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Risk taking as a distinctive intrapreneurial competence among university students

La asunción de riesgos como competencia intraemprendedora distintiva entre jóvenes universitarios

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ABSTRACT

The development of entrepreneurial and intrapreneurial initiatives is a significant factor for the economic and social progress of countries and is having a increasing interest in academic settings. The study was conducted on a sample of 337 Spanish university students from three fields of study (Education, Engineering, and Social Sciences). This work aims to measure intrapreneurial competencies in young Spanish university students, adapting the COIN_CR1 ©2017 scale for this purpose. A quantitative methodology was employed through the administration of self-reported

surveys to the selected sample. The results indicate a proper behavior of the model in terms of the number of constituent dimensions and the competencies they encompass. Statistically significant differences were observed in the intrapreneurial competency dimension "Risk Taking", with higher scores among engineering students. This research seeks to contribute to a better understanding of the overall construct of intrapreneurship, intrapreneurial competencies, and the dimensions that form it.

Keywords. Intrapreneurship, Intrapreneurial Competencies, Intrapreneurship and undergraduates, Measurement Model, Quantitative Methodology, Risk Taking

RESUMEN

El desarrollo de iniciativas emprendedoras e intraemprendedoras constituye un factor de relevancia para el progreso económico y social de los países, y es de interés creciente en el entorno académico. El estudio se ha realizado sobre una muestra de 337 universitarios españoles de tres ramas de estudio. (Educación, Ingeniería y Ciencias Sociales). Este trabajo busca medir las competencias intraemprendedoras en jóvenes estudiantes universitarios, adaptando y evaluando el ajuste de la escala COIN_CR1 ©2017. Se ha planteado una metodología de tipo cuantitativo a través de la aplicación de encuestas auto informadas a la muestra seleccionada. Los resultados obtenidos apuntan hacia un comportamiento adecuado del modelo, tanto en cuanto al número de dimensiones constituyentes como en lo relativo a los constructos competenciales que lo integran, y señala diferencias estadísticamente significativas en la dimensión competencial intraemprendedora “Asunción de Riesgos”, con mayor puntuación entre los universitarios de ingeniería. Esta investigación busca contribuir a un mayor conocimiento del constructo general de intraemprendimiento, las competencias intraemprendedoras y las dimensiones que lo configuran.

Palabras clave. Intraemprendimiento, Competencias Intraemprendedoras, Intraemprendimiento y estudiantes universitarios, Modelo de medición, Metodología cuantitativa, Asunción de riesgos

INTRODUCTION

Several studies have previously addressed the variables of intrapreneurship and university students. Rahman et al., (2022) emphasize the importance of integrating intrapreneurial practices into curricula to foster an entrepreneurial mindset, considering that intrapreneurship strategies within organizations can enhance innovation and competitiveness. In the work of Ordoñez Párada et al., (2019) and Torralbas and Chávez, (2022), it is concluded that collaboration in educational environments boosts creativity and innovation, preparing them for real business challenges, as well as the importance of creating innovative digital environments, which promote intrapreneurship, allowing students to experiment with innovative projects.

Universities play a crucial role in the generation, dissemination, and transfer of knowledge (Etzkowitz et al., 2000; Veciana, 2007). They have become key actors in the new economy, society, and culture, where knowledge is recognized as a strategic resource that provides competitive advantages and contributes to the differentiation and sustainability of organizations (Drucker, P, 2012). It can be stated that universities are experiencing a structural change in their traditional functions: from focusing solely on education and research to a third task, which involves the transmission and transfer of new knowledge to drive economic development (Etzkowitz et al., 2000). Already in the first half of the 20th century, Ortega y Gasset (1937) articulated the idea of the third mission of the university, urging educational institutions to develop and transfer knowledge for the well-being of the community. Therefore, universities play a crucial role by being recognized

as one of the main sources of innovation in a country or region (Veciana, 2007). According to Amorós et al. (2023), individual factors such as education have a significant impact on the likelihood of individuals undertaking entrepreneurial activities. In this context, university students play an essential role (Moraes Abrahão, E et al., 2023) in acquiring knowledge and beginning to develop their intrapreneurial behavior. This implies that, through their actions, they will generate benefits both at the university level and in society in general, contributing positively to the progress and well-being of the community, although it is true that in education, competitiveness often has a negative reputation, preferring collaborative and cooperative learning methodologies. However, from an economic perspective, competitiveness is closely linked to prosperity and economic growth (Erdmann et al., 2022).

It is relevant at this point to define intrapreneurship as an individual proactive action aimed at creating new businesses within the organization, which involves taking risks, as well as improving its capacity to adapt and respond to internal and external changes through strategic innovation (Gawke et al., 2019). Organizationally, intrapreneurial efforts enhance competitive advantage, stimulating the growth and well-being of the company (Hayton and Kelley, 2006). This may lead to the creation of a new organization, the renewal of the existing one, or the introduction of innovations in products and processes (Rubio, 2015). It is worth mentioning that 84.5% of the companies surveyed in Spain promote corporate entrepreneurship and that more than half of them (55.8%) (CISE, 2020), have been doing so for at least the last five years, which seems to indicate that intrapreneurship is not only a new field of study but also enriching for companies.

Speaking in individual terms, intrapreneurs are characterized by their willingness to take calculated risks, meeting the growth and improvement needs of the organization, and, what is particularly relevant, possessing an entrepreneurial spirit that drives them to initiate or promote change (Varela and Irizar, 2009; Vargas-Halabí, et al., 2017). From an individual perspective, the study of intrapreneurship and the intrapreneurial competencies that enable new opportunities for innovation without leaving the organization is addressed (Garzón et al, 2004). In terms of academic literature, the focus has been more directed towards analyzing the influence of organizational variables (expressed as collective) than in identifying the characteristics of individual intrapreneurs (Antoncic and Hisrich, 2001; Stull, 2005). Despite recognizing their influence, a gap is detected in the literature concerning the desirable qualities in an intrapreneurial subject, beyond education and work experience (Vargas-Halabí et al., 2017). In this sense, Blanka (2019) and Itzkovich and Klein (2017), among others, highlighted the scarcity of research at the individual level of subjects, as most previous research focused on organizational concepts such as corporate entrepreneurship. Huang et al. (2021) echo this situation by highlighting the scarcity of studies that specifically address individual intrapreneurial employees. Previously, Hayton and Kelley (2006) pointed out the need to do so in a clear and coherent competency framework. The importance of their study has been noted to contribute to understanding and fostering such competencies and thus having more chances of business success (Jain et al., 2015).

This work seeks to study the latent intrapreneurial competencies among young Spanish university students, mostly with little or no work experience, and analyze if there are differences between them based on the field of study they come from. Work experience has been considered as a discriminating variable, considering that only 8% of Spanish university students combine both activities (El País, 2023). Also, authors like Barba-Sánchez and Atienza-Sahuquillo, 2018, emphasize that intrapreneurship activities in the university environment are crucial for developing entrepreneurial skills, although it is true that the focus of their studies did not include the competency base in these groups.

Consequently, this work proposes to cover this gap in the literature, through the measurement and analysis of the intrapreneurial competencies in young undergraduate students at Spanish universities. For this, it is proposed to adapt and validate the COIN_CR1 ©2017 scale (Vargas-Halabí et al., 2017), with two main objectives; the first, to assess the fit of the dimensional model

proposed by the authors, initially designed for a sample of workers - managers in Costa Rica, and the second, to verify if there are differences in the intrapreneurial competency dimensions of the students based on the branches of study they come from.

Thus, the article makes several contributions to the study topic. First, it contributes to the research on the understanding of intrapreneurial profiles from the analysis of their competencies, adapting a scale already developed to a group of interest, such as undergraduate students. Additionally, it addresses the gap pointed out by Slavec and Drnovsek (2012) regarding the little emphasis that the entrepreneurship field has placed on the development of a valid measurement scale, being the present a contribution of utility to refine measurement tools of intrapreneurial competencies with potential for implementation in the field of management and research. Finally, it responds to the need to identify and meet the support needs of students with entrepreneurial skills exposed by Huang et al. (2021) as it addresses the study of intrapreneurship among young university students, most of them with little or no work experience. From a practical perspective, it is expected that this research will contribute to a greater understanding of intrapreneurship, intrapreneurial competencies, and the structural dimensions that define it.

This work continues with a section dedicated to conceptualizing the main constructs of the study, namely, intrapreneurship and intrapreneurial competencies. Subsequently, the methodological design used in the study is presented, and then the results obtained are exposed. Finally, the conclusions, limitations of the work, and future lines of research are included. Additionally, understanding this relationship between the intrapreneurial competencies of the subject and the branch of studies they pursue can influence the planning of studies by universities, in the decisions of companies that opt for their selection) and in the individual's career management. Understanding this relationship can influence the planning of studies by universities, in the decisions of companies that opt for their selection, and in the individual's career management.

LITERATURE REVIEW

Intrapreneurship

The term "intrapreneurship" is adopted to refer to the strategic renewal of the company (Pinchot, 1985) or to the entrepreneurial behavior that uses internal resources to develop innovation that creates value (Kuratko and Audretsch, 2013), distinguishing in the literature between ventures that emerge within and outside the organizational boundaries. Intrapreneurship is defined as innovation initiated by employees (Carrier, 1996), but there is no single definition universally recognized (Sharma and Chrisman, 1999). The approach to the term is complex, as there are different names for it in the literature: corporate entrepreneurship, organizational entrepreneurship, or Intrapreneurship (Antoncic and Hisrich, 2001). For Varela and Irizar (2009), intrapreneurship is defined as an activity that ultimately aims to generate projects and businesses for the parent company. Other authors, such as McGinnis and Verney (1987), refer to intrapreneurship as a requirement to direct the entrepreneurial spirit within organizations. Thus, intrapreneurship defines a process in which an individual or group of individuals, part of an existing organization, identify, pursue, and foster innovative value-creating opportunities for that organization (Ma and Tan, 2006), a definition that has been adopted in the course of this work.

The study area of intrapreneurship has recently sparked interest (especially in the second decade of the 21st century) in the scientific community, although it is still a niche area, as compared to the field of entrepreneurship, it barely accounts for 1% of the publications recorded in it (Cerro-Urcelay et al., 2023). Although the line of study of intrapreneurship is still under construction, it is possible to identify some common characteristics or elements; first, it recognizes that the event or phenomenon originates within the organization (Burgelman, 1983; Goodale et al., 2011; Ma et al., 2016). Second, these actions can be undertaken as a result of intertwined business activities of multiple participants (Burgelman, 1983) at different organizational levels, i.e., management, a unit,

or operations (Miller, 1983), including an individual or group of individuals within the company (Sharma and Chrisman, 1999; Stevenson and Jarillo, 1990). Third, it indicates that business actions are directed towards developing innovation for the company. As Covin and Miles (1999) state, innovation is at the core of the nomological network that encompasses the construction of corporate entrepreneurship.

Efforts to promote processes that enable employees to convert opportunities into innovation are increasingly frequent and coincide with the growing dynamism of organizations, consumers, and industries (Hisrich and Kearney, 2012). This capability, which we call intrapreneurship, arises from fostering the entrepreneurial spirit of employees. Intrapreneurs can identify, generate, and develop new opportunities that allow them to create utility, wealth, and value for the company. As Hayton and Kelly (2006) highlighted, this significantly enhances the competitive advantage of the company while also aiding its growth.

As previously mentioned, the literature has focused more on analyzing the influence of organizational variables than on identifying the characteristics of intrapreneurs (Antoncic and Hisrich, 2001; Stull, 2005). The importance of studying this has been noted to understand and promote such competencies and thus have more chances of business success (Jain et al., 2015).

Intrapreneurial Competencies

As specified by the World Economic Forum (2021), five main competencies are identified for development by employees from 2025: critical thinking, active learning, creativity and initiative, technological design, and innovation. Regarding innovation, its pursuit is one of the main facets within the context of intrapreneurship, as well as the creation of new businesses, the internal renewal of the organization, and proactivity (Bedoya et al., 2017). In relation to other perspectives of entrepreneurship, the creation of new businesses focuses on exploring new sources of revenue through identifying opportunities in both existing and new markets (Corduras et al., 2011), while the strategic repositioning required by the organization is closely related to the dimension of internal renewal (Ireland and Webb, 2009). Finally, regarding proactivity, it manifests in the orientation of senior management towards greater competitiveness, which involves initiative and risk-taking (Antoncic and Hisrich, 2001).

Other authors also include risk disposition as a central competency, defined as the inclination toward situations that have the potential to offer beneficial rewards in case of success but also carry severe consequences in case of failure. It refers to an individual's willingness to engage with opportunities despite the risk of failure (Moriano et al., 2009). Thus, the intrapreneur ventures into unknown areas for the organization without knowing the potential outcomes.

Competency models in the business realm are theoretical approaches that seek to identify and define the skills, knowledge, attitudes, and behaviors necessary to perform effectively in a specific job role. Boyatzis (2008) defines job competency as the inherent characteristics of an individual related to effective performance in a job, which has the advantage of being learned in adulthood. Woodruffe (1993) defines competency as a set of behavior patterns that the holder must bring to a certain level to successfully perform their tasks and functions. In this sense, he considers competencies as a particular aspect of individual behavior that must be appropriate for performing a job, and that these patterns may be better executed by some individuals than others.

This last point aligns with the view of Hayton and Kelley (2006), who maintain that individuals may or may not have the competency level to meet the performance criteria required in a specific work context. They understand it, therefore, as a continuous, not discrete concept, highlighting its attitudinal component. The performance will be competent if the individual "knows how and is willing to" carry it through successfully. Thus, an individual's competencies are conceived as inherent characteristics, including specific combinations of knowledge, skills, and personality traits. The authors also note that empirical evidence shows the influence of human capital in the field on intrapreneurship; one of them is the competencies related to individuals. However, they consider

that there remains a gap in the current literature related to the connection between human capital and intrapreneurship, particularly in terms of a clear definition of the characteristics that are desirable in an individual.

Following the work of Vargas-Halabí et al. (2017), the theoretical model of competencies is based on two main components: knowledge, skills, and attitudes on one side, and innovative outcomes or roles on the other. For this, they rely on the holistic model of professional competence proposed by Cheetham and Chivers (1998), which assumes the existence of three basic components of competencies: cognitive, functional, and behavioral. Each of these components possesses its own constitutive competencies and they interact with each other.

- Cognitive competence is understood as possessing adequate knowledge for a task and the ability to effectively develop that knowledge.
- Functional competence is defined as the ability of the individual to perform work tasks adequately to achieve specific results.
- Finally, behavioral competence is seen as the ability of the individual to develop appropriate behaviors in such situations.

Hayton and Kelley (2006) propose in their model a higher tier called meta-competencies, more generic, which in their interaction with the basic components provide final indicators (outcomes) of the subject's competence. They include, additionally, contextual variables such as the organizational environment or work context.

In this context, and for the measurement of subjects' intrapreneurial competencies, we will adapt the model suggested by Vargas-Halabí et al. (2017) for the development of scales. In this model, the competency approach based on attributes is combined with the approach based on observable performance, which is the result required to demonstrate competent performance (Hoffmann, 1999). The combinations of attributes of knowledge, skills, and attitudes are explained by different dimensions of intrapreneurial competencies, and, on the other hand, these dimensions are related to the innovative activities of the subjects studied (Vargas-Halabí et al., 2017). This model does not attend to the concept of metacompetencies or organizational and contextual factors but assumes that the basic competencies undoubtedly impact the intrapreneurial outcome.

The development of the COIN_CR1 ©2017 scale for the measurement of intrapreneurial competencies among employees of companies in Costa Rica identified five sub-dimensions of attributes, which it titled as: opportunity promoter, proactivity, flexibility, driver, and risk-taking (Vargas-Halabí et al., 2017).

Intrapreneurship, University, and National Cultures

Given that the original sample for measuring intrapreneurship was drawn from managers in Costa Rica, and the one investigated in this study is with university students in Spain, it is worth asking how cultural differences might affect the measurement results of intrapreneurial competencies between both groups. The theory of intrapreneurship originated in the United States and various studies have questioned its universality (Antoncic and Hisrich, 2001). Several comparative research studies on intrapreneurship across cultures (Antoncic and Hisrich, 2001; Urbano et al., 2013; Covin and Miller, 2014) indicate that national culture influences the development of intrapreneurship. Moreover, there is some evidence that cultural values such as individualism and uncertainty avoidance are significantly related to traits such as internal locus of control, risk-taking, and innovation capacity, which are associated with the entrepreneurial spirit (Mueller and Thomas, 2000).

Considering the two cultural variables mentioned, framed within Hofstede et al.'s model of national cultures (2010) and identified by Mueller and Thomas (2000) with respect to the two countries analyzed, Spain and Costa Rica offer similar values in terms of uncertainty avoidance (86), and differ in terms of individualism-collectivism. In the case of Spain, with a score of 67 according to Hofstede Insights (2023), it represents an individualistic society. This means there is

a high preference for a loose social framework in which individuals are expected to take care of themselves. In individualistic societies, the employer/employee relationship is based on a contract for mutual benefit, hiring and promotion decisions are supposed to be based solely on merit, and management focuses on managing individuals. On the other hand, teamwork is considered natural, and employees tend to work this way without needing strong motivation from management. Conversely, Costa Rica, with a score of 15, maintains the general tone of Latin American countries as a collectivist society. In collectivist countries, trust, loyalty, personal relationships, and social networks with the family group are essential.

Furthermore, when an appropriate relationship between the University and its students is established, and they show a commitment to generating new ideas arising from the needs of the educational institution, a student-led project with intrapreneurial behaviors can be carried out (Cabana et al., 2018). This involves creating activities from within the university, beneficial for the academic institution and that can have positive effects on society. Moreover, this experience can contribute to the development of entrepreneurial skills in students, whether in a corporate environment or as individual entrepreneurs, allowing them to impact businesses, communities, and globally (Cortés Salcedo, 2012).

RESEARCH AIMS

This analytical perspective raises the research problem of evaluating intrapreneurial competencies in university students, from which studies on the competency frameworks required by the business society for intrapreneurial development in their companies can be derived and promoted. We have mentioned that previous studies have addressed the variables of intrapreneurship and university students (Barba-Sánchez and Atienza-Sahuquillo, 2018; Ordoñez Párada et al., 2019; Rahman et al., 2022; Torralbas and Chávez, 2022), but the focus of their studies did not include the competency base in these groups. Therefore, from this individual approach, the aim is to study the latent intrapreneurial competencies among young university students, mostly with little or no work experience, and to analyze if there are differences between them based on their field of study.

Thus, the main objective of this work is to measure and evaluate the intrapreneurial competencies in a group of Spanish university students in the final years of their degree (3rd and 4th years) from three different fields of knowledge (Engineering, Educational Sciences, and Social Sciences) through an adaptation of the COIN_CR1 ©2017 scale (Vargas-Halabí et al., 2017).

The research questions posed are as follows:

- Will the results of the evaluation of intrapreneurial competencies in this particular sample of Spanish students confirm the five dimensions obtained in the sample (company employees) in Costa Rica (Vargas-Halabí et al., 2017)?

- Will similar or different competency values be obtained among the three subgroups (fields of knowledge) of surveyed university students?

Based on this, the following specific objectives are highlighted:

1. Adapt the COIN_CR1 ©2017 scale for measuring intrapreneurial competencies in young university students and evaluate its validity.

2. Analyze whether the results of the application in this sample confirm the five dimensions obtained in the previous application (company employees) in Costa Rica.

3. Confirm whether similar or different competency values are obtained among the three subgroups (fields of knowledge) of university students posed.

METHODOLOGY

As previously mentioned, the main objective of this work is to evaluate intrapreneurial competencies in a group of Spanish university students in the final years of their degree (3rd and 4th years) from three different fields of knowledge (Engineering, Educational Sciences, and Social Sciences) through an adaptation of the COIN_CR1 ©2017 scale (Vargas-Halabí et al., 2017).

To achieve these objectives, a quantitative methodology was proposed through the application of self-reported surveys to the selected sample. The process carried out is detailed below.

Phases and Stages of the Methodological Design

Phase 1: Adaptation of the COIN_CR1 ©2017 scale and preparation of the final questionnaire. For the adaptation and validation of the scale to the pursued objectives, a three-stage process was followed, according to suggestions found in the academic literature (Camisón and Cruz, 2008; Slavec and Drnovsek, 2012).

Adaptation of the scale to the context of interest: Spanish university students (with little or no work experience). Expert judgment (Escobar-Pérez and Cuervo-Martínez, 2008) was used to adapt the items of the original scale to the measurement objectives. Six prestigious experts participated: two university professors with more than 20 years of teaching experience (including Professor Tomás Vargas-Halabí, precursor of the original scale), two with extensive experience in the private sector, and two entrepreneurial businessmen with more than 25 years of professional career. This strategy sought to contrast the adaptation of the scale context, as the initial one is focused on the business domain. In their review, the expert panel agreed on the items that needed adaptation and proposed alternative wording for each of them.

Subsequently, the "cognitive interview" or pilot test technique, frequently used to adapt scales (Beatty and Willis, 2007), was applied to refine the language so that the information obtained aligns the items with the corresponding construct. The scale was administered to five students to confirm that it was correctly understood.

Once the adapted scale was agreed upon by the expert committee, the complete structured self-administered online questionnaire was prepared, lasting approximately 5-7 minutes, thus configuring the COIN_ESP1 2024 scale, which includes the adapted COIN_CR1 ©2017 scale for measuring intrapreneurial competencies and incorporates other classification questions (Field of study, age, gender, work experience).

Phase 2. Application – Sample

The test was applied to a total sample of 337 Spanish university students (sampling error of 5.4% with a 95% confidence level). For conducting an exploratory factor analysis, the literature suggests that the number of observations should be 5 or 10 times greater than the number of variables, in this case, the 20 items of the scale (Hair et al., 2012). Minimum quotas of 100 subjects per field of study were established, and 100 participants from Educational Sciences, 127 from Social Sciences (Business Administration and Marketing), and 110 Engineering students were obtained.

The convenience sampling technique was used. The non-probabilistic approach was chosen due to the accessibility of the users, while the convenience sampling strategy was chosen due to its time efficiency. Although convenience sampling can lead to over or under-representation of particular groups within the sample (Saunders et al., 2009), in this study, the quotas for the field of study were controlled to prevent over or under-representation. The research project was approved by the Research Ethics Committee of the Rey Juan Carlos University (Madrid, Spain).

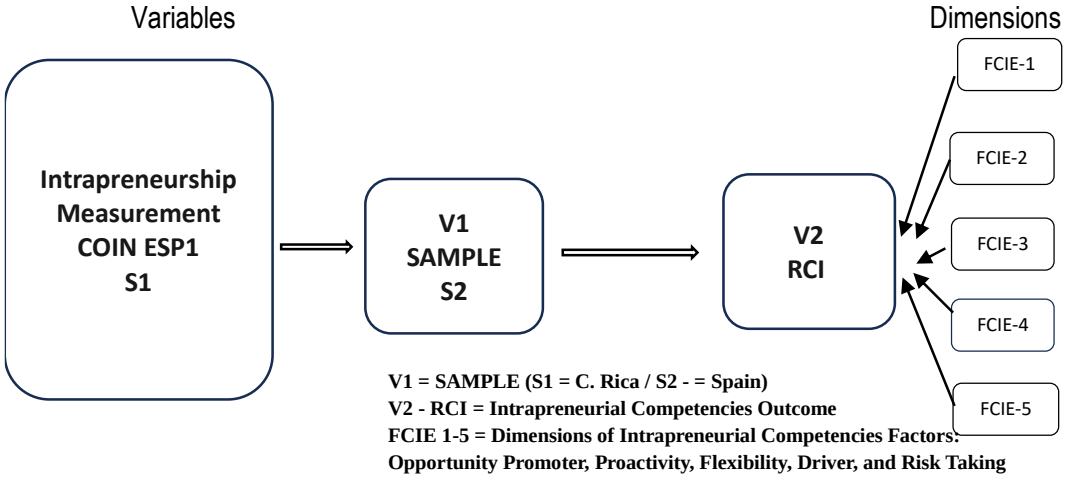
Regarding the composition of the sample, 69.4% were women, with an average age of 21.5 years (standard deviation 2.152) and a range of 19 to 44 years. In terms of work experience, 65% (219) reported having some type of experience, but as they were in the final years of their degree,

only 14.8% reported having more than 2 years of full-time experience. Therefore, it can be stated that 85% of the sample had less than 2 years of work experience.

Phase 3. Conceptual Model and Analysis

As shown below, the conceptual model and analysis are presented in Figure 1. The methodology applied for data processing was structured in two stages. In the first stage, the adequacy of the dimensions resulting from an Exploratory Factor Analysis (EFA) is evaluated, and the reliability and validity of the measurement scales are analyzed through Cronbach's alpha in the student sample, compared to those found and previously reported by the authors of the original scale (Figure 1)

Figure 1. Conceptual Model of Analysis



A factor analysis is a technique used to discover groupings of variables such that the variables within each group are highly correlated, while the groups are relatively uncorrelated. This reduces a number of intercorrelated variables to a smaller number of factors that explain most of the variability of each variable (Montoya Suárez, 2007). Following the authors of the scale (Vargas-Halabí et al., 2017), principal components extraction and Oblimin rotation were performed due to the high degree of interrelation estimated between the dimensions. A high proportion of studies in the context of EFA use the Varimax rotation procedure as it simplifies the interpretation of factors by imposing orthogonality between them. However, imposing the orthogonality of rotated factors results in hiding the possible dependency relationship between them (Ferrando and Lorenzo-Seva, 2014). Allowing the obliquity of factors does not imply imposing it, and if the factors are independent by nature, the solution will show correlations close to zero. Hence, authors like Browne (2001) recommend systematically applying oblique rotations, especially when correlation between the analyzed constructs is presumed. IBM SPSS V-28.0.1.0 software was used for the statistical analysis of the data.

In a second stage, a comparative analysis of results on S2 (sample of the study - Spain) is performed, segmenting the results to analyze the influence of the university students' field of study variable.

Instruments/Measures/Assessment Scales

As mentioned, the instrument used for intrapreneurial competencies is an adaptation of the COIN_CR1 ©2017 Scale (Vargas-Halabí et al., 2017). The adapted model has been used as a measurement instrument for the intrapreneurial competencies of young university students. The order of presentation of the 20 items of the scale was automatically randomized for the subjects in the sample.

The adaptation made by the group of experts essentially focused the questions on the "university" environment instead of the "company" context of the original scale. The dimensions reported in their work by the authors of the scale and the conceptual framework associated with each were as follows:

- Opportunity Promoter: Behaviors aimed at identifying, seizing, convincing others, and being diligent in the face of opportunities for new initiatives in the company (6 items / OP1 – OP6)
- Proactivity: Behaviors aimed at supporting actions and provoking efforts for new initiatives (3 items / PR1 – PR3)
- Flexibility: Behaviors oriented towards flexibility and the lack of attachment to rigid schemes and procedures (4 items / FL1 – FL4)
- Driver: Behaviors that reflect the individual's ability to be interested in the progress and support of new initiatives and even take actions to convince other people (4 items / DR1 – DR4)
- Risk Taking: Capacities oriented towards taking risks in new initiatives for the company (3 items / RT1 – RT3)

RESULTS

Stage 1. Comparative results in intrapreneurial dimensions S2 (study sample – Spain) vs S1 (original sample – Costa Rica).

Factor Structure: Table 1 shows the main parameters found; the KMO = 0.942 obtained indicated sample adequacy (Montoya Suárez, 2007), being slightly higher (KMO = 0.927) than that found by the authors in their original scale. Bartlett's Test of Sphericity is used to test the null hypothesis that the variables are not correlated in the population. That is, it checks if the correlation matrix is an identity matrix (Cea, 2002). In this case, the null hypothesis is rejected, and the analysis continues. The determinant of the correlation matrix is very low (1.632E-5), which means that there are variables with high intercorrelations, mostly above 0.3, making it feasible to continue with the factor analysis. In the anti-image correlation matrix, values higher than 0.9 were observed on the diagonal and the rest close to 0, so the factor analysis can proceed (Montoya Suárez, 2007).

Table 1. KMO test and Bartlett

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0,942
Bartlett's Test of Sphericity	Approx. Chi-Square	3621,173
	gl	190
	Sig.	0

Although three factors met Kaiser's criterion of an eigenvalue greater than or equal to one (DeVellis, 2012), some of the communalities were poorly represented, so it seemed reasonable to retain the five-factor solution proposed by the authors of the scale. This solution explained 67.079% of the variance, as seen in Table 2, a value even higher than the result in the original tests by the authors of the scale (63.140%). The component correlation matrix (Table 3) shows moderate correlations between the factors. Table 4 includes the pattern matrix with details of the items from the adapted scale and the weight they load on each dimension.

Table 2. Total of Variance explained

.

Component	Total	% Variance	% Aggregate
1	9,335	46,675	46,675
2	1,310	6,55	53,225
3	1,187	5,937	59,162
4	0,828	4,141	63,303
5	0,755	3,776	67,079

Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.

Table 3. Correlation Matrix of Components

Component	1	2	3	4	5
1	1	0,423	0,298	0,445	0,502
2	0,423	1	0,212	0,379	0,255
3	0,298	0,212	1	0,214	0,244
4	0,445	0,379	0,214	1	0,459
5	0,502	0,255	0,244	0,459	1

Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.

Table 4. Pattern Matrix with Item Details

Variable	ITEMS	Components or Factors of Vargas-Halabí et al., (2017)				
		FL = Flexibility	DR = DRIVE	RT = Risk Taking	OP = Opportunity Promoter	PR = Proactivity
		1	2	3	4	5
I have methods to evaluate the "pros and cons" of a new initiative at the university.	FL4	0,697	-0,082	0,109	-0,091	0,178
I recognize how to obtain the resources (human/material) to develop a new initiative at the university.	FL3	0,683	-0,137	-0,007	0,165	0,182
I am willing to evaluate new opportunities for the development of the university with others (students/professors/managers).	PR1	0,666	0,331	0,172	-0,093	-0,164
I identify what type of resources will be needed to start and sustain a new initiative.	DR2	0,592	0,004	-0,073	0,203	0,197
I have a well-defined framework for recognizing opportunities to generate new initiatives at the university.	FL1	0,525	0,163	-0,101	0,271	0,176
I identify the key resources to promote a new initiative at the university.	FL2	0,519	0,100	0,014	0,442	-0,085
I act as a delegate or coordinator to follow up on the progress of a proposed new initiative at the university.	DR1	0,002	0,798	-0,198	0,019	0,136
I act quickly to seize opportunities to make changes or generate new initiatives (academic, cultural, sports) at the university	OP1	0,049	0,687	0,201	0,089	-0,029
I have the ability to convince others of the usefulness of carrying out new initiatives within the university.	OP3	-0,030	0,600	0,314	0,058	0,095

I seek to clarify to university officials what a proposed new initiative means for the university.	DR3	0,251	0,332	-0,011	0,169	0,309
I am more inclined towards high-risk new initiatives.	RT1	0,096	0,101	0,795	0,047	-0,05
I am willing to take risks in new initiatives with uncertain outcomes.	RT3	0,032	-0,095	0,648	0,04	0,381
I enjoy betting and taking chances on new initiatives at the university.	RT2	-0,016	0,148	0,391	0,542	0,076
I ask questions that challenge how things are done at the university.	OP2	0,046	-0,109	0,105	0,729	0,09
I take actions aimed at uniting efforts among groups of different classes/grades/faculties/colleagues to implement new initiatives at the university.	PR2	0,034	0,253	-0,186	0,642	0,135
I have the ability to turn opportunities into manageable initiatives for the university.	OP4	0,281	0,257	0,091	0,495	-0,036
I support new ideas for the development of the university regardless of who proposes them.	PR3	-0,047	-0,018	-0,004	0,163	0,740
I remain supportive of the new initiative even when others say it cannot be done.	DR4	0,151	0,061	0,172	-0,047	0,691
I show confidence that the proposed new initiatives will be carried out at the university.	OP5	0,206	0,204	-0,038	-0,098	0,641
I encourage others to maintain enthusiasm during the implementation of new initiatives within the university.	OP6	0,095	0,079	0,102	0,189	0,598

Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization. The rotation has converged in 14 iterations. Note: items with the most significant loadings related to the original model are highlighted.

In this research, the first and clearly most important factor, which in this study is proposed to be titled "Extended Flexibility," consists of six items, four of which were assigned by the authors of the original scale to the category "Flexibility" (FL1; FL2; FL3; FL4). This factor captures behaviors oriented towards flexibility and the lack of adherence to rigid schemes, and it includes the ability to manage resources, in addition to an item associated with the "Proactivity" dimension and another from the "Driver" category.

The second factor, which we would title "Leadership," incorporates behaviors that reflect the individual's ability to be interested in the progress and support of new initiatives and even take actions to convince others. It includes four items, two of which (DR1; DR3) correspond to the "Driver" dimension in the original scale. Additionally, it includes two items associated with the original "Opportunity Promoter" dimension.

Third, we find the "Risk Taking" (RT) factor, which matches the originally proposed factor through these three items (RT1; RT2; RT3) and reveals capacities oriented towards taking risks in new initiatives for the organization.

Fourth, the "Opportunity Promoter" (OP) dimension appears, represented by three items, two of which coincide with the original scale (OP2; OP4). This dimension is oriented towards behaviors aimed at identifying, seizing, convincing others, and being diligent in the face of opportunities for new initiatives in the organization. Additionally, the "Proactivity" dimension completes this dimension with one item.

Lastly, weakly represented in this case, is the factor we title "Proactivity and Initiative." It includes four items (only PR3 from the original scale) that seem to refer to the individual's involvement based on behaviors aimed at supporting actions and provoking efforts for new initiatives.

Reliability and Validity

An internal consistency analysis of the scale was conducted using Cronbach's alpha following the evaluation criteria proposed by DeVellis (2012). The result obtained with $\alpha = 0.938$ reflects a

high internal consistency of the measurement scale for the set of 20 items. Cronbach's alpha coefficient is an internal consistency coefficient expressed based on the covariation between the items of a questionnaire or test, such that the higher the covariation, the higher the alpha score (Barrios and Cosculluela, 2013). One advantage of this measure is the possibility of evaluating how much the reliability of the test would improve (or worsen) if a particular item were excluded.

Table 5 shows the high reliability and internal consistency of each obtained dimension, through the measurement of Cronbach's alpha for the resulting dimensions and intra-dimension items.

Table 5. Internal reliability of the new dimensions

ORIGINAL DIMENSION	Original Ítem	RENAMED DIMENSION	Ítems	Cronbach Alfa α	Cronbach Alfa if the item is deleted
FLEXIBILITY	FL1	EXTENDED FLEXIBILITY	FE1	0,872	0,844
	FL2		FE2		0,834
	FL3		FE3		0,842
	FL4		FE4		0,865
	FL5		FE5		0,865
	FL6		FE6		0,842
DRIVER	DR1	LEADERSHIP	LD1	0,774	0,745
	DR2		LD2		0,719
	DR3		LD3		0,702
	DR4		LD4		0,712
RISK TAKING	RT1	RISK TAKING	RT1	0,738	0,634
	RT3		RT3		0,666
	RT2		RT2		0,653
OPPORTUNITY PROMOTER	OP1	OPPORTUNITY PROMOTER	OP1	0,744	0,722
	OP 2		OP 2		0,630
	OP 3		OP 3		0,616
PROACTIVITY	PR1	PROACTIVITY AND INITIATIVE	PI1	0,827	0,763
	PR2		PI2		0,814
	PR3		PI3		0,791
	PR4		PI4		0,757

Discriminant Validity (Table 6). It is confirmed if the external loading for each item representing a construct is greater than any of its cross-loadings on other constructs, and if the square root of the Average Variance Extracted (AVE) for each construct exceeds any of its correlations with other constructs (Hair et al., 2014; Zait and Bartea, 2011). Furthermore, the square root of AVE serves as a measure of the variance explained by the construct, indicating whether the items within that construct represent more variance than the items of other constructs (Hair et al., 2012). This parameter is confirmed in Table 6.

Table 6. Discriminant validity

Construct	GR	LD	RT	OP	P/I
FE	0,682				
LD	0,179	0,700			
RT	0,089	0,045	0,725		
OP	0,198	0,144	0,046	0,687	
P/I	0,252	0,065	0,060	0,211	0,692

In conclusion, the tool (scale) shows a high degree of reliability and internal validity (α = 0.938) and the five-factor solution explained 67.079% of the variance. The fit concerning the assignment of items to dimensions from the original scale is not perfect, but it shows an appreciable alignment. In all cases, the item with the highest loading on the factor corresponds to one of the expected ones, and the dimensions" Extended Flexibility" and "Risk Taking" are particularly well represented.

Stage 2. Comparative results on S2 (study sample – Spain) analyzing the influence of the field of study variable.

The global variable "Intrapreneurship" has been included as the result of the simple sum of the subjects' scores on the set of 20 items. This variable is configured as an Intrapreneurial Competencies Index (ICI). As observed in the descriptives represented in Table 7, the mean score of the sample is 53.477 with a standard error of 1.443. This reflects a median position on the scale, which could have a minimum of 20 and a maximum of 100. The three fields of study show very similar scores in ICI.

Additionally, five other variables have been generated, each corresponding to the students' scores in each of the factors or dimensions, calculated in a weighted manner based on the loading of each item. The highest scores are found in the dimensions "Proactivity and Initiative" (mean = 3.195; standard error = 1.152), "Extended Flexibility" (mean = 2.908; error = 1.131), and "Risk Taking" (mean = 2.878; error = 1.085). Below we find the dimensions "Leadership" (mean = 2.411; error = 1.142) and "Opportunity Promoter" (mean = 2.386; error = 1.174).

Tabla 7. Descriptive statistics of intrapreneurial competencies vs. fields of study

VARIABLE	Field of Study	N	Mean	ST Deviation	ST Error
INTRAEMPRENEURSHIP – TOTAL (ICI)	Education Sciences	100	55,2400	14,46006	1,44601
	Social Sciences	127	52,4016	16,48292	1,46262
	Engineering	110	53,1182	15,13774	1,44333
	Total	337	53,4777	15,46714	0,84255
EXTENDED FLEXIBILITY	Education Sciences	100	2,9897	1,09156	0,10916
	Social Sciences	127	2,8426	1,14006	0,10116
	Engineering	110	2,9094	1,16257	0,11085
	Total	337	2,9080	1,13161	0,06164
LEADERSHIP	Education Sciences	100	2,4715	1,04073	0,10407
	Social Sciences	127	2,4675	1,20855	0,10724
	Engineering	110	2,2907	1,15466	0,11009
	Total	337	2,4110	1,14298	0,06226
RISK TAKING	Education Sciences	100	2,7160	0,99876	0,09988
	Social Sciences	127	2,8125	1,02337	0,09081
	Engineering	110	3,1021	1,19839	0,11426
	Total	337	2,8784	1,08555	0,05913
OPPORTUNITY PROMOTER	Education Sciences	100	2,5564	1,20384	0,12038
	Social Sciences	127	2,2730	1,20071	0,10655
	Engineering	110	2,3621	1,10703	0,10555
	Total	337	2,3862	1,17425	0,06397
PROACTIVITY AND INITIATIVE	Education Sciences	100	3,4177	1,06667	0,10667
	Social Sciences	127	3,1042	1,19556	0,10609
	Engineering	110	3,0994	1,15800	0,11041
	Total	337	3,1956	1,15201	0,06275

After confirming the normality of the distribution using the Kolmogorov-Smirnov criterion, an ANOVA test is carried out to verify the association between intrapreneurial competencies and the subjects' field of study. Through the ANOVA test, the means of "Y" associated with the different levels of the factor (X1, X2, ... Xn) are basically compared. A measure of variation between different levels (MS-factor) is compared with a measure of variation within each level (MS-error). If the MS-factor is significantly greater than the MS-error, we conclude that the means associated with different levels of the factor are different. This means that the factor significantly influences the dependent variable "Y" (García-Ferrer, 2016).

As seen in Table 8, statistically significant differences are found in the "Risk Taking" dimension (F = 3.750; P = 0.025). When reviewing the scores of each group, it is observed that the Engineering field obtains significantly higher scores in this dimension (mean = 3.102; error = 1.198) compared to the Social Sciences field (mean = 2.812; error = 1.023) and the Educational Sciences field (mean = 2.716; error = 0.998). The "Proactivity and Initiative" dimension also shows statistical significance, although at a lower level (F = 2.667; P = 0.071). In this case, it is observed that the Educational Sciences field achieves the highest scores (mean = 3.417; error = 1.066), ahead of Social Sciences (mean = 3.104; error = 1.195) and Engineering (mean = 3.099; error = 1.158).

Table 8. ANOVA - intrapreneurial competencies VS. Field of study

	Sum of squares	gl	Mean squares	F Value
INTRAEMPRENEURSHIP – TOTAL (ICI)	471,86	2	235,93	0,986
EXTENDED FLEXIBILITY	1,211	2	0,605	0,471
LEADERSHIP	2,363	2	1,182	0,904
RISK TAKING	8,696	2	4,348	3,75**
OPPORTUNITY PROMOTER	4,591	2	2,295	1,671
PROACTIVITY AND INITIATIVE	7,011	2	3,505	2,667*

Note: ** p < 0,05; * p < 0,10

In conclusion, significant differences have been found in the dimensions of "Risk Taking" and "Proactivity and Initiative" between the values obtained in intrapreneurial competencies according to the tested fields of study (Engineering, Educational Sciences, Social Sciences), but not in the overall scale (ICI) nor in the rest of the evaluated dimensions.

Once it has been determined that there are differences between the means, Post-Hoc tests of multiple pairwise comparisons allow determining which means differ. Multiple pairwise comparisons contrast the difference between each pair of means and generate a matrix where asterisks indicate group means that are significantly different at an alpha level of 0.05. It provides several comparison tests when equal variances are assumed (Table 9).

Table 9. Tests of Homogeneity of Variances

	Levene Statistics (1)	gl1	gl2	Sig.
INTRAEMPRENEURSHIP – TOTAL (ICI)	2,791	2	334	0,063
EXTENDED FLEXIBILITY	0,504	2	334	0,604
LEADERSHIP	1,607	2	334	0,202
RISK TAKING	2,452	2	334	0,088
OPPORTUNITY PROMOTER	0,201	2	334	0,818
PROACTIVITY AND INITIATIVE	1,417	2	334	0,244

(1.- Based in the Mean)

For multiple comparisons, the Bonferroni test has been used, which utilizes t-tests to perform pairwise comparisons between group means while controlling the overall error rate. Thus, the observed significance level is adjusted for the fact that multiple comparisons are being made (Table 10). The results show statistically significant differences only in the "Risk Taking" dimension between the fields of Educational Sciences and Engineering, but not in the rest of the studied dimensions.

Table 10. Post-Hoc Tests / Multiple Comparisons - Bonferroni

Dependant Variable	(I) FACULTY	(J) FACULTY	Mean Difference (I-J)	ST Error
EXTENDED FLEXIBILITY	Education Sciences	Social Sciences	0,1471	0,15153
		Engineering	0,08023	0,1566
	Social Sciences	Education Sciences	-0,1471	0,15153
		Engineering	-0,06686	0,14762
	Engineering	Education Sciences	-0,08023	0,1566
		Social Sciences	0,06686	0,14762
LEADERSHIP	Education Sciences	Social Sciences	0,00391	0,15285
		Engineering	0,18074	0,15797
	Social Sciences	Education Sciences	-0,00391	0,15285
		Engineering	0,17683	0,14891
	Engineering	Education Sciences	-0,18074	0,15797
		Social Sciences	-0,17683	0,14891
RISK TAKING	Education Sciences	Social Sciences	-0,09653	0,14396
		Engineering	-,38616*	0,14878
	Social Sciences	Education Sciences	0,09653	0,14396
		Engineering	-0,28962	0,14025
	Engineering	Education Sciences	,38616*	0,14878
		Social Sciences	0,28962	0,14025
OPPORTUNITY PROMOTER	Education Sciences	Social Sciences	0,28348	0,15668
		Engineering	0,19438	0,16192
	Social Sciences	Education Sciences	-0,28348	0,15668
		Engineering	-0,0891	0,15264
	Engineering	Education Sciences	-0,19438	0,16192
		Social Sciences	0,0891	0,15264
PROACTIVITY AND INITIATIVE	Education Sciences	Social Sciences	0,31343	0,15326**
		Engineering	0,31832	0,15839**
	Social Sciences	Education Sciences	-0,31343	0,15326**
		Engineering	0,00488	0,14931
	Engineering	Education Sciences	-0,31832	0,15839**
		Social Sciences	-0,00488	0,14931

Note: ** p < 0,05; * p < 0,10

DISCUSSION AND CONCLUSIONS

This study aimed to measure intrapreneurial competencies in young Spanish university students by adapting the COIN_CR1 ©2017 scale originally developed on a sample of workers from Costa Rica. The objective was to explore the relationship between students' intrapreneurial competencies and their fields of study.

To achieve this, the adapted COIN_ESP1 2024 scale was developed. The scale has demonstrated high reliability and internal validity (α = 0.938), with the solution to five factors explaining 67.079% of the variance. While the alignment with the item allocation from the original scale's dimensions is not perfect, it indicates a significant degree of harmony. Each obtained dimension shows high reliability, internal consistency, and discriminant validity.

However, some items in the scale do not contribute as expected to the theoretical factor-dimension of the original scale. Specifically, in the realm of flexibility, two elements from other dimensions of the original scale were integrated. It is noteworthy that both "willingness to evaluate new opportunities with others" and "ability to identify necessary resources" are closely linked to flexibility, demonstrating an open, adaptable mindset receptive to diverse perspectives. They also illustrate the capability to adjust to changing limitations and conditions in generating and promoting new initiatives within the university environment.

Therefore, the item "I am willing to evaluate new opportunities with others (students/professors/managers) that arise for the university's development" shows flexibility by being open to collaboration and consultation with others to assess new opportunities. The willingness to debate and consider different perspectives and opinions reflects a flexible mindset willing to adapt to various ideas and approaches in the process of evaluating and developing new opportunities.

Similarly, the item "I identify what type of resources will be needed to initiate and maintain a new initiative" illustrates the ability to adapt to resource constraints and adjust plans accordingly. Continuously identifying necessary resources involves a readiness to adjust resource requirements based on availability and changing circumstances. This adaptability to different conditions and constraints reflects a flexible attitude towards developing and implementing new initiatives.

Overall, both elements are closely related to flexibility and the lack of adherence to rigid schemes and procedures, hence their inclusion in the flexibility dimension. This dimension represents 46.7% of the variance in university students' intrapreneurial competence.

Additionally, items related to the original dimensions of "Opportunity Promotion" (OP) and "Proactivity" are less prominent in the results of the Spanish university student sample. This is consistent with the anticipated correlation between dimensions as per the theoretical framework, with previous research suggesting that differences in contextual settings (students vs. managers) can affect results.

Results, including those in Table 5, indicate the model's appropriate behavior in the tested student sample, both in terms of constituent dimensions and the competency constructs they integrate. It should be noted, as suggested by the original scale's authors, that these factors represent different competencies resulting from item development based on competency dimensions and attributes.

Regarding its application in the tested sample, statistically significant differences were found in "Risk Taking" ($F = 3.750$; $P = 0.025$) and "Proactivity and Initiative," albeit at a lower level ($F = 2.667$; $P = 0.071$). Engineering students scored significantly higher in "Risk Taking," suggesting a potential correlation between preparation in dealing with complex problems and confidence in their abilities. This hypothesis warrants further investigation.

The scale did not show statistically significant differences in other dimensions or in the overall measure termed "Intrapreneurial Competence Index" (ICI) in this study. Nevertheless, this index serves as a benchmark for future research in this field, exploring potential significant differences among different fields of study and similar geographic cohorts of non-university young individuals.

In conclusion, this study confirms the feasibility of measuring intrapreneurial competencies to compare results among diverse samples, both globally (ICI) and across each identified dimension (factors). This finding not only facilitates result comparison across different groups, allowing for segmentation of interest (e.g., groups with higher extended flexibility) but also enables the development of strategies targeting the differential development of desired intrapreneurial competencies for specific roles.

Moreover, the study's measurement was conducted on a very specific group (young university students) with little to no work experience. Traditionally, intrapreneurship (like entrepreneurship) has been almost exclusively linked to the professional environment, but it appears necessary to expand its scope beyond purely labor perspectives. This aligns with Ma and Tan's (2006) definition,

which extends intrapreneurship to a process where individuals or groups within an existing organization identify, pursue, and foster innovative opportunities that create value for the organization, thus surpassing purely entrepreneurial realms.

The humanistic perspective on intrapreneurship study emphasizes that intrapreneurial competencies are found in individuals without work experience, suggesting that individuals contribute their competencies to the work context rather than the organization providing them. This perspective does not negate the importance of studying the organizational environment that fosters the internal development of these skills.

This article contributes to the literature on intrapreneurship by enhancing understanding of intrapreneurial profiles through competency analysis, adapting an already developed scale to a relevant group such as undergraduate students. It also addresses the gap highlighted by Slavec and Drnovsek (2012) regarding the emphasis on developing a valid measurement scale within entrepreneurship, serving as a valuable contribution to refining tools for measuring intrapreneurial competencies for potential implementation in management and research fields. Lastly, it explores intrapreneurship among young university students, most of whom have little or no work experience. Understanding the relationship between a person's intrapreneurial competencies and their field of study can influence university curriculum planning, company hiring decisions, and personal career management.

As for the study's limitations, two are noteworthy. Firstly, the tool was designed based on a competency model that deliberately excludes external, organizational, and contextual variables (Hayton and Kelley, 2006). Secondly, the sample was restricted to final-year university students in Spain (specifically from Madrid), so it remains to be seen if results differ in other contexts (city, country, field of study, public vs. private education).

Looking ahead, future research should delve into the intrapreneurial competency baggage that university graduates bring to the job market upon completing their higher education. This involves questioning whether competencies vary depending on the field of study, expanding to other educational branches, the work experience gained during studies, and other socio-demographic variables of interest (national culture, gender, age, among others).

Understanding how an individual's intrapreneurial skills relate to their field of study can impact university curriculum planning, company hiring decisions, and personal career management. From a practical standpoint, it is expected that this research will contribute to a better understanding of intrapreneurship and the structural dimensions and competencies that define it.

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