

ARTICLES

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PASSION, EDUCATION, AND CREATIVITY AND THEIR EFFECTS ON ENTREPRENEURIAL INTENTION

Paixão, educação e criatividade e seus efeitos na intenção empreendedora

Pasión, educación y creatividad y sus efectos en la intención emprendedora

Renata Torquato de Araujo Pitombeira*¹ | torquato@unifor.br | ORCID: 0000-0002-6087-1380

José Milton de Sousa-Filho¹ | miltionsousa@unifor.br | ORCID: 0000-0002-3078-3179

Macário Neri Ferreira Neto¹ | macario@edu.unifor.br | ORCID: 0000-0002-9697-4066

*Corresponding author

¹Universidade de Fortaleza, Programa de Pós-Graduação em Administração, Fortaleza, CE, Brazil

ABSTRACT

This research aimed to verify the effects of entrepreneurial passion, education, and creativity on entrepreneurial intention (EI). The study used PLS-SEM to analyze data collected via questionnaires from university students in the Brazilian city of Fortaleza. The results showed that entrepreneurial education directly affects EI, whereas the hypothesis that entrepreneurial creativity is a predictor of EI was not supported unless it was mediated by self-efficacy. Finally, the results showed that entrepreneurial passion influences EI directly and when mediated by self-efficacy.

Keywords: entrepreneurship, entrepreneurial intention, entrepreneurial education, entrepreneurial passion, entrepreneurial creativity.

RESUMO

Esta pesquisa teve como objetivo verificar os efeitos da paixão empreendedora, da educação e da criatividade na intenção empreendedora (IE). O estudo utilizou o PLS-SEM para analisar dados coletados por meio de questionários de estudantes universitários da cidade brasileira de Fortaleza. Os resultados mostraram que a educação empreendedora afeta diretamente a IE, enquanto a hipótese de que a criatividade empreendedora é um preditor da IE não foi apoiada a menos que fosse mediada pela auto-eficácia. Por fim, os resultados mostraram que a paixão empreendedora influencia a IE diretamente e quando mediada pela auto-eficácia.

Palavras-chave: empreendedorismo, intenção empreendedora, educação empreendedora, paixão empreendedora, criatividade empreendedora.

RESUMEN

Esta investigación tuvo como objetivo verificar los efectos de la pasión, la educación y la creatividad emprendedoras sobre la intención emprendedora (IE). El estudio utilizó PLS-SEM para analizar datos recopilados mediante cuestionarios de estudiantes universitarios en la ciudad brasileña de Fortaleza. Los resultados mostraron que la educación empresarial afecta directamente a la IE, mientras que la hipótesis de que la creatividad empresarial es un predictor de la IE no fue respaldada a menos que estuviera mediada por la autoeficacia. Finalmente, los resultados mostraron que la pasión emprendedora influye en la IE directamente y cuando está mediada por la autoeficacia.

Palabras clave: emprendimiento, intención emprendedora, educación emprendedora, pasión emprendedora, creatividad emprendedora.

INTRODUCTION

The topic of entrepreneurial intention (EI) has evolved and been studied since the work of Shapero and Sokol (1982) was published 40 years ago. There have also been the studies of Ajzen (1991) and Bandura (1982), who developed theories in the area of Social Psychology and have contributed to increasing theoretical understanding in the field of entrepreneurship. Thus, EI comprises, in general, two strands of research: that of Social Psychology, which analyzes various aspects of behavior, and that which addresses the field of entrepreneurship. The first aspect analyzes an individual's behavior and studies the mental process from attitudes and beliefs to the act of doing – in this sense, Ajzen (1991) proposes the Theory of Planned Behavior (TPB) – and the second aspect, proposed by Bird (1988) and Shapero and Sokol (1982), is specific to the study of entrepreneurship, when the intention to start a business results from the individual's perception of the desirability of the entrepreneurial role and the viability of the entrepreneurial venture, as well as the individual's tendency to act accordingly with the opportunities available.

The TPB emerged in order to predict and analyze individual behavior in certain situations. The theory addresses attitudes, subjective norms, and perceived behavioral control (PBC), this last factor having real importance in that the opportunities that appear for an individual dictate the possibility of carrying out a certain behavior (Ajzen, 1991).

According to Liñán et al. (2010), the perceptions that favor the action of becoming an entrepreneur are defined as PBC and can be influenced in the context of entrepreneurial education. A central objective of most entrepreneurship programs is to create awareness of entrepreneurial activities or necessary entrepreneurial knowledge and skills (Fellnhöfer, 2017).

In addition to entrepreneurial education (EE), entrepreneurial passion (EP), which is one of the emotions capable of motivating entrepreneurial efforts, is essential in undertaking ventures (Cardon et al., 2009). Entrepreneurial creativity (EC) refers to the construction of ideas that are new and could be useful in the short or long term and has a very close relationship with entrepreneurship in that there is the recognition of opportunities, which leads to the opening of new businesses (Amabile, 1996; Ko & Butler, 2007).

Previous studies sought to demonstrate the factors that lead individuals to undertake an enterprise, including EC, EP and EE (Biraglia & Kadile, 2017; Ferreira et al., 2023; Hou et al., 2019). Moreover, research has demonstrated the existence of EC, EP and EE (Anjum et al., 2018; Nasiru et al., 2015), which allows us to have a positive perspective for studies in the area.

However, no model was found in the literature that considers the influence EC, EP and EE have on EI mediated by PBC, thus demonstrating research opportunities. To address this gap, the authors use the TPB to capture environmental and personal factors that indicate anticipating the individual's entrepreneurial actions.

Thus, the general objective of the research is to verify the influence of EE, EP and EC mediated by PBC on EI. To achieve the objective, questionnaires were administered to students at a private university, with the participation of 251 respondents. Structural equations were used to validate the hypotheses proposed in the work.

This research is carried out with the intention of improving understanding of the determinants of students' EI for creating their own ventures after graduation. It also seeks to contribute by advancing the study of the EC, EE and EP constructs associated with the individual's intention to undertake an enterprise. Likewise, we intend to obtain a better understanding of whether creativity, proposed by Ko and Butler (2007), has an influence on the intention to undertake an activity, and whether entrepreneurial education and passion, defended by Cardon et al. (2009), are stimulating factors for generating new business.

THEORETICAL BACKGROUND

Entrepreneurship and the Theory of Planned Behavior (TPB)

Entrepreneurship is a process activity that involves an opportunity; one or more people with attitude; risk; innovation that produces results such as value, new products, services or processes; and profits, personal benefit and growth (Morris et al., 1994).

Therefore, to have entrepreneurship, an individual must first have entrepreneurial opportunities (Shane & Venkataraman, 2000). Entrepreneurs act based on what they believe to be an opportunity. When opportunities exist (or are created and/or generated), entrepreneurs must use their judgment on whether or not to act (Hisrich et al., 2017).

Entrepreneurial opportunities refer to situations in which new goods, services, raw materials, markets, and organizational methods can be inserted through the creation of new means, ends, or means-end relationships, because they are different from each other (Shane et al., 2003).

An individual's intention to start a business has been addressed by several studies. According to Liñán (2004), there are three factors that can influence entrepreneurial behavior: personal attitude, which says whether the person has a positive or negative attitude about entrepreneurship; the subjective norm, which measures the perceived social pressure to exercise or not exercise business behaviors; and PBC, which is understood as the individual's perception of whether or not it is easy for them to be an entrepreneur.

According to Oliveira and Rua (2018), all models that explain EI show that entrepreneurial action is a process determined by EI. Krueger et al. (2000) and Shapero and Sokol (1982) suggest a four-step model to demonstrate this process, this being: the intention to start the process, the identification of opportunities, and the preparation and implementation of opportunities. Shane and Venkataraman (2000) suggest a model containing three phases: opportunity recognition, operational planning, and opportunity implementation.

The PBC view, proposed by Bandura (1982), is more compatible with the concept of self-efficacy, which is concerned with judging how well one can execute courses of action necessary to deal with prospective situations. Self-efficacy beliefs can influence the choice of activities, the effort expended for a given activity, and also emotional reactions and thoughts (Bandura, 1982).

The TPB specifies three distinct attitudinal antecedents of intention, each drawn from existing theory and prior evidence. Two of them reflect the preconceived desire to perform the behavior: personal attitudes toward the results of the behavior and adopted social norms. The third, the TPB, reflects the subject's perception that the behavior is personally controllable, it also reflects the perceived feasibility of performing the behavior and is related to the subject's perceptions of personal situational competence (i.e., self-efficacy) (Ajzen, 1991; Krueger & Carsrud, 1993).

The TPB is increasingly seen as a useful theoretical framework in new venture creation, as it helps explain the complex cognitive processes that lead to new business creation (Krueger et al., 2000; Liñán, 2008).

Entrepreneurial Intention (IE)

Previous research has shown that EI precedes any entrepreneurial behavior, being a reliable predictor of entrepreneurship (Bird, 1988; Koe, 2016). Entrepreneurial intentions as the core structure of entrepreneurship have received great attention and are affected by various internal and external factors of entrepreneurs (Smith et al., 2016).

In this context, EI can be defined as the idea coming from a person who intends to build a new venture and, consciously, plans to carry it out at some point in the future (Thompson, 2009). Intention becomes the fundamental element to explain entrepreneurial behavior, as it indicates the effort that the person will make to carry out this entrepreneurial behavior (Liñán, 2004).

Entrepreneurial action is generally intentional. Entrepreneurs intend to pursue certain opportunities, explore new markets and offer new products, and this is rarely the process of unintentional behavior. Intentions look for the factors that motivate a certain behavior, being indications of how hard people are willing to try and how much effort they plan to exert to perform the behavior (Hisrich et al., 2017).

Therefore, individuals with EI can be distinguished from those who simply have an entrepreneurial personality or disposition by the fact that they have, first, given some degree of conscious importance to the likelihood that they themselves will start a new venture at some stage in the future, and then, secondly, they did not reject such a possibility (Thompson, 2009). Thus, entrepreneurial intention aims to create a new venture or create new values in existing ventures (Bird, 1988).

Entrepreneurial Education (EE)

Entrepreneurial education involves all forms of knowledge delivery that aim to empower the individual to create real wealth in the economic sector, thereby advancing the cause of the development of the nation as a whole (Oguntimehin & Oyejoke, 2018).

Entrepreneurial education can have several distinct effects. First, EE is likely to influence knowledge and skills. Courses at university institutions are generally oriented towards teaching methods, concepts, and facts. However, the skills and knowledge taught will have generic

components; in this case, this education may not change business intentions much. However, entrepreneurial education also affects students' attitudes and perceptions, and can affect entrepreneurial intentions, in this case, through actions (Graevenitz et al., 2010).

In short, there are a wide range of factors that are commonly linked to the desire of university students to have their own business. Therefore, the challenge still remains in understanding the phenomenon and building a consistent assessment instrument (Santos et al., 2010). It has been observed from most studies in this field that the samples focus on university students, showing that EIs have assumed an essential role in the entrepreneurship scenario, more precisely in the intention to undertake an enterprise. EIs have become a field of study on the topic due to the important role they play in society and the development of the region (Souza et al., 2018).

Intention, according to Ajzen (1991), is generally recognized as the only predictor for an individual to engage in a specific behavior. In their study, Krueger et al. (2000) showed how intention can be a single predictor for entrepreneurial behavior.

By acquiring general knowledge of entrepreneurship and improving opportunity recognition skills through EE, a person's desire to undertake an activity increases (Puni et al., 2018). In this sense, Bae et al. (2014) carried out a meta-analysis consisting of 73 studies with 37,285 individuals which confirmed the hypothesis that EE has a positive influence on EI.

Thus, in recent years, researchers have come to realize the importance of the relationship between EE and EI. Some studies pointed out the positive impact of EE on students' EI (Iwu et al., 2021; Li & Wu, 2019; Wu et al., 2022), however, other studies indicated the opposite situation, when EE failed to promote the EI of the students surveyed. (Nabi et al., 2018). Based on this, this research suggests the first hypothesis:

H1a: EE directly and positively influences EI.

Entrepreneurial education is a necessary condition for cultivating IE, but it is not a sufficient condition unless it is integrated into PBC. PBC has a strong mediating effect between university students' EE and entrepreneurial will (Oyugi, 2015). In a survey involving 226 university students in Ghana, Adu et al. (2020) verified the hypothesis that behavioral control mediates the relationship between EE and EI. In this context, the following hypothesis is presented:

H1b: PBC mediates the relationship between EE and EI.

Entrepreneurial Creativity (EC)

Staying creative is a quality that a successful entrepreneur must have. In the field of entrepreneurship, individual creativity refers to the process in which entrepreneurs can combine existing resources and generate new ideas to start innovative businesses (Chua & Bedford, 2015; Shi et al., 2020).

EC refers to the production of new and useful ideas about products, services, working methods, and processes by an individual or a small group of individuals working together to launch a new venture. In both developed businesses and new ventures, creativity is visible. However, just doing tasks and activities that are different from others does not mean that it is successful creativity at work (Amabile, 1996, 1997).

Creativity can be seen as an essential element of entrepreneurship, since EC is associated with the discovery and development of new ideas and with the implementation of useful new ideas to create something new and to find new ways of looking at problems and opportunities (Amabile, 1996; Kusmintarti et al., 2017).

Thus, if we consider successful entrepreneurs as those who identify opportunities and start new businesses, they will need to have the ability to generate more than new and useful ideas. An individual who becomes creative enough and has the potential to be an entrepreneur needs to perceive her/himself as capable of conducting the activities inherent to opening a new business (Biraglia & Kadile, 2017).

EC is one of the entrepreneurial characteristics that determines EI (Kusmintarti et al., 2017). Thus, EC can manifest itself not only in identifying opportunities, but also in implementing these ideas. The generation of new ideas can, therefore, be indicative of the individual's EC. Individuals who have new ideas for starting a business are more likely to have viable perceptions about recognizing opportunities and, therefore, are likely to have greater entrepreneurial intentions (Smith et al., 2016).

Thus, in recent years, creativity has become an important predictor of EI. The relevance of the relationship between EC and EI has been highlighted by studies that reported the positive impact of EC on students' EI (Anjum et al., 2018; Kumar & Shukla; 2019), while other research indicated the opposite situation, when EC did not influence the EI of the students researched (Ferreira et al., 2023). Therefore, we have the following hypothesis:

H2a: EC directly and positively influences EI.

Tang (2008) argued that entrepreneurs with high self-efficacy and high creative ability are more attentive to new opportunities. Individuals with EC can increase PBC or self-efficacy that will lead to a more successful business start-up (Shahab et al., 2019).

Previous research has verified the significance of self-efficacy mediating the relationship between EC and EI, demonstrating that, although EC can trigger the entrepreneurial process, self-efficacy drives towards opening new businesses (Ndofirepi et al., 2018). Thus, in the research by Kumar and Shukla (2019), the mediation results confirmed entrepreneurial self-efficacy as a mediator of the relationship between EC and entrepreneurial intention. In this context, we have the following hypothesis:

H2b: PBC mediates the relationship between EC and EI.

Entrepreneurial Passion (EP)

EP was addressed by Cardon et al. (2009), who conceptualized it based on two key statements: i) EP is a conscious, positive, and accessible emotion and ii) it results from engagement in activities that bring meaning to the individual. The research by Cardon et al. (2009) initially addressed passion in psychology studies and then related it to the topic of entrepreneurship.

Furthermore, these authors drew attention to the multifaceted nature of EP, proposing three different identities related to various aspects of the entrepreneurial process: (1) an inventor, who is passionate about activities involved in identifying, inventing, and exploring new opportunities; (2) a founder, who is passionate about activities involved in creating a venture to commercialize and explore opportunities; and (3) a developer, who is passionate about activities relevant to nurturing, growing and expanding the business once established. These different passions related to identity influence cognitions linked to goals and generate specific business results (Cardon et al., 2009).

EP is defined as a positive, strong and conscious feeling, experienced by participating in role-related entrepreneurial activities, and is important in the self-identification of entrepreneurs. Conceived from this experiential perspective, measuring EP therefore requires considering three aspects of this definition: 1) passion involves the experience of intense positive feelings; 2) these feelings are experienced through activities, which are central to the individual's self-identity; and 3) feelings and the centrality of identity are focused on three specific domains of entrepreneurship (Cardon et al., 2009; Cardon et al., 2013).

With empirical research, Liu et al. (2011) found that EP mediates the effects of the organization's support for the person's autonomy on the employee's EC. The studies by Cardon et al. (2009) show that people who are passionate about invention, which is the focus of this research, that is, who identify as not having yet undertaken an enterprise, are more innovative and creative individuals, and search for creative solutions to problems that arise. Thus, the passion for entrepreneurial activities within a given context can trigger planning to start a business and probably generate action-oriented entrepreneurial intentions (Biraglia & Kadile, 2017).

In this way, passion for entrepreneurial activities can be the trigger for planning a company. In other words, an influential general state of EP embedded in a particular context is likely the production of action-oriented EI (Karimi, 2019). Furthermore, the notions of self-efficacy are significant in generating the passion necessary for successful entrepreneurship. This means that self-efficacy can be crucial for maintaining and developing passion in the context of entrepreneurship (Arshad et al., 2018).

Previous studies indicate a positive relationship between EP and EI (Ferreira et al., 2023; Neneh, 2022), thus the following hypothesis is presented:

H3a: EP directly and positively influences EI.

There is an indication in previous research, such as that by Karimi (2019), which points to the role of PBC as a mediator that associates psychology parameters with the results of entrepreneurship.

Intrinsically, PBC is a potentially proximal indicator of EI, while passion is a more distant indicator. Based on the discussion in the literature, there is the prediction of an indirect relationship between EP and the intention to undertake an enterprise through PBC (Saboor et al., 2020).

Individuals who are passionate about starting a new business (EP) will persist in finding ways to develop the skills and capabilities needed to handle the roles and challenges required to be an entrepreneur (self-efficacy) and therefore be more motivated to get involved in entrepreneurial intention (EI) (Neneh, 2022). In this context, the following hypothesis is proposed:

H3b: PBC mediates the relationship between EP and EI.

Table 1 presents the constructs used in this research with their respective authors.

Table 1. Constructs

Constructs	References
Entrepreneurial Intention	Bird (1988); Koe (2016); Smith et al. (2016); Thompson (2009); Lián (2004); Hisrich et al. (2017)
Entrepreneurial Education	Oguntimehin & Oyejoke (2018); Graevenitz et al. (2010); Santos et al. (2010); Souza et al. (2018); Ajzen (1991); Krueger et al. (2000); Puni et al. (2018); Bae et al. (2014); Iwu et al. (2021); Li & Wu (2019); Wu et al. (2022); Nabi et al. (2018)
Entrepreneurial Creativity	Chua & Bedford (2015); Shi et al. (2020); Amabile (1996, 1997), Kusmintarti et al. (2017); Biraglia & Kadile (2017); Smith et al. (2016); Anjum et al. (2018); Kumar & Shukla (2019); Ferreira et al. (2023)
Perceived Behavior Control	Tang (2008); Ndofirepi et al. (2018); Shahab et al. (2019); Kumar & Shukla (2019); Saboor et al. (2020)
Entrepreneurial Passion	Cardon et al. (2009); Cardon et al. (2013); Liu et al. (2011); Biraglia & Kadile, (2017); Arshad et al. (2018); Neneh (2022)

Source: Prepared by the authors (2020).

METHODS

For this research, a descriptive, explanatory and quantitative analysis was adopted. The research design is classified according to its nature as applied, in that the techniques developed are used so that its hypotheses can be tested. In its approach, the research is classified as quantitative, as it will measure the relationship between the constructs by using statistical techniques to obtain results and construct the conclusion. The research will be explanatory, as it will seek to deepen knowledge about the characteristics of a given group, estimating their proportions and relating their variables (Cooper & Schindler, 2016; Richardson, 2014).

Sample and data collection

The sample included 251 students out of a total of 792 students enrolled in the Administration course from a private university in the city of Fortaleza. This sample presented a confidence level of 95% with a margin of error of 5% (Richardson, 2014).

To collect data, a questionnaire composed of scales adopted in previous works was used (Anjum et al., 2018; Bae et al., 2014; Biraglia & Kadile, 2017; Shi et al., 2020). Thus, data collection was carried out with an electronic questionnaire, based on the following scales (constructs): EE (Saptono et al., 2019), PBC and EI (Liñán & Chen, 2009), EP for invention (Cardon et al., 2013) and EC (Shahab et al., 2019).

The questionnaire used a Likert scale ranging from 1 to 7, ranging from completely disagree to completely agree. The survey method, used to collect primary data, is normally used when there is a significant number of respondents (Hair et al., 2009). Respondents were chosen based on their presence in the classroom and availability to participate in the research. The rooms visited occurred randomly, and the questionnaire was administered in the presence of one of the researchers, who explained the research instrument.

Data analysis

The data were put into an Excel[®] spreadsheet and exported to IBM[®] SPSS[®] Statistics, version 20, for descriptive statistics calculations, and to Smart PLS-SEM, version 3.2.9, for structural equation modeling (Ringle et al., 2014).

Sample analysis includes students' demographic characteristics and other aspects related to the research questions. The data were analyzed using SPSS software for initial and descriptive calculations. To verify the hypotheses Structural Equation Modeling (SEM) based on variance was used, with the Partial Least Squares (PLS) technique.

PLS-SEM offers numerous advantages for researchers working with structural equation models, such as non-normal data, small sample sizes, and formatively measured constructs (Hair et al., 2014). SEM comes from the family of statistical techniques, and has become very popular in marketing, due to its ability to model latent variables, to consider various forms of measurement errors, and to test entire theories, which makes it useful for a multitude of research questions (Henseler, 2017).

DATA ANALYSIS AND DISCUSSION

Descriptive statistics

In this section, the data were analyzed, firstly, by describing the sample and descriptive analysis of the questionnaire. Table 2 shows that the majority of respondents were male (60.2%), single (90.8%), white (62.2%), without paid work (39.8%) and of the age group up to 20 years (39.8%).

Table 2. Descriptive data of sample (N=251)

	Description	N	F(%)
Sex	Male	151	60.2
	Female	100	39.8
Marital status	Single	228	90.8
	Married/Stable union	19	7.6
	Separated/Divorced	4	1.6
Race/Color	White	156	62.2
	Mixed-race	74	29.5
	Black	14	5.6
	Asian	7	2.8
Occupation	Without paid work	89	35.5
	Private company employee	49	19.5
	Business owner	49	19.5
	Scholarship/Intern	39	15.5
	Self-employed	24	9.6
	Public service employee	1	0.4
Age	Until 20 years	100	39.8
	From 21 to 25 years	94	37.5
	From 26 to 30 years	36	14.3
	From 31 to 35 years	11	4.4
	More than 35 years	10	4.0

Source: Prepared by the authors.

After describing the sample, the following tables demonstrate the descriptive data for each construct. First, the internal reliability of the instrument was calculated, for this purpose, composite reliability was used to measure the consistency of each questionnaire. The minimum acceptable value is 0.70 (Hair et al., 2009). The questionnaire did not present missing data, and the discrepant data were not significant enough to interfere with the answers, and was maintained by the researcher's decision.

Structural Equation Modeling (SEM)

To use SmartPLS, a minimum sample is required, based on the variable with the highest predictors and using the *GPower* v application. 3.1.9.4. For a power of 0.95 and effect of 0.15 (medium), a minimum sample of 119 responses is required; In this work there is a sample of 251 individuals, meeting the sample parameters for the use of SmartPLS (Ringle et al., 2014).

After verifying that the sample size meets the *G*Power* parameters with an estimated power of 0.95 and the minimum required cases of 10 per parameter (Hair et al., 2009), the process of interpretation of structural equation modeling (SEM) follows: evaluation of the measurement model (relationships between indicators and constructs) and evaluation of the structural model (relationships between constructs).

Assessment of the measurement model

For the first analysis, it is verified whether the factor loadings of all items exceeded the recommended value of 0.6. Next, the internal consistency of the research instrument is assessed using composite reliability, which provides a more appropriate measurement of internal consistency reliability if minimum values of 0.70 are expected (Hair et al., 2014).

The evaluation of the Average variance Extracted (AEV) is part of the data (in variables), explained by the respective structures or latent variables, referring to the set or number of variables, on average, the variables, and their respective structures or VL is positively correlated. Therefore, for an AEV greater than 0.50, it is assumed that the model converges to a satisfactory result (Fornell & Larcker, 1981; Hair et al., 2014; Lin et al., 2006).

Discriminant validity indicates how different the construct is from other constructs empirically if the construct measures what it purports to measure. To be effective, the framework must share more differences with its indicators than with any other framework. To test this requirement, the AVE of each structure must be greater than the largest quadratic correlation with any other structure (Fornell & Larcker, 1981; Hair et al., 2014). In summary, the measurement model demonstrated adequate reliability, convergent validity, and discriminant validity. Regarding multicollinearity, according to Hair et al. (2009) the Variance Inflation Factor (VIF) value should not be greater than 10; As shown in Table 3, this requirement was met.

Table 3. Composite validity

Construct	Factor Loading	CR	AEV	VIF
Perceived Behavior Control		0.918	0.652	
Starting a company and keeping it running would be easy for me.	0.783			2.00
I am prepared to open a viable company.	0.859			2.88
I can control the process of creating a new company.	0.851			2.76
I know the practical details required to start a company.	0.783			2.12
I know how to develop an entrepreneurial project.	0.806			2.38
If I tried to start a company, it would have a high probability of success.	0.757			1.69
Entrepreneurial Creativity		0.914	0.573	
I am a very creative person.	0.708			1.93
I set aside a few minutes each day or week to be creative.	0.706			1.78
I have a lot of ideas.	0.820			2.54
I look for new solutions even when they are not necessary.	0.744			1.92

Continue

Table 3. Composite validity

Concludes

Construct	Factor Loading	CR	AEV	VIF
My ideas are often very original.	0.791			2.13
I'm sensitive to seeing problems that others do not see.	0.797			2.12
New solutions also come to mind when they are not especially necessary.	0.783			2.38
It is easy for me to find proposals for improvement.	0.695			1.58
Entrepreneurial Education		0.921	0.796	1.87
My education at university encourages me to develop creative ideas to be an entrepreneur.	0.908			3.57
My university offers the necessary knowledge about entrepreneurship.	0.865			
My university develops my entrepreneurial skills and abilities.	0.903			3.59
Entrepreneurial Intention		0.957	0.787	
I am ready to do anything to be an entrepreneur.	0.808			2.18
My professional goal is to become an entrepreneur.	0.876			3.43
I will make every effort to start and run my own company.	0.939			6.35
I am determined to create a company in the future.	0.944			7.16
I have thought very seriously about starting a company.	0.879			3.25
I firmly intend to start a company one day.	0.869			3.62
Entrepreneurial Passion		0.932	0.734	
It's exciting to find new ways to solve unmet market needs that can be commercialized.	0.810			2.21
Looking for new ideas for products/services to offer is enjoyable for me.	0.876			2.90
I am motivated to discover ways to improve existing products/services.	0.867			2.71
Probing new opportunities in the market is exciting for me.	0.895			3.10
Creating new solutions to problems is an important part of who I am.	0.832			2.29

Note: CR – Composite reliability; AVE – Average Variance Extracted; VIF – Variance Inflation Factor

Source: Prepared by the authors.

As shown in Table 3, the values are higher than expected, therefore confirming the validity of the constructs. Next, discriminant validity is verified, which is the criterion of Fornell and

Larcker (1981). This method states that the difference between a construct and its index is greater than that of any other construct. Table 4 demonstrates that this step was satisfied.

Table 4. Discriminant validity

Construct	PBC	EC	EE	EI	EP
Perceived Behavioral Control (PBC)	0.807				
Entrepreneurial Creativity (EC)	0.488	0.757			
Entrepreneurial Education (EE)	0.111	0.282	0.892		
Entrepreneurial Intention (EI)	0.581	0.455	0.276	0.887	
Entrepreneurial Passion (EP)	0.448	0.502	0.249	0.559	0.857

Note: On the main diagonal (in bold) is the square root of the AVE.

Source: Prepared by the authors.

Assessment of the structural model

The first analysis is the evaluation of Pearson's coefficient of determination (R^2), which evaluates the part of the variance of the endogenous variables, explained by the structural model, and R^2 is the predictive measure of the model. Cohen (1988), therefore, recommends that the values of 0.26, 0.13 and 0.02 are substantial, medium and weak, respectively. Relying solely on R^2 can cause problems, so using Q^2 (cross-validation redundancy) strengthens the model's predictive correlation (Ringle et al., 2014).

Q^2 is based on sample reuse technology, which estimates model parameters and uses the estimated values to predict missing parts. The smaller the difference between the predicted value and the original value, the higher the Q^2 and, therefore, the higher the model's prediction accuracy. Q^2 is considered relevant when it is greater than zero, and the closer it is to 1, the greater the predictability of the model (Hair et al., 2014).

Therefore, the result that is displayed in Table 5 explicitly indicates that all independent variables can explain 47.2% of the variance in students' EI. Thus, R^2 occupies a substantial level and is in accordance with Cohen's (1988) suggestion. The values of $Q^2 > 0$ and f^2 varying between 0.01 and 0.17 demonstrate that the model in this study expresses adequate predictive relevance (Gelaidan & Abdullateef, 2017).

Table 5. Predictive values R^2 and Q^2

Construct	R^2	Adjusted R^2	Q^2
PBC	0.288	0.288	0.187
EI	0.472	0.463	0.364

Source: Prepared by the authors.

The correlation values and their significance were then evaluated using the “Bootstrapping” module (resampling technique). Effect size (f^2) is calculated by observing the change in R^2 when a specific construct is eliminated from the model. Based on the f^2 value, the omitted construct effect size for a particular endogenous construct can be determined such that 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively (Hair et al., 2014; Ringle et al., 2014).

Table 6. Structural coefficients

Relation	Hypothesis	Coefficient	Standard deviation	P value	f^2	Validity
EE → EI	H1a	0.135	0.047	0.004	0.031	YES
EE → PBC → EI	H1b	-0.024	0.026	0.350		NO
EC → EI	H2a	0.062	0.053	0.203	0.006	NO
EC → PBC → EI	H2b	0.143	0.026	0.000		YES
EP → EI	H3a	0.316	0.068	0.000	0.128	YES
EP → PBC → EI	H3b	0.110	0.032	0.001		YES

Source: Prepared by the authors.

As shown in Table 6, the relationships $EE \rightarrow EI$; $EC \rightarrow PBC \rightarrow EI$; $EP \rightarrow EI$ and $EP \rightarrow PBC \rightarrow EI$ were validated.

Hypothesis H1a, which predicted the relationship between EE and EI, was validated ($\beta = 0.135$, $p < 0.05$), similar to the work of Li and Wu (2019), which points to EE being positively related to EI ($\beta = 0.355$, $p < 0.001$), as well as the research by Puni et al. (2018), which shows empirical evidence that EE can have a positive effect on EI, and the study by Saptono et al. (2019), which proved the significance of the relationship between education and EI ($\beta = 0.796$, $p < 0.001$). However, when mediated by PCB (H1b), it was not supported ($\beta = -0.024$, $p > 0.05$), unlike in previous research, which confirmed the mediation of self-efficacy in the relationship between EE and EI (Oyugi, 2015; Puni et al., 2018).

Thus, with regard to EE, the direct relationship with intention was validated; the same did not happen when mediated by PCB or self-efficacy. This suggests that students' perception of the effectiveness of entrepreneurial education discourages them from wanting to engage in entrepreneurial activities after graduation, demonstrating that entrepreneurial education in private universities still needs to be improved, especially in how to increase the perception

of controlling their students' behavior or self-efficacy in relation to entrepreneurship (Wang & Nie, 2018).

These results reinforce previous literature that recognizes the motivating role of entrepreneurial education in entrepreneurial activity among young people, and that it promotes an increase in the employment rate and boosts economic growth, innovation and employment (Iwu et al., 2021).

Hypothesis H2a pointed to the relationship between EC and EI, which was refuted ($\beta = 0.068$, $p > 0.05$); this result is in line with the work of Kusmintarti et al. (2017), which also did not validate the proposal ($\beta = 0.217$, $p > 0.05$), but disagrees with the research by Smith et al. (2016), which validated the hypothesis that EC is positively related to EI ($\beta = 0.100$, $p < 0.05$). The result can be interpreted as creativity being directly proportional to the level of EI, but the influence of the creative personality on the student's EI is not significant.

In reference to hypothesis H2b, the relationship between EC and EI, mediated by self-efficacy or PCB, was validated ($\beta = 0.143$, $p < 0.05$), a result similar to that found in the research by Ndofirepi et al. (2018), which confirmed the same relationship ($\beta = 0.136$, $p < 0.05$), and with the result pointed out by Kumar and Shukla (2019), which confirmed entrepreneurial self-efficacy as a mediator of the relationship between EC and EI.

In this case, with EC preceding intention, it was not supported, but, when mediated by self-efficacy, the result was significant. Since the effect of EC on EI was fully mediated by self-efficacy, it means that creativity, by itself, will not stimulate favorable intentions to pursue a career in entrepreneurship; rather, one needs to have confidence to start a new business (Kumar & Shukla, 2019).

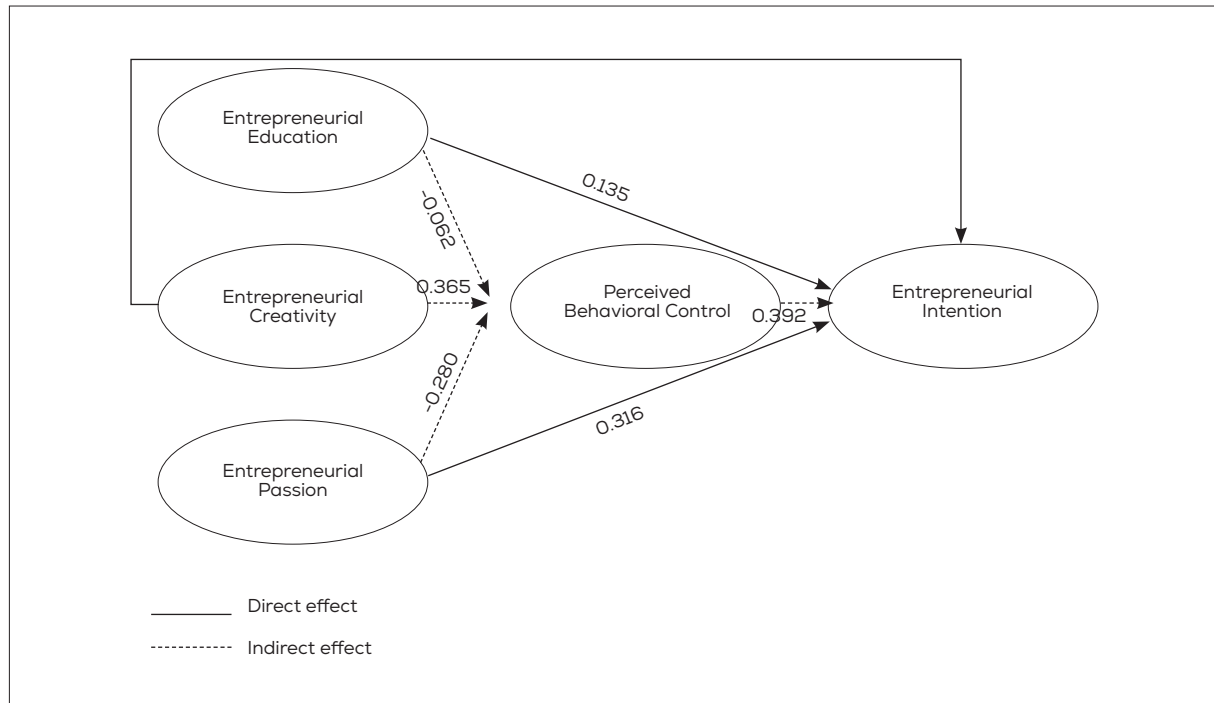
Regarding hypothesis H3a, the relationship between EP and EI was validated ($\beta = 0.316$, $p < 0.05$), confirming the positive influence of passion on EI, in accordance with the work of Biraglia and Kadile (2017), which also confirmed the relationship ($\beta = 0.671$, $p < 0.001$), and with the research by Nasiru et al. (2015), which validated the hypothesis that EP for invention has a positive influence on EI ($\beta = 0.301$, $p < 0.001$).

Hypothesis H3b was also confirmed, validating the relationship between EP and EI, being mediated by perceived behavioral control ($\beta = 0.110$, $p < 0.05$), a result similar to the work of Karimi (2019), who validated the same hypothesis with a group of Iranian students ($\beta = 0.250$, $p < 0.05$). Likewise, Neneh (2022) validated the suggested hypothesis that self-efficacy would mediate the association between passion and EI ($\beta = 0.200$, $p < 0.05$), similar to the work of Saboor et al. (2020), who found a significant positive relationship between EP and EI mediated by behavioral control. In the same sense, Ferreira et al. (2020) found a significant relationship between EP for invention and self-efficacy ($\beta = 0.48$, $p < 0.05$).

Regarding EP as an antecedent of EI, with direct or mediated relationships by self-efficacy, the results presented demonstrate that the relationships are significant, although the mediation of self-efficacy in the relationship between passion and EI was partial, considering that the value of standardized beta was smaller when compared to the direct relationship between the EP and EI constructs.

Figure 1 graphically presents the relationships and coefficients of the paths established in this research.

Figure 1. Research model



Source: Prepared by the authors (2020).

CONTRIBUTIONS

This study presents its contributions with regard to theory, methodology and practice. Theoretically, this study looks at using the TPB structure to present useful information related to EI, contributing to academia by presenting a model that demonstrates the need for better monitoring of students and greater promotion of events on entrepreneurship to improve the confidence and self-efficacy of students.

Furthermore, it tested and complemented the TPB from the perspective of learning, passion, creativity, and self-efficacy. The results provide empirical evidence to support existing theories and will also serve as a valuable reference for follow-up studies.

Methodologically, this study employed structural modeling using PLS to explain the relationships in its model, allowing entrepreneurship development stakeholders to gain better insight into how EI is established and how the perceptions of potential venture initiators affect their intention of establishing a business.

Potentially, it allows governments and policymakers to include young adults who are likely to have EI in their action plans, thereby accelerating the creation of business ventures.

Practically, stakeholders responsible for entrepreneurship development will have a better view of how EI is formed and how the beliefs and perceptions of potential venture initiators impact their intention to start a business.

This study should be of interest to groups of researchers, teachers, and supporters of entrepreneurship, as it clarifies the interaction between the little explored concepts of EE effectiveness, creativity and EP for invention, as well as the perception of self-efficacy in the formation of EE.

CONCLUSION

The results demonstrated that the mediating effect of PBC on the relationships between EC and EP did not have a significant effect on the relationship between EE and EI.

Thus, the relationship between EE and EI was not significant when mediated by PBC, but was significant when directly related to each other. In this case, the results demonstrated that the students did not feel confident in entrepreneurship, even though they demonstrated their intention to have their own businesses.

Regarding EC and its relationship with EI, this proved to be not significant, requiring the mediation of the PBC, demonstrating that EC alone is not capable of generating the intention to undertake an enterprise.

As for EP, both its direct relationship with EI and when mediated by PBC proved to be significant. However, mediation reduces the direct effect of the relationship between EP and EI.

Therefore, it is concluded that the EE demonstrated the need for greater university participation to stimulate the perceived capacity to start a new business, EC needs PBC to influence EI, and that EP influences EI, but this influence decreases when mediated by self-efficacy. The results are in line with the theories and theoretical framework addressed in the study.

As a limitation of the work, a cross-sectional design was used, which does not allow for confirmation of causality between the variables tested, although the model presented was based on previous research, which empirically tested the proposed relationships.

It is expected that this study will guide new research to explore the interaction of personality traits and environmental conditions in improving entrepreneurship, in addition to the possibility of extending the research to other federative units, providing comparisons between regions of the country.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

CONTRIBUTION OF THE AUTHORS

Renata Torquato de Araujo Pitombeira: Conceptualization; Methodology; Writing – original draft; Writing – review and editing.

José Milton de Sousa-Filho: Conceptualization; Data Curation; Methodology; Supervision; Writing – review and editing.

Macário Neri Ferreira Neto: Formal analysis; Investigation; Methodology; Validation; Visualization; Writing – review and editing.