SemeAd 2023
XXVI Seminários em Administração

07, 08, 09 e 10 de novembro de 2023
ISSN 2177-3866

Assessing the digital entrepreneurial intention of young university students in relation to digital entrepreneurship

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1. Introduction

Contemporary entrepreneurship is, simultaneously, tempting and challenging. Tempting, because nowadays professionals of all ages receive objective and subjective stimuli to create new businesses; and challenging, because today's competitiveness requires confidence in one's value proposition (Lagoudas, Yoon, Boehm, & Asbell, 2020), management capabilities, and adaptation to identify and exploit opportunities that are often hidden (Santoso, Soh, Larso, & Chen, 2020). Entrepreneurial activity is one of the most relevant forces that will sustain the economies (Subramanian, Subramanian, Al-Haziazi, & Sherimon, 2017). Entrepreneurship has been a key instrument to promote the competitive capacity of countries and to contain competition from other nations (Passaro, Scandurra, & Thomas, 2017).

With this in mind, public and private agents have sought to favor entrepreneurship, especially in innovation and high-tech sectors (Passaro et al., 2017; Trivedi, 2016). Among the challenges involved in promoting entrepreneurship are the creation and fostering of ecosystems (Cavallo, Ghezzi, & Rossi-Lamastra, 2021; Hudek, Tominc, & Sirec, 2021; Nambisan & Baron, 2021; Prashantham, 2021), companies (Fan, Schwab, & Geng, 2021) and conditions conducive for the emergence of new entrepreneurs (Haddoud, Onjewu, Nowinski, & Alammari, 2022; Huang, 2021; Kaminsky, Yereshko, Kyrychenko, & Tulchinskiy, 2021; Kowang et al., 2021; Sansone, Ughetto, & Landoni, 2021).

Entrepreneurship often assumes the condition of lifestyle, or even of personal project, stimulating autonomy and reducing unemployment (Iglesias-Sánchez, Jambrino-Maldonado, Velasco, & Kokash, 2016; Mawson & Kasem, 2019). Staniewski and Awruk (2016) considers the ability to identify and solve problems as vital in entrepreneurial action and cite the belief in one's own skills to solve them creatively and effectively. Personality traits, skills, self-management (Slogar, Stanic, & Jerin, 2021), and social context (Shahid & Ahsen, 2021) contribute significantly to entrepreneurial intentions.

Ajzen (1991) investigated predictive human behavior, striving to understand how specific psychological resources—attitudes, subjective norms, and perceived behavioral control—can influence, or even determine, an individual's prior (or planned) intention to act in a certain way, aiming at a goal. The author named this model Theory of Planned Behavior (TPB).

TPB has been widely used in research on entrepreneurial intent in emerging countries (Akinwale, Ababtain, & Alaraifi, 2019; Arafat, Saleem, & Dwivedi, 2020; Bogatyreva & Shirokova, 2017; Doanh, 2021; Joshi, Joshi, & Pathak, 2020; Mahmood, Al Mamun, Bin Ahmad, & Ibrahim, 2019; Sher, Abbas, Mazhar, & Lin, 2020; Subramanian et al., 2017; Tran, Bui, Nguyen, & Mai, 2018; Trivedi, 2016), including Brazil (da Cruz & Alvaro, 2013; Guerrero, Urbano, & Gajón, 2014; S. Lasso, Mainardes, & Motoki, 2019; S. V. Lasso, Mainardes, & Motoki, 2018; Wegner, Thomas, Teixeira, & Maehler, 2020).

Researchers investigating the subject often opt for employing the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. Despite such profusion of studies, we identified an opportunity for developing Ajzen (1991) TPB by adding sub-factors not yet explored jointly by the literature: (i) Social Capital; (ii) Anticipated Positive Emotions and (iii) Anticipated Negative Emotions, given that this combined influence has not been explored in previous research, nor in digital entrepreneurship. Thus, this article investigates how the interaction between social capital and anticipated emotions (negative and positive) influence digital entrepreneurial intentions. Its academic relevance becomes more explicit when

considering that Business Administration and IT undergraduates, who will compose our study sample, are potential entrepreneurs.

Besides this introduction, the research consists of four other sections. Section 2 presents a literature review (based on articles identified by the RSL conducted) on (i) Theory of Planned Behavior and Entrepreneurial Intention and (ii) PLS-SEM (analyzing the studies that use this method). Section 3 explains the methodology. Section 4 presents the results, with discussion and data analysis. Finally, section 5 outlines some conclusions.

2. Literature review

2.1. TPB and Entrepreneurial Intention

The Theory of Planned Behavior (Ajzen, 1991) assumes that individuals make their decisions in an eminently rational way, systematically using the information available to them, considering the implications of their actions before deciding whether or not to behave in a certain way.

The theory was proposed by Ajzen (1985) as an extension of the Theory of Reasoned Action, developed by Ajzen and Fishbein (1977). TPB suggests that behavioral intentions are influenced by three main factors: attitude toward the behavior, subjective norm, and perceived behavioral control.

According to this theory, the factors responsible for variation in behavior relate to personal attitude, subjective norms and perceived behavioral control (Ajzen, 1991). Peng, Li, Zhou, and Sadowski (2021) conclude that these factors can be moderated by experience, and TPB has been widely used to predict entrepreneurial intentions (Iglesias-Sánchez et al., 2016). The intention-action gap is a phenomenon that occurs when the desire to establish a business does not become reality (Bogatyreva & Shirokova, 2017).

Entrepreneurial intention may remain dormant, but it is stable over time (Joensuu-Salo, Varamäki, & Viljamaa, 2015). Family (Hadjimanolis, 2016; Ting, Mohd Rosdi, & Abidin, 2020; Vracheva, Abu-Rahma, & Jacques, 2019) and the university environment affect EI through subjective norms (Vracheva et al., 2019). Potential entrepreneurs' confidence is positively affected even by the quality of financial and legal institutions (Shirokova, Osiyevskyy, Bogatyreva, Edelman, & Manolova, 2020).

2.1.1. Ajzen (1991) three subfactors

Akinwale et al. (2019) highlight *attitude* as the key factor for entrepreneurial intention. Entrepreneurial knowledge contributes to the entrepreneur's entrepreneurial beliefs and course content is relevant to the attitude (Kakouris, Molina, & Liargovas, 2020). By verifying which characteristic personality traits are relevant to entrepreneurial intention, Ahmed, Klobas, and Ramayah (2021) highlight awareness as a mediator between risk aversion and entrepreneurial intentions. Attitude can be understood as the expectation individuals have that success and positive results depend mostly on their efforts. Studies have shown the importance of attitude in entrepreneurial intention (Arafat et al. (2020); Mahmood et al., 2019; Passaro et al., 2017; Vracheva et al., 2019).

Amini Sedeh, Abootorabi, and Zhang (2021) point out generalized trust, breadth of formal organizational associations, and civic engagement, all components of *subjective norms*, as facilitators of entrepreneurial intention. Krueger Jr, Reilly, and Carsrud (2000), however, indicate that subjective norms do not significantly influence entrepreneurial intention, fact suggested by Arafat et al. (2020) in a research conducted with Indian university students.

Perceived behavioral control, the third factor, refers to one's perception of the ease or difficulty of performing behavioral intentions (Ajzen, 1991), which translates, according to Ahmed et al. (2021), into risk propensity and stress tolerance.

2.2.1. Social Capital

Social capital is a multidimensional construct (Zheng, Li, Wu, & Xu, 2014) that generates positive impacts on entrepreneurial capacity, considering three main aspects: generalized trust, breadth of formal organizational associations, and civic engagement (Amini Sedeh et al., 2021). Family influence can significantly support entrepreneurial intention (Ayalew & Zeleke, 2018; Edelman, Manolova, Shirokova, & Tsukanova, 2016; Gubik & Farkas, 2016; Hoang & Le, 2021) via positive examples and references (Zampetakis, Lerakis, Kafetsios, & Moustakis, 2016), shaping emotions and attitudes towards effort and work. Thus, adolescents and young adults can more easily engage in wider social networks, in the formative years in schools and universities (Gubik & Farkas, 2016; Hulsink & Koek, 2014), in family businesses (Bogatyreva & Shirokova, 2017) and other social groups, increasing relations and the exchange of relevant social experiences (Schwarz, Wdowiak, Almer-Jarz, & Breitenecker, 2009). This can contribute to the creation of new businesses (Ting et al., 2020).

Although opportunities for intellectual and technical improvement stimulate entrepreneurial intent, low-income youth can be induced to act as social entrepreneurs in order to fill certain institutional voids that affect their neighborhood, city or country, with encouragement and family support (Manolova, Edelman, Shirokova, & Tsukanova, 2019), including access to financial resources, however modest (Raijman, 2001).

University environments help in creating social bonds and, consequently, in developing attitudes essential to entrepreneurship (Muscio, Shibayama, & Ramaciotti, 2021). Among these attitudes are tolerance and efficient stress management (Ahmed et al., 2021) and the willingness to take risks (Chang, Memili, Chrisman, Kellermanns, & Chua, 2009) and deal with failure (Wang & Huang, 2020). En though entrepreneurial education is covered in the university curriculum (Alam, Bilal, Sabir, & Kaleem, 2020; Mason, Anderson, Kessl, & Hruskova, 2020), some studies suggest that the subject should be addresses even before entering higher education (Do Paço, Ferreira, Raposo, Rodrigues, & Dinis, 2011; Hoi, 2020; Johansen, 2013; Jones & Colwill, 2013).

Jayawarna, Jones, and Macpherson (2014) comment on the tendency to overestimate knowledge acquisition, while ignoring the relevance of social capital for the success of entrepreneurial initiatives. The subjective norms acquired during childhood are essential for youth to assimilate positive and proactive attitudes when dealing with life and professional situations, enhancing skills such as creativity, analytical capacity and problem solving (Carr & Sequeira, 2007; Jayawarna et al., 2014).

Social networks play an important role in creating social capital, increasing the chances of business survival (Pérez-Fernández, Martín-Cruz, Delgado-García, & Rodríguez-Escudero, 2020; Pugalia, Prakash Sai, & Cetindamar, 2020), especially in its early stages. van der Westhuizen and Goyayi (2020) consider that acquiring technological skills can increase one's ability to seek information and relationships, increasing self-confidence (Ayalew & Zeleke, 2018), so that potential entrepreneurs consider that creating a new business depends more on internal aspects than external ones (Hadjimanolis, 2016). However, one must remember the always relevant influence of a favorable institutional environment in fostering entrepreneurial intention (Smith & Beasley, 2011).

2.2.2. Emotions

Izard and Izard (1977) consider that emotion consists of a complex psychological process, which involves a series of interconnected components, composed of cognitive, physiological and behavioral aspects. In their work, the authors propose a theoretical model with 9 (nine) basic emotions: (i) joy; (ii) anger; (iii) disgust; (iv) fear; (v) surprise; (vi) sadness; (vii) shame; (viii) guilt; and (ix) contempt (Izard & Izard, 1977).

Regarding emotions, Liu, Zhang, and Fan (2021) argue that fear of failure is the strongest psychological barrier to the realization of the entrepreneur's intentions, decreasing the perception of the existence of financial resources and social support. Emotions and desires are closely related and have a substantial impact on entrepreneurial intention (Londono, Wilson, & Osorio-Tinoco, 2021; Luong & Lee, 2021). Social networks can generate positive impacts on affectivity and entrepreneurial disposition (Perez-Fernandez, Martin-Cruz, Delgado-Garcia, & Rodriguez-Escudero, 2020). The improvement of psychological mechanisms, including emotion and cognition, is essential for the development of entrepreneurial behavior (Cai, Gu, & Wu, 2021). Positive emotions, to stimulate professional initiatives, including entrepreneurial intention, need to be balanced by cognition (Chen, Yuan, Yin, & Wu, 2021). Educational programs can support the development of skills, such as resilience (Elshaer & Saad, 2021), important for the intention to start a business (Renko, Bullough, & Saeed, 2021). The understanding of emotions allows entrepreneurs to overcome critical situations and crises stronger than before (Duchek, 2018).

3. Methodology

3.1. Bibliographic portfolio

The steps taken to form the portfolio were: (i) extraction of documents in the article databases; (ii) removal of duplicate items; (iii); removal of items without relevant information; (iv) identification and removal of non-aligned items. The academic papers used in this research were extracted from the Scopus and Web of Science databases. The terms and queries used are presented in Table 1.

Added terms	Database	Query
Digital business; Digital entrepreneurship; Technological business; Tech entrepreneurship; Entrepreneurship Startup; start-up; Entrepreneurial intention; Entrepreneurial digital mindset; Entrepreneurial attitude Theory of planned behavior; social capital; emotions	*Scopus*	TITLE-ABS-KEY ((digital AND business) OR (digital AND entrepreneurship) OR (technological AND business) OR (tech AND entrepreneurship) OR (entrepreneurship) OR (startup) OR (start-up)) AND ("entrepreneurial AND intention" OR "entrepreneurial AND digital mindset" OR "entrepreneurial AND attitude" OR "theory of planned behavior" OR "theory AND of AND planned AND behavior") AND ("TPB" OR "theory AND of AND planned AND behavior (TPB)") OR (social AND capital AND digital AND entrepreneur OR digital AND entrepreneurship) AND ("emotions" AND "entrepreneurial intention")
	Web of Science	TS = (digital AND business) OR (digital AND entrepreneurship) OR (technological AND business) OR (tech AND entrepreneurship) OR (entrepreneurship) OR (startup) OR (start-up) AND TS = (entrepreneurial AND intention OR entrepreneurial AND digital mindset OR entrepreneurial AND attitude OR theory of planned behavior OR theory AND of AND planned AND behavior) AND TS = (TPB OR theory AND of AND planned AND behavior (TPB)) OR (social AND capital AND digital AND entrepreneur OR digital AND entrepreneurship) AND (emotions) AND (entrepreneurial intention)

Table 1: Terms and queries used for the extraction in the Scopus and Web of Science databases.

To perform the refinement of the portfolio, the files extracted from the Scopus databases were imported into the Endnote software. After the initial extraction (step 1), the refinement was carried out by performing: step 2, removing duplicate documents using Endnote; step 3 removing documents with missing information (year, title or author); and step 4, removing articles not aligned with the scope of the research, through the application of analysis lenses. The lenses used considered the (i) theme (entrepreneurial intentions, social capital and

emotions) and/or the methodology (structural equation modeling). Table 2 presents the subtotals of each step.

Steps	Step 1: Extraction	Step 2: Duplicate items	Step 3: No information	Step 4: Non-aligned items	Total
Subtotals	**(+) 2055**	**(-) 48**	**(-) 91**	**(-) 1205**	**711**

Table 2: Document extraction results

A total of 711 documents were added to the portfolio of articles, which served as the basis for the literature review and the formulation of the hypotheses, presented in the next section.

3.2. Hypotheses

3.2.1. Existing hypotheses

Table 3 summarizes the existing hypotheses addressed by the selected papers and their respective authors.

ID	Hypothesis	Authors
H1	Social capital influences Attitudes.	(Doanh, 2021; Andrew Henley, Francoise Contreras, Juan C Espinosa, and David Barbosa (2017); Mao & Ye, 2021; Popescu, Bostan, Robu, & Maxim, 2016).
H2	Social Capital influences Digital Entrepreneurial Intentions.	(Hoong, Qureshi, Sajilan, & Al Halbusi, 2019); (Pérez-Macías, Fernández-Fernández, & Vieites, 2018; Sultana, Im, & Im, 2019).
H3	Attitudes influence Digital Entrepreneurial Intentions.	Adapted from [19, 21].
H4	Subjective norms influence Digital Entrepreneurial Intentions.	Adapted from (Ajzen, 1991, 2002, 2011).
H5	Perceived Behavioral Control influences Digital Entrepreneurial Intentions.	Adapted from (Ajzen, 1991, 2002, 2011).

Table 3: Hypotheses developed by previous studies.

3.2.1. New hypotheses

This section presents the two new hypothesis formulated and explored in the present work. These hypotheses, outlined in table 4, explore the moderating power anticipated negative and positive emotions have on social capital and digital entrepreneurial intentions. Emotions and desires are closely related and substantially impact entrepreneurial intention (Londono et al., 2021; Luong & Lee, 2021).

Social networks can generate positive impacts on affectivity and entrepreneurial disposition (Perez-Fernandez et al., 2020). Positive emotions, despite stimulating entrepreneurial intent, need to be balanced by cognition (Chen et al., 2021). Elshaer and Saad (2021) cite resilience as an important characteristic. Business education and social capital promote entrepreneurial behaviors (Lee, Cortes, & Joo, 2021), requiring their development through psychological mechanisms, including emotion and cognition (Cai et al., 2021).

ID	Hypothesis
H6	Anticipated Negative Emotions negatively moderate the relationship between Social Capital and Digital Entrepreneurial intentions.
H7	Anticipated Positive Emotions positively moderate the relationship between Social Capital and Digital Entrepreneurial intentions.

Table 4: New hypotheses proposed by the study (anticipated positive and negative emotions)

The next topic outlines the model developed to achieve the research objectives.

3.3. Model of digital entrepreneurial intentions, social capital and emotions

Our proposed model consists of 7 constructs. To facilitate grasping the concepts discussed in the following sections, Table 5 summarizes the code, description, and category (mediator and moderator) of these constructs.

Code	Construct	Independent	Mediator?	Moderator?	Dependent
CAPS	Social Capital	Yes			
ATIT	Attitudes		Yes		
NORS	Subjective Norms	Yes			
COCP	Perceived Behavioral Control	Yes			
EMNA	Anticipated Negative Emotions			Yes	
EMPA	Anticipated Positive Emotions			Yes	
INTE	Digital Entrepreneurial Intentions				Yes

Table 5: Code and description of the model constructs

Figure 1 illustrates the model developed based on the existing hypotheses discussed and those proposed after the portfolio analysis. The constructs added to Ajzen (1991)'s model are written in gray. Codes are formed by four letters identifying the construct followed by the sequential number of the indicator.

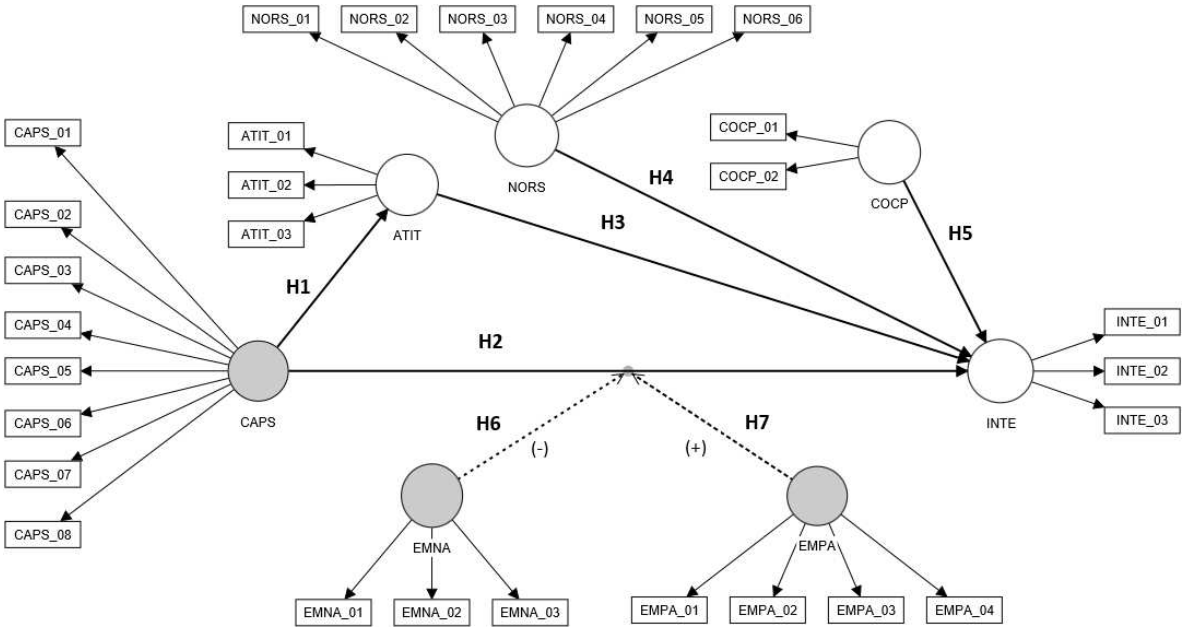

Figure 1: Model of entrepreneurial intention (Elaborated by the authors)

PS.: The constructs added to the TPB (CAPS, EMNA and EMPA) are written in gray.

Table 6 presents the relationship between the construct indicators and authors used to develop the questions. TPB constructs (ATIT, COCP, NORS and INTE) are presented first, followed by the constructs added to the model proposed by the researchers (CAPS, EMNA and EMPA).

Construct	Indicator	Indicator description	Question ID	Author
ATIT	ATIT_01	Conviction to find a viable solution when dealing with new problems.	17	Murugesan and Dominic (2014)
	ATIT_02	Conviction to find a viable solution when dealing with new opportunities.	18	Murugesan and Dominic (2014)
	ATIT_03	Conviction to find a viable solution when facing new challenges from existing resources.	19	Murugesan and Dominic (2014)
COCP	COCP_01	Perception of having knowledge and skills to start a digital business.	21	Liñán and Chen (2009)
	COCP_02	Fear of failure diminished in the face of the desire to create a digital business.	26	Liñán and Chen (2009)
NORS	NORS_01	Increased confidence in performing tasks based on advice from family members.	04	Moussa and Kerkeni (2021)
	NORS_02	Increased confidence in achieving results based on advice from family members.	05	Moussa and Kerkeni (2021)
	NORS_03	Increased confidence in performing tasks based on examples from family members.	06	Moussa and Kerkeni (2021)
	NORS_04	Increased confidence in achieving results based on examples from family members.	07	Moussa and Kerkeni (2021)
	NORS_05	Family approval of the decision to start a digital business.	15	Liñán and Chen (2009)
	NORS_06	Friend's approval of the decision to start a digital business.	16	Liñán and Chen (2009)
INTE	INTE_01	Propensity to create a digital business given the availability of opportunity and resources.	20	Liñán and Chen (2009)
	INTE_02	Capacity to develop and deal with the challenges of a digital business.	22	Liñán and Chen (2009)

	INTE_03	Confidence in the ability to create a digital business as this desire increases.	27	Salamzadeh, Sangosanya, Salamzadeh, and Braga (2022)
CAPS	CAPS_01	Increased confidence in performing tasks based on advice from social circle.	08	Luo, Huang, and Gao (2022)
	CAPS_02	Increased confidence in achieving results based on advice from social circle.	09	Luo et al. (2022)
	CAPS_03	Encouragement of positive behavior by the influence of relationships outside the family.	10	Salamzadeh et al. (2022)
	CAPS_04	Increased confidence in the ability to create a successful digital business based on advice from family members.	11	Moussa and Kerkeni (2021)
	CAPS_05	Increased confidence in the ability to create a successful digital business based on examples from family members.	12	Moussa and Kerkeni (2021)
	CAPS_06	Increased confidence in the ability to create a successful digital business based on advice from social circle.	13	Baughn, Cao, Le, Lim, and Neupert (2006)
	CAPS_07	Increased confidence in the ability to create a successful digital business based on examples from social circle.	14	Baughn et al. (2006)
	CAPS_08	Increased social relationships from digital business studies.	25	Zhu, Fan, and Zhao (2019)
EMNA	EMNA_01	Fear of disappointing family members.	01	Izard and Izard (1977)
	EMNA_02	Fear of failing professionally.	02	Izard and Izard (1977)
	EMNA_03	Fear of disappointing the social circle.	03	Izard and Izard (1977)
EMPA	EMPA_01	Positive emotional support from social relations.	23	Izard and Izard (1977)
	EMPA_02	Prior preparation for daily emotional conflicts.	24	Goleman (1995)
	EMPA_03	Avoid bad behaviors due to the desire to create a digital business.	28	Kanonuhwa, Rungani, and Chimucheka (2018)
	EMPA_04	Encourage good behaviors due to the desire to create a digital business.	29	Kanonuhwa et al. (2018)

Table 6: Information about model constructs and items

The next topic presents the criteria for sample selection and data collection techniques.

3.4. Sample selection and data collection

Data were collected by means of a questionnaire sent to Business Administration, Engineering and Information Technology undergraduates, aged 18 years or older, from public institutions in São Paulo. This choice is justified by the fact that São Paulo is the most economically developed state in Brazil and more prone to use technologies; besides, the majority of the researchers work in the state. Students belong to courses with a strong entrepreneurial vocation. Minimum sample was calculated using GPower 3.1 software. The research was approved by the Research Ethics Committee in Human and Social Sciences (CEP-CHS), CAAE no. 58711822.6.0000.8142. A 5-point Likert scale questionnaire consisting of 29 questions was applied (Appendix 1).

3.5. Data analysis

Data analysis used the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. Quality considers content validity (convergent and discriminant). While convergent validity considers the ability of indicators to measure the proposed construct, discriminant validity measures how representative and distinct such indicators are (Hair, 2014).

PLS-SEM is often used to explain correlations between multiple variables (Hair, Risher, Sarstedt, & Ringle, 2019) and suitable in testing theoretical frameworks (Hair et al., 2019). MS Excel was used for data tabulation and SmartPLS 4 for running the PLS-SEM algorithm. Evaluation of the measurement model assesses the quality of the set of indicators.

4. Results

4.1. Sample description

When considering seven predictors, with a 5% significance level, statistical power of 8% and average effect size ($f^2 = 0.15$, equivalent to $R^2 = 13\%$), calculation suggested a sample with 103 observations. The questionnaire was applied in both online and in-person formats in October 2022. In the end, we obtained 1,110 responses.

4.2. Descriptive statistics

Of the 1,110 respondents, 58.1% are men and 41.89% are women. As for course, 57.30% were majoring in Engineering, 32.87% in Business Administration, and 10.63% in Information Technology (Computer Science, Information Systems, Software Engineering, etc.) (Table 7).

Characteristics		**Frequency (%)**
Gender	Man	58.11
	Woman	41.89
Major	Engineering	57.30
	Business Administration	32.07
	IT	10.63

Table 7: Sample description

The next sections present calculations regarding the (i) validity and reliability of the model and (ii) valuation of the structural model.

4.3. Measuring model

As already mentioned, model validity and reliability verification considers (i) convergent validity and (ii) discriminant validity. After analyzing the results generated by SmartPLS 4, we adjusted the model by removing 5 of the 29 indicators: CAPS_01, CAPS_02, CAPS_03, EMPA_01 and INTE_01, leaving 24 indicators.

Table 8 presents the Fornell-Larcker, Cronbach's alpha, composite reliability and average variance extracted (AVE) values calculated using SmartPLS 4. VME square root values (hatched diagonal on Table 8) should be greater than the correlations of the respective constructs. While Cronbach's alpha of NORS is below 0.7, the composite reliability of all constructs are equal to or greater than 0.7 (Hair, 2014). Moreover, AVE values are all greater than 0.5. Thus, the model can be considered adjusted.

Construct	ATIT	CAPS	COCP	EMNA	EMPA	INTE	NORS
ATIT	**0.825**						
CAPS	0.235	**0.719**					
COCP	0.365	0.548	**0.828**				
EMNA	–0.161	–0.046	–0.162	**0.778**			
EMPA	0.243	0.565	0.698	–0.080	**0.779**		
INTE	0.297	0.514	0.719	–0.136	0.789	**0.810**	
NORS	0.215	0.392	0.247	0.001	0.229	0.211	**0.627**
Cronbach's alpha	0.765	0.786	0.546	0.725	0.679	0.492	0.743
Composite reliability	0.765	0.835	0.565	1.164	0.748	0.552	0.736
Average variance extracted	0.681	0.517	0.686	0.605	0.607	0.656	0.393

Table 8: Fornell-Larcker, Cronbach's alpha, Composite Reliability and Average Variance Extracted values.

The validation stage thus outlined, the next section presents the analyses of the structural model.

4.4. Structural model

4.4.1. Model analysis

Table 9 presents the Cohen's (f^2), Pearson's (r^2) and Stone-Geisser's (Q^2) coefficients, calculated for the dependent variables (ATIT and INTE) based on the independent variable (CAPS). These three coefficients indicate the explanatory power of the model. Effect size (f^2), presented in Table 11, was as proposed by Cohen (1988), who considers values of 0.02, 0.15 and 0.35, listed as (i) low, (ii) medium and (iii) moderate, respectively. Pearson's coefficient of determination (r^2) measures the correlation between two variables, with values of 0.02, 0.13, and 0.26 listed as high, medium, and low in social and behavioral sciences (Cohen, 1988).

Construct	f^2	r^2	Q^2
ATIT	0.058	0.055	0.052
INTE	0.002	0.683	0.675

Table 9: Structural model values

The predictive validity of the model depends on Q^2 values greater than zero (Hair, 2014), which is true for the analysis in question, as shown in the aforementioned table (ATIT → 0.052 and INTE → 0.675).

4.4.2. Resulting model

Figure 2 illustrate the resulting complete model with the respective path coefficients. The R^2 analysis shows that the "Entrepreneurial Intention" (INTE) construct has 68.3% of its variance explained by the constructs attitude (ATIT), perceived behavioral control (COCP), subjective norms (NORS), and social capital (CAPS). Perceived behavioral control (29.4%) is the model's most relevant construct. CAPS is moderated by the constructs anticipated negative emotions (EMNA) and anticipated positive emotions (EMPA), which have low significance values (4% and 1.9%, respectively).

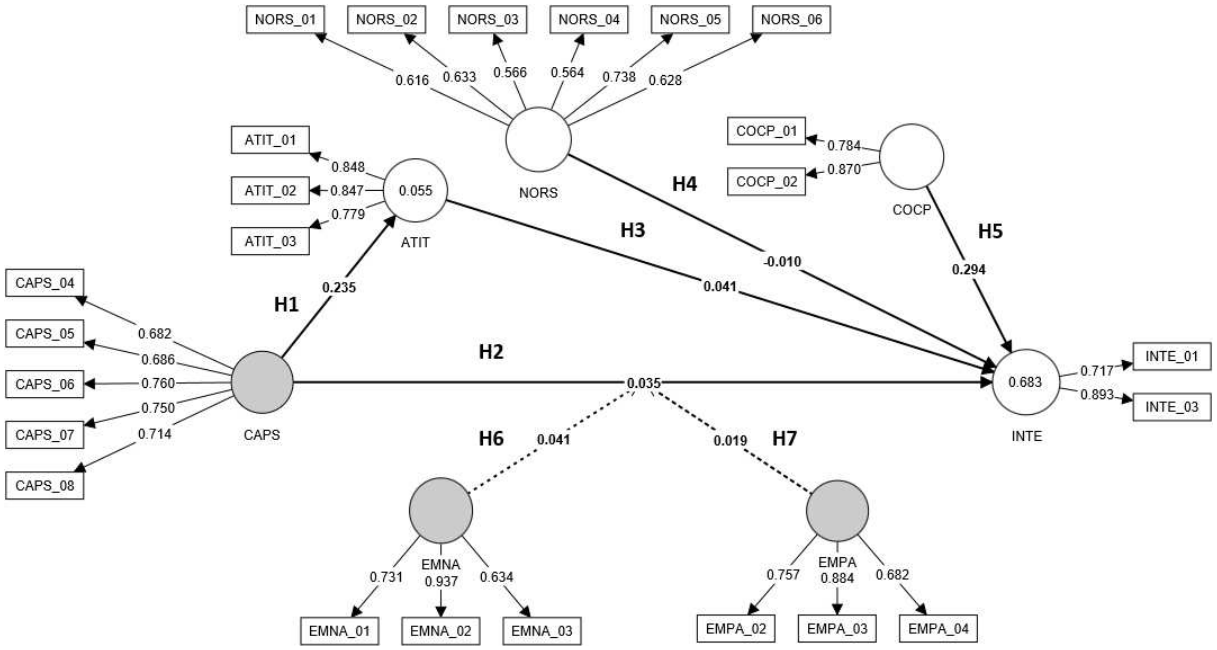

Figure 2: Adjusted final model.

The next section presents the results of the hypotheses testing.

4.5. Hypothesis testing

Table 10 presents the result of the hypothesis testing. SmartPLS 4 (bootstrapping function, using 10,000 subsamples and 5% significance level as parameters) was used to calculate t-statistic and the p-value. As observed in the table, H2 (CAPS → INTE), H4 (NORS → INTE) and H7 (EMPA x CAPS → INTE) are the unsupported hypotheses. The remaining hypotheses were confirmed ($p<0.05$).

Hypothesis	Relation	t-Statistics	p-value	Supported?
H1	CAPS → ATIT	7.678	< 0.001	**Yes**
H2	CAPS → INTE	1.287	0.198	No
H3	ATIT → INTE	2.025	0.043	**Yes**
H4	NORS → INTE	0.533	0.594	No
H5	COCP → INTE	8.407	< 0.001	**Yes**
H6	EMNA x CAPS → INTE	2.234	0.026	**Yes**
H7	EMPA x CAPS → INTE	1.338	0.181	No

Table 10: Results of the structural model hypothesis testing

In the following section, we discuss these results.

4.6. Discussion of results

According to the study, social capital influences attitudes, since academic experiences can spur undergraduates to acquire positive habits that increase the chances of achieving their professional aspirations. These aspirations are not limited to acting as a digital entrepreneur, but also involve the numerous roles performed in public, private, and social institutions. Our findings points out that social capital is not directly related to the intention to become a digital entrepreneur, as suggested by Doanh (2021) and Hoong et al. (2019).

Nor are family social relationships alone sufficient to induce entrepreneurial intentions, however genuine and true they may be, according to A. Henley, F. Contreras, J. C. Espinosa,

and D. Barbosa (2017). Only the social capital that comes from the social ties created by those who frequent entrepreneurial ecosystem environments can encourage entrepreneurial intention (Cai et al., 2021; Mamabolo & Lekoko, 2021), creating and maintaining generic social relationships is not enough (for promoting entrepreneurial intentions). Mao and Ye (2021) states that opportunities for varied cultural experiences are essential for building social networks and encouraging entrepreneurial intention.

Cognitive ability is affected by education. Valencia-Arias and Restrepo (2020) concludes that entrepreneurship education can foster students' confidence in their own abilities, as it supports understanding contexts and visualizing opportunities and risks and helps with self-awareness. Consequently, the authors suggest that training programs should present practices and means to search for business opportunities and identify mechanisms for financial support. Entrepreneurship education can help develop students' entrepreneurial attitudes (Bazkiaei, Heng, Khan, Saufi, & Kasim, 2020; Laguía, Moriano, & Gorgievski, 2019) by increasing their propensity to take risks (Younis, Katsioloudes, & Bakri, 2020). Despite the positive correlation between entrepreneurial learning and entrepreneurial intention, the latter is significantly mediated by TPB factors, especially attitude (Zhang, Wei, Sun, & Tung, 2019), indicating that promoting entrepreneurship in teaching environments through education is essential.

The endogenous variables—attitude and perceived behavioral control—are essential in explaining entrepreneurial intentions (Blaese & Liebig, 2021; Yu, Khalid, & Ahmed, 2021), since they motivate individuals to think and act rationally, regardless of an unfavorable external environment. Al-Mamary, Abdulrab, Alwaheeb, and Alshammari (2020) emphasize that among the most prominent attitudes are those related to behavior, such as self-efficacy, autonomy, propensity to take risks, proactivity, and some competitive aggressiveness.

According to the present study, subjective norms do not induce students' digital entrepreneurial intention. Krueger Jr et al. (2000), Turuk, Horvatinovic, and Sudaric (2020), Arafat et al. (2020), and Hendieh, Aoun, and Osta (2019) assess that subjective norms alone are not promoters of entrepreneurial intentions, which coincides our findings. Doanh and van Munawar (2019) maintain that subjective norms have an indirect effect on entrepreneurial intentions, favoring—or not—attitudes, mainly through habits assimilated through the cultural environment (Farrukh, Lee, Sajid, & Waheed, 2019).

The family can be as much a source of positive beliefs and habits as it can be a source of limiting beliefs and habits that undermine not only work life, but other dimensions of life. However, Shrivastava and Acharya (2020) argue that family influence and support are essential in stimulating the entrepreneurial vocation of economically disadvantaged youth. Thus, practices that support understanding of surrounding people (family and friends, for example) and role models (religious and social) can be effective in inspiring young people's entrepreneurial intentions (Baharuddin & Ab Rahman, 2021).

The present study showed that positive anticipated emotions do not have a positive moderating effect between social capital and entrepreneurial intentions in digital entrepreneurship. Despite this, anticipated positive emotions seem to be a sine qua non condition for the desire to undertake, especially in promoting self-efficacy (Amorim Neto, Rodrigues, Stewart, Xiao, & Snyder, 2018; Koe, Krishnan, & Alias, 2021). Negative anticipated emotions, in turn, exert negative moderating power. Evaluated broadly, anticipated negative emotions can undermine any personal or professional initiative, since they decrease the individual's desire for achievement and fulfillment, and entrepreneurial behaviors must be developed through psychological mechanisms, including emotion and cognition, a result that is in accordance with that exposed in (Cai et al., 2021).

In Musiiwa, Khaola, and Rambe (2019)'s view, those involved with promoting entrepreneurship should pay attention to students emotions to positively influence their career choices. Baharuddin and Ab Rahman (2021) emphasize that knowing the potential character of

students who become entrepreneurs can help to formulate more effective policies aimed at stimulating entrepreneurship, which coincides with the target audience analyzed here.

5. Conclusions

This research evaluated the impact social capital and anticipated positive and negative emotions have on the digital entrepreneurial intentions of Engineering, Business Administration and Information Technology undergraduates. For this purpose, we performed a systematic literature review to develop the analysis model. The collected data were analyzed using the PLS-SEM approach.

Social capital cultivated in entrepreneurial discussion and experience environments can promote digital entrepreneurial intentions. Although professional aspirations are varied at University, not being restricted only to digital entrepreneurship, social capital can positively influence the attitudes of students who intend to become entrepreneurs. Thus, educational institutions can positively influence social capital formation and induce positive attitudes via appropriate teaching, academic outreach, research, and internationalization activities.

Although dependent on genetics and experiences in childhood and adolescence, one's emotional state is (also) influenced by the environment. Today's social environments are characterized by competitiveness and the search for results. Companies and professionals are not always prepared to face the requirements and demands of this complex economic context. Added to this the COVID-19 effects, including illness and decreased emotional and cognitive capacity. These consequences must be addressed systematically (Hernández-Sánchez, Cardella, & Sánchez-García, 2020; Ruiz-Rosa, Gutiérrez-Taño, & García-Rodríguez, 2020). At the local level, schools and universities can create committees and allocate resources to effectively address the challenges posed to family, business, and student environments (Godswill Agu, Okwara, Okocha, & Madichie, 2021).

Despite all the problems and losses caused by the COVID-19 pandemic, digital entrepreneurship has grown significantly, requiring a large number of companies and professionals to rework their strategies, objectives, and means to act in the digital environment. It is likely that only after a certain time will it be possible to further assess the "legacy" of the COVID-19 pandemic for digital entrepreneurship. The end of social distancing and consequent resumption of life and economic relations may cool the highly positive performance of digital companies seen in 2020 and 2021.

The model proposed can be replicated in other countries, aiming to compare the perception of students from other cultures with the Brazilian reality, exposed in the present study and in other regions of the country. Besides undergraduates, other significant groups such as high school students and professionals with entrepreneurial verve can be explored, with no theoretical or practical restriction to the model.

We evaluated the construct anticipated emotions, which tend to change significantly over time. In future applications, this research can use panel data to monitor the phenomenon over a significant period. Data were collected post-pandemic, shortly after the face-to-face environments reopened and normal activities resumed. For feasibility reasons, the research focused on majors with a higher incidence of digital entrepreneurial activity. Higher Education Institutions from São Paulo were chosen for this same reason, limiting our ability to extrapolate the results.

Future research may evaluate physiological aspects that can play a moderating role in anticipated emotions, such as temperament and personal habits (diet, physical activity, among others). Besides, different cultural contexts can be investigated to obtain comparison parameters that explain the variables involved, as well as the moderating effect of mental health and education programs and activities aimed at students.

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APPENDIX 1 – Questionnaire applied for in person data collection.

RESEARCH QUESTIONNAIRE

Our goal is to evaluate the impact emotions and social capital have on the digital entrepreneurial intention of undergraduates from São Paulo. The study seeks to contribute to public policy makers, institutions and managers involved in fostering entrepreneurial initiatives, especially in emerging countries. Research approved by the Research Ethics Committee in Human and Social Sciences (CEP-CHS) (CAAE number: 58711822.6.0000.81420). All results obtained will be used exclusively for academic purposes. The respondents' answers represent only an individual opinion, which will preserve their anonymity. Thank you for your cooperation!

FOR THE PURPOSES OF THIS RESEARCH, YOU ARE CONSIDERED TO BE MAJORING IN ENGINEERING, IT, OR BUSINESS ADMINISTRATION, AND OVER 18 YEARS OLD.

About you, please check:

Gender: ( ) Man ( ) Woman ( ) I'd rather not answer

Age: ( ) Adult (>=18) ( ) Minor (< 18)

Institution: ( ) 1 ( ) 2 ( ) 3 ( ) 4

Major: ( ) Management (Business Administration, Public Administration or technologists in management)

( ) IT (Computer Science, Information Systems, Software Engineering or others)

( ) Engineering (including Computer Engineering)

FOR EACH FOLLOWING STATEMENT, MARK ONLY ONE ALTERNATIVE FROM 1 "STRONGLY DISAGREE" TO 5 "STRONGLY AGREE."

1 - Strongly disagree	2 - Disagree	3 – Indifferent	4 - Agree	**5 - Strongly agree**

Q	Question	Scale				
1	I am afraid of disappointing my family members.	1	2	3	4	5
2	I'm afraid of failing professionally.	1	2	3	4	5
3	I'm afraid of disappointing my social circle (outside the family).	1	2	3	4	5
4	Advice from my family members increases my confidence in my ability to accomplish tasks.	1	2	3	4	5
5	Advice from my family members increases my confidence in my ability to accomplish tasks.	1	2	3	4	5
6	Examples from my family members increases my confidence in my ability to accomplish tasks.	1	2	3	4	5
7	Examples from my family members increases my confidence in my ability to achieve results.	1	2	3	4	5
8	My social circle (outside the family) increases my confidence in my ability to accomplish tasks.	1	2	3	4	5
9	My social circle (outside the family) increases my confidence in my ability to achieve results.	1	2	3	4	5
10	The influence of my social circle (inside or outside the family) encourages me to behave positively.	1	2	3	4	5
11	Advice from my family members increases my conviction that I am capable of creating a successful digital business.	1	2	3	4	5
12	Examples from my family members increases my conviction that I am capable of creating a successful digital business.	1	2	3	4	5
13	Advice from my social circle (outside the family) increases my conviction that I can create a successful digital business.	1	2	3	4	5
14	Examples from my social circle (outside the family) increases my conviction that I can create a successful digital business.	1	2	3	4	5
15	My immediate family would approve of my decision to open a digital business.	1	2	3	4	5
16	My friends would approve of my decision to open a digital business.	1	2	3	4	5
17	When I deal with new problems, I immediately have the conviction that I will find a viable solution.	1	2	3	4	5
18	When I deal with new opportunities, I immediately have the conviction that I will find a viable solution.	1	2	3	4	5
19	When I face new challenges, I can find viable solutions from the resources I already have.	1	2	3	4	5
20	If I have the opportunity and the resources, I would like to start a digital business.	1	2	3	4	5
21	I have enough knowledge and skills to start a digital business.	1	2	3	4	5
22	I'm capable of developing or managing the challenges of a digital business.	1	2	3	4	5

23	My social relationships help me when I engage with others.	1	2	3	4	5
24	As I have prepared myself for daily emotional conflicts, my social relationships have been positively impacted.	1	2	3	4	5
25	My social relationships have increased since I started studying more about digital business.	1	2	3	4	5
26	As I feel desire to create a digital business, my fear of failure diminishes.	1	2	3	4	5
27	As my desire to create a digital business increases, I feel more confident in my ability to accomplish this goal.	1	2	3	4	5
28	As my desire to create a digital business increases, I have been avoiding bad behaviors more often.	1	2	3	4	5
29	As my desire to create a digital business increases, I have been promoting good behaviors more often.	1	2	3	4	5