case for entrepreneurship research (Alves et al., 2019), this study can contribute to this discussion by broadening the knowledge about university environment and characteristics related to entrepreneurship, considering the Business Administration (BA) students' perspective in different contexts. Also, the results may serve as support for the improvement of university environments in the context of their three missions, aimed at entrepreneurship.

Entrepreneurial activities vary according to student's field of expertise. According to GUESSS Report (2018), out of the 208.636 respondents, Business/Management field detains 43.6% of students willing to endeavor within 5 years and 12.3% willing to endeavor directly out of university, being the second field with the strongest entrepreneurial intention; whilst the first one is the science of art due to its specific job profile. On the other hand, Business and Management students constitute the largest group in GUESSS Report's sample (24.7% of all students) and in Brazilian undergraduate courses scenario (14.5% of all courses), therein being the most representative field of expertise (INEP, 2017; Sieger et al., 2018). Business is also the typical home for entrepreneurship programs, which were first introduced in 1945 by Harvard Business School and since then, it has spread out in different courses (concentration, majors or degrees) around the globe (Streeter, Jaquette Jr, & Hovis, 2002; Vesper & Gartner, 1997). Hence, Business Administration course will be the focus of this study.

Also, universities have an active role in regional development. According to Etzkowitz's Triple Helix Model, the dynamic knowledge creation is based on recursive and cross-institutional relations amongst universities, industry and government; so, regional knowledge capabilities are key in the local effects due to the spatial proximity among the actors

involved in knowledge creation (Etzkowitz & Leydesdorff, 2000; Matt & Schaeffer, 2018). Considering entrepreneurship effect differs across regions and its impact limits itself to the region in which it operates, this research is going to be held in Amazonas (at Amazonas State University – UEA) and São Paulo (at University of Campinas – UNICAMP and at University of São Paulo – USP) State Universities, which are closely related to their respective states that fund and support each one (Fischer, Schaeffer, et al., 2019; Urbano et al., 2019).

Amazonas and São Paulo features differ in many aspects. Amazonas is a large state with natural characteristics and socioeconomic peculiarities (SUDAM, 2016). It detains less than 1% of Brazil's education institutions, being below Brazil's average, also only 2% of Brazil's undergraduate courses are offered in Amazonas. Regarding BA students, throughout Amazonas there were over twenty-seven thousand students enrolled in 2017, while over four thousand were seniors; referring to an average of 2% of Brazil's BA students (INEP, 2017). On the other hand, São Paulo detains a quarter of Brazil's education institutions and englobes 23% of total undergraduate courses and 26% of BA courses. Regarding BA students, the average of 28% of Brazil's freshman and senior students were located throughout the state in 2017 (INEP, 2017).

Therefore, since each university community is unique, Amazonas and São Paulo diverse factors influence each university's attitude towards entrepreneurship (Guerrero & Urbano, 2012). UEA is the youngest university analyzed in this study, receiving the equivalent of only 5% of São Paulo's investments on its universities, which combined stands over 7,200 million *reais*. While UEA offers, respectively, 84 and 129 different undergraduate and graduate courses, UNICAMP offers 66 and 248, and USP offers 321 and 1102, thus São Paulo state universities focus on graduate programs that, due to its nature, foster research practices. Additionally, São Paulo State universities also gather a high number of extra & co curricular courses, networks and test markets when compared to UEA (David Miller & Acs, 2017).

Furthermore, from a practical standpoint, graduate students play a major role in the initial establishment of academic spin-off companies and the development, growth, and reconfiguration of spin-offs (Hayter et al., 2017). Thus, by focusing on the perception of BA students, it is possible to identify more effective and systematic ways of promoting entrepreneurship in universities, and, consequently, contribute to society with the placement or creation of new ventures (Matt & Schaeffer, 2018). Additionally, the local context is characterized by economic, institutional, legal, cultural, social and political factors and is

important for student's entrepreneurship (Hayter et al., 2017; Matt & Schaeffer, 2018), so this research can be useful for innovative entrepreneurship policies strategy in developing countries, such as Brazil (Lederman, Messina, Pienknagura, & Rigolini, 2014).

1.1 Research Questions and Objectives

The purpose of this research is to explore the role of university environment on behavioral aspects related to entrepreneurship, through analyzing its effect on behavioral characteristics and entrepreneurial intention of Amazonas and São Paulo State Universities' Business Administration (BA) students. More specifically, it questions:

1. What is university environment's impact on entrepreneurial characteristics and intention of BA students?

2. What are the differences in Amazonas' and São Paulo's university environment impact?

Furthermore, in order to fulfill the research objective, this study unfolds into the following specific objectives:

1. Explore the content of entrepreneurship, regarding university environment and behavioral aspects;

2. Formulate a Conceptual Model to evaluate the relationship between university environment and entrepreneurial behavioral aspects;

3. Evaluate if a supportive university environment for entrepreneurship has a positive relation with entrepreneurial intention and characteristics;

4. Comprehend and validate the hypotheses listed in the proposed Conceptual Model;

5. Analyze the differences between Amazonas and São Paulo BA students' perceptions.

This dissertation is organized into six chapters: First one being the introduction where the research objectives are outlined. Second chapter refers to the literature review. Third and fourth chapters show the method chosen and the conceptual model to conduct this study, as well as the research analysis. Chapters five and six demonstrates the results regarding BA students in each university, and is dedicated to research discussion and conclusion, respectively. This study's main steps are shown on Figure 1.



Figure 1: Main Steps of the dissertation Source: Own authorship.

2. LITERATURE REVIEW

The literature review will address entrepreneurial ecosystem (2.1), university environment (2.2), entrepreneurial education (2.3), behavioral aspects (2.4), entrepreneurial intention (2.4.1) and entrepreneurial characteristics (2.4.2).

2.1 Entrepreneurial Ecosystem

Entrepreneurial ecosystem can be defined as "an interdependent set of actors that is governed in such a way that it enables entrepreneurial action" (Stam, 2014, p. 2). It is the "institutional, organizational and other systemic factors that interacts and influences identification and commercialization of entrepreneurial opportunities" (Audretsch & Belitski, 2017, p. 1031). The entrepreneurial ecosystem approach offers a distinctive perspective on the clustering of economic activity, since it (i) focus on entrepreneurial activity; (ii) emphasizes the local and regional environments, as well as the conditions required to generate and support ambitious entrepreneurship; and (iii) emphasizes the interactions between framework conditions and local/regional geographical environments (Mason & Brown, 2014).

In addition, Audrestch and Link (2019) provides another insight on entrepreneurial ecosystem as a system that typically spans multiple organizations, institutions and constituents at the same geographic place. Thus, the entrepreneurship is connected to its local context. The authors explain that entrepreneurial ecosystems consist of multiple enterprises, organizations, institutions, and individuals that interact in such a manner as to elevate their own economic performance as well as the economic performance of a place. Likewise, Mason & Brown (2014, p. 5) defines entrepreneurial ecosystem as

"a set of interconnected entrepreneurial actors (both potential and existing), entrepreneurial organizations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies) and entrepreneurial processes (e.g. the business birth rate, numbers of high growth firms, levels of 'blockbuster entrepreneurship', number of serial entrepreneurs, degree of sellout mentality within firms and levels of entrepreneurial ambition) which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment." The entrepreneurial ecosystems generally emerge in locations that have placespecific assets, such as strategic locations and concentration of knowledge and human capital; thus, the context plays and important role once it sets a unique set of conditions and circumstances (Acs, Stam, Audretsch, & O'Connor, 2017; D. Isenberg, 2011; Mason & Brown, 2014). Isenberg (2011) identified six generic domains for the entrepreneurial (eco)system: a conducive culture, enabling policies and leadership, availability of appropriate finance, quality human capital, venture friendly markets for products, and a range of institutional supports.

In consonance, World Economic Forum - WEF (2013) lists eight pillars (Table 1) to make a successful entrepreneurial ecosystem, in which universities and education are a part.

Pillar	Components
	Domestic market: Large/medium/small companies as customers, governments
Accessible markets	as customer;
Accessible markets	Foreign market: Large/medium/small companies as customers, governments as
	customer.
Human canital/workforce	Management talent, technical talent, entrepreneurial company experience,
	outsourcing availability, access to immigrant workforce.
Funding & finance	Friends and family, angel investors, private equity, venture capital, access to
Funding & Infance	debt.
Sunnart systems / mentars	Mentors/advisors, professional services, incubators/accelerators, networks of
Support systems / mentors	entrepreneurial peers.
Covernment & regulatory	Ease of starting a business, tax incentives, business-friendly legislation/policies,
Framework	access to basic infrastructure, access to telecommunications/broadband, access
Framework	to transport.
Education & training	Available workforce with pre-university education, available workforce with
	university education, entrepreneur-specific training.
Major universities as	Promoting a culture of respect for entrepreneurship, playing a key role in idea-
Cotolysts	formation for new companies, playing a key role in providing graduates to new
	companies.
	Tolerance for risk and failure, preference for self-employment, success
Cultural support	stories/role models, research culture, positive image of entrepreneurship,
	celebration of innovation.

Table 1: Entrepreneurial ecosystem pillars and their components

Source: World Economic Forum, 2013, p. 7

Even though there is no formula to create an entrepreneurial ecosystem, the abovementioned are fundamental to comprehend the contribution of each pillar as well as to provide insight of the proximate causes – or even, road maps – to entrepreneurial ecosystem (Isenberg, 2010; Stam, 2014). This research's focus lays on universities, which are seen as crucial institutions to economic growth and job creation through its human capital formation and excellence in research. The closer interaction between funding, government and other ecosystem actors highlight the importance of universities in structuring successful ecosystems, once the philanthropists' financial contribution, government's local conditions and policy initiatives creation, as well as universities' extensive entrepreneurial programs and off-campus opportunities can enhance the likelihood of firm-formation, and, consequently, impact on socioeconomic development at the local level (Miller & Acs, 2017; Schaeffer, Fischer, & Queiroz, 2018). Therefore, universities represent one of the key actors due to its participation in the generation and exploitation of knowledge and technology to government and industries; as well as its contribution to the community with its students, who bring new ideas and increase the intellectual capacity of the community (Guerrero & Urbano, 2012; Mason & Brown, 2014).

2.2 University Environment

Universities are complex organizations and when considering it as an organism, it is composed of many elements that combined can translate university's attitudes toward entrepreneurship (Etzkowitz, 2003; Guerrero & Urbano, 2012). Each element has its own function to assure the whole structure functions properly. These elements can be observed on Table 2.

Element	Examples
Incentive system	Faculty; Departments; Technology Transfer Offices (TTOs).
Status	Public/Private; University prestige; Departments (e.g. medical school)
Location	Proximity to high-tech firms/industries
Culture	Culture; Historical context; Supportive
Faculty	Motivation; Embeddedness; Business knowledge, market understanding; Involvement/ cooperation; Background; Quality; Exposure to external agents; Status; Perception; Disclosure decision
Intermediary agents	Technology Transfer Offices (availability, age, perspective); Incubators
Experience	University learning; University experience
Defined role & identity	Boundaries of interaction with industry; Division of labor (basic vs. applied research) & its implications; Alignment of academic mission (teaching and research vs. entrepreneurship)
Technology	Feasibility; Contribution/focus; Radicalness; Productivity

Table 2: Elements of the Entrepreneurial University

Source: Rothaermel, Agung, & Jiang, 2007, p. 737.

These elements are embedded in a larger environmental context, which continuously influences the way the universities participate in entrepreneurial activities. At the same time, the core of university continuously self-organizes in order to renew and transform its mission (Rothaermel et al., 2007). Even though universities are bureaucratic organizations, student entrepreneurship have traditionally been connected to academia's missions (Matt & Schaeffer, 2018; Rothaermel et al., 2007), which are: (i) education, (ii) research and (iii)

activities related to innovation, social change and industrial competitiveness (Alves et al., 2019). Regarding education, universities may provide formal courses such as four-year degree or MBA programs, or even elective courses under business administration programs (Ozaralli & Rivenburgh, 2016). Related to research, universities can foster applied research or even, drive undergraduate students to research projects, capstone course papers and occasional basic researches, all related to entrepreneurship (Moraes et al., 2018; Ozaralli & Rivenburgh, 2016). Considering the third mission, universities can offer certificate programs, conferences, seminars, congresses, symposiums, workshops, business incubators and so forth; all in order to put entrepreneurship into practice (Moraes et al., 2018; Ozaralli & Rivenburgh, 2016).

The university environment can support students through creating an atmosphere conducive for entrepreneurship, which is crucial for understanding student's perceptions of the received university support (Mustafa, Hernandez, Mahon, & Chee, 2016). According to literature, these are the types of supportive university environment for entrepreneurship:

• Perceived educational support: refers to the traditional role of university where the focus is on knowledge, skills, internship and networking opportunities given to students to start a new business venture (Saeed et al., 2015);

• Perceived concept development support: refers to university's businesspromotion role in which business development of ideas, knowledge required to start a new business and introductions to entrepreneurial role models are given to students, in order to transform ideas into workable concepts (Saeed et al., 2015). Trivedi (2016) entitles this as Targeted Cognitive Support and defines as the cognitive support given to students to build awareness or develop new and innovative business model.

• Perceived business development support: refers to financial arrangements given to students for new ventures creation, as well as the support network given (Saeed et al., 2015). Trivedi (2016) calls this as Targeted Non-Cognitive Support in which universities provide seed-funding or incubation facilities as well as act as key person in transferring knowledge for future commercialization and good of society.

• Perceived entrepreneurial characteristics development support: relates to the behavioral role of an individual and it reflects one's innermost skills, abilities and thoughts on whether they have what is needed to perform a certain task successfully (Saeed et al., 2015).

Broadly, student's interest in entrepreneurship is developed and instigated when executing all kinds of activity inside the university environment (Moraes et al., 2018; Mustafa

et al., 2016). It's important to highlight that these activities can happen inside or outside the classroom and are embedded in the university ecosystem, which is composed by the availability of assets and infrastructure within campus, curricular programming, leadership and shared values and norms (Rideout & Gray, 2013). For the purposes of this research, the supportive university environment for entrepreneurship will be the focus of this investigation, considering university's three missions, as well as its roles (traditional, business-promotion, socio-economical and behavioral), that students have at their disposal in a higher education institution. On table 3 lies an overview of the supportive university environment for entrepreneurship content.

University environment's constructs	Description	Conceptual basis
Perceived Educational Support	 University that provides (i) elective disciplines, (ii) project work, (iii) internship, (iv) bachelor or (v) master study focused on entrepreneurship; University that arranges conferences and/or workshops on entrepreneurship; University that brings entrepreneurial students in contact with each other. 	Saaed et al. (2015)
 • University that creates awareness of entrepreneurship as a possible career choice; • University that provides students with ideas and knowledge needed to start a new business from. 		
Perceived Business Development Support	 University that provides students with the financial means to start a new business; University that uses its reputation to support students that start a new business or serves as a lead customer of students that start a new business. 	Saaed et al. (2015)
Perceived Entrepreneurial Characteristics Development Support	 The university environment that assists the student to (i) identify business opportunities, (ii) be persistent and (iii) to develop the skills to conduct new business opportunities; The university environment that develops students' (i) leadership skills and (ii) ability to plan; The university environment that enhances students' (i) ability to innovate and (ii) ability to take calculated risk. The university environment that provides students with several important contacts both personally and professionally. The university environment that motivates the students to desire opening their own businesses. 	Fayolle and Liñán (2014), Saeed et al. (2015), Schwarz et al. (2009).

Table 3: The supportive university environment for entrepreneurship content

Source: Own authorship

2.3 Entrepreneurial Education

Education, amongst other factors, influences people's attitude toward entrepreneurship. Rönkkö and Lepistö (2015) defines entrepreneurial education as a learning

by doing process, where the participation, interaction, decision-making and problem-solving skills of the students are developed. In addition, Peterman and Kennedy (2003) states that entrepreneurial education provides social experiences, such as opportunities to exercise significant responsibilities and to observe role models. Hence entrepreneurship education programs reinforce interactive learning, experience-based learning, role models and community and business links.

Entrepreneurship education is delineated in three objectives (Table 4): (i) learn about entrepreneurship to develop a broad understanding of it, (ii) learn for entrepreneurship to become entrepreneurial and (iii) comprehend how to be an entrepreneur through learning entrepreneurship (Pittaway & Edwards, 2012; Rönkkö & Lepistö, 2015)

Objectives	Categories of learning outcomes	Focus of the course
About	 Key minimum business knowledge of the start- up process and other entrepreneurial contexts; Understanding the process of business entry and stages of setting up an organization. 	 Academic entrepreneurship; Business planning; Corporate entrepreneurship; Corporate venturing.
For	 Entrepreneurial behavior, attitude and skill development; Students gain generic entrepreneurship competencies associated with entrepreneurship. 	 Creativity and idea generation; Entrepreneurial simulations; Entrepreneurship; Family firms; Franchising.
Through	 Students clearly empathize with, understand and "feel" the lifeworld of the entrepreneur; Students understand the nature of the relationships they need to develop with key stakeholders and are familiarized with them. 	 Food and hospitality entrepreneurship; Healthcare entrepreneurship; New venture planning; Sales and marketing for entrepreneurs; Small business management

Source: Adapted from Pittaway and Edwards (2012)

So, entrepreneurial education can be considered the content and the method of learning. Pittaway and Edwards (2012) explains that learning "about" entrepreneurship refers to more traditional educational practices, oriented to raise understanding or share knowledge. While "for" emphasizes tasks, projects and activities enabling students to acquire competences and key skills. Finally, "through" approach allows entrepreneurship practices in prudent conditions. In contrast, Sarasvathy' Effectuation Theory states the entrepreneurs identifies opportunities from existing resources and is formed by the following principles: (i) affordable loss rather than expected returns, so the loss is predetermined; (ii) strategic alliances rather than competitive analyses, where pre-commitments from stakeholders and strategic alliances are tools for reducing and/or eliminating uncertainty; (iii) exploitation of contingencies rather than exploitation of preexisting knowledge, which refers to just take advantage of contingencies aroused unexpectedly over time; and (iv) controlling an unpredictable future rather than

predicting an uncertain one, that focuses on "to the extent that we can control the future, we do not need to predict it" (Sarasvathy, 2001, p. 252).

Albeit Sarasvathy' Effectuation Theory is an important perspective, this investigation considers the causation logic where the entrepreneurial education raises awareness to think and act in an entrepreneurial way, since it enables students to absorb knowledge, to develop key entrepreneurial behaviors and competences, as well as to engage in experiences as entrepreneurs (Pittaway & Edwards, 2012; Sarasvathy, 2001).

2.4 Behavioral Aspects

This topic will approach the behavioral aspects: entrepreneurial intention (2.4.1) and entrepreneurial characteristics (2.4.2).

2.4.1 Entrepreneurial Intention

Entrepreneurial intention is the connection between ideas and action. It is the state of mind that directs a person toward a specific goal (Saeed et al., 2015). Likewise, Ajzen (1991, p. 181) defined as "the indication of how hard people are willing to try, of how much an effort they are planning to exert, in order to perform the behavior". Thus, the stronger the intention, the more likely an individual will engage in an activity.

As mentioned by Saeed et al. (2015), the creation and implementation of a new business demands considerable planning, so it is the exact type of planned behavior for which intention-based models are cut out for. Intention-based models considered in this research are Shapero and Sokol's Theory of the Entrepreneurial Event (1982) and Ajzen's Theory of Planned Behavior (1991), which are valuable tools for understanding the process of organizational emergence (Krueger, Reilly, & Carsrud, 2000). Ajzen's theory centers on the individual's intention to perform a given behavior. The idea of behavioral achievement depends on prior factors, as shown on figure 2:



Figure 2: Ajzen's Intention-Based Model: Theory of planned behavior Source: Ajzen, 1991, p. 182

These prior factors are believed to determine intention and, wherefore, influence behavior (Ajzen, 1991). They are:

• Attitude toward the behavior: refers to individuals' assessment of the personal desirability of creating a new business. It depends on personal expectations and beliefs and reflects a person's favorability to perform the behavior in question (Ajzen, 1991; Krueger et al., 2000).

• Subjective norm: refers to individuals' perceptions of what important people in their lives think about business creation, thus it reflects the social pressure to perform the behavior question (Ajzen, 1991; Krueger et al., 2000).

• Perceived behavioral control: refers to individuals' perception of their ability to initiate a new business. It reflects individual's confidence and personal control to achieve a successful conclusion question (Ajzen, 1991; Krueger et al., 2000).

Ajzen (1991) states the more favorable the attitude and subjective norm, combined with a greater perceived behavioral control, to creating a new business, the stronger is the individual's intention to initiate an organization.

On top of that, Shapero and Sokol (1982, p. 99) establishes that "each entrepreneurial event is the endpoint of a process and the beginning of another", so changes lead human behavior to a paradigm shift and inertia is defied in order to one's life path go from

one to another one. The choice of behavior can precipitate sizable increases in entrepreneurial activity (Shapero & Sokol, 1982). In Shapero and Sokol's Theory of Entrepreneurship Event (Figure 3), entrepreneurship is a result of displacement, which is further boosted by the perceptions of desirability and feasibility. According to this theory, the factors that influences intention are:

• Perceived Desirability: individual's attractiveness of starting a business affected by intrapersonal and extrapersonal factors (Krueger et al., 2000).

• The Propensity to Act: refers to the personal disposition to act on one's decisions, reflecting volitional aspects of intentions, it's the "I will do it" attitude. (Krueger et al., 2000).

• The Perceived Feasibility: refers to the individual's perception of carrying out a new business; in other words, it measures the individual's capability of conducting new business. (Krueger et al., 2000).



Figure 3: Shapero and Sokol's Intention-Based Model: Entrepreneurial Event Theory Source: Shapero and Sokol, 1982.

And so, Shapero and Sokol's model intended to combine all possible factors (social, cultural, and so on) that could lead to an entrepreneurial event.

It's important to highlight that the intention-based models above mentioned present similarities. Both contain a degree to perceived self-efficacy (Perceived behavioral control in Ajzen's and Perceived feasibility in Shapero & Sokol's), Ajzen's Attitude and Subjective Norm are correlated to Shapero and Sokol's Perceived desirability. Yet, Shapero and Sokol's theory added an element to intentions, the propensity to act (Krueger et al., 2000). Considering both intention models and their components for the analysis of how decisions are made, entrepreneurial intention is closely related to entrepreneurship behavior and may be affected by several factors (Koe, Sa'ari, Majid, & Ismail, 2012), such as innovative environments (Liñán & Chen, 2009), knowledge, experience (Koe et al., 2012), and behavioral aspects (Saeed et al., 2015). Also, these intention models have already been tested in different situations, proving its fitting into diverse scenarios (Moraes et al., 2018). In this sense, this study will consider entrepreneurial intention as the first step into the process of venture creation, since intention is not action *per se*, it is a valuable predictor of behavior (Ajzen, 1991; Liñán & Chen, 2009).

2.4.2 Entrepreneurial Characteristics

Prior studies regarding entrepreneurial characteristics are diverse and rich, however little has been made to consolidate the nomenclature. These have been entitled as entrepreneurial profile (Moraes et al., 2018; Schmidt & Bohnenberger, 2009), entrepreneurial personality (Caliendo & Kritikos, 2011; Ozaralli & Rivenburgh, 2016; Zhao, Seibert, & Lumpkin, 2010), individual factors (Markman & Baron, 2003; Zhao, Hills, & Seibert, 2005) and entrepreneurial characteristics (Filion, 1994). For the purpose of this study, entrepreneurial characteristics will be adopted since the focus will not be on psychological level, but on the different aspects of how entrepreneurs conduct themselves (Filion, 1994).

An individual with certain characteristics may be driven to entrepreneurship more likely than others (Moraes et al., 2018). While managers pursue objectives by making effective and efficient use of resources, entrepreneurs extrapolate their worlds (Filion, 1994). They are a "different breed of manager" hence they have different characteristics (Caliendo & Kritikos, 2011, p. 1). Thus, there are a set of attitudinal characteristics identified as entrepreneurial characteristics displayed on Table 5:

Attitudinal characteristics	Description	Conceptual basis
Self-efficacy	People who have ability to achieve intended results.	Markman and Baron (2003); Schmidt and Bohnenberger (2009).
Risk-taking	People who, in the face of a personal project, list and analyze the variables that can influence its result, and from this decide the project continuity.	Caliendo and Kritikos (2011); Schmidt and Bohnenberger (2009).
Planning	People who organize the activities required to achieve a desired goal.	Schmidt and Bohnenberger (2009).

 Table 5: Entrepreneurial Characteristics

Opportunity	People who identify, explore and act on business	Markman and Baron (2003);	
recognition	opportunities.	Krakauer et al. (2018).	
Donaictonov	People who work constantly, regardless of negative	Markman and Baron (2003);	
Persistency	outcomes, to achieve own goals.	Krakauer et al. (2018).	
Sasiability	Degree of social network use for professional activity	Markman and Baron (2003).	
Sociability	support.		
Innovation	Deeple who apply new ideas, devices or methods	Filion (1994); Schmidt and	
Innovation	People who apply new ideas, devices of methods.	Bohnenberger (2009).	
Loodorshin	People who, from their own goals, influence others to	Filion (1994)	
Leadership	voluntarily adopt this goal.		
		_	

Source: Adapted from Moraes et al., 2018; Schmidt and Bohnenberger, 2009.

Self-efficacy relates to the ability a person has to organize and effectively execute actions. It allows an individual to outperform those who are lower on this dimension, since they are motivated, regulated and directed by the ongoing exercise of self-efficacy (Markman & Baron, 2003). An entrepreneur with high level of self-efficacy is more likely to perform a task successfully in order to potentialize a positive outcome from the new venture (De Noble, Jung, & Ehrlich, 1999).

Risk-taking represents the inclination one has to perform certain activities, considering all relevant variables in order to stop, change courses or continue an entrepreneurial project. Entrepreneurs with high risk perception have an improved business performance, as perceiving more risks leads to preventive measures. In other words, risk tolerance seems crucial to the entrepreneurial process (Caliendo & Kritikos, 2011; Schmidt & Bohnenberger, 2009).

Planning represents one's preparation for the future, being one's ability to organize oneself in order to achieve a desired goal (Schmidt & Bohnenberger, 2009).

Opportunity recognition refers to individual's notions to differ high-potential from low-potential opportunities and to spot adversities beforehand. The benefit of alertness is the possibility to lead to superior ventures. Yet, this characteristic promotes entrepreneurial intention hence it's connected to the stimulus configuration of opportunities (Krakauer et al., 2018; Markman & Baron, 2003).

Persistency is viewed as the ability to overcome several obstacles, make mistakes and persist because until success is achieved, individuals bear numerous disincentives. Since entrepreneurs encounter repeated adversities, the ability to withstand and quickly overcome it represents an important characteristic (Krakauer et al., 2018; Markman & Baron, 2003).

Sociability represents social capital. Talented individuals carry within them knowledge and expertise to reinforce institutional ties, social networks and contacts, as well as

relationship with others. It is crucial to determine access to resources in order to contribute to one's success (Markman & Baron, 2003).

Innovation is crucial since the work demands a different view of the environment where the key is initiating change. It corresponds to the ability to gather ideas, necessities and other demands in a creative manner (Filion, 1994; Schmidt & Bohnenberger, 2009).

Leadership in an entrepreneurial context relates to engaging others into pursuing one's vision and objectives, thus influencing others to adopt one's goal voluntarily (Filion, 1994; Krakauer et al., 2018).

Although there are other variables listed in literature regarding entrepreneurial characteristics, such as Extraversion, Emotional Stability, Agreeableness, Conscientiousness and Openness to Experience forming the Big Five personality dimensions (Barrick & Mount, 1991), and the negative extreme of entrepreneurial personality (Danny Miller, 2015); the abovementioned variables are important to entrepreneurship (Caliendo & Kritikos, 2011). Thus, these are the entrepreneurial characteristics used in this research's conceptual model, which have already been built and validated.

3. RESEARCH METHODOLOGY

This study used a quantitative approach, the statistical technique called multivariate data analysis which enables simultaneous analysis of multiple measurements on individuals under investigation (Hair, Hult, Ringle, & Sarstedt, 2017). In specific, Partial Least Squares-Structural Equation Modeling (PLS-SEM) was conducted here, which is a statistical model used for examining the prediction and explanation of the constructs and, also, it provides a common point between path modeling and confirmatory factor analysis, thus, it is adequate to comprehend the relationship amongst university environment, entrepreneurial intention and entrepreneurial characteristics (Hair et al., 2017).

Another motive to use PLS-SEM is that this model will also present reflective and formative indicators. Additionally, this model presents two hierarchical latent variables, where entrepreneurial characteristics and university environment are second order constructs (High Order Constructs – HOCs) constituted by first order constructs (Low Order Constructs – LOCs) (Hair, Sarstedt, Ringle, & Gudergan, 2018; Sarstedt, Hair, Cheah, Becker, & Ringle, 2019). To calculate and validate the statistical tests, the Software SmartPLS 3.0 M3 (Ringle, Wende, & Becker, 2015) was used.

This chapter focus on enlightening the procedures for this research: it contains the conceptual model and the study hypothesis (3.1), as well as the sample aspect (3.2).

3.1 Conceptual Model and Research Hypothesis

Based on literary review, a conceptual model (Figure 4) was prepared to answer the research's objective, which is to explore the role of university environment on behavioral aspects related to entrepreneurship, through analyzing its effect on entrepreneurial characteristics and entrepreneurial intention of Amazonas and São Paulo State Universities' Business Administration students. Visual representation assists on understanding the conceptual model proposed (Whetten, 1989).



Figure 4: Conceptual Model Source: Own Authorship

The conceptual model is constituted by three constructs, one moderator variable and four hypotheses to evaluate the relationship between university environment, entrepreneurial characteristics and entrepreneurial intentions. Constructs' and variable's definition can be viewed on Table 6, as considered along the literature review.

Variable	Description	Conceptual basis
Supportive university environment for entrepreneurship	Concerns the university's three and its roles that students have at their disposal in a higher education institution. In sum, it refers to the students' perception about the quality of services provided by the university to prepare them to become an entrepreneur.	Saeed et al. (2015); Trivedi (2016); Wibowo et al. (2019)
Entrepreneurial intention	Refers to the motivation and willingness that lead an individual to starting a new business.	Ajzen (1991); Liñán & Chen (2009); Shapero & Sokol (1982).
Entrepreneurial characteristics	Corresponds to the set of behavioral characteristics (Self- efficacy, Risk-taking, Planning, Opportunity recognition, Persistency, Sociability, Innovation, Leadership) commonly perceived on entrepreneurs.	Barrick & Mount (1991); Caliendo & Kritikos (2011); Filion (1994); Schmidt & Bohnenberger (2009).
Educational context	Concerns the different settings that BA undergraduate students are at Amazonas and São Paulo State Universities.	UEA (2016); UNICAMP (2018); USP (2018).
Source: Own Authorship		

Table 6: Latent and Moderator variables' description

Source: Own Authorship

3.1.1 University Environment & Entrepreneurial Behavior

Career preference is formed at the university, so educational programs can encourage individuals to start or improve a business, hence it is able to provide specialized courses, support programs, as well as foster a positive attitude towards entrepreneurship (Peterman & Kennedy, 2003; Turker & Selcuk, 2009; Wibowo et al., 2019). Even though, universities can fail on providing sufficient business knowledge and preparation, and, therefore, discourage students from choosing an entrepreneurial career (Wang & Wong, 2004), universities are still an important part of the puzzle.

Saeed et al. (2015, p. 1131) point out that "universities can play an important role in identifying and developing entrepreneurial traits and inclinations among students and making them capable of starting their own venture", since once individuals perceive the support from university environment, they will be more confident in becoming entrepreneurs. In other words, when students consider universities provide an adequate preparation for them to start a new venture, it will increase the likelihood of entrepreneurial intention (Wibowo et al., 2019). Similarly, Moraes et al. (2018) state that university environment exercises great influence on entrepreneurial characteristics since it provides proper development of attitudinal characteristics of students. Alike, Canever, Barral and Ribeiro (2017) affirm that, with appropriate pedagogical solutions, universities can influence student's entrepreneurial characteristics.

H1: A supportive university environment for entrepreneurship has a positive influence on undergraduate student's entrepreneurial intention.

H2: A supportive university environment for entrepreneurship has a positive influence on undergraduate student's entrepreneurial characteristics.

Furthermore, Krueger Jr et al. (2000) enforces that contextual factors may influence intentions. Midst those factors is the entrepreneurial characteristics, which has led theorists to claim there is a relation between them and entrepreneurial intention (Lüthje & Franke, 2003); meanwhile Wibowo et al. (2019) recognizes the importance of entrepreneurial characteristics in predicting entrepreneurial intention, thus these characteristics are relevant to the intention of creating new business. GEM report (2016) confirms this trend, stating that 53.6% of Brazilians perceive having the knowledge and characteristics for starting a new business. H3: Entrepreneurial Characteristics have a positive influence on undergraduate student's entrepreneurial intention

3.1.2 Different Educational Contexts: Amazonas vs. São Paulo

Entrepreneurship is about profit-seeking ambition and, when successful, enriches the overall economy and society (Isenberg, 2011). The economic actors – entrepreneurs – can create financial and non-financial value with their new ventures (Isenberg, 2011; Sieger, Fueglistaller, Zellweger, & Braun, 2018). According to GUESSS¹ Report (2018), there is a prominent number of intentional business founders in Latin America countries; whereas in Brazil, out of the 20.623 students interviewed, 38.2% intent to endeavor between 2019 and 2023 and 12% intent to do it right out of university.

Amazonas is one of the 27 Brazilian federative units, being the largest one by area (IBGE, 2018). It was the center of Rubber Boom that lasted 33 years (1879-1912) and had another spurt during the Second World War (Barham & Coomes, 1994). In the time of Rubber Era, Amazonas held country's attention and was a synonym for prosperity for all immigrants. Afterwards, Amazonas faced the Rubber Era downfall which culminated into socio-economic challenges (SUDAM, 2016).

These challenges demanded federal interventions that would change the course of regional development, amongst was the creation of Manaus Free Trade Zone (MFTZ)² (SUDAM, 2016). MFTZ is regulated by Decree-Law No. 288/1967 and, according to SUFRAMA (2013) was designed as a free import and export trade area with special tax incentives, aiming the creation of industrial, commercial and agricultural center in Amazon Region, which would be equipped with economic conditions that would enable the region to be occupied and developed. Even though MFTZ has enabled the development of economic hubs, it has an expiration year (2073), therefore Amazonas government has been making efforts to assure the state's economic survival, such as long-term plans in different fields of expertise like Agriculture, Tourism, Industry and Education (SUDAM, 2016).

On the other hand, this study is also going to address São Paulo, the state that detains 25% of country's education organizations (INEP, 2017), has the highest per capita GDP (Gross

¹ GUESSS is an acronym that stands for Global University Entrepreneurial Spirit Students' Survey.

² In Portuguese, ZFM - Zona Franca de Manaus.

Domestic Product) in Brazil as well as the highest density with over forty-five million people in the state; also, it carries the best result at IDEB³ while being the twelfth largest state (IBGE, 2018).

In terms of Brazil, the comparison (Table 7) between Amazonas and São Paulo will indicate country's entrepreneurial basis in two different contexts. On one hand, there's Amazonas, an eccentric state that cannot fit into Brazil's pattern of high growth entrepreneurship; and on the other hand, there is São Paulo, one of the most important metropolitan areas in the country (Fischer, Schaeffer, et al., 2019). Amazonas and São Paulo are situated in two different regions (respectively, North and Southeast) with different cultures as well as different educational socio-economic contexts.

	AMAZONAS	SÃO PAULO	BRAZIL
Estimated Population in 2018	4,080,611	45,538,936	208,494,900
Per capita GDP in 2016	R\$ 22,245.00	R\$ 45,542.00	R\$ 30,548.40
Human Development Index in 2018	0.674	0.783	0.759
Education Organizations in 2017	20	611	2,448
Public Institutions	3	101	296
Universities	2	9	106
University Centers	0	3	8
Colleges	0	88	142
Federal Institutes	1	1	40
Private Institutions	17	510	2,152
Undergraduate courses offered in 2017	744	8,118	35,380
BA courses offered in 2017	139	1,364	5,193
Public Institutions	86	121	706
Private Institutions	53	1243	4,487
Enrolled BA Students in 2017	27,229	336,345	1,221,870
Public Institutions	4,901	35,227	156,127
Private Institutions	22,328	301,118	1,065,743
Senior BA Students in 2017	4,607	65,753	223,474
Public Institutions	1,551	5,274	21,192
Private Institutions	3,056	60,479	202,282

Table 7: Indexes of Amazonas, São Paulo and Brazil

Source: IBGE, 2018; INEP, 2017; Secretaria da Fazenda e Planejamento - SP, 2018; SEPLANCTI-AM, 2018

Overall, they represent extreme ends: economically, north region only participated in 5.38% of Brazil's 2016 GDP while Southeast contributed with 53.17% whereas São Paulo was the biggest contributor (with R\$2,038 million) and Amazonas, the sixteenth with R\$89

³ IDEB is an acronym for Basic Education Development Index, or, in Portuguese, Índice de Desenvolvimento da Educação Básica

million (SEPLANCTI, 2016). Education wise the same pattern can be seen where the concentration of public and private institutions, courses and students in Brazil is in São Paulo while Amazonas presents modest numbers.

In this sense, Amazonas and São Paulo's State Universities are presented, respectively: (i) the University of the State of Amazonas (UEA) is an eighteen-year-old institution that offers over thirty graduation courses throughout fifty-eight cities, being the biggest multicampus institution in Brazil; focused on enhancing entrepreneurship among its students (UEA, 2016). As established in the National Higher Education Assessment System (SINAES⁴), there are 18 institutions evaluated in Amazonas and UEA holds the third position, also being number one as State University with a score of 2.8456 (INEP, 2017). (ii) University of Campinas (UNICAMP) and University of São Paulo (USP) are top two on the entrepreneurial universities rank because of disciplines taught, organizations affiliated and so forth (CAPES, 2016). Even though USP did not participate at SINAES, UNICAMP is the number three in the rank, with a 4.3891 score, out of 526 institution assessed in São Paulo (INEP, 2017).

On table 8, UEA, UNICAMP and USP aspects are displayed, where (i) university's first mission focus on education, thus the amount of undergraduate and graduate programs are presented, (ii) university's second mission aims at research, so applied and basic research initiatives (centers - institutions dedicated to finding solutions to big challenges, for example; groups – group of researchers specialized on the same subject, working together on an issue; and, projects – scientific initiative to answer a specific question) are mapped according to CNPQ, as well as the publication of research initiatives; and (iii) universities third mission emphasizes activities related to innovation, social change and industrial competitiveness, highlighting certificate courses, academic events, business incubators, junior companies and academic administrations and centers (which stands for a hub of students with variable emphases, like services, instruction and so forth).

	UEA	UNICAMP	USP
State	Amazonas	São Paulo	São Paulo
Foundation year	2001	1966	1934
Number of campuses	58	3	10
State investment received in 2018 (in BRL)	406.4 million	2,207 million	5,090 million

Table 8: Indexes of UEA, UNICAMP and USP

⁴ SINAES was created to evaluate the quality of undergraduate courses and higher education institutions throughout Brazil in three components: institutional evaluation, course evaluation and student achievement assessment, generating a maximum result of 5.0000. (INEP, 2017).

University's first mission ^a			
Undergraduate courses	84	66	321
Graduate courses			
Specialists Programs	108	93	401
Master Programs	16	83	368
Doctoral Programs	5	72	333
University's second mission ^b			
Research centers	3	24	136
Research groups funded by CNPQ	5	75	162
Journals funded by CNPQ	0	4	22
Research projects registered at CNPQ	12	297	562
University's third mission ^c			
Courses	0	1279	902
Academic events funded by CNPQ	2	12	25
Junior companies	0	20	20
Business incubators	1	1	4
Academic administrations and centers	17	71	88

Source: CNPQ, 2019; UEA, 2016; UNICAMP, 2018; USP, 2018; Secretaria da Fazenda e Planejamento - SP, 2018; SEPLANCTI-AM, 2018

Note: ^a Education; ^b Research; and ^c Activities related to innovation, social change and industrial competitiveness.

And once again, the pattern repeats itself, where UNICAMP and USP detain the most expressive numbers in all universities' mission, englobing a high number of undergraduate and graduate courses; research projects, groups and centers; academic journals and events; as well as junior companies, business incubators and academic centers; while UEA has a shy collaboration on these.

Therefore, surrounding each university community is its attributes of liberty, diversity, and available assets, as well as the agents, institutions, and processes that allow them support the processes of entrepreneurial ecosystems, functioning as sources of ideas, manpower, and entrepreneurs themselves; corroborating on regional presence of skilled labor and knowledge (Fischer, Schaeffer, et al., 2019; David Miller & Acs, 2017).

H4: A supportive university environment for entrepreneurship, entrepreneurial intention and entrepreneurial characteristics differ in their relationship when considering the educational contexts.

H4a: A supportive university environment for entrepreneurship and entrepreneurial intention differ in its relationship when considering the educational contexts.

H4b: A supportive university environment for entrepreneurship and entrepreneurial characteristics differ in its relationship when considering the educational contexts.

H4c: Entrepreneurial characteristics and entrepreneurial intention differ in its relationship when considering the educational contexts.

All hypotheses can be found on Table 9 below:

Hypotheses	Description	Conceptual basis
H1	A supportive university environment for entrepreneurship has a positive influence on undergraduate student's entrepreneurial intention	Peterman and Kennedy (2003); Saeed et al. (2015); Turker and Selcuk (2009); Wibowo et al., 2019
H2	A supportive university environment for entrepreneurship has a positive influence on undergraduate student's entrepreneurial characteristics	Canever et al. (2017); Saeed et al. (2015); Moraes et al. (2018); Wibowo et al., 2019
Н3	Entrepreneurial Characteristics have a positive influence on undergraduate student's entrepreneurial intention	Ajzen (1991); Krueger Jr et al. (2000); Wibowo et al. (2019).
H4	A supportive university environment for entrepreneurship, entrepreneurial intention and entrepreneurial characteristics differ in their relationship when considering the educational contexts.	
H4a	A supportive university environment for entrepreneurship and entrepreneurial intention differ in its relationship when considering the educational contexts	Guerrero and Urbano (2012); INEP (2017); IBGE (2018); UEA (2016);
H4b	A supportive university environment for entrepreneurship and entrepreneurial characteristics differ in its relationship when considering the educational contexts	UNICAMP (2018); USP (2018).
H4c	Entrepreneurial characteristics and entrepreneurial intention differ in its relationship when considering the educational contexts	

Table 9: Conceptual model's hypotheses

Source: Own Authorship

3.2 Sample Aspect

A single cross-section survey was conducted in order to, among other objectives, identify opinions of specific groups and distribution of the phenomenon in the population (Pinsonneault & Kraemer, 1993). The questionnaire was submitted to Ethics Committee of the university through *Plataforma Brasil* and its Consent Form⁵ is at appendix A.

Data collection happened between May, 15th, 2019 and June, 19th, 2019. All students in each class were invited to participate on an anonymous basis and survey completion was voluntary. Sample characterization information – age, gender, marital status, University,

⁵ Consent Form refers to the *TCLE*, *Termo de Consentimento Livre e Esclarecido* (in portuguese).

course and graduation year – was also collected. Four hundred and twenty (420) answers were gathered, being: One hundred and forty-four (144) respondents were from UEA, one hundred and ninety-one (191) from UNICAMP and eighty-five (85) from USP. Out of the 420 respondents, 53% were female, 96% were single, on an average age of 22 years old, 39% were senior students and 19% were juniors. The collection process happened 97% in person and 3% online.

Considering literature review, the questionnaire was prepared to measure students' perception on university environment, entrepreneurial intention and entrepreneurial characteristics. Appendix B presents the questionnaire with the indicators, questions and references. This survey used a seven-point Likert-type scale being: Strongly Disagree (1), Disagree (2), Partially Disagree (3), Neither agree or disagree (4), Partially Agree (5), Agree (6) and Strongly Agree (7).

To evaluate the sample size and statistical power of the analysis, an analysis with the G*Power 3.1 software (Faul, Erdfelder, Buchner, & Lang, 2009) was conducted and based on the recommendations by Chin and Newsted (1999), Cohen (1988), and Hair et al. (2017). The largest number of arrows that reach a latent variable is 8 (largest number of predictors). Considering eight predictors, a significance level of 5%, a statistical power of 0.8, and an average effect size ($f^2 = 0.15$, which is equivalent to $r^2 = 13\%$), the minimum size of the sample required is 109. As the final sample used comprised 420 students, it is suitable for estimation by Partial Least Squares Path Modeling (PLS-PM).

The analyses a posteriori (post hoc) for the sample obtained indicate that: (i) any r^2 higher than 3.52% would be detected as significant (keeping the power of 0.8 and the significance level of 5%); and (ii) to the average effect size, the power is of 0.999, which is well above the value of 0.8, recommended by Chin and Newsted (1999) and Hair et al. (2017).

4. RESEARCH ANALYSIS

Research analysis is divided into four: Confirmatory factor analysis (4.1), High order constructs analysis (4.2), Evaluation of the measurement model (4.3) and Evaluation of the structural model (4.4).

4.1 Confirmatory Factor Analysis

A first step in the empirical analysis involves the evaluation of measures included in the conceptual model, since some indicators have been adapted and others developed by the authors. Confirmatory Factor Analysis (CFA) was used to evaluate the psychometric properties of constructs, with SmartPLS 3 software (Ringle et al., 2015). All measures were tested in the same model and were restricted to load on their respective factor (Brady & Cronin, 2001). Initially, only measures with factor loads higher than or equal to 0.7 were kept in the model (Hair et al., 2017). However, measures with factor loads higher than 0.4 and lower than 0.7 are also susceptible to be kept in the model (Hair et al., 2017). In this case, the impact of excluding these measures in the average variance extraction (AVE) and in composite reliability (CR) was evaluated. The model excluded only the measures that could prejudice AVE and CR (Hair et al., 2017). Thus, SE1, SE5, RT3, IN3, L11, PE2 and SO3 indicators were excluded. The results of CFA and descriptive analyses are presented on Table 10.

Questions	Standardized path loading	Critical ratio	P- value	Mean	Standard deviation
Self-efficacy					
(SE2) I can originate new ideas and products.	0.761	24,810	0.000	0.760	0.031
(SE3) I can develop and maintain favorable relationship with potential investors.	0.751	22,599	0.000	0.759	0.034
(SE4) I can see new market opportunities for new products and services.	0.872	51,033	0.000	0.856	0.017
(SE6) I can develop a working environment that encourages people to try out something new.	0.552	9,449	0.000	0.571	0.060
Risk Taking					
(RT1) I would assume a long-term debt, believing in the advantages that a business opportunity would bring me.	0.730	14,171	0.000	0.703	0.050
(RT2) I admit taking risks in exchange for possible benefits.	0.728	18,237	0.000	0.739	0.041
(RT4) I believe that getting involved in situations of higher risk will create results of great impact.	0.743	18,798	0.000	0.754	0.040

Table 10: Standardized CFA path loadings and descriptive statistics

Opportunity Recognition

(OR1) I believe I have a good ability in recognizing business opportunities					
	0.832	39,742	0.000	0.826	0.021
(OR2) I believe I have the skill to understand, recognize and make use of abstract data, also implied and in constant modification	0.537	10,777	0.000	0.549	0.051
(OR3) I am always up to any opportunity that may arise	0.822	39,050	0.000	0.821	0.021
(OR4) I feel able to identify business opportunities and profit from them	0.879	73,150	0.000	0.878	0.012
Entrepreneurial Intention					
(EI1) I am ready to do whatever it takes to be an entrepreneur.	0.818	40,082	0.000	0.813	0.020
(EI2) Even though I work for other companies, I will never abandon my dream of opening my business.	0.816	45,440	0.000	0.823	0.018
(EI3) My greatest achievement will be to have my own business.	0.870	52,639	0.000	0.865	0.016
(EI4) I will make every effort to create and maintain my own company.	0.894	74,311	0.000	0.893	0.012
(EI5) I intend to start a business in the coming years.	0.873	59,801	0.000	0.873	0.015
Innovation					
(IN1) I prefer a job full of novelty instead a routine activity.	0.743	5,232	0.000	0.676	0.133
(IN2) I like changing my way of work whenever possible	0.725	9,671	0.000	0.727	0.077
(IN4) I bet on creativity while elaborating projects/activities.	0.721	7,290	0.000	0.734	0.102
Leadership					
(L2) People respect my opinion	0.703	13,121	0	0.675	0.052
(L3) I can convince people to overcome conflicts and work as a team to achieve a particular result.	0.761	15,556	0	0.768	0.050
(L4) I can encourage people to perform tasks for which they are unmotivated	0.719	14,320	0	0.763	0.054
(L5) Frequently, people ask my opinion regarding wok or study issues	0.627	6,714	0	0.568	0.085
Persistency					
(PE1) Professionally, I consider myself more persistent than others.	0.719	14,722	0	0.715	0.049
(PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans.	0.719 0.838	14,722 32,292	0 0	0.715 0.844	0.049 0.026
(PE1) Professionally, I consider myself more persistent than others.(PE3) I'm capable of creating, conducting and implementing new life plans.(PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity.	0.719 0.838 0.570	14,722 32,292 8,217	0 0 0	0.715 0.844 0.558	0.049 0.026 0.068
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning	0.719 0.838 0.570	14,722 32,292 8,217	0 0 0	0.715 0.844 0.558	0.049 0.026 0.068
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning (PL1) I always plan everything I do very carefully 	0.719 0.838 0.570 0.744	14,722 32,292 8,217 15,186	0 0 0	0.715 0.844 0.558 0.768	0.049 0.026 0.068 0.051
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning (PL1) I always plan everything I do very carefully (PL2) To achieve my goals, I detail all the steps to be followed. 	0.719 0.838 0.570 0.744 0.807	14,722 32,292 8,217 15,186 23,038	0 0 0 0 0	0.715 0.844 0.558 0.768 0.811	0.049 0.026 0.068 0.051 0.035
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning (PL1) I always plan everything I do very carefully (PL2) To achieve my goals, I detail all the steps to be followed. (PL3) I know I can set my short, medium and long-term goals. 	0.719 0.838 0.570 0.744 0.807 0.692	14,722 32,292 8,217 15,186 23,038 9,934	0 0 0 0 0 0	0.715 0.844 0.558 0.768 0.811 0.677	0.049 0.026 0.068 0.051 0.035 0.069
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning (PL1) I always plan everything I do very carefully (PL2) To achieve my goals, I detail all the steps to be followed. (PL3) I know I can set my short, medium and long-term goals. (PL4) I like to set goals and targets to feel challenged. 	0.719 0.838 0.570 0.744 0.807 0.692 0.659	14,722 32,292 8,217 15,186 23,038 9,934 8,929	0 0 0 0 0 0 0	0.715 0.844 0.558 0.768 0.811 0.677 0.614	0.049 0.026 0.068 0.051 0.035 0.069 0.069
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning (PL1) I always plan everything I do very carefully (PL2) To achieve my goals, I detail all the steps to be followed. (PL3) I know I can set my short, medium and long-term goals. (PL4) I like to set goals and targets to feel challenged. 	0.719 0.838 0.570 0.744 0.807 0.692 0.659	14,722 32,292 8,217 15,186 23,038 9,934 8,929	0 0 0 0 0 0 0	0.715 0.844 0.558 0.768 0.811 0.677 0.614	0.049 0.026 0.068 0.051 0.035 0.069 0.069
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning (PL1) I always plan everything I do very carefully (PL2) To achieve my goals, I detail all the steps to be followed. (PL3) I know I can set my short, medium and long-term goals. (PL4) I like to set goals and targets to feel challenged. Sociability (SO1) The social contacts that I have are very important for my personal life. 	0.719 0.838 0.570 0.744 0.807 0.692 0.659 0.695	14,722 32,292 8,217 15,186 23,038 9,934 8,929 9,818	0 0 0 0 0 0 0 0	0.715 0.844 0.558 0.768 0.811 0.677 0.614 0.680	0.049 0.026 0.068 0.051 0.035 0.069 0.069 0.070
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning (PL1) I always plan everything I do very carefully (PL2) To achieve my goals, I detail all the steps to be followed. (PL3) I know I can set my short, medium and long-term goals. (PL4) I like to set goals and targets to feel challenged. Sociability (SO1) The social contacts that I have are very important for my personal life. (SO2) I know several people who could assist me professionally, if I needed it. 	0.719 0.838 0.570 0.744 0.807 0.692 0.659 0.695 0.730	14,722 32,292 8,217 15,186 23,038 9,934 8,929 9,818 10,586	0 0 0 0 0 0 0 0	0.715 0.844 0.558 0.768 0.811 0.677 0.614 0.680 0.691	0.049 0.026 0.068 0.051 0.035 0.069 0.069 0.070 0.066
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning (PL1) I always plan everything I do very carefully (PL2) To achieve my goals, I detail all the steps to be followed. (PL3) I know I can set my short, medium and long-term goals. (PL4) I like to set goals and targets to feel challenged. Sociability (SO1) The social contacts that I have are very important for my personal life. (SO2) I know several people who could assist me professionally, if I needed it. (SO4) I try to maintain constant contact with people in my network. 	0.719 0.838 0.570 0.744 0.807 0.692 0.659 0.659 0.695 0.730 0.820	14,722 32,292 8,217 15,186 23,038 9,934 8,929 9,818 10,586 22,603	0 0 0 0 0 0 0 0 0 0	0.715 0.844 0.558 0.768 0.811 0.677 0.614 0.680 0.691 0.849	0.049 0.026 0.068 0.051 0.035 0.069 0.069 0.069 0.070 0.066 0.038
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning (PL1) I always plan everything I do very carefully (PL2) To achieve my goals, I detail all the steps to be followed. (PL3) I know I can set my short, medium and long-term goals. (PL4) I like to set goals and targets to feel challenged. Sociability (SO1) The social contacts that I have are very important for my personal life. (SO2) I know several people who could assist me professionally, if I needed it. (SO4) I try to maintain constant contact with people in my network. 	0.719 0.838 0.570 0.744 0.807 0.692 0.659 0.659 0.695 0.730 0.820	14,722 32,292 8,217 15,186 23,038 9,934 8,929 9,818 10,586 22,603	0 0 0 0 0 0 0 0 0 0	0.715 0.844 0.558 0.768 0.811 0.677 0.614 0.680 0.691 0.849	0.049 0.026 0.068 0.051 0.035 0.069 0.069 0.070 0.066 0.038
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning (PL1) I always plan everything I do very carefully (PL2) To achieve my goals, I detail all the steps to be followed. (PL3) I know I can set my short, medium and long-term goals. (PL4) I like to set goals and targets to feel challenged. Sociability (SO1) The social contacts that I have are very important for my personal life. (SO2) I know several people who could assist me professionally, if I needed it. (SO4) I try to maintain constant contact with people in my network. Perceived Entrepreneurial Characteristics Development Support (ECD1) The university environment helped me to identify business onportunities. 	0.719 0.838 0.570 0.744 0.807 0.692 0.659 0.659 0.730 0.820	14,722 32,292 8,217 15,186 23,038 9,934 8,929 9,818 10,586 22,603 31,326		0.715 0.844 0.558 0.768 0.811 0.677 0.614 0.680 0.691 0.849 0.791	0.049 0.026 0.068 0.051 0.035 0.069 0.069 0.069 0.070 0.066 0.038
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning (PL1) I always plan everything I do very carefully (PL2) To achieve my goals, I detail all the steps to be followed. (PL3) I know I can set my short, medium and long-term goals. (PL4) I like to set goals and targets to feel challenged. Sociability (SO1) The social contacts that I have are very important for my personal life. (SO2) I know several people who could assist me professionally, if I needed it. (SO4) I try to maintain constant contact with people in my network. Perceived Entrepreneurial Characteristics Development Support (ECD1) The university environment helped me to identify business opportunities. (ECD2) The university environment helped me being persistent 	0.719 0.838 0.570 0.744 0.807 0.692 0.659 0.659 0.730 0.820 0.793 0.751	14,722 32,292 8,217 15,186 23,038 9,934 8,929 9,818 10,586 22,603 31,326 26,169		0.715 0.844 0.558 0.768 0.811 0.677 0.614 0.680 0.691 0.849 0.791 0.749	0.049 0.026 0.068 0.051 0.035 0.069 0.069 0.069 0.066 0.038 0.025 0.029
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning (PL1) I always plan everything I do very carefully (PL2) To achieve my goals, I detail all the steps to be followed. (PL3) I know I can set my short, medium and long-term goals. (PL4) I like to set goals and targets to feel challenged. Sociability (SO1) The social contacts that I have are very important for my personal life. (SO2) I know several people who could assist me professionally, if I needed it. (SO4) I try to maintain constant contact with people in my network. Perceived Entrepreneurial Characteristics Development Support (ECD1) The university environment helped me to identify business opportunities. (ECD2) The university environment developed my leadership skills through group work. 	0.719 0.838 0.570 0.744 0.807 0.692 0.659 0.659 0.730 0.820 0.793 0.751 0.683	14,722 32,292 8,217 15,186 23,038 9,934 8,929 9,818 10,586 22,603 31,326 26,169 16,735		0.715 0.844 0.558 0.768 0.811 0.677 0.614 0.680 0.691 0.849 0.791 0.749 0.683	0.049 0.026 0.068 0.051 0.035 0.069 0.069 0.069 0.066 0.038 0.025 0.029 0.042
 (PE1) Professionally, I consider myself more persistent than others. (PE3) I'm capable of creating, conducting and implementing new life plans. (PE4) Every chance I have, I evaluate myself considering perseverance, imagination and creativity. Planning (PL1) I always plan everything I do very carefully (PL2) To achieve my goals, I detail all the steps to be followed. (PL3) I know I can set my short, medium and long-term goals. (PL4) I like to set goals and targets to feel challenged. Sociability (SO1) The social contacts that I have are very important for my personal life. (SO2) I know several people who could assist me professionally, if I needed it. (SO4) I try to maintain constant contact with people in my network. Perceived Entrepreneurial Characteristics Development Support (ECD1) The university environment helped me to identify business opportunities. (ECD2) The university environment provided me with planning and strategy tasks in different disciplines, developing my ability to plan. 	0.719 0.838 0.570 0.744 0.807 0.692 0.659 0.659 0.730 0.820 0.793 0.751 0.683 0.748	14,722 32,292 8,217 15,186 23,038 9,934 8,929 9,818 10,586 22,603 31,326 26,169 16,735 22,447		0.715 0.844 0.558 0.768 0.811 0.677 0.614 0.680 0.691 0.849 0.791 0.749 0.683 0.745	0.049 0.026 0.068 0.051 0.035 0.069 0.069 0.069 0.066 0.038 0.025 0.029 0.042 0.033

(ECD6) The university environment has enabled me to relate and analyze the variables that influence the result of a problem, increasing my ability to take calculated risks.	0.767	31,439	0	0.766	0.024
(ECD7) The university environment provided me with several important contacts both personally and professionally.	0.683	18,817	0	0.682	0.036
(ECD8) The university environment motivated me to desire opening my own business.	0.705	19,787	0	0.704	0.036
(ECD9) The university environment developed my skills to conduct a new business opportunity.	0.776	28,508	0	0.776	0.027
Perceived Concept Development Support					
(PCD1) My university creates awareness of entrepreneurship as a possible career choice.	0.744	29,179	0	0.830	0.028
(PCD2) My university motivates students to start a new business	0.807	36,803	0	0.882	0.024
(PCD3) My university provides students with ideas to start a new business from	0.692	44,398	0	0.895	0.020
(PCD4) My university provides students with the knowledge needed to start a new business.	0.659	20,700	0	0.821	0.040
Perceived Business Development Support					
(PBD1) My university provide students with the financial means to start a new business.	0.695	21,240	0	0.881	0.042
(PBD2) My university use its reputation to support students that start a new business.	0.730	6,566	0	0.677	0.102
(PBD3) My university serve as a lead customer of students that start a new business	0.820	19,433	0	0.869	0.045
Perceived Educational Support					
(PES1) My university offers elective courses on entrepreneurship.	0.712	9,546	0	0.695	0.075
(PES2) My university offers project work focused on entrepreneurship.	0.834	14,156	0	0.823	0.059
(PES3) My university offers internship focused on entrepreneurship.	0.698	8,447	0	0.689	0.083
(PES4) My university offers a bachelor or master study on entrepreneurship	0.703	8,937	0	0.696	0.079
(PES5) My university arranges conferences /workshops on entrepreneurship.	0.750	11,508	0	0.737	0.065
(PES6) My university brings entrepreneurial students in contact with each other.	0.740	9,964	0	0.739	0.074

Source: Own authorship

Note: Likert scale responses from 1 (totally disagree) to 7 (totally agree). The students responded how much they agreed with the statements.

4.2 High-Order Constructs Analysis

Hierarchical latent variable models are characterized by the quantity of levels and by the relation between the model's constructs (Becker, Klein, & Wetzels, 2012). A High Order Constructs (HOC) is a general concept formed (formative construct) or represented (reflexive constructs) by Low Order Constructs (LOCs). In this case, relations between the HOCs and the LOCs do not portray dependence, but hierarchy (Becker et al., 2012; Sarstedt et al., 2019), since the HOCs (entrepreneurial characteristics and university environment) do not exist without the LOCs. This research's model presents two hierarchical latent variables, where the constructs entrepreneurial characteristics and university environment are second order constructs (HOCs) formed by first order constructs (LOCs).

Due to the conceptualization and operationalization of the hierarchical model, this research model is classified as a model of hierarchical latent variables of a reflexive-formative type (Chin, 1998; Becker et al., 2012; Sarstedt et al., 2019). The LOCs constructs are reflexive, while the HOCs constructs are formatives and it full mediates the influence of the LOCs in the entrepreneurial intention.

Model's parameters were estimated by the two stages approach (Becker et al., 2012; Hair et al., 2018; Sarstedt et al., 2019). In the first stage (Figure 5-A), the latent variable scores of LOCs were obtained in a model that did not consider the HOC. In the second stage (Figure 5-B), the latent variable scores obtained in the first stage were used as indicators for the HOCs constructs. The two stages approach has the advantage of estimating a more parsimonious model, since there is no need to represent LOCs (Hair et al., 2018; Sarstedt et al., 2019), besides being more adequate when the researcher's interest lies only on the relationships stating in the HOC (Becker, et al., 2012; Sarstedt et al., 2019), which is the case of our model.



Figure 5: **Two stage approach** Source: Own Authorship

A: FIRST STAGE MODEL

B: SECOND STAGE MODEL

Next, the evaluation of the measurement model is presented in the first and second stages.

4.3 Evaluation of the Measurement Model

The measurement model evaluation is divided into first stage analysis (4.3.1) and second stage analysis (4.3.2).

4.3.1 First Stage Analysis

The Measurement model analysis at first stage level (Figure 5-A) considers thirteen reflexives constructs. Criteria for evaluating reflective measurement models, according to Hair et al. (2017) are: internal consistency (composite reliability); reliability of the indicator; convergent validity (average variance extracted); and discriminant validity.

Convergent validity is defined as the measure of a set of indicators in a model, that converge or share a high variance proportion in common. It is the degree to which items that should be theoretically related are, in fact, interrelated (Hair et al., 2017). Discriminant validity is considered the measure in which a model's indicators represent a single construct and the construct's indicators are distinct from the other constructs in the model (Hair et al., 2017), where the confiability of a measure is its consistency and stability. A measure is reliable if the same value is obtained repeatedly (Hair et al., 2017). And, the discriminant validities were assessed at the level of indicators and latent variables.

To verify if the associated indictors of each construct really reflect the concept they represent, the cross-factorial loads of each indicator was analyzed (Hair et al., 2017). Factorial loads should be equal or superior to 0.7 and higher than cross factorial loads in other constructs so the indicators stay in the model (Hair et al., 2017). In case the factorial loads is lower than 0.4, the indicator should automatically be excluded; and if the indicator presents factorial loads lower than 0.7, but higher than 0.4, the exclusion impact should be analyzed through the Average Variance Extracted (AVE) and composite reliability (Hair et al., 2017). Since some indicators were excluded in the confirmatory factor analysis, no indicators were excluded in this step. Table 11 presents factorial loads.

Table 11: Cross Factor Loading

Indic.	SE	RT	OR	EI	IN	L	PE	PL	SO	ECD	PCD	PBD	PES
SE2	0.761	0.266	0.450	0.326	0.420	0.231	0.373	0.163	0.171	0.160	0.112	0.064	0.094
SE3	0.751	0.249	0.396	0.268	0.214	0.391	0.341	0.206	0.306	0.191	0.061	0.135	0.111
SE4	0.872	0.337	0.672	0.473	0.392	0.368	0.458	0.257	0.325	0.244	0.088	0.058	0.078
SE6	0.552	0.130	0.318	0.152	0.294	0.410	0.345	0.199	0.205	0.130	0.095	0.068	0.103
RT1	0.319	0.730	0.365	0.355	0.293	0.163	0.297	0.129	0.163	0.162	0.037	0.011	-0.010
RT2	0.248	0.728	0.378	0.300	0.289	0.237	0.333	0.240	0.188	0.129	0.106	0.060	0.040
RT4	0.202	0.743	0.326	0.331	0.313	0.192	0.315	0.220	0.227	0.199	0.145	0.071	0.054
OR1	0.578	0.384	0.832	0.509	0.375	0.344	0.506	0.330	0.288	0.220	0.129	0.066	0.101
OR2	0.367	0.274	0.537	0.200	0.309	0.345	0.366	0.240	0.261	0.162	0.107	0.095	0.101
OR3	0.479	0.396	0.822	0.530	0.306	0.326	0.534	0.363	0.338	0.245	0.147	0.129	0.098
OR4	0.590	0.439	0.879	0.515	0.366	0.321	0.539	0.293	0.323	0.284	0.193	0.103	0.118
EI1	0.435	0.392	0.519	0.818	0.264	0.168	0.357	0.125	0.173	0.140	0.017	0.033	0.009
EI2	0.397	0.352	0.542	0.816	0.194	0.174	0.380	0.290	0.266	0.216	0.122	0.106	0.097
EI3	0.344	0.413	0.483	0.870	0.246	0.136	0.342	0.125	0.125	0.126	0.087	-0.015	0.019
EI4	0.350	0.407	0.507	0.894	0.289	0.177	0.427	0.134	0.168	0.176	0.078	-0.039	0.006
EI5	0.380	0.358	0.483	0.873	0.275	0.182	0.419	0.188	0.14	0.132	0.044	-0.032	-0.009
IN1	0.253	0.286	0.243	0.198	0.743	0.128	0.279	0.119	0.097	-0.002	-0.030	-0.144	-0.085
IN2	0.274	0.306	0.295	0.213	0.725	0.198	0.348	0.289	0.099	0.074	0.053	0.006	0.036
IN4	0.431	0.300	0.384	0.236	0.721	0.213	0.350	0.194	0.185	0.150	0.057	0.022	0.040
L2	0.317	0.197	0.281	0.106	0.128	0.703	0.332	0.254	0.230	0.217	0.102	0.116	0.009
L3	0.363	0.209	0.358	0.205	0.210	0.761	0.316	0.289	0.321	0.224	0.095	0.118	0.066
L4	0.293	0.147	0.266	0.112	0.183	0.716	0.325	0.319	0.241	0.206	0.153	0.159	0.089
L5	0.269	0.191	0.237	0.115	0.176	0.627	0.365	0.263	0.245	0.152	0.012	0.082	-0.006
PE1	0.371	0.299	0.447	0.288	0.307	0.443	0.719	0.455	0.355	0.235	0.086	0.085	0.051
PE3	0.436	0.376	0.554	0.419	0.324	0.348	0.838	0.410	0.322	0.250	0.133	0.066	0.120
PE4	0.271	0.225	0.316	0.234	0.368	0.204	0.570	0.305	0.111	0.121	0.029	0.107	-0.026
PL1	0.181	0.134	0.265	0.110	0.183	0.243	0.408	0.744	0.133	0.196	0.119	0.120	0.103
PL2	0.145	0.193	0.257	0.142	0.192	0.288	0.410	0.807	0.160	0.190	0.070	0.113	0.083
PL3	0.281	0.208	0.339	0.187	0.117	0.333	0.371	0.692	0.256	0.115	0.067	0.059	0.090
PL4	0.208	0.237	0.292	0.148	0.304	0.297	0.397	0.659	0.256	0.127	0.032	0.020	0.056
SO1	0.178	0.203	0.168	0.103	0.066	0.232	0.229	0.150	0.695	0.168	0.039	0.068	0.038
SO2	0.317	0.195	0.328	0.177	0.179	0.298	0.270	0.184	0.730	0.182	0.069	0.022	0.048
SO4	0.263	0.199	0.342	0.168	0.143	0.299	0.353	0.266	0.820	0.246	0.136	0.121	0.104
ECD1	0.213	0.164	0.238	0.082	0.050	0.203	0.235	0.171	0.178	0.793	0.541	0.537	0.485
ECD2	0.141	0.151	0.212	0.109	0.031	0.180	0.222	0.158	0.235	0.751	0.452	0.476	0.410
ECD3	0.126	0.068	0.078	0.001	0.084	0.294	0.182	0.166	0.247	0.683	0.352	0.330	0.310
ECD4	0.113	0.104	0.091	-0.018	0.069	0.198	0.142	0.210	0.227	0.748	0.453	0.403	0.414
ECD5	0.216	0.169	0.252	0.075	0.146	0.238	0.248	0.264	0.190	0.801	0.521	0.489	0.476
ECD6	0.186	0.224	0.237	0.079	0.081	0.280	0.230	0.193	0.198	0.767	0.427	0.406	0.405
ECD7	0.110	0.113	0.156	0.014	0.074	0.259	0.167	0.131	0.249	0.683	0.323	0.427	0.357
ECD8	0.243	0.219	0.320	0.423	0.096	0.102	0.239	0.074	0.142	0.705	0.467	0.407	0.389
ECD9	0.272	0.231	0.303	0.324	0.071	0.204	0.252	0.112	0.183	0.776	0.486	0.402	0.412
PCD1	0.121	0.063	0.133	-0.004	0.044	0.108	0.100	0.077	0.096	0.484	0.831	0.447	0.652
PCD2	0.060	0.102	0.131	0.096	0.026	0.083	0.069	0.053	0.048	0.481	0.884	0.533	0.605

PCD3	0.112	0.140	0.197	0.080	0.063	0.113	0.115	0.069	0.099	0.529	0.898	0.578	0.610
PCD4	0.096	0.126	0.164	0.096	-0.002	0.134	0.133	0.130	0.133	0.562	0.825	0.531	0.521
PBD1	0.112	0.064	0.143	0.041	-0.069	0.156	0.125	0.114	0.096	0.477	0.539	0.896	0.491
PBD2	0.029	-0.017	0.017	-0.042	0.017	0.080	0.042	0.069	0.087	0.394	0.476	0.668	0.429
PBD3	0.081	0.075	0.097	-0.005	-0.04	0.156	0.079	0.078	0.060	0.556	0.518	0.876	0.502
PES1	0.136	-0.030	0.086	0.029	0.040	0.049	0.073	0.078	0.077	0.375	0.540	0.313	0.712
PES2	0.090	0.036	0.110	0.003	-0.018	0.059	0.064	0.066	0.071	0.454	0.579	0.455	0.834
PES3	0.068	0.067	0.108	0.031	-0.085	0.038	0.037	0.071	0.068	0.361	0.423	0.470	0.698
PES4	0.105	0.031	0.117	0.072	0.046	-0.005	0.049	0.012	0.039	0.382	0.500	0.403	0.703
PES5	0.094	0.033	0.098	0.014	0.018	0.043	0.106	0.137	0.066	0.413	0.461	0.391	0.750
PES6	0.025	0.034	0.057	-0.024	-0.025	0.071	0.026	0.129	0.064	0.454	0.575	0.543	0.740

Source: Own authorship

Note: Indic.: Indicator; SE: self-efficacy; RT: risk-taking; OR: opportunity recognition; EI: entrepreneurial intention; IN: innovation; L: 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.

Average Variance Extracted (AVE) and internal consistency (Cronbach's alpha) are criteria also used at model's convergent validity (Hair, Ringle & Sarstedt, 2011). Average Variance Extracted (AVE) should present a value superior to 0.5 (Hair, Ringle & Sarstedt, 2011). Regarding internal consistency, which is assessed through Cronbach's Alpha, values between 0.60 and 0.70 are considered acceptable in exploratory studies; but for studies at more advanced stages, values between 0.70 and 0.90 are considered satisfactory (Nunally & Berstein, 1994; Hair et al., 2017).

Besides the indicator's factor loads assessment, composite reliability is also used to evaluate the conceptual model. Thus, to evaluate the measurement model, besides examination of the loading for each indicator, a main measure is composite reliability of each construct (Hair et al., 2005; Hair et al., 2017). Composite reliability describes the degree to which the indicators represent the latent construct in common. A commonly used benchmark for acceptable reliability is 0.70.

Table 12 displays the abovementioned indicators. All indicators are within established values, except Cronbach's Alpha for some indicators. However, according to Hair et al. (2017), Cronbach's alpha is sensitive to the number of items on the scale and generally tends to underestimate internal consistency, thus it is more appropriate to perform the composite reliability assessment, where the indicators presented adequate values.

Constructs	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Self-efficacy	0.733	0.828	0.552
Risk-taking	0.573	0.777	0.538
Opportunity Recognition	0.781	0.857	0.607
Entrepreneurial Intention	0.908	0.931	0.731
Innovation	0.564	0.773	0.532
Leadership	0.659	0.796	0.500
Persistency	0.531	0.757	0.515
Planning	0.701	0.817	0.530
Sociability	0.614	0.794	0.563
Perceived Entrepreneurial Characteristics Development Support	0.901	0.919	0.557
Perceived Concept Development Support	0.884	0.919	0.740
Perceived Business Development Support	0.771	0.858	0.672
Perceived Educational Support	0.836	0.879	0.549
Source: Own outborchin			

Table 12: Cronbach's Alpha, Composite Reliability and Average Variance Extracted

Source: Own authorship

The square root of the AVE is another indicator for discriminant validity between the constructs. These values are presented on Table 13. The square root of the AVE is presented diagonally, in bold, must be higher than the correlation between latent variables (Fornell & Larcker, 1981).

Table 13: Discriminant Validity - Square Root of AVE

OR PE PL SO ECD PCD PBD PES SE RT EI IN L SE 0.743 RT 0.350 0.734 OR 0.652 0.484 0.779 EI 0.446 0.450 0.593 0.855 IN 0.447 0.408 0.427 0.298 0.729 L 0.446 0.266 0.412 0.196 0.248 0.703 PE 0.511 0.428 0.629 0.451 0.447 0.470 0.718 PL 0.277 0.264 0.394 0.201 0.271 0.398 0.545 0.728 **SO** 0.343 0.263 0.385 0.204 0.179 0.372 0.385 0.273 0.750 ECD 0.252 0.225 0.297 0.185 0.106 0.287 0.292 0.217 0.268 0.746 PCD 0.115 0.130 0.187 0.081 0.037 0.131 0.126 0.100 0.115 0.605 0.860 PBD 0.102 0.063 0.123 0.012 0.051 0.168 0.111 0.110 0.096 0.578 0.613 0.820 PES 0.121 0.037 0.130 0.028 0.003 0.058 0.085 0.114 0.088 0.548 0.689 0.570 0.741

Source: Own authorship

Note: SE: self-efficacy; RT: risk-taking; OR: opportunity recognition; EI: entrepreneurial intention; IN: Innovation; L: 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.

According to Table 13, all correlation values between latent variables are higher than the square root of the average variance extracted (diagonal).

4.3.2 Evaluation of the Measurement Model - Second Stage Analysis

To perform the second stage model analysis, the construct's scores from the first stage were saved and added as new variables in the dataset (Hair et al., 2018; Sarstedt et al., 2019). Thus, the measurement model analysis of the second stage model (Figure 5-B) considers one reflexive construct (entrepreneurial intention) e two formative constructs (entrepreneurial characteristics and university environment).

To assess entrepreneurial intention construct, the criteria already presented are used. Table 14 displays Cronbach's alpha, composite reliability e AVE for this new model.

Table 14: Cronbach's Alpha, Composite Reliability and Average Variance Extracted of **Entrepreneurial Intention**

Construct	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Entrepreneurial Intention	0.902	0.903	0.928	0.720

Source: Own authorship

All indicators are within the established parameters (Hair et al., 2017). Additionally, table 15 presents the square root of the AVE and the results are also within the recommended.

Table 15: Discriminant Validity - Square Root of AVE								
Construct	University Environment	Entrepreneurial Characteristics	Entrepreneurial Intention					
University Environment	FORMATIVE							
Entrepreneurial Characteristics	0.395	FORMATIVE						
Entrepreneurial Intention	0.255	0.614	0.848					
~ ~								

4 \$7.1.14 **T** 1 1 1 **T D** 1 **I** -.

Source: Own authorship

In order to evaluate the indicator of the second order model (Figure 5-B), which are formative (entrepreneurial characteristics and university environment), the following criteria is used: convergent validity, multicollinearity analysis and significance and relevance (Hair et al., 2017).

Convergent validity was determined through redundancy analysis. This was achieved through the correlation of variables of the formative construct with a global measure of the indicator. The construct was modeled as the independent variable and the global measure as the dependent variable. It is necessary that the value of the path coefficient reaches levels above 0.80 so that the formative construct has convergent validity (Hair et al., 2017). In the case of the University Environment construct, the value was of 0.918 and for Entrepreneurial Characteristics, the value was 0.804, thus providing support for convergent validity in both cases.

To test the collinearity of indicators, the values of Variance Inflation Factor (VIF) for variables of the formative construct were analyzed. All values were lower than five and within the established range (Hair et al., 2017).

The bootstrapping technique was used, at SmartPLS, to analyze significance and relevance. According to Hair et al. (2017), the t-statistics of outer weights were analyzed and, when necessary, the outer loadings as well. All values were significant, and variables were maintained in the model.

Finally, to analyze the influence of each variable on the second order constructs, Table 16 presents the indicators' outer weights. In the case of the HOC entrepreneurial characteristics, some variables had a positive influence (self-efficacy, risk-taking, opportunity recognition, persistency and sociality) and other negative influence (innovation, leadership and planning). In the case of the HOC university environment, while the variables perceived entrepreneurial characteristic development support and perceived concept development support had a positive influence, the perceived business development support and perceived educational support variables had a negative influence.

Table 16: Outer	• Weights o	of the H	Formative	HOCs
-----------------	-------------	----------	-----------	------

Indicators	Entrepreneurial Characteristics	University Environment
SE	0.126	
RT	0.344	
DO	0.571	
IN	-0.085	
L	-0.014	
PE	0.281	
PL	-0.106	
SO	0.032	
ECD		1.154
PCD		0.172
PBD		-0.258
PES		-0.296

Source: Own authorship

Note: SE: self-efficacy; RT: risk-taking; OR: opportunity recognition; IN: innovation; L: 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.

4.4 Evaluation of the Structural Model

Before evaluating the structural model, it is important to test the structural model's collinearity. To examine collinearity, the values of Variance Inflation Factor (VIF) for each subsection of the structural model was analyzed. All values are within those established by Hair et al. (2017), below 5.

The bootstrapping technique was once again used to analyze the significance of indicators (Efron & Tibshirani, 1998). The use of this technique to analyze the significance of the acquired loadings for the observable variables is not only based on a model estimation, but also on a calculation of estimates of parameters and their confidence intervals based on multiple estimates (Hair et al., 2017).

Student's t-test analyzes the hypothesis that coefficients of correlation are equal to zero. If the results of this test indicate values higher than 1.96, the hypothesis is not accepted, and the correlation is significant (Efron & Tibshirani, 1998; Hair et al., 2017). Table 17 presents the values of coefficients between the constructs and their respective Student's t-tests.

Path	Sample Mean	Standard Deviation	T-Statistics	P-Values
Entrepreneurial Characteristics -> Entrepreneurial Intention	0.611	0.040	15,039	0.000
University Environment -> Entrepreneurial Characteristics	0.395	0.056	7,026	0.000
University Environment -> Entrepreneurial Intention	0.015	0.046	0.329	0.742
0				

 Table 177: Coefficients of the Structural Model – Between Constructs

Source: Own authorship

Results indicate that the relationships between entrepreneurial characteristics and entrepreneurial intention and between university environment and entrepreneurial characteristics are significant, supporting hypotheses 2 and 3. However, they also suggest that university environment does not influence entrepreneurial intention, although studies show that this relationship exists (Koe et al., 2012; Moraes et al., 2018; Peterman & Kennedy, 2003; Saeed et al., 2015; Turker & Selcuk, 2009; Wibowo et al., 2019). One possible explanation for this lack of significance may be the presence of a full mediation relationship of entrepreneurial characteristics between the university environment and entrepreneurial intention. In fact, there is theoretical support for the full mediation of some entrepreneurial characteristics with others constructs (Zhao et al., 2005).

In this case, it is recommended that relationships between the constructs to be recalculated without the presence of the mediating variable (Baron & Kenny, 1986; Edwards & Lambert, 2007). Thus, based on the possibility of a full mediation relationship by entrepreneurial characteristics, a new calculation was made without the presence of this relationship in the structural model. The values of the coefficients for the obtained constructs are presented in Table 18.

 Table 18: Full mediation analysis of entrepreneurial characteristics - coefficients of the structural model

Doth	Sample	Standard	T Statistics	D Voluos	
	Mean	Deviation	1-Statistics	1 - values	
University Environment -> Entrepreneurial Characteristics	0.476	0.044	10.385	0.000	
University Environment -> Entrepreneurial Intention	0.265	0.055	4.616	0.000	
Source: Own authorship					

From these results, it can be understood that the university environment is one of the factors that promotes entrepreneurial intention and that this association is mediated by entrepreneurial characteristics, what suggest the acceptance of our first research hypothesis.

To evaluate the coefficient of determination (r^2) we based our analysis on the studies of Cohen (1988) and Faul et al. (2007), which determine that f^2 values equal to 0.02, 0.15 and 0.35 are considered, respectively, as small, medium and large effects. These values of f^2 represent values of r^2 equal to 2%, 13% and 25%, respectively. According to the analyses, the complete model presented a r^2 of 0.377 for the entrepreneurial intention construct, which is considered high; and a r^2 of 0.156 for the entrepreneurial characteristics construct, considered medium. While for the full mediation model, the results of the entrepreneurial intention construct presented a r^2 of 0.204, considered medium.

Besides evaluating the magnitude of r^2 values as a criterion of predictive accuracy, it is necessary to evaluate the value Q², which is an indicator of the model's predictive relevance. The Q² value uses a blindfolding procedure for a certain omission distance, which is iterative and that repeats until each data point has been omitted and the model reestimated. Specifically, when a PLS-SEM shows predictive relevance, it accurately predicts the indicator data points in the reflexive measurement models. Table 19 shows de r², adjusted r² e Q².

Table 18: **Results of \mathbb{R}^2 and \mathbb{Q}^2**

		Complete Model		Fu	Ill Mediation Model	
Construct	R Square	R Square Adjusted	\mathbf{Q}^2	R Square	R Square Adjusted	Q ²
Entrepreneurial Characteristics	0.156	0.154	0.069	0.204	0.202	0.074
Entrepreneurial Intention	0.377	0.374	0.255	0.066	0.063	0.042
0 0 1 1						

Source: Own authorship

For, SEM models, values of Q2 higher than zero indicate the predictive relevance of the path model. In the case of this study, the values are considered adequate (Hair et al., 2017).

In order to test if there are differences between the relationships according to the University's State, multigroup analysis were performed, according to the suggestions of Hair et al. (2018). Table 20 presents the analysis' results of the constructs' significant relationships among groups of respondents from Amazon and São Paulo universities.

Table 19:	Analysis	of relationships	according to	the State o	f the university

	Complete Model		Full Mediation Model		
Path	Path Coefficients - difference	P-Values	Path Coefficients - difference	P-Values	
	(Amazonas vs SP)		(Amazonas vs SP)		
University Environment -> Entrepreneurial Characteristics	0.133	0.715	0.058	0.226	
University Environment -> Entrepreneurial Intention	0.080	0.789	0.106	0.713	
Entrepreneurial Characteristics -> Entrepreneurial Intention	0.160	0.029			

Source: Own authorship

According to the results (Table 20) it is possible to affirm that there are significant differences in the relationships between the constructs depending on the state of the university. When considering the complete model, this difference lies in the relationship between entrepreneurial characteristics and entrepreneurial intention (Hypothesis 4c), and this effect is more strongly positive at Amazonas university than at São Paulo universities. However, when considering the full mediation model, there's no significant differences, depending on the state of the university, in the relationships between university environment and entrepreneurial characteristics (Hypothesis 4a) and between university environment and entrepreneurial intention (Hypothesis 4b).

The complete model resulting from our empirical approach is presented in Figure





Regarding the full mediation model, figure 7 presents it considering the entrepreneurial characteristics mediation on the relationship between university environment and entrepreneurial characteristics. The relationship between entrepreneurial characteristics and entrepreneurial intention, as previously mentioned, was excluded from the model.



Figure 7 : Full Mediation Empirical Model Note 1: * = significant at 5%; ** = significant at 1%; *** = significant at 0.1%; NS = not significant.

The synthesis of this study hypotheses tests is shown on Table 21.

Table 20: Synthesis of the Study Hypotheses Tests

Hypotheses	Description	Result
H1	A supportive university environment for entrepreneurship has a positive influence on undergraduate student's entrepreneurial intention	Confirmed
H2	A supportive university environment for entrepreneurship has a positive influence on undergraduate student's entrepreneurial characteristics	Confirmed
Н3	Entrepreneurial Characteristics have a positive influence on undergraduate student's entrepreneurial intention	Confirmed
H4	A supportive university environment for entrepreneurship, entrepreneurial intention and entrepreneurial characteristics differ in their relationship when considering the educational contexts.	Partially Confirmed
H4a	A supportive university environment for entrepreneurship and entrepreneurial intention differ in its relationship when considering the educational contexts	Not Confirmed
H4b	A supportive university environment for entrepreneurship and entrepreneurial characteristics differ in its relationship when considering the educational contexts	Not Confirmed
H4c	Entrepreneurial characteristics and entrepreneurial intention differ in its relationship when considering the educational contexts	Confirmed

Source: Own Authorship

5. DISCUSSION

This research focused on exploring the role of university environment on behavioral aspects related to entrepreneurship, through analyzing its effect on behavioral characteristics and entrepreneurial intention of UEA, UNICAMP and USP Business Administration students. A supportive university environment for entrepreneurship assists students on: (i) education, by providing necessary knowledge for new venture creation; (ii) concept development, by supporting student's ideas development; (iii) business development, by enabling new business creation through financial arrangements assistance; and (iv) entrepreneurial characteristics development, by enabling individuals' innermost entrepreneurial behavior (Saeed et al., 2015; Trivedi, 2016). A conceptual model with an explanatory value for entrepreneurial intention and an explanatory value for entrepreneurial characteristics was presented.

Results confirmed the positive influence of supportive university environment for entrepreneurship and entrepreneurial characteristics on entrepreneurial intention. This result corroborates with the findings of previous studies between supportive university environment and entrepreneurial intention (Asimakopoulos et al., 2019; Moraes et al., 2018; Saeed et al., 2015) as well as supportive university environment and entrepreneurial characteristics (Lüthje & Franke, 2003; Mustafa et al., 2016; Rocha & Freitas, 2014; Vodă & Florea, 2019). Entrepreneurial characteristics presented a full mediation effect, as seen similarly on Bignotti and Roux (2016) study. This investigation has the novelty of indicating that a supportive university environment influences entrepreneurial intention on BA students both directly and indirectly through entrepreneurial characteristics.

Considering the results gathered from both states, the following contributions can be drawn. First, even though the supportive university environment for entrepreneurship has a positive influence on behavioral aspects related to entrepreneurship, its four dimensions weren't all positively assessed. Perceived Concept Development and Perceived Entrepreneurial Characteristics Development Support have a positive impact on this result. This means that the students perceive their university environment as a provider of ideas and knowledge needed to start a new business and as a motivator to start a new business; besides being a catalyst to boost students' ability to innovate, to plan, to take calculated risk and leadership skills, as well as an assistant at helping students on identifying business opportunities, being persistent and developing the skills to conduct new business opportunities. Thus, university environment prepares individuals to pursue this career by providing them the necessary skills and capacities to undertake different kinds of challenges (Vodă & Florea, 2019).

On the other hand, Perceived Educational Support and Perceived Business Development Support gathered negative results, which means students don't see their university environments with courses (undergraduate or graduate), project work, events focused on entrepreneurship, or acting as a bridge between entrepreneurial students or mentors and interested students; or even, as a business connector that gathers funds, or gives financial support for the new business creation. Thus, universities need to enhance their solutions on educational and business development mainly to be a better influence on entrepreneurial intention due to the trust, resources, and inspiration that students deposit on them (Asimakopoulos et al., 2019; Canever, Barral, & Ribeiro, 2017).

Second, the relationship between entrepreneurial characteristics and entrepreneurial intention has been demonstrated positively. In other words, students' intention to engage their business in future is strongly influenced by their entrepreneurial characteristics; which presents a higher influence on entrepreneurial intention than university environment, as seen similarly on Kusmintarti et al (2014). Students with opportunity recognition, risk-taking, persistence, self-efficacy, sociability, leadership, innovation and planning characteristics tend to like becoming bosses for their own businesses. Although leadership, innovation and planning characteristics had a positive outcome. Taking a closer look, the mediation effect in the relationship between supportive university environment for entrepreneurship and entrepreneurial intention illustrates the low influence of the university environment, which means that BA students enrolled at UEA, UNICAMP and USP do not intent to create new business *per se.*; but when combining student's enrollment and characteristics serves as a trigger to the positive effect of entrepreneurial intention.

Third, the educational context is the focus. The results indicate that educational context doesn't affect the relationship of supportive university environment for entrepreneurship with entrepreneurial intention nor its relationship with entrepreneurial characteristics. Regarding entrepreneurial intention, there's no significant difference between Amazonas and São Paulo; which relates to the important and similar way of initially exposing students to entrepreneurship (Hayter et al., 2017; Wibowo et al., 2019). Concerning entrepreneurial characteristics, there's no significant difference between Amazonas and São

Paulo, as well; which indicates that UEA, UNICAMP and USP students benefit similarly from each university environment (Caliendo & Kritikos, 2011). Both results related to entrepreneurship's behavioral aspects can be explained by (i) alike perceptions of interest among individuals, (ii) poor entrepreneurial culture in Brazil, (iii) the same regulatory environment for entrepreneurial activity; or (iv) Brazil's economic background (Fischer, Schaeffer, et al., 2019; Landström & Harirchi, 2018).

Lastly, considering the different educational contexts effect in the relationship between entrepreneurial characteristics and entrepreneurial intention, there's a positive outcome, where Amazonas displayed a stronger relation than São Paulo. UEA students' characteristics work as a driver to entrepreneurial motivation, which, combined with certain conditions, can enhance the firm-formation process (Fischer, Moraes, et al., 2019; Fischer, Schaeffer, et al., 2019). This result aligns with Amazonas government's efforts to create and enforce a positive entrepreneurship ecosystem. This state has (i) legal devices that supports entrepreneurship (State Law n° 3.152/2007, Decrees n° 21.182/2008, 24.421/2008 and 29.935/2010, and State Resolution^o 10/2010, for example); (ii) a program that facilitates company's opening, updating and closing; (iii) lines of credit and financing through AFEAM⁶, Cooperatives of Credit and Microcredit State Programs; as well as (iv) education initiatives at high schools, with Young Entrepreneur and Growing Ups and Endeavoring programs, at technical colleges, with Pronatec Entrepreneur program and at higher education institutions, through implementing entrepreneurship as a subject of study at federal and state institutions (SEBRAE, 2018). Thus, Amazonas' public policies, financing and education are leaning to strengthen its entrepreneurial ecosystem.

São Paulo also has initiatives to enforce entrepreneurship, like PIPE⁷ that has reached over 1200 companies with a financial support of, approximately, four hundred million reais; and State Law n° 15.693/2015, which focuses on promoting entrepreneurship inclusion at high schools and at technical colleges through the State Entrepreneurial Education Plan (SEBRAE, 2018). This state is number one at Endeavor's Entrepreneurial City Index, however, São Paulo faces challenges due to its dimensions, like culture (low entrepreneurship potential and perception) public policies (high taxes cost and complexity, as well as long processes

⁶ AFEAM is an acronym for Amazonas State Development Agency, or in portuguese, *Agência de Fomento do Estado do Amazonas*.

⁷ PIPE is an acronym for Small Business Innovation Program, or in portuguese, *Programa Inovação em Pequenas Empresas*.

duration), which might be connected to the lower attractiveness to opening a new business found in this state (Endeavor, 2017).

Therefore, even though Amazonas is still under entrepreneurial development, its regional policies and networks may have an impact on entrepreneurial intentions and characteristics; which can be observed thought its participation services sector, that has risen since 2010, which means the alternative of founding a company has become more attractive to these individuals. Also, the work values connected with self-employment such as independence and self-realization have become more desirable for Amazonas natives (Lüthje & Franke, 2003; SUDAM, 2016).

6. CONCLUSION

Universities play an important role on understanding the conducive environment for new venture creation (Trivedi, 2016). The main contribution of this investigation is to evidence the university environment role and collaborate on complementary reflections with entrepreneurship studies conducted in developing countries, such as Brazil (Moraes et al., 2018). Also, this study broadens the knowledge regarding the important factors that universities need to promote to foster entrepreneurship, according to students' perception. Specifically, this research sought to understand the supportive university environment for entrepreneurship influence on entrepreneurial intention and on entrepreneurial characteristics of Amazonas and São Paulo Business Administration students. And, additionally, the possible differences in these relationships when considering both educational contexts.

This study addressed the aforementioned relationships through a robust conceptual model tested with a representative sample of four hundred and twenty respondents from three universities. Considering the research gaps found, this investigation offers progress. First, a robust inquiry was developed to assess the connections of supportive university environment for entrepreneurship and behavioral aspects related to entrepreneurship. Second, the assessment tool was validated for measuring and order different initiatives that could be part of Amazonas and São Paulo educational contexts. In addition, the model presented is comprehensive enough to be applied in different contexts and consider its specific characteristics, as it has been validated in UEA, UNICAMP and USP universities with different characteristics. Third, we have added information on the dynamics of supportive university environment for entrepreneurship in regional contexts, thus providing a set of evidence on these matters out of the cross-national context and developed countries.

Findings address the influence of supportive university environment for entrepreneurship and behavioral aspects related to entrepreneurship, illustrating the lower influence of university environment on entrepreneurial intention than entrepreneurial characteristics on intentions. In face with the educational context, the relation between entrepreneurial characteristics and entrepreneurial intention is particularly stronger in Amazonas than São Paulo. These insights offered an awareness of São Paulo's student lack of propensity to endeavor; which might be related to the high number of job opportunities available when compared to other states, as well as to the barriers existing in the new business creation process. In contrast, Amazonas students are inserted in a working context tangled with MFTZ parameters; thus, in order to receive and offer different job opportunities, the firmformation process stands as a strong possibility. Therefore, this study findings can be appropriated by universities managers and policymakers since it demonstrates each university community perception, and so, acts as a diagnosis map that can be used as a basis for either change or improvement plans and actions, according to each university needs and goals.

Regarding the limitations of this study, it comprises only business administration students from Amazonas (UEA) and São Paulo (UNICAMP and USP); therefore, the debate brought evidences of this specific universities group. This study considered the perception of BA students, which is a subjective manner and might not reflect reality. Also, students from all years were approached, therefore the maturation in students' perceptions might differ when considering freshman and senior students. Additionally, despite the extensive efforts to characterize university environment, scholars are still discussing this theme and there might be more dimensions to be considered.

Replicating the study with students from other fields of expertise and other universities, as well as students in Master's and Doctorate programs could enrich the analyses. Also, further investigation can focus on students from a specific year of graduation to understand their perception on endeavoring. Another possibility is to consider tertiary institutions (like Federal Institutes and Technological Colleges) students and their propensity to create new businesses and behavioral characteristics. Additionally, a longitudinal study could be performed to evaluate if the intention to start new business evolves to the creation itself; besides deepen the understanding of these constructs and their relation by performing a qualitative approach could deepen the understanding of these constructs and their relation. Another avenue for research is to consider self-efficacy as the entrepreneurial characteristic, as seen in literature.

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TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO

O efeito do ambiente universitário nas características comportamentais do estudante

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Número do CAAE: 10935519.5.0000.5404

Você está sendo convidado a participar como voluntário de um estudo. Este documento, chamado Termo de Consentimento Livre e Esclarecido, visa assegurar seus direitos como participante e é elaborado em duas vias, uma que deverá ficar com você e outra com o pesquisador.

Por favor, leia com atenção e calma, aproveitando para esclarecer suas dúvidas. Se houver perguntas antes ou mesmo depois de assiná-lo, você poderá esclarecê-las com o pesquisador. Se preferir, pode levar para casa e consultar seus familiares ou outras pessoas antes de decidir participar. Se você não quiser participar ou retirar sua autorização, a qualquer momento, não haverá nenhum tipo de penalização ou prejuízo.

Justificativa e objetivos:

Essa pesquisa intuito de estudar a influência do ambiente universitário de suporte ao empreendedorismo nas características comportamentais do universitário brasileiro.

Procedimentos:

Ao aceitar participar deste estudo, você irá preencher um questionário considerando a sua percepção sobre o suporte universitário ao empreendedorismo, por parte de sua instituição de ensino, tendo em mente as atividades de ensino, pesquisa e extensão. O tempo necessário para responder o questionário é de aproximadamente 15 (quinze) minutos.

Desconfortos e riscos:

A pesquisa não apresenta riscos previsíveis. Você terá a garantia ao direito á indenização diante de eventuais danos decorrentes da pesquisa. A pesquisa tem uma duração de aproximadamente 15 (quinze) minutos.

Benefícios:

Os benefícios estão em um maior entendimento sobre o ambiente universitário de suporte ao empreendedorismo. A pesquisa não apresenta benefícios diretos aos participantes.

Sigilo e privacidade:

Você tem a garantia de que sua identidade será mantida em sigilo e nenhuma informação será dada a outras pessoas que não façam parte da equipe de pesquisadores. Na divulgação dos resultados desse estudo, seu nome não será citado.

Contato:

Em caso de dúvidas sobre o estudo, você poderá entrar em contato com os pesquisadores:

Prof.	Dr.	Gustavo	Hermínio	Salati	Anne K	athlee	n Lopes	da Ro	ocha	
Marco	ndes de	e Moraes			Aluna	do	curso	de	Mestrado	em
Rua Pe	edro Za	ro Zaccaria, 1300 – Sala 2 UL 93 Administração da FCA/Unicamp					camp			
E-mail	: gusta	vo.salati@f	ca.unicamp.b	or	E-mail:	anne.	rocha@l	notma	il.com.br	
Telefo	ne: (19) 3701-675	7							

Em caso de denúncias ou reclamações sobre sua participação e sobre questões éticas do estudo, você pode entrar em contato com a secretaria do Comitê de Ética em Pesquisa (CEP) da UNICAMP: Rua: Tessália Vieira de Camargo, 126; CEP 13083-887 Campinas – SP; telefone (19) 3521-8936; fax (19) 3521-7187; e-mail: cep@fcm.unicamp.br

Responsabilidade do Pesquisador:

Asseguro ter cumprido as exigências da resolução 466/2012 CNS/MS e complementares na elaboração do protocolo e na obtenção deste Termo de Consentimento Livre e Esclarecido. Asseguro, também, ter explicado e fornecido uma cópia deste documento ao participante. Informo que o estudo foi aprovado pelo CEP perante o qual o projeto foi apresentado. Comprometo-me a utilizar o material e os dados obtidos nesta pesquisa exclusivamente para as finalidades previstas neste documento ou conforme o consentimento dado pelo participante.

Anne Klathleen Dopes da Racha

(Assinatura do pesquisador)

Consentimento livre e esclarecido:

Após o esclarecimento sobre a natureza da pesquisa, seus objetivos, métodos, benefícios previstos, potenciais riscos e o incômodo que esta possa acarretar, aceito participar dessa pesquisa:

Nome do participante: ______ Data: ____/____.

APPENDIX B

Questionnaire applied to BA students

Construct		Indicator	Question	Reference
		SE1	I can work productively, regardless of stress, pressure and conflict.	_
	_	SE2	I can originate new ideas and products.	-
eurial Characteristics	acy	SE3	I can develop and maintain favorable relationship with potential investors.	-
	f-effic:	SE4	I can see new market opportunities for new products and services.	Adapted from De Noble, et al. (1999)
	Sel	SE5	I can recruit and train company's employees.	_
		SE6	I can develop a working environment that encourages people to try out something new.	
	-	SE7	I have the necessary skills to conduct a new business opportunity.	-
	-	RT1	I would assume a long-term debt, believing in the advantages that a business opportunity would bring me.	Schmidt and Bohnenberger (2009);
	king.	RT2	I admit taking risks in exchange for possible benefits.	- Rocha and Freitas (2014).
	kisk-tal	RT3	My decisions are not predominantly based on my comfort zone.	
	Н	RT4	I believe that getting involved in situations of higher risk will create results of great impact.	Moraes et al. (2018)
	8 U	PL1	I always plan everything I do very carefully	Schmidt and Bohnenberger (2009); Rocha and Freitas (2014).
ntreprei	Planni	PL2	To achieve my goals, I detail all the steps to be followed.	Adapted from Rocha and Freitas (2014).
Ш	-	PL3 I know I can set my short, medium and long-term goals.		Managa et al. (2018)
	_	PL4	I like to set goals and targets to feel challenged.	Moraes et al. (2018)
	nition	OR1	I believe I have a good ability in recognizing business opportunities	Adapted from Krakauer et al. (2018)
	ty recogi	OR2	I believe I have the skill to understand, recognize and make use of abstract data, also implied and in constant modification	Adapted from Markman and Baron (2003)
	rtuni	OR3	I am always up to any opportunity that may arise	
-	Oppoi	OR4	I feel able to identify business opportunities and profit from them	Krakauer et al. (2018)
	_	PE1	Professionally, I consider myself more persistent than others.	Schmidt and Bohnenberger (2009);
	stency	PE2	I can work in projects intensely with a risk of depriving my social life, even if the project has uncertain outcome.	Adapted from Markman and Baron (2003)
	Persis	PE3	I'm capable of creating, conducting and implementing new life plans.	_ Adapted from Rocha
		PE4	Every chance I have, I evaluate myself considering perseverance, imagination and creativity.	and Freitas (2014)

(To be Continued)

Construct Indicator Question		Reference			
	-	SO1	The social contacts that I have are very important for my personal life.	Schmidt and Bohnenberger (2009);	
	ability	SO2	I know several people who could assist me professionally, if I needed it.	Rocha and Freitas (2014).	
	Soci	SO3	I relate very easily with other people.	Schmidt and Bohnenberger (2009)	
tics –		SO4	I try to maintain constant contact with people in my network.	Moraes et al. (2018)	
stic		IN1	I prefer a job full of novelty instead a routine activity.	Schmidt and	
urial Characteris	/ation	IN2	I like changing my way of work whenever possible	Bohnenberger (2009); Rocha and Freitas (2014).	
	Innov	IN3	I like improving the conventional and correct way of activities, not strictly following steps.	Adapted from Schmidt and Bohnenberger	
rene		IN4	I bet on creativity while elaborating projects/activities.	(2009).	
Entrepr	_	L1	I am often chosen as a leader in school or professional activities	Schmidt and	
щ		L2	People respect my opinion	Bohnenberger (2009);	
	dership	L3	I can convince people to overcome conflicts and work as a team to achieve a particular result.	(2014).	
	Lea	L4	I can encourage people to perform tasks for which they are unmotivated	Adapted from Schmidt and Bohnenberger	
	-	L5	Frequently, people ask my opinion regarding wok or study issues	(2009).	
F	Ξ.	EI1	I am ready to do whatever it takes to be an entrepreneur.	Liñán and Chen (2009)	
Intentio		EI3	Even though I work for other companies, I will never abandon my dream of opening my business.	Moraes et al. (2018)	
leinnen		EI4	My greatest achievement will be to have my own business.	Adapted from Liñán and Chen (2009).	
atrenre 1		EI2	I will make every effort to create and maintain my own company.	Adapted from Saeed et al. (2015); adapted from	
Ĺ	i i	EI5	I intend to start a business in the coming years.	Liñán and Chen (2009)	
	ort	PES1	My university offers elective courses on entrepreneurship.		
iment	Supp	PES2	My university offers project work focused on entrepreneurship.		
nviror	ttional	PES3	My university offers internship focused on entrepreneurship.		
sity Eı	Educe	PES4	My university offers a bachelor or master study on entrepreneurship	Saaed et al. (2015)	
Jnivera	eived	PES5	My university arranges conferences /workshops on entrepreneurship.		
C	Perce	PES6	My university brings entrepreneurial students in contact with each other.	•	

(To be continued)

pt			
Perceived Concept Development Support	PCD1	My university creates awareness of entrepreneurship as a	Saaed et al. (2015)
		possible career choice.	
	PCD2	My university motivates students to start a new business	
	PCD3	My university provides students with ideas to start a new business from	
	PCD4	My university provides students with the knowledge needed to start a new business.	
ment Perceived Business Development	PBD1	My university provides students with the financial means to start a new business.	- Saaed et al. (2015)
	PBD2	My university uses its reputation to support students that start a new business.	
	PBD3	My university serves as a lead customer of students that start a new business	
Environ tics	ECD1	The university environment helped me to identify business opportunities.	Adapted from Fayolle and Liñán (2014) and Saeed et
	ECD2	The university environment helped me being persistent	al. (2015).
cteris	ECD4	The university environment developed my leadership skills through group work.	Adapted from Schwarz et
ial Chara Support	ECD3	The university environment provided me with planning and strategy tasks in different disciplines, developing my ability to plan.	al. (2009) and Fayolle and Liñán (2014).
eur	ECD5	The university environment enhanced my ability to innovate	
ntrepren	ECD6	The university environment has enabled me to relate and analyze the variables that influence the result of a problem, increasing my ability to take calculated risks.	
ived E De	ECD7	The university environment provided me with several important contacts both personally and professionally.	Adapted from Fayolle and Liñán (2014).
Percei	ECD8	The university environment motivated me to desire opening my own business.	
	ECD9	The university environment developed my skills to conduct a new business opportunity.	
	Perceived Entrepreneurial CharacteristicsPerceived ConDevelopment SupportDevelopmentDevelopment SupportSupport	PCD2PCD3PCD3PCD3PCD4PCD4PCD4PBD1PBD2PBD3PBD3PBD3PBD3ECD1ECD2ECD4PBD3ECD4ECD4ECD4ECD4ECD5ECD5ECD6ECD7ECD6ECD7ECD8ECD9ECD9ECD9	Possible carefer choice:PCD2My university motivates students to start a new businessPCD3My university provides students with ideas to start a new business fromPCD4PCD4My university provides students with the knowledge needed to start a new business.PBD1PBD1My university provides students with the financial means to start a new business.PBD2PBD2My university provides students with the financial means to start a new business.PBD3PBD2My university serves as a lead customer of students that start a new businessPBD3PBD3My university environment helped me to identify business opportunities.ECD1The university environment helped me being persistentECD3ECD4The university environment provided me with planning and strategy tasks in different disciplines, developing my ability to plan.ECD5The university environment has enabled me to relate and analyze the variables that influence the result of a problem, increasing my ability to take calculated risks.ECD7The university environment provided me with several important contacts both personally and professionally.ECD3The university environment motivated me to desire opening my own business.ECD9The university environment developed my skills to conduct a new business opportunity.

Source: own authorship.