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Entrepreneurial intention among Colombian university students: A theory of planned behavior analysis in Colombia

Intención emprendedora en estudiantes universitarios: un análisis desde la teoría del comportamiento planificado en Colombia

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ABSTRACT

Studies on entrepreneurship have used several approaches, among which, research on entrepreneurial intention (EI) can be highlighted. Studies on EI help researchers better understand entrepreneurial behavior. In this sense, one of the most relevant frameworks in EI studies is the Theory of Planned Behavior (TPB), which stands out for its predictive capacity, mainly in a university context. The aim of this research was to determine the relationship between the variables of Personal Attitudes (PAs), Subjective Norms (SNs), and Perceived Behavioral Control (PBC) with respect to the EI of university students in Colombia. For this purpose, we constructed a model that integrates the elements of the TPB with EI with reference to the validated instrument of the Global University Entrepreneurial Spirit Student's Survey (GUESSS) project applied to a sample of 12,383 students. The estimation of the model uses structural equations (SEMs) by means of Partial Least Squares-Path Modelling (PLS-PM). The findings show that PAs and PBC are determinants of EI, while SNs have no direct influence; however, their effects are indirect. These results have implications for how to promote entrepreneurship in emerging economies through the university environment. The results indicate that the development of students' capabilities is essential for entrepreneurship and its incorporation into the university's knowledge transfer model.

Keywords: Entrepreneurial Intention, University Students, Theory of Planned Behavior, SEM, Emergent Economy.

RESUMEN

Los estudios sobre el espíritu empresarial han tenido varios enfoques, entre los que destaca la investigación sobre la intención emprendedora (IE). Los estudios sobre la IE permiten explicar y comprender el comportamiento emprendedor. En este sentido, uno de los marcos más relevantes en los estudios de IE es la Teoría del Comportamiento Planificado (TCP), que ha destacado por su capacidad predictiva principalmente en el contexto universitario. El objetivo de esta investigación es determinar la relación entre las variables Actitudes Personales (AP), Normas Subjetivas (NS) y Control Conductual Percibido (CCP) con respecto a la IE de estudiantes universitarios en Colombia. Para ello se construye un modelo que integra los elementos de la TCP con la IE tomando como referencia el instrumento validado del proyecto *Global University Entrepreneurial Spirit Student's Survey* (GUESSS) aplicado a una muestra de 12.383 estudiantes. La estimación del modelo se realiza a través de ecuaciones estructurales (SEM) mediante *Partial Least Squares - Path Modelling (PLS-PM)*. Los resultados muestran que las AP y el CCP son determinantes de la IE, mientras que las NS no tienen influencia directa; sin embargo, sus efectos son indirectos. Estos resultados tienen implicaciones sobre cómo promover el espíritu empresarial en las economías emergentes desde el ámbito universitario. Por lo tanto, es evidente que el desarrollo de las capacidades de los estudiantes es esencial para el emprendimiento y su incorporación al modelo de transferencia de conocimiento de la universidad.

Palabras clave: Intención emprendedora, Estudiantes Universitarios, Teoría del Comportamiento Planificado, SEM, Economía Emergente.

1. INTRODUCTION

Within the various fields of study on entrepreneurship, there are several analyses on the characteristics of the entrepreneur as a subject, where the determination of the entrepreneur contributes to development through the creation of new companies (Pfeilstetter, 2020). These studies have been focused on explaining the subject (Shapero & Sokol, 1982) in order to understand entrepreneurship behavior (Ajzen, 1991). Indeed, EI studies seek to explain the interactions of people and their contexts to determine entrepreneurial behavior (Liñán & Fayolle, 2015), which both play a significant role (Bandura, 1982).

EI studies focus on the identification of personal factors and their relationship with the context (Liñán & Fayolle, 2015). Several studies focused on personal factors and tended to estimate the relationship between the influence of factors such as gender (Nowiński *et al.*, 2017; Contreras-Barraza *et al.*, 2021), family history (Amofah & Saladrigues, 2022a), and vocational training (Piperopoulos & Dimov, 2015) and EI. Other studies have contrasted the behavior of groups at the territorial level to understand the influence of cultural and environmental factors on EI (Franke & Lüthje, 2004; Liñán & Chen, 2009; Moriano *et al.*, 2012; Torres *et al.*, 2017; Blanco-Mesa *et al.* 2021). There are also studies that combine both types of factors and focus on the role of institutions in promoting EI (Amofah & Saladrigues, 2022a; Su *et al.*, 2021). Specifically, approaches with personal and contextual factors allow one to generate a more complete vision of the interactions between elements that can influence entrepreneurial behavior.

Recently, EI research has extended to prosocial personality traits, such as social capital and social entrepreneurship, through regional approaches (Alfaro-García *et al.*, 2022), where the social environment significantly influences behavior (Bandura, 1999). The implications of the social environment have been studied in various classes of individuals, with several studies focusing on university students and their environments in relation to their life goals (Awang *et al.*, 2016). According to the *Global Entrepreneurship Monitor* (GEM, 2022), there are structural conditions for entrepreneurship, where higher education plays a significant role in the generation of competencies, the formation of thinking, and the identification of opportunities for entrepreneurial development. In this sense, entrepreneurial environmental conditions can have key roles for university students in relation to entrepreneurship (Fu *et al.*, 2022). The social environment can stimulate or deter IE (Santos *et al.*, 2016). Therefore, the understanding of these traits among university students has brought with it a diversity of methodological approaches that have allowed the analysis of IE under heterogeneous perspectives that contribute diversely to the field of study.

Methodologies used to address EI in a university context are varied. The most popular are the construction of structural equations (SEM) (Krueger *et al.*, 2000, Zhao *et al.*, 2005), the evaluation of hierarchical order via cluster analysis (Giacomin *et al.*, 2016; Roman & Maxim, 2017), the application of fuzzy set analysis (Nowiński & Haddoud, 2019), and the analysis of symmetric and asymmetric evaluations of estimators (Ali *et al.*, 2019). Each methodology has a specific function. For example, cluster analysis allows the identification of territorial or social nodes of university entrepreneurship, while fuzzy analysis also allows comparison between groups of individuals. Structural equations address the relationship between individual and contextual variables, making it possible to validate the existence and degree of relationship (weak or strong) between them.

Based on the above factors, the main aim of the present study is to determine the relationship between the variables PAs, SNs, and PBC and the EI of university students in Colombia. For this purpose, constructs validated in the framework of the GUESSS project are used to establish the determinants of EI by estimating structural equations with PLS-PM. The study of these variables is relevant since seeking higher education for entrepreneurship in Colombia is the factor with the best performance in the construction of the entrepreneurial ecosystem, even surpassing that of countries with greater investments in this area (GEM, 2022). Therefore, determining the effects of the variables studied will contribute to the construction of elements that facilitate the promotion of entrepreneurship from higher education in the context of an emerging economy.

This article is structured as follows. The second section presents the theoretical framework on EI and the elements associated with the TPB in a university context, as well as the development of the hypotheses and proposed theoretical model. The third section explains the methodological design and model estimation process through PLS-PM. The fourth section presents the main findings related to the model estimation and hypothesis testing. The fifth section presents a discussion and analysis of the results. Finally, the sixth section presents the conclusions of the research.

2. THEORETICAL BACKGROUND

2.1. The Theory of Planned Behavior and entrepreneurial intentions

Entrepreneurship is a field of research dedicated to the identification of characteristics that guide behavior around the generation of value (Ang & Hong, 2000). EI studies consider situational elements that determine the entrepreneurial event (Shapero & Sokol, 1982) and beliefs that integrate human behavior and guide intentions in specific contexts (Ajzen, 1991). Thus, behavioral beliefs (attitudes), normative beliefs (subjective norms), and control beliefs (perceived behavioral control) are used to predict entrepreneurial behavior and comprise the TPB. Hence, these elements help explain human behavior in terms of EI and are promising and applicable in a variety of contexts (Liñán & Fayolle, 2015; Yuriev *et al.*, 2020).

The TPB explains that intentions are not the starting point of the entrepreneurial process (attitudes and perceptions) (Kautonen *et al.*, 2015). Likewise, intentions allow one to understand the motivational factors that influence a behavior (Ajzen, 1991) and why some people take advantage of opportunities and others do not (Ang & Hong, 2000). Thus, intentions could help us understand the behaviors that could be performed to create a new business in the future.

Intentions allow one to predict behaviors with the understanding that individuals will develop actions to achieve their

objectives (Bandura, 1999). It should be noted that intentions are produced through the interaction between PAs, PBC, and SNs (Ajzen, 1991). PAs are defined as a form of self-perception (Bandura, 1982) that can guide the positive or negative assessment of a behavior (Liñán & Chen, 2009). PBC involves self-perception but in relation to the degree of competence and performance. SNs involve the individual's environment and are defined as a form of social pressure to perform (or not perform) a behavior (Feola *et al.*, 2019). Each of these elements can have a significant impact on intentions if self-perception and the social environment interact in the same direction to enhance the execution of those intentions.

2.2. Entrepreneurial Intention among university students

Social cognitive theory states that different types of environmental structures influence individuals' personal aspirations through family, economic, educational standards, etc. (Bandura, 1982). For EI, individuals' environmental conditions such as support from family and friends can be influential in a broad sense (Fu *et al.*, 2022). Because of this factor, social norms can favor or deter the perception of entrepreneurship as a career choice (Santos *et al.*, 2016). Aspects such as entrepreneurship education can directly impact EI, turning the social environment into a platform for intentionality towards an entrepreneurial career (Awang *et al.*, 2016). Specifically, the study of EI pays special attention to university students due to the vulnerability that is evident in their employment conditions and professional development (Amofah & Saladrigues, 2022a), their entrepreneurial potential (Contreras-Barraza *et al.*, 2021), and the ways in which they are influenced by their social environment for decision making (Awang *et al.*, 2016).

One of the most relevant lines of research within EI is the study of university students and the conditions that influence their decisions regarding entrepreneurship (Liñán & Fayolle, 2015). Some studies have focused on cultural factors (Gaofeng, 2019; Liñán & Chen, 2009; Moriano *et al.*, 2012), family members (Altinay *et al.*, 2012), gender (Montero & Camacho, 2018; Santos *et al.*, 2016; Shinnar *et al.*, 2012), and career intention (Fayolle & Gailly, 2015; Liñán *et al.*, 2011; Nabi *et al.*, 2017; Nabi *et al.*, 2018). This last set of factors has gained relevance with the understanding that learning and inspiration can generate certain incentives for EI among university students (Nabi *et al.*, 2018).

Likewise, research on EI employs different approaches such as the demographic and social approaches of students and researchers (Ahmed *et al.*, 2010; Feola *et al.*, 2019), as well as the incidence of intervention and support exerted by universities on entrepreneurial behavior (Coduras *et al.*, 2008; Su *et al.*, 2021), which can be used to compare the performance of these factors against EI promotion (Fayolle & Gailly, 2015; Franke & Lüthje, 2004; Souitaris *et al.*, 2007). These factors become even more important for young people with an average age of 25, whose decisions will significantly impact their future (Turker & Selcuk, 2009).

EI in an emerging economy context presents characteristics of interest in relation to the underlying cultural factors. University students in an emerging economy are more inclined to seek self-employment. In Latin America, students showed a positive relationship between their skills, family background, and risk propensity to engage in entrepreneurship (Torres *et al.*, 2017). Colombian university students presented an EI of considerable magnitude mediated by preparation for entrepreneurship received during their university studies (Cano & Tabares, 2017). Thus, studying EI in an emerging economy such as Colombia's will help us better understand this phenomenon.

2.2.1. Attitudes and entrepreneurial intention of university students

PAs are defined as the degree to which a person's assessment of a behavior is favorable or unfavorable (Ajzen, 1991). Attitudes play an important role in motivation, which is derived from the self-perception of one's own capabilities (Bandura, 1982). In this sense, attitude includes affective and evaluative considerations about behaviors that lead an individual to consider a behavior as convenient (or not) for personal development (Liñán & Chen, 2009).

PAs represent one of the most relevant predictive elements of this theory, serving as a constant variable throughout the analysis of EI among university students from different cultures (Liñán & Chen, 2009; Moriano *et al.*, 2012). Nabi *et al.* (2018) have demonstrated that entrepreneurship training can play a more significant role in inspiration than in knowledge since emotional factors can be very powerful in both supporting students in and dissuading them from their intention. Thus, personal beliefs and expectations constitute strong elements in the EI of researchers and academics (Feola *et al.*, 2019).

PAs with a proactive approach reinforce the intention towards entrepreneurship (Barba-Sánchez *et al.*, 2022). A favorable attitude towards such behaviors can make university students perceive them as challenges that they are willing to face (Rueda-Barrios *et al.*, 2022). There are several factors that can shape PAs, such as personality, beliefs, and perception capability (Kobylińska, 2022). Likewise, attitude is derived from the hedonic values of individuals, which makes it a determinant that remains constant over and above other factors and externalities (Yasir *et al.*, 2021). Therefore, the influence of PAs can be a determinant in EI. In this sense, we propose Hypothesis 1:

H1. Personal attitudes are positively related to the entrepreneurial intention of university students.

2.2.2. Social environment and entrepreneurial intention of university students

Subjective norms (SNs) are an important part of the TPB and are defined as the perceived social pressure to perform or not perform a behavior (Ajzen, 1991). SNs measure the manner in which the social environment influences a person to carry out, or not, entrepreneurial behaviors (Feola *et al.*, 2019). However, the perceptions of "people of reference" can influence the approbation or disapprobation of the entrepreneur's decision (Liñán & Chen, 2009). Thus, the influence of SNs can be diverse, as social pressures are perceived in different ways depending on different social groups' characteristics.

SNs are a form of social pressure that drives or restrains an individual's intentions (Blanco-Mesa *et al.*, 2022). However, SNs can be considered the weakest theory predictor and consider the perception of the individual's immediate environment (Kautonen *et al.*, 2015). Hence, environmental factors can play a key role in fostering or limiting the entrepreneurship in particular groups. In this sense, the social environment can be a referent for assessing capabilities with respect to perceived advantages and obstacles (C. Chen *et al.*, 1998). There are several stakeholders that can influence an individual's behavior, such as family (Altinay *et al.*, 2012); close social groups (Maresch *et al.*, 2016); normative influences (Kor & Mullan, 2011; Santos *et al.*, 2016); and, in the context of university students, the environment of the surrounding training centers and educational programs (Díaz-García & Jiménez-Moreno, 2010; Fayolle & Gailly, 2015; Souitaris *et al.*, 2007). The latter factor is notable because universities have tools that can guide students' entrepreneurial behaviors or even discourage them (Franke & Lüthje, 2004).

The university environment plays an important role in EI. Franke and Lüthje (2004) showed that a favorable environment for entrepreneurship makes university students more inclined toward this behavior. Accordingly, institutional entrepreneurship is a way of promoting the creation of companies through the active participation of universities in each stage of their development (Parada *et al.*, 2019). Likewise, Nowiński *et al.* (2017) showed that the university environment increased self-efficacy for entrepreneurship. Hence, there are several variables that could be relevant for EI, such as academic programs focused on entrepreneurship (Bae *et al.*, 2014) and cultural, institutional, and pedagogical variables that encourage entrepreneurial behavior (Liñán & Fayolle, 2015).

Additionally, the university environment's influence can have indirect effects since it can shape students' attitudes by motivating or dissuading them from their intentions (Barba-Sánchez *et al.*, 2022). When universities promote innovative entrepreneurial training tools, they can also indirectly broaden the basic knowledge and skills of university students in entrepreneurship, which can engender the idea of becoming an entrepreneur (Su *et al.*, 2021). In this sense, the university environment can facilitate a deeper understanding of the external factors that shape attitudes and capabilities for entrepreneurship (Contreras-Barraza *et al.*, 2021). In this sense, we propose the following hypotheses:

H2. Subjective norms regarding entrepreneurial decisions are positively related to the entrepreneurial intention of university students.

H2a. Subjective norms are positively related to entrepreneurial intention through personal attitude.

H2b. Subjective norms are positively related to entrepreneurial intention through perceived behavioral control.

2.2.3. Capacity for Action and Entrepreneurial Intention of University Students

Perceived behavioral control (PBC) refers to individuals' perception of the ease or difficulty of performing a behavior (Ajzen, 1991). This element is related to the self-efficacy concept, which refers to the degree of effectiveness in the execution of actions to deal with future situations (Bandura, 1982). For entrepreneurial intention, self-efficacy refers to an individual's belief that he or she is capable of successfully performing the tasks of an entrepreneur (Chen *et al.*, 1998). Thus, PBC could be assumed to represent behavioral performance that is properly dependent on the individual (Blanco-Mesa *et al.*, 2022).

PBC involves risk propensity that can be mediated by the perception of one's own abilities to deal with ambiguity (Zhao *et al.*, 2005). In this sense, Kautonen *et al.* (2015) noted that participants who put their capabilities into practice in activities aimed at starting a business reported a positive level of intention to continue doing so. Hence, PBC might be a more objective measure for the implementation of intentions, which is a concept recognized as mediating action-taking in the entrepreneurial context (van Gelderen *et al.*, 2018).

When studying IE among college students, the results of personal and social factors can be mixed. Thus, related research on indicators of the transition from intention to entrepreneurial behavior is key to understanding the gaps in this theory (Nabi *et al.*, 2017). In this sense, PBC has a strong impact on university students in terms of their need for achievement and independence (Barba-Sánchez & Atienza-Sahuquillo, 2018), the development of self-efficacy for their entrepreneurial orientation (Liñán *et al.*, 2011; Nowiński *et al.*, 2017), and the generation of self-confidence given by skills and capacities for entrepreneurship (Bae *et al.*, 2014; Oosterbeek *et al.*, 2010). In emerging economies, university students have demonstrated the ability to take charge of their actions despite perceived difficulties in their contexts (Torres *et al.*, 2017).

Notably, university students' own capabilities are often the basis for their decisions, meaning that students who consider themselves well prepared to play the role of entrepreneur are more inclined to engage in this behavior (Bae *et al.*, 2014; Kobylińska, 2022). Thus, PBC is related to EI since an entrepreneur is characterized by constant preparation to assert his or her ability to manage a business (Nowiński *et al.*, 2017).

University students' perception of their own capabilities can be determined by previous family experiences of entrepreneurship (Amofah & Saladrigues, 2022) and early training in entrepreneurial skills (Bae *et al.*, 2014). These factors can encourage an individual to consider entrepreneurship as a viable alternative for his or her life goals (Liñán *et al.*, 2011). PBC is an important element because it connects to an individual's values of self-transcendence, which can lead to a greater capacity to take risks and face adversity to achieve his or her purpose (Yasir *et al.*, 2021). In this sense, we propose Hypothesis 3:

H3. Perceived behavioral control is positively related to entrepreneurial intention among university students.

Figure 1 shows the theoretical model. The proposed hypotheses are presented with their abbreviations to facilitate identification, alongside proposed indirect effects. The proposed theoretical model is composed of four latent variables that are related to each other through a system of three hypotheses, which suggest that TPB elements have a direct relationship with the EI of Colombian university students. Estimation of these relationships enables one to determine their magnitude and test the hypotheses proposed for the specific context.

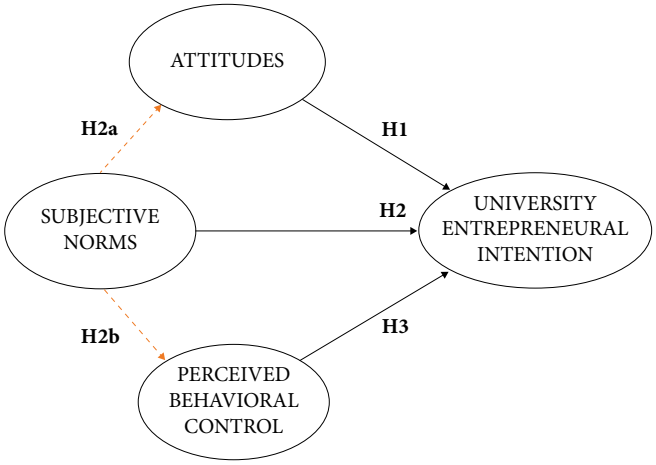

Figure 1
Theoretical model to IE
Source: Own elaboration based on theoretical review.

3. RESEARCH METHOD

Once the theoretical constructs that support the research have been established, we present some data on the population and the method of empirical validation for the hypotheses used. The population consists of Colombian university students interviewed within the framework of the GUESSS Global University Entrepreneurial Spirit Student's Survey project in which 57 national universities participate and whose questionnaire includes the theoretical dimensions presented up to this point. The methodology used to estimate the Path coefficients and validate the hypotheses is Partial Least Squares Path Modeling (PLS-PM), a two-stage methodology that allows one to construct indexes associated with the theoretical unobservable variables and establish their statistical relationship with the theoretical variables.

3.1. Sample

The GUESSS project started in 2003 with the objective of systematically studying and documenting the entrepreneurial intention and activity of university students around the world (Martins *et al.*, 2019). In its most recent version (2021), 208,636 students from 54 countries participated. In the case of Colombia, there is a survey record of 12,383 students belonging to 57 national universities. Considering that the objective of this study is to determine the relationships between the latent variables defined as determinants of EI among university students in Colombia, the population under study is defined as the 12,383 respondents in the country. This condition made it unnecessary to carry out any type of sampling since the necessary records were already available.

3.2. Dataset

The students surveyed belong to 12 departments of the country, with Valle del Cauca (20.42%) and Antioquia (18.44%) having the highest participation among the total population. Table 1 shows the frequency by department (see statement of data availability).

Table 1
Population distribution by department of residence

Departament	Individuals	Participation (%)
Valle	2504	20.42
Antioquia	2262	18.44
Atlántico	1788	14.58
Risaralda	1512	12.33
Caldas	1077	8.78
Boyacá	958	7.81
Cauca	928	7.57
Cundinamarca	629	5.13
Bolívar	343	2.80
Nariño	216	1.76
Quindío	48	0.39

Source: Prepared by the authors based on data from Project GUESSS (2021).

Regarding the responses, it should be noted that the GUESSS survey uses a 7-point scale, with 1 being the lowest level of qualification and 7 the highest. The response frequency for each of the proposed theoretical dimensions is shown in Figure 2. The average scale for the Personal Attitudes (PAs) variable is 3.2 points and indicates somewhat negative behavior among the students. The same analysis applies to the dimensions of Perceived Behavioral Control (PBC) (3.0) and Entrepreneurial Intensity (EI) (3.2). In the case of Subjective Norms (SNs), it is interesting that although students perceive the existence of these norms based on an average evaluation scale of 5.35 points, these norms do not ultimately have a relationship with the scales of entrepreneurial intention.

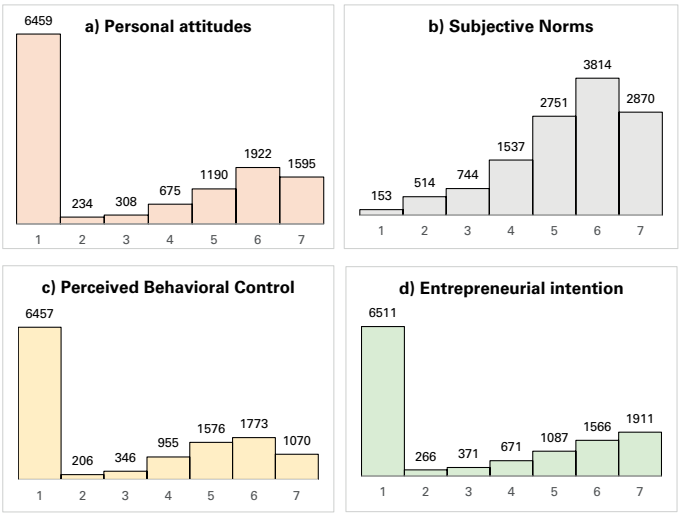

Figure 2
Frequency of responses by scale and dimension
Source: Prepared by the authors based on GUESSS Project (2021).

Figure 2 shows a scenario of relative pessimism on the part of Colombian university students. Here, EI is evaluated at a low level. Approximately 50% of the students do not have many incentives to start their entrepreneurial processes. The few that engage in entrepreneurship do so based on good indicators for PAs and PBC. This result highlights a preliminary disconnection between SNs[1] and EI.

[1] Which, although they exist, are not reflected in concrete undertakings.

3.2. Estimation method: Partial Least Squares-Path Modeling

Structural equation models (SEM) are used here to evaluate the proposed hypotheses. Such models have become an important tool for multivariate analysis during the last two decades in the social sciences (Castillo-Vergara & Torres Aranibar, 2019; Cepeda Carrión & Roldán Selgueiro, 2004). This method combines the use of unobserved variables (latent variables), which usually correspond to theoretical constructs, with the use of measurable variables for their estimation. These measurable or observable variables are usually handled using instruments measured on a Likert scale (Castillo-Vergara & Torres Aranibar, 2019; G. David Garson, 2016).

The SEM are made up of two stages that are estimated at different times. The first, called the External Model, establishes the relationships between latent variables or theoretical constructs and, through an analysis associated with Principal Component Analysis, allows one to estimate indexes associated with each of the latent variables. The second, known as the internal model, is made up of the causal relationships or relationships established between the latent variables. These relationships are presented as hypotheses, and the objective is to validate or invalidate these hypotheses by means of an estimation of relationship coefficients (Path) using Ordinary Least Squares (OLS) (Amofah & Saladrigues, 2022b; Chin, 1998; G. David Garson, 2016; Sánchez, 2013). The estimation of SEM is carried out via one of two types of techniques: 1) covariance analysis or 3) variances or correlations (Barroso *et al.*, 2010). In this case, estimation by means of variances or correlations will be used to establish relationships between the proposed theoretical constructs (Nguyen *et al.*, 2022).

To estimate the relationships between variables, Partial Least Squares-Path Modeling (PLS-PM) is used. This process uses blocks of manifest variables associated with an estimated variable to create a series of data associated with the theoretical concept. This construction is validated by applying Cronbach's Alpha and Dillon Goldstein's Rho statistics. Subsequently, parameter estimation is performed through OLS, and statistical validation is performed through t-Student and bootstrapping (Chin, 1998; G. David Garson, 2016; Sánchez, 2013). Estimates are made using the PLS.PM library developed by Sánchez (2013) for the programming language R.

3.3. Empirical Finding

As a first step, an evaluation of the blocks of manifest variables and their relevance in the latent variables' measurement is carried out. This is a Confirmatory Factor Analysis - CFA performed on the instrument to determine the statistical validity of the questions (Gil-León *et al.*, 2021). The validation of the manifest variables is carried out through four indicators. First, Cronbach's Alpha, which measures the overall relevance of the block of manifest variables based on the variance explained as a whole, the critical value of the Alpha must be greater than 0.8 to be considered excellent and greater than 0.6 to be acceptable (Castillo-Vergara *et al.*, 2018; Castillo-Vergara & Torres Aranibar, 2019). Chin (1998) and Latan and Richard (2018) consider an Alpha of 0.7 to be optimal. Second, Dillon Goldstein's Rho, which is defined by Sánchez (2013) as an estimator of the variance between manifest variables that structure a variable, its validity indicators are the same as those of the Alpha (with a trend equal to or greater than 0.7). Loading is an indicator of individual variance explanation for each of the manifest variables that structure the instrument, must be greater than 0.7 to give validity to the indicator. Finally, the communality of the variables, which is understood as a type of variance associated with the behavior of the data series for each question, is defined as the square of the loading value, so the critical value for validation is 0.5. Table 2 presents the results of the CFA performed on the blocks of manifest variables. As can be observe, validity and statistical robustness are found to be able to affirm that each of the manifest variables considered for the explanation of the hypotheses is significant and valid. This implies giving validity to the external model proposed in the research.

In addition, we performed an evaluation of cross-correlations, which showed the relevance of each of the manifest variables to its block or latent variable and not to others. The results showed that each of the manifest variables has the highest level of correlation with its own explained variable and that there is no type of variable that should be eliminated or changed in the distribution of blocks. Once the external model was statistically validated, the results of the internal model were presented and validated. To statistically evaluate the hypotheses using the PLS-PM methodology, three aspects must be considered: the direction and magnitude of the effect, validation of the t-statistic, and validation according to the bootstrapping interval.

Regarding the direction and magnitude of the effect between variables (Path), where the estimator is expected to be positive, as the formulation of hypotheses is carried out in the affirmative, a negative result suggests the existence of an opposite effect. The magnitude should be greater than 0.2 to find a weak relationship and greater than 0.8 to establish a very strong relationship (Chin, 1998). In this case, we found a strong statistical relationship between PAs and the corresponding EI (H_1). For H2, a negative sign was found, which indicates an inverse relationship between SNs and EI, a condition that directly invalidates this hypothesis and leads to the conclusion that it does not have statistical significance. Finally, H3 assembles the direction criterion (positive), but the magnitude establishes the existence of only a very slight relationship (0.17). Because we were close to the validation limit, we checked the other indicators to define the statistical validity of the hypothesis.

The t-Student statistic is a validation statistic for estimators obtained through OLS, which requires that the statistic obtained be greater than 0. Following Gujarati & Porter (2010), the statistic must be greater than the critical value of 5% confidence, i.e., greater than 1.96. In this case, statistical significance is again found for H_1 because the elements together with the Path of the existence of a strong relationship between the variables that structure this hypothesis are sufficient. In the case of H_2, there is not enough evidence to affirm its significance, so the hypothesis is considered not validated. In the case of H_3, validity is given to the existence of an effect (which is weak), and the t value of 26.6 gives statistical significance to the proposed relationship.

Table 2
Measurement evaluation results

Latent Variables	Cronbach's Alpha	Rho de Dillon Goldstein	Observed Variables	Loading	Communality
Personal Attitudes	0.985	0.988	Q4.1b_1	0.950	0.902
			Q4.1b_2	0.972	0.945
			Q4.1b_3	0.976	0.953
			Q4.1b_4	0.980	0.961
			Q4.1b_5	0.974	0.949
Subjective Norms	0.937	0.948	Q3.1_1	0.763	0.583
			Q3.1_2	0.846	0.716
			Q3.1_3	0.830	0.690
			Q3.2_1	0.828	0.686
			Q3.2_2	0.859	0.738
			Q3.2_3	0.862	0.743
			Q3.2_4	0.816	0.666
			Q3.2_5	0.854	0.729
Perceived Behavioral Control	0.989	0.991	Q4.2_1	0.963	0.928
			Q4.2_2	0.968	0.937
			Q4.2_3	0.975	0.951
			Q4.2_4	0.962	0.926
			Q4.2_5	0.970	0.941
			Q4.2_6	0.975	0.951
			Q4.2_7	0.974	0.949
Entrepreneurial Intention	0.989	0.991	Q4.1a_1	0.943	0.889
			Q4.1a_2	0.978	0.957
			Q4.1a_3	0.984	0.968
			Q4.1a_4	0.982	0.964
			Q4.1a_5	0.972	0.945
			Q4.1a_6	0.979	0.958

Source: own elaboration based on estimation results in R Studio.

Finally, a bootstrapping test was performed. This test consists of performing 100 simulations of the model estimation with the objective of constructing confidence intervals for each of the estimated Path coefficients. This test allows one to measure the degree of volatility of the data and its replicability with similar sample sets. In this case, notable robustness was found for each of the results obtained. Here, the calculated intervals comply with the condition of being short and not offering any surprises, thereby giving robustness and significant statistical validation to the estimated model.

Tabla 3
Resultados y validación de hipótesis

Hypothesis	Path	t-value	Boots. Interval	Hypothesis
H_1 – Personal attitudes → Entrepreneurial intention	0.81013	128.00	(0.80991 - 0.81034)	Validated***
H_2 – Subjective Norms → Entrepreneurial intention	–0.00119	–0.54	(–0.00123 - –0.00114)	No Validated
H_3 – Perceived Behavioral Control → Entrepreneurial intention	0.16951	26.66	(0.16929 - 0.16973)	Validated***

Note: *** denotes significance at 1% accepted error.

Source: Prepared by the authors based on estimation results in *R Studio.*

The statistical results validate two of the three hypotheses proposed in the internal model. The value obtained for the t-Student test exceeds the critical value of 1.96 for the evaluation. In addition, the bootstrapping intervals have a small deviation. Thus, significance was found in the relationships between PAs and PBC with the object variable EI among Colombian university students. Figure 3 shows the estimated model and the indirect effects, which will be discussed in the next section.

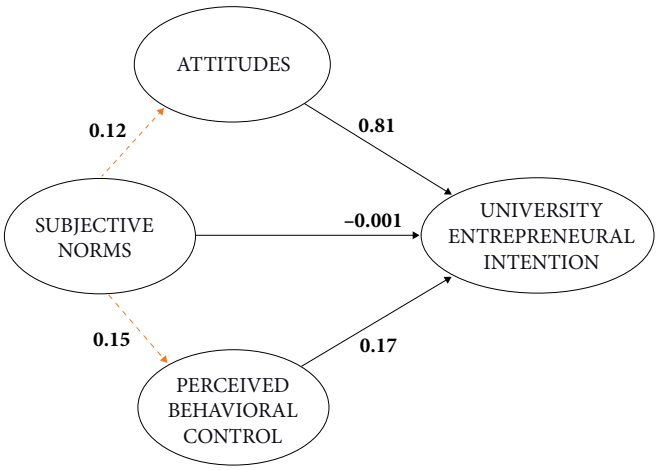

Figure 3
Estimated model
Source: own elaboration.

4. DISCUSSION

The TPB focuses on the influence of behavioral, normative, and control beliefs to explain human behavior (Ajzen, 1991). Through an empirical study, this research used these elements to analyze their relationship with the EI of university students in Colombia. The findings showed that the PBC and PA variables play a significant role in EI, while the SN variable is not relevant among Colombian university students. These results are consistent with studies conducted on university students in emerging economies such as India, China, and Iran, where SNs play an indirect role in EI (Esfandiar *et al.*, 2019; Roy *et al.*, 2017; Su *et al.*, 2021). It is noteworthy that Colombian university students have a negative perception of EI. When evaluating the PA and PBC variables, 54% of the sample revealed some favorability, while only 28% evaluated their EI within scales of 6 or 7 (see Figure 2). Precisely, these last scales evaluate the PA and PBC variables positively, explaining the relevance of both in EI and validating hypotheses H1 and H3. In this sense, a direct relationship was found between EI and the variables of PAs and PBC, and an inverse relationship was found between SNs and EI, which could indicate a possible disconnect between university initiatives and entrepreneurial actions among students.

The results show that PBC has only slight relevance in EI (H3), although it is important in explaining the entrepreneurial intentions of university students. First, Colombian university students showed progress in moving from intention to implementation of their actions. This result reveals that there are goals that guide intentions and allow the construction of a clear line of action focused on entrepreneurship (van Gelderen *et al.*, 2018). Second, we found a favorable perception of entrepreneurial capabilities; as more technical, creative, and managerial skills are developed, students' abilities to face the challenges associated with entrepreneurial activities also improve (Rueda-Barrios *et al.*, 2022). Those that have comprehensive preparation will be able to better act as entrepreneurs (Kobylińska, 2022). Third, PBC can be due to an increased propensity to engage in risk, which is common at this stage of life, especially among Latin American students (Torres *et al.*, 2017). This combination of factors allows us to better understand that skill development for university students is crucial to focus their actions and assume the risks involved in entrepreneurial activities.

The most relevant variable was found to be PAs (H1). This result is based on personality characteristics, which have been shown to have a high predictive capacity in emerging economies (Munir *et al.*, 2019). Likewise, attitudes are derived from the hedonic values that guide behavior, which can remain unchanged in different contexts (Kobylińska, 2022; Yasir *et al.*, 2021). Indeed, a favorable attitude allows students to perceive challenges in a more optimistic way (Barba-Sánchez *et al.*, 2022). It is, therefore, noteworthy that Colombian university students who presented favorable PAs had a greater propensity towards entrepreneurial activities.

The direct effects of PAs and PBC on EI show that as Colombian students feel they have more control over a behavior, they also develop a more favorable attitude towards that behavior. This favorable attitude is given not only in terms of taste but also in terms of feasibility (Liñán & Chen, 2009). Indeed, a notable cohort of university students in Colombia do not perceive that entrepreneurial activities will be viable or lead to advantages for the development of their life goals. However, students with favorable PAs perceived a greater capacity for entrepreneurship, knowing the challenges and difficulties that could arise in the development of their objectives. Hence, the favorability of PAs has an indirect effect that can potentiate PBC, allowing a combination of both variables to explain the orientation of EI among university students in Colombia.

The SNs did not show a significant relationship with, or a direct effect on, the EI of university students in Colombia (H2) (Amofah & Saladrigues, 2022; Barba-Sánchez *et al.*, 2022; Kobylińska, 2022). This result could be explained by perception of the university's climate and the approaches of entrepreneurship programs, many which are focused on theoretical discourse rather than practical tools for capacity building and have a negative effect on EI (Piperopoulos & Dimov, 2015). Hence, university students' perceptions related to entrepreneurship university programs are favorable in an academic scenario but not in a practical scenario. In fact, SNs did not have the expected effect, given that Colombian culture is considered collectivist (Seo, 2020). Students perceived the university's environmental conditions for entrepreneurship as indifferent in a real scenario, generating low adjustment toward normative beliefs and leading to behavioral and control beliefs (Esfandiar *et al.*, 2019).

SNs were found to have an indirect effect through the variables PAs and PBC (see Table 4). Although the perception of the environment was not significant enough to have a direct effect on EI, some aspects were found to have an important influence on PAs and PBC, indirectly shaping PAs (Barba-Sánchez *et al.*, 2022). Likewise, the construction of a university environment oriented toward entrepreneurship can form knowledge and skills that improve self-efficacy. Thus, the relevance obtained in PBC among Colombian university students could be partially and indirectly due to the university climate and entrepreneurship programs of their institutions (Kobylińska, 2022). In this sense, although there is no direct effect of the SNs on EI, the capabilities are indirectly potentiated by the resources of the environment and the structural support that is perceived in that context.

Table 4
Direct and indirect effects of the variables

Relationships	Direct	Indirect	Total
SN → PA → EI	0.000	0.12	0.120
PA → PBC	0.000	0.00	0.000
PA → EI	0.810	0.00	0.810
SN → PBC → EI	0.000	0.15	0.150
SN → EI	–0.001	0.00	–0.001
PBC → EI	0.170	0.00	0,170

Source: Prepared by the authors based on estimates made in *R Studio.*

These results allow us to understand the predictive capacity of TPB elements in relation to EI among university students in Colombia. In this sense, we determined how the perception of PAs and PBC can stimulate or dissuade EI. A negative effect was evidenced by a low perception of the viability of entrepreneurial activities and existing capabilities for executing such activities. However, we found that the incidence of SNs is directly irrelevant, which suggests that the development of conditions in the university environment to stimulate EI is still incipient. One of the shortcomings of universities in entrepreneurship promotion is the lack of connections with the productive sector and the generation of spaces outside the classroom for entrepreneurial skill development (Parada *et al.*, 2019).

These findings have practical implications for universities by promoting the understanding that entrepreneurship can help fulfill the third mission through knowledge transfer (Lopes *et al.*, 2021). Indeed, the integration of university students in knowledge exchange processes through external relationships contributes to the formation of capabilities that can stimulate EI. According to Calderón & Pérez (2021), there is a direct relationship between the increase in patents in universities, knowledge exchange, and the capacity building of academics. Therefore, developing capabilities for entrepreneurship is fundamental. Additionally, shifting the focus of entrepreneurship training programs from theoretical to experiential is crucial to engender such capabilities in a practical way and thereby close knowledge gaps and stimulate EI (Anosike, 2018). In short, the formation of capabilities among university students through an experiential process of knowledge exchange could become a strategy to stimulate entrepreneurship and transform it into one of the main ways of disseminating knowledge as a contribution of universities to their stakeholders.

5. CONCLUSIONS AND LIMITATIONS

The study of EI among university students is relevant in the field of entrepreneurship research due to its transcendence and implications in the orientation of entrepreneurial behavior, with EI being the best predictor of behavior. In this sense, the TPB proposed by Ajzen (1991) was applied here as a study framework with a high predictive capacity to analyze the influence of the PA, SN, and PBC variables on EI. Following international trends and the specific conditions of the study, a model of three latent variables (according to the dimensions of the TPB) with three directly related variables was proposed. The model was estimated using the Partial Least Squares Path Modeling methodology with a sample of 12,383 university students in Colombia.

The results showed a low perception of university students' favorability towards entrepreneurship, with the variables PBC and PAs being key determinants for this intention (i.e., the degree of favorability in these variables could stimulate or dissuade students' EI). However, SNs did not present any relevance in relation to EI, with the university environment as a variable perceived to have low significance in relation to entrepreneurial decisions. Nevertheless, SNs were found to have indirect effects through PBC and PAs. Hence, the entrepreneurial environment can play an important role in the development of entrepreneurial capabilities and beliefs among students. These findings have implications for this field of study since the results contribute to the understanding of the interactions between each of the elements of the entrepreneurial environment, TPB, and EI.

This research shows the effects and predictive ability of PAs and PBC in the context of an emerging economy. It also explores the indirect effects that can shape intentions, with the understanding that SNs can be associated with a change in vision regarding the role of universities in the promotion of EI. From this perspective, entrepreneurship can be considered a way of disseminating knowledge. However, it is necessary to develop a university climate focused on knowledge transfer that allows students to see entrepreneurship as a form of professional development. Accordingly, future lines of research in this field could focus on how entrepreneurship is consolidated within the processes of appropriation and knowledge transfer in the mission development of universities.

Finally, it is important to consider the limitations of this study, including the limited scope of the data and the consolidation of the constructs of each latent variable, as there was limited access to the instrument applied by the GUESSS project. In addition, the study provided results consistent with the geographical area of reference (Colombia), so it is possible that this methodology would obtain different results if applied to another territorial context. This is not a methodological limitation, per se, but a consideration for future replicability scenarios.

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7. REFERENCES

Ahmed, I., Nawaz, M. M., Ahmad, Z., Shaukat, M. Z., Usman, A., Wasim-ul-Rehman, & Ahmed, N. (2010). Determinants of students' entrepreneurial career intentions: Evidence from business graduates. *European Journal of Social Sciences*, *15*(2), 14-22.

Ajzen, I. (1991). The theory of planned behavior. *Handbook of Theories of Social Psychology*, 179-211. https://doi.org/10.4135/9781446249215.n22

Alfaro-García, V. G., Blanco-Mesa, F., & León Castro, E. (2022). Entrepreneurial intention a bibliometric approach. *Cuadernos de Gestión*, *21*(2), 1-15. https://doi.org/10.5295/cdg.211558el

Ali, I., Ali, M., & Badghish, S. (2019). Symmetric and asymmetric modeling of entrepreneurial ecosystem in developing entrepreneurial intentions among female university students in Saudi Arabia. *International Journal of Gender and Entrepreneurship*, *11*(4), 435-458. https://doi.org/10.1108/IJGE-02-2019-0039

Altinay, L., Madanoglu, M., Daniele, R., & Lashley, C. (2012). The influence of family tradition and psychological traits on entrepreneurial intention. *International Journal of Hospitality Management*, *31*(2), 489-499. https://doi.org/10.1016/j.ijhm.2011.07.007

Amofah, K., & Saladrigues, R. (2022). Impact of attitude towards entrepreneurship education and role models on entrepreneurial intention. *Journal of Innovation and Entrepreneurship*, *11*(1). https://doi.org/10.1186/s13731-022-00197-5

Ang, S. H., & Hong, D. G. P. (2000). Entrepreneurial spirit among East Asian Chinese. *Thunderbird International Business Review*, *42*(3), 285-309. https://doi.org/10.1002/1520-6874(200005/06)42:3<285:aid-tie2>3.0.co;2-5

Anosike, P. (2018). Entrepreneurship education knowledge transfer in a conflict Sub-Saharan African context. *Journal of Small Business and Enterprise Development*, 25(4), 591-608. https://doi.org/10.1108/JSBED-01-2017-0001

Awang, A., Amran, S., Nor, M. N., Ibra-, I. I., Fazly, M., & Razali, M. (2016). Individual entrepreneurial orientation impact on entrepreneurial intention: Intervening effect of PBC and subjective norm. *Journal of Entrepreneurship, Business and Economics*, *4*(2), 94-129.

Bae, T. J., Qian, S., Miao, C., & Fiet, J. O. (2014). The relationship between entrepreneurship education and entrepreneurial intentions: A meta-analytic review. *Entrepreneurship: Theory and Practice*, *38*(2), 217-254. https://doi.org/10.1111/etap.12095

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, *37*(2), 122-147. https://doi.org/10.1037/0003-066X.37.2.122

Bandura, A. (1999). Social cognitive theory: An agentic perspective. *Asian Journal of Social Psychology*, *2*(1), 1-26.

Barba-Sánchez, V., & Atienza-Sahuquillo, C. (2018). Entrepreneurial intention among engineering students: The role of entrepreneurship education. *European research on management and business economics*, *24*(1), 53-61. https://doi.org/10.1016/j.iedeen.2017.04.001

Barba-Sánchez, V., Mitre-Aranda, M., & Brío-González, J. del. (2022). The entrepreneurial intention of university students: An environmental perspective. *European Research on Management and Business Economics*, *28*(2), 100184. https://doi.org/10.1016/j.iedeen.2021.100184

Barroso, C., Carrión, G. C., & Roldán, J. L. (2010). Applying maximum likelihood and pls on different sample sizes: studies on SERVQUAL model and employee behavior model. In *Handbook of Partial Least Squares* (pp. 427-447). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-540-32827-8_20

Blanco-Mesa, F. Mariño-Becerra, G. & León-Castro, E. (2022). Intención emprendedora de los estudiantes universitarios en Tunja: (1.ª ed.). Editorial UPTC. https://editorial.uptc.edu.co/gpd-intencion-emprendedora-de-los-estudiantes-universitarios-en-tunja-9789586606097.html

Blanco-Mesa, F., Leon-Castro, E., Bermudez-Mondragon, D. & Castro-Amado, M. (2021). Forgotten Motivational Factors of Boyacense Colombian Entrepreneurs: A Subjective Analysis of Second-Generation Incidences. Mathematics, 9(9), 973. https://doi.org/10.3390/math9090973

Calderón, G., & Pérez, P. (2021). Academic patents and entrepreneurial intention. To what extent are other knowledge transfer mechanisms affected in a mexican university? Journal of Evolutionary Studies in Business, 6(2), 126-150. https://doi.org/10.1344/jesb2021.2.j094

Cano, J. A., & Tabares, A. (2017). Determinants of university students' entrepreneurial intention: GUESSS Colombia study. *Espacios*, *38*(45), 22.

Castillo-Vergara, M., Barrios Galleguillos, N., Jofré Cuello, L., Alvarez-Marin, A., & Acuña-Opazo, C. (2018). Does socioeconomic status influence student creativity? *Thinking Skills and Creativity*, *29*, 142-152. https://doi.org/10.1016/j.tsc.2018.07.005

Castillo-Vergara, M., & Torres Aranibar, E. (2019). El papel de la cooperación para desarrollar innovación tecnológica en la PYME. *Journal of Technology Management & Innovation*, *14*(4), 41-53. https://doi.org/10.4067/s0718-27242019000400041

Cepeda Carrión, G., & Roldán Selgueiro, J. L. (2004). Aplicando en la práctica la técnica PLS en la administración de empresas. *Conocimiento y Competitividad: Congreso ACEDE*.

Chen, C., Gene, P., & Crick, A. (1998). Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing*, *13*, 295–316. https://doi.org/10.1016/S0883-9026(97)00029-3

Chin, W. W. (1998). The partial least squares approach to structural equation modelling. In Marcoulides G. A. (Ed.). *Modern Methods for Business Research*, January *1998*.

Coduras, A., Urbano, D., Rojas, Á., & Martínez, S. (2008). The relationship between university support to entrepreneurship with entrepreneurial activity in Spain: A GEM data based analysis. *International Advances in Economic Research*, *14*(4), 395-406. https://doi.org/10.1007/s11294-008-9173-8

Contreras-Barraza, N., Espinosa-Cristia, J. F., Salazar-Sepulveda, G., & Vega-Muñoz, A. (2021). Entrepreneurial intention: A gender study in business and economics students from Chile. *Sustainability (Switzerland)*, *13*(9), 1-14. https://doi.org/10.3390/su13094693

Díaz-García, M. C., & Jiménez-Moreno, J. (2010). Entrepreneurial intention: the role of gender. *International entrepreneurship and management journal*, *6*(3), 261-283. https://doi.org/10.1007/s11365-008-0103-2

Esfandiar, K., Sharifi-Tehrani, M., Pratt, S., & Altinay, L. (2019). Understanding entrepreneurial intentions: A developed integrated structural model approach. *Journal of Business Research*, *94*(August 2016), 172-182. https://doi.org/10.1016/j.jbusres.2017.10.045

Fayolle, A., & Gailly, B. (2015). The impact of entrepreneurship education on entrepreneurial attitudes and intention: Hysteresis and persistence. *Journal of Small Business Management*, *53*(1), 75-93. https://doi.org/10.1111/jsbm.12065

Feola, R., Vesci, M., Botti, A., & Parente, R. (2019). The determinants of entrepreneurial intention of young researchers: combining the theory of planned behavior with the triple helix model. *Journal of Small Business Management*, *57*(4), 1424-1443. https://doi.org/10.1111/jsbm.12361

Franke, N., & Lüthje, C. (2004). Entrepreneurial intentions of business students: A benchmarking study. *International Journal of Innovation and Technology Management*, *1*(3), 269-288. https://doi.org/10.1142/S0219877004000209

Fu, X., Yan, T., Tian, Y., Niu, X., Xu, X., Wei, Y., Hu, Q., Ouyang, Z., & Wu, X. (2022). Exploring factors influencing students' entrepreneurial intention in vocational colleges based on structural equation modeling: evidence from China. *Frontiers in Psychology*, *13*(June). https://doi.org/10.3389/fpsyg.2022.898319

G. David Garson. (2016). *Partial Least Squares (PLS-SEM) - Regression and Structural Equation Models*. http://info.smartpls.com/data/uploads/ebook_on_pls-sem.pdf

Gaofeng, Y. (2019). Cross-border collaboration strategies in academic entrepreneurship of new R&D institutions: Insights from explorative case studies in China. *Science, Technology and Society*, *24*(2), 288-315. https://doi.org/10.1177/0971721819841991

Global Entrepreunership Monitor. (2022). Actividad emprendedora. Colombia un país en reactivación: 2021-2022. In *Actividad emprendedora. Colombia un país en reactivación: 2021-2022* (p. 202). https://doi.org/10.18046/eui/gem.2022

Giacomin, O., Janssen, F., & Shinnar, R. S. (2016). Student entrepreneurial optimism and overconfidence across cultures. *International Small Business Journal: Researching Entrepreneurship*, *34*(7), 925-947. https://doi.org/10.1177/0266242616630356

Gil-León, J., Gutiérrez-Ayala, J., & Ramírez, E. (2021). El papel del turismo patrimonial en el índice de competitividad turística regional de Colombia : una evaluación de las relaciones mediante PLS-PM. *Revista Escuela de Administración de Negocios*, *90*, 1-33. https://doi.org/https://doi.org/10.21158/01208160.n90.2021.2973

Gujarati, D., & Porter, D. (2010). *Econometría*. McGraw-Hill. https://econometria101.files.wordpress.com/2013/02/econometria-damodar-n-gujarati.pdf

Kautonen, T., van Gelderen, M., & Fink, M. (2015). Robustness of the theory of planned behavior in predicting entrepreneurial intentions and actions. *Entrepreneurship: Theory and Practice*, *39*(3), 655-674. https://doi.org/10.1111/etap.12056

Kobylińska, U. (2022). Attitudes, subjective norms, and perceived control versus contextual factors influencing the entrepreneurial intentions of students from Poland. *WSEAS Transactions on Business and Economics*, *19*, 94-106. https://doi.org/10.37394/23207.2022.19.10

Kor, K., & Mullan, B. A. (2011). Sleep hygiene behaviours: An application of the theory of planned behaviour and the investigation of perceived autonomy support, past behaviour and response inhibition. *Psychology and Health*, *26*(9), 1208-1224. https://doi.org/10.1080/08870446.2010.551210

Krueger, N. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing*, *15*(5-6), 411-432. https://doi.org/10.1016/S0883-9026(98)00033-0

Latan, H., & Richard, N. (2018). *Partial Least Squares Path modeling: basic concept, methodological issues and application*. Springer International Publishing.

Liñán, F., Rodríguez-Cohard, J. C., & Rueda-Cantuche, J. M. (2011). Factors affecting entrepreneurial intention levels: A role for education. *International Entrepreneurship and Management Journal*, *7*(2), 195-218. https://doi.org/10.1007/s11365-010-0154-z

Liñán, F., & Chen, Y.-W. (2009). Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship: Theory and Practice*, *56*, 593-617.

Liñán, F., & Fayolle, A. (2015). A systematic literature review on entrepreneurial intentions: citation, thematic analysis, and research agenda. *International Entrepreneurship and Management Journal*, *11*(4), 907-933. https://doi.org/10.1007/s11365-015-0356-5

Lopes, J. M., Oliveira, M., Oliveira, J., Sousa, M., Santos, T., & Gomes, S. (2021). Determinants of the entrepreneurial influence on academic entrepreneurship-lessons learned from higher education students in Portugal. *Education Sciences*, *11*(12), 771. https://doi.org/10.3390/educsci11120771

Maresch, D., Harms, R., Kailer, N., & Wimmer-Wurm, B. (2016). The impact of entrepreneurship education on the entrepreneurial intention of students in science and engineering versus business studies university programs. *Technological Forecasting and Social Change*, 104, 172-179. https://doi.org/10.1016/j.techfore.2015.11.006

Martins, I., Alvarez, C., Moreno Gómez, J., Pérez, P., Lopez, T., & Huguet, A. (2019). *El espíritu emprendedor de los estudiantes en Colombia. Resultados del Proyecto GUESSS Colombia 2018-2019*. http://www.eafit.edu.co/

Montero, B., & Camacho, J. A. (2018). Caracterización del emprendimiento femenino en España: Una visión de conjunto. *REVESCO. Revista de Estudios Cooperativos*, *129*(129), 39-65. https://doi.org/10.5209/reve.61936

Moriano, J. A., Gorgievski, M., Laguna, M., Stephan, U., & Zarafshani, K. (2012). A cross-cultural approach to understanding entrepreneurial intention. *Journal of Career Development*, *39*(2), 162–185. https://doi.org/10.1177/0894845310384481

Munir, H., Jianfeng, C., & Ramzan, S. (2019). Personality traits and theory of planned behavior comparison of entrepreneurial intentions between an emerging economy and a developing country. *International Journal of Entrepreneurial Behaviour and Research*, *25*(3), 554-580. https://doi.org/10.1108/IJEBR-05-2018-0336

Nabi, G., Linan, F., Fayolle, A., Krueger, N., & Walmsley, A. (2017). The impact of entrepreneurship education in higher education. *Academy of Management Learning & Education*, *16*(2), 277-299. https://doi.org/10.5465/amle.2015.0026

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

Nguyen, A. T. H., Nguyen, P. v., & Do, H. T. S. (2022). The effects of entrepreneurial orientation, social media, managerial ties on firm performance: evidence from Vietnamese SMEs. *International Journal of Data and Network Science*, *6*(1), 243-252. https://doi.org/10.5267/J.IJDNS.2021.9.004

Nowiński, W., Haddoud, M. Y., Lančarič, D., Egerová, D., & Czeglédi, C. (2017). The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in the Visegrad countries. *Studies in Higher Education*, *44*(2), 361-379. https://doi.org/10.1080/03075079.2017.1365359

Nowiński, W., & Haddoud, M. Y. (2019). The role of inspiring role models in enhancing entrepreneurial intention. *Journal of Business Research*, *96*, 183-193. https://doi.org/10.1016/j.jbusres.2018.11.005

Oosterbeek, H., van Praag, M., & Ijsselstein, A. (2010). The impact of entrepreneurship education on entrepreneurship skills and motivation. *European Economic Review*, *54*(3), 442-454. https://doi.org/10.1016/j.euroecorev.2009.08.002

Parada, J., Romero J., & Castro, H. (2019) Estrategias de emprendimiento institucional: caso Universidad Pedagógica y Tecnológica de Colombia. En F. Blanco-Mesa (Ed.), *Caracterización y aplicación del emprendedor y la innovación* (11-33). Editorial UPTC.

Pfeilstetter, R. (2020). El emprendedor. Una reflexión crítica sobre usos y significados actuales de un concepto. *Gazeta de Antropología*, *27*(1), 1-11. https://doi.org/10.30827/digibug.15684

Piperopoulos, P., & Dimov, D. (2015). Burst bubbles or build steam? entrepreneurship education, entrepreneurial self-efficacy, and entrepreneurial intentions. *Journal of Small Business Management*, *53*(4), 970-985. https://doi.org/10.1111/jsbm.12116

Roman, T., & Maxim, A. (2017). National culture and higher education as pre-determining factors of student entrepreneurship. *Studies in Higher Education*, *42*(6), 993-1014. https://doi.org/10.1080/03075079.2015.1074671

Roy, R., Akhtar, F., & Das, N. (2017). Entrepreneurial intention among science & technology students in India: extending the theory of planned behavior. *International Entrepreneurship and Management Journal*, *13*(4), 1013-1041. https://doi.org/10.1007/s11365-017-0434-y

Rueda-Barrios, G. E., Reyes-Rodriguez, J. F., Villarraga-Plaza, A., Vélez-Zapata, C. P., & Gómez-Zuluaga, M. E. (2022). Entrepreneurial intentions of university students in Colombia: Exploration based on the theory of planned behavior. *Journal of Education for Business*, *97*(3), 176-185. https://doi.org/10.1080/08832323.2021.1918615

Sánchez, G. (2013). *PLS Path Modeling with R*. http://gastonsanchez.com/PLS_Path_Modeling_with_R.pdf

Santos, F. J., Roomi, M. A., & Liñán, F. (2016). About gender differences and the social environment in the development of entrepreneurial intentions. *Journal of Small Business Management*, *54*(1), 49-66. https://doi.org/10.1111/jsbm.12129

Seo, E. S. (2020). A study of the benefits and applications of online theological education for western cross-cultural teachers and remote local churches of Colombia, South America.

Shapero, A. & Sokol, L. (1982). The social dimensions of entrepreneurship. In C.A. Kent, D.L. Sexton, & K.H. Vesper (Eds.). Encyclopedia of Entrepreneurship. Englewood Cliffs, NJ: Prentice-Hall, 72-90.

Shinnar, R. S., Giacomin, O., & Janssen, F. (2012). Entrepreneurial perceptions and intentions: the role of gender and culture. *Entrepreneurship: Theory and Practice*, *36*(3), 465-493. https://doi.org/10.1111/j.1540-6520.2012.00509.x

Souitaris, V., Zerbinati, S., & Al-Laham, A. (2007). Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. *Journal of Business Venturing*, *22*(4), 566-591. https://doi.org/10.1016/j.jbusvent.2006.05.002

Su, Y., Zhu, Z., Chen, J., Jin, Y., Wang, T., Lin, C. L., & Xu, D. (2021). Factors influencing entrepreneurial intention of university students in China: Integrating the perceived university support and theory of planned behavior. *Sustainability*, *13*(8), 4519. https://doi.org/10.3390/su13084519

Torres, F. C., Méndez, J. C. E., Barreto, K. S., Chavarría, A. P., Machuca, K. J., & Guerrero, J. A. O. (2017). Exploring entrepreneurial intentions in Latin American university students. *International Journal of Psychological Research*, *10*(2), 46-59. https://doi.org/10.21500/20112084.2794

Turker, D., & Selcuk, S. S. (2009). Which factors affect entrepreneurial intention of university students?. *Journal of European industrial training*, *33*(2), 142-159. https://doi.org/10.1108/03090590910939049

Van Gelderen, M., Kautonen, T., Wincent, J., & Biniari, M. (2018). Implementation intentions in the entrepreneurial process: concept, empirical findings, and research agenda. *Small Business Economics*, *51*(4), 923-941. https://doi.org/10.1007/s11187-017-9971-6

Yasir, N., Mahmood, N., Mehmood, H. S., Rashid, O., & Liren, A. (2021). Article the integrated role of personal values and theory of planned behavior to form a sustainable entrepreneurial intention. *Sustainability (Switzerland)*, *13*(16), 1-21. https://doi.org/10.3390/su13169249

Yuriev, A., Dahmen, M., Paillé, P., Boiral, O., & Guillaumie, L. (2020). Pro-environmental behaviors through the lens of the theory of planned behavior: A scoping review. *Resources, Conservation and Recycling*, *155*(January), 104660. https://doi.org/10.1016/j.resconrec.2019.104660

Zhao, H., Hills, G. E., & Seibert, S. E. (2005). The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology*, *90*(6), 1265-1272. https://doi.org/10.1037/0021-9010.90.6.1265