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ARTICLE / ARTÍCULO

Do our university students see themselves as digital entrepreneurs?

¿Se perciben como emprendedores digitales nuestros estudiantes universitarios?

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Abstract: Competence in digital entrepreneurship is considered key for citizens in the 21st century, as it integrates entrepreneurial and digital skills necessary to face the challenges of today's society, although its development in the university environment is still an unexplored field. The aim of this article is to analyse the self-perception of digital entrepreneurship competence in university students in the last year of their Bachelor's Degree in Spanish public universities, within the framework of the EmDigital model. A quantitative, non-experimental, descriptive and correlational cross-sectional approach was used. The sample was made up of a large representation of students from different Spanish public universities, selected by stratified probabilistic sampling (N=4100). Data collection was carried out using a validated Likert-type questionnaire. The results show that students have moderate-high levels in all dimensions, with action planning standing out as the best valued, while implementation and collaboration obtain the lowest score, especially in relation to the real intention to undertake. The dimensions are moderately related to each other, which confirms their independent character within the model. Overall, the findings show a dichotomy between students' high theoretical self-perception and low practical initiative, which highlights the need to incorporate experiential learning methodologies in university education to promote the real implementation of digital entrepreneurship.

Keywords: Entrepreneurship, Competence, Higher Education, Digital Literacy, Self-perception.

Resumen: La competencia en emprendimiento digital se considera clave para la ciudadanía del siglo XXI, al integrar capacidades emprendedoras y digitales necesarias para afrontar los retos de la sociedad actual, aunque su desarrollo en el ámbito universitario sigue siendo un terreno poco explorado. El objetivo de este artículo es analizar la autopercepción de la competencia de emprendimiento digital en estudiantes universitarios de último curso de Grado en universidades públicas españolas, en el marco del modelo EmDigital. Se empleó un enfoque cuantitativo, no experimental, descriptivo y correlacional de corte transversal. La muestra estuvo conformada por una amplia representación de estudiantes de distintas universidades públicas españolas, seleccionada mediante muestreo probabilístico estratificado (N=4100). La recogida de datos se realizó mediante un cuestionario validado de tipo Likert. Los resultados muestran que el alumnado presenta niveles moderados-altos en todas las dimensiones, destacando la planificación de la acción como la mejor valorada, mientras que la implementación y colaboración obtiene la puntuación más baja, especialmente en lo relativo a la intención real de emprender. Las dimensiones se relacionan entre sí de forma moderada, lo que confirma su carácter independiente dentro del modelo. En conjunto, los hallazgos evidencian una dicotomía entre la alta autopercepción teórica y la baja iniciativa práctica del alumnado, lo que pone de manifiesto la necesidad de incorporar metodologías de aprendizaje experiencial en la formación universitaria para favorecer la implementación real del emprendimiento digital.

Palabras-clave: Emprendimiento, Competencia, Educación Superior, Alfabetización Digital, Autopercepción.

1. Introduction

Ever since the use of the internet by the general public began to expand in the 1980s and 1990s, there has been constant talk of the Digital Age. And since we began using chatbots (Generative Artificial Intelligence) in 2022, it is generally accepted that the Digital Age has given way to the Age of Artificial Intelligence (hereinafter, AI). Over the past few decades, we have experienced a rapid transformation driven by technologies that pose challenges across all spheres of society: the workplace, education, the economy, and culture. These challenges arising in our digitalized society require more complex skills related to critical and strategic thinking, communication and collaboration, leadership, innovation, and problem identification and resolution, among others. In this context, we believe that education must necessarily shift toward learning situations that are less data-centric and more competency-centric, thereby giving digital entrepreneurship a prominent role.

Digital entrepreneurship combines digital competence with entrepreneurship. On the one hand, entrepreneurship is a set of skills that—far from being merely an economic or business-oriented approach—is now viewed as an essential civic competency. It involves transforming ideas and opportunities into initiatives with social, cultural, or economic value through the development of skills that encompass creativity, autonomy, the identification of needs, and the ability to develop one's own innovative projects (Bacigalupo et al., 2016; Council of the European Union, 2018; Flores Oré, 2023). In this regard, Prendes-Espinosa and Martínez-Roig (2023) argue that educating citizens to acquire digital entrepreneurship competencies is fundamental to the progress of any society that aspires to be competitive. The Council of the European Union (2018) also identifies it as one of the basic competencies for lifelong learning. On the other hand, digital competence is understood as the ability to “use digital technologies safely, critically, and responsibly for learning, at work, and for participation in society, as well as to interact with them” (Council of the European Union, 2018, p. 9).

1.1. *Digital Entrepreneurship Competency*

Digital entrepreneurship links the competencies inherent to entrepreneurship with those of digital competence, which are, of course, associated with the development of technologies. Thus, digital entrepreneurship is seen as a driver of innovation and economic development (Cuadra Morales et al., 2023). Digital entrepreneurship combines entrepreneurial initiative (creativity, leadership, innovation, achievement orientation, team management, etc.) with the strategic use of digital technologies in activities that promote research and innovative solutions to problems. In other words, it involves identifying ideas and opportunities to transform them into innovative actions using digital tools that have an economic, social, or cultural impact (Allen, 2019; González-Calatayud et al., 2022; Prendes-Espinosa, 2022a; National Observatory on Technology and Society, 2023).

At the Educational Technology Research Group at the University of Murcia, we have been researching digital entrepreneurship in higher education for several years now, but we have always focused our research on the development of this competency. Our interest in entrepreneurship began with a European project on training entrepreneurs, in which—in addition to working on student training—we

collected data from a sample of 272 secondary school teachers (Prendes-Espinosa et al., 2020) regarding their understanding of and approach to entrepreneurship in the classroom. These teachers stated that, in their opinion, the most important factors for training future entrepreneurs were motivation, experiential learning, and teamwork.

Subsequently, thanks to funding from the Seneca Foundation (reference 20962/PI/18), we launched the project “EmDigital: Competencies for Digital Entrepreneurship Among College Students,” in which we designed a self-assessment questionnaire on digital entrepreneurship competencies for college students that was validated through a long and complex process. In the first phase, we focused on designing the conceptual model of digital entrepreneurship competence (using a comparative analysis of models, focus groups, and expert judgment).

We used the models of the European Framework as a basis (see Bacigalupo, 2022). In the case of digital competence, our reference was the DigComp model from the European Framework for Digital Competences for Citizenship. In its most recent version (DigComp 3.0), the general structure of 5 areas and 21 competencies is maintained, but aspects related to AI are systematically integrated into all competencies. It also distinguishes between explicit AI (acting directly and significantly on the competency) and implicit AI (acting in the background) (Cosgrove and Cachia, 2025). Complementing this framework is the European Framework for Digital Competence in Educators (DigCompEdu), which addresses the need for teachers to develop specific digital competencies for their professional practice (Redecker and Punie, 2017), and the DigCompOrg model for digitally competent organizations (Kampylis et al., 2015). Furthermore, in the field of entrepreneurship, the European Commission developed the European Framework for Entrepreneurial Competences (EntreComp) in 2016, structured into three areas and fifteen specific competencies (McCallum et al., 2018)—a model that was revised and expanded following a comparative analysis with other entrepreneurship models (see Prendes-Espinosa, 2022b).

Based on these frameworks for digital competence and entrepreneurial competence, the EmDigital model was developed, specifically designed to analyze digital entrepreneurial competence among college students. This model integrates the digital and entrepreneurial dimensions, breaking them down into four areas and fifteen competencies (González-Calatayud et al., 2022; Prendes-Espinosa, 2022b; Prendes-Espinosa and García-Tudela, 2020; Prendes-Espinosa et al., 2021), thus constituting one of the first attempts to operationalize both competencies in a coordinated manner within the context of higher education.

After designing the EmDigital model, a mixed-methods approach (quantitative and qualitative) was used to validate the questionnaire, following this sequence: comparative item analysis by experts; peer review; expert judgment; focus group; cognitive interviews with 19 college students; a pilot study with 190 students and AFE, yielding a Cronbach's alpha of 0.956 (see González-Calatayud et al., 2022; Prendes-Espinosa, 2022b). Following its validation, it was administered to a sample of 1,108 college students in the Region of Murcia (Prendes-Espinosa et al., 2025).

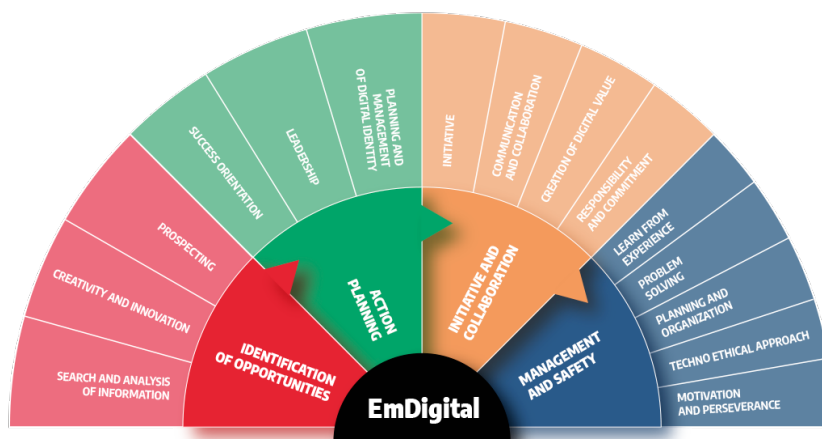


Figure 1. EmDigital Model.

1.2. Education for Digital Entrepreneurship

In the field of education, the European Commission issued the Council Recommendation of May 22, 2018, which establishes eight key competencies for the education of citizens, including digital competence and entrepreneurial competence. Both are incorporated into the Spanish curriculum (Organic Law 3/2020, of December 29, amending Organic Law 2/2006 on Education, LOMLOE) as skills that students must develop throughout the various stages of education. However, although these two competencies coexist in the national and European curriculum frameworks, there is no competency specifically named “digital entrepreneurship” that explicitly integrates them, as we do in our proposal and our model.

Thus, the EmDigital model fills an important gap and highlights the need to move toward educational approaches that address both dimensions in a coordinated manner rather than as independent elements. Delving deeper into this idea—and specifically within the Spanish context—a study conducted in schools in the Region of Murcia revealed a gap between teachers’ perceptions of ICT and its practical application: while teachers recognize the potential of these tools to stimulate creativity and collaborative work, their use to foster an entrepreneurial spirit remains limited. Among the identified causes were insufficient teacher training in entrepreneurship and a limited level of teachers’ digital competence (Blázquez and Marín, 2021). This reality underscores the importance of effectively incorporating the entrepreneurial dimension into digital environments in basic education from the earliest grades, as it is a strategy to ensure that students are prepared to face the challenges of today’s society.

The university setting is no exception to this reality. Although scholarly research on digital entrepreneurship at the university level remains limited (Fuentes Cabrera et al., 2024; Flores Oré, 2023), the available studies offer relevant findings. In this vein, García-Tudela et al. (2024) note that college students do not feel they have sufficient training to tackle digital entrepreneurship initiatives. Similarly, Pérez-Paredes et al. (2022) highlight a lack of confidence among Mexican college students regarding the resources, knowledge, and skills needed to become entrepreneurs. For his part, Al-

Fattal (2024) highlights that undergraduate business students understand entrepreneurship solely from an economic perspective, without viewing it as a social phenomenon in the broader sense, and identify a lack of practical experience and knowledge as a major barrier. Along the same lines, the systematic review by Flores Oré (2023) concludes that students face difficulties related to the skills and resources needed for digital entrepreneurship.

However, other studies offer a more favorable view. Puad et al. (2025) report that university students in Malaysia self-assess their entrepreneurial and digital competencies as moderate. Similarly, Moreira-Delgado et al. (2025) find that students at the University of the Andes (Colombia) demonstrate a high level of these competencies.

Consequently, it is clear that digital entrepreneurship must be analyzed as a basic, cross-cutting competency that undoubtedly needs to be addressed in undergraduate and graduate education, as it contributes to the employability of our graduates. Our research is grounded in this perspective, approaching digital entrepreneurship from an educational rather than a business standpoint.

2. Methodology

2.1. Research Questions and Objective

We ask whether final-year undergraduate students (and thus future graduates) perceive themselves as competent in digital entrepreneurship. In other words, do they perceive themselves as capable of identifying business opportunities? Do they consider themselves capable of designing innovative proposals? Do they believe they possess leadership skills? Are they competent in managing their digital identity? Are they capable of ensuring the digital security of their proposal? These and other questions related to our EmDigital model of digital entrepreneurship seem to us to be of vital importance for designing educational programs tailored to the real needs of our future graduates. To answer them, we defined the objective of this specific phase of our research as analyzing the self-perceived competence in digital entrepreneurship among senior undergraduate students at Spanish public universities.

2.2. Research Design

This research was conducted using a quantitative approach, with a non-experimental, descriptive, and correlational cross-sectional design. This methodological design allows us, first, to characterize students' self-perceived level of digital entrepreneurial competence and, second, to establish the magnitude and direction of the bivariate relationships among the different dimensions that make up the construct, without intervention or manipulation of the study variables.

2.3. Participants and Sample

The study population consisted of university students enrolled in the final year of their respective bachelor's degree programs at public universities. To select participants, a stratified probability sampling procedure was implemented based on the total population of the participating universities. The population strata were defined based

on two key structural variables: the university to which the student belonged and the field of study. As a key methodological decision, the broad academic field of Social and Legal Sciences was broken down into three independent strata (Social Sciences, Legal Sciences, and Economics). This division is justified both by the large number of students historically grouped within this category and by the marked theoretical and practical differences in educational profiles and attitudes toward entrepreneurship among these fields, since, in the university tradition, entrepreneurship has been associated very narrowly with the field of Economics.

The initial fieldwork collected a sample of 4,271 records. Following a data cleaning and quality control process, a listwise deletion criterion was applied, eliminating cases that showed a total or majority absence of responses in the survey instrument. This procedure ensured the robustness of the data matrix, resulting in a final valid sample of N=4,100 subjects.

The sociodemographic profile of the sample revealed a mean age of 22.43 years (SD=4.30). Regarding gender identity, the majority of participants identified as female (63.0%), followed by the male category (35.1%). The institutional distribution showed broad geographic coverage, with the highest representation coming from the University of Granada (30.0%), the University of Málaga (21.8%), and the University of Murcia (15.3%). The final breakdown by fields of study reflected the desired representativeness (Figure 2).

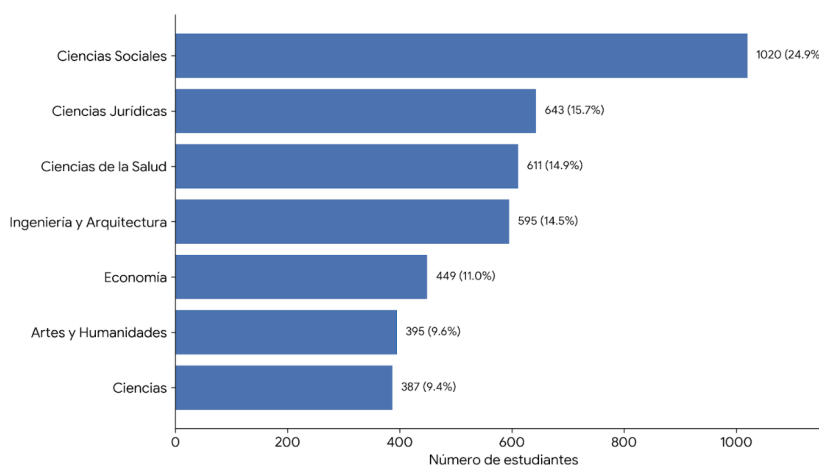


Figure 2. Distribution of the sample by fields of study.

2.4. Data Collection Instruments

To collect empirical data, the EmDigital questionnaire (González et al., 2022) was used, a validated instrument for measuring self-perceived digital entrepreneurship competence in the university setting. The questionnaire uses a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

The structural model of the instrument assesses four interdependent dimensions (Figure 1 above, showing the EmDigital model): Opportunity Identification (Block 1), Action Planning (Block 2), Implementation and Collaboration (Block 3), and

Management and Security (Block 4). To confirm the psychometric properties of the scale in this specific application, internal consistency tests were conducted. The results indicated excellent overall reliability, with a Cronbach's alpha coefficient of 0.966 and a McDonald's omega coefficient of 0.973. At the di al level, Cronbach's alpha values ranged from 0.825 for Block 1 to 0.938 for Block 4. Additionally, Confirmatory Factor Analysis (CFA) yielded Composite Reliability (CR) indices that exceeded the acceptance threshold, ranging from 0.825 to 0.939 for all dimensions, thereby ensuring the measure's precision and construct validity.

2.5. Procedure

Fieldwork and data collection were conducted during the 2024–2025 academic year, specifically between September 2024 and February 2025. The questionnaire was administered entirely in digital format but was administered in the classroom with the collaboration of faculty members and through institutional channels.

The research was conducted in strict compliance with current ethical principles. The study protocol received a unanimous favorable opinion from the Research Ethics Committee of the University of Murcia (ID: 4352/2023) on February 27, 2023. Prior to participation, all subjects were informed of the research objectives and were required to provide explicit informed consent, which guaranteed voluntary participation, anonymity, and the confidential and aggregated processing of the data collected.

2.6. Data Analysis

The empirical data were processed and analyzed using advanced statistical software. In an initial analytical phase, univariate descriptive statistics (frequency distributions, percentages, arithmetic means, and standard deviations) were calculated to characterize both the sociodemographic variables and self-reported performance across the various dimensions of competence.

Prior to conducting inferential tests, the parametric assumptions of the data set were verified. Since the normality test indicated a violation of this assumption and given the ordinal-metric nature of the measurement scale, only nonparametric statistical methods were used. Consequently, to address the study's correlational objectives, Spearman's rank correlation coefficient (Rho) was calculated, allowing for an accurate assessment of the magnitude and statistical significance ($p < 0.05$) of the bivariate associations among the assessed dimensions.

3. Results

3.1. Descriptive Analysis of the Dimensions of Digital Entrepreneurial Competence

To assess participants' self-perception of their digital entrepreneurial competence, descriptive statistics for the four dimensions that make up the instrument were analyzed. Overall, the sample reported moderate-to-high levels in all areas assessed, with dimensional means ranging from 3.57 to 4.11 on a 5-point scale (Table 1).

Table 1. Descriptive statistics for the assessed dimensions.

Dimension	Minimum	Maximum	Mean (M)	Standard Deviation (SD)
Action Planning	1	5	4,11	0,78
Identifying Opportunities	1	5	3,85	0,78
Management and security	1	5	3,66	0,89
Implementation and Collaboration	1	5	3,57	0,77

Identifying Opportunities

The Opportunity Identification dimension encompasses three subcompetencies—information search and analysis, creativity, and prospecting—which together reflect the student's ability to detect, generate, and anticipate opportunities in digital environments. The results show that the sample scores above the midpoint of the scale in all three subcompetencies (Table 2), although there are substantial differences among them that warrant specific analysis.

Table 2. Subcompetencies of the Opportunity Identification dimension.

Subcompetency	M	DT	Skewness	Kurtosis
Information Search and Analysis	3,48	0,78	-0,21	-0,12
Creativity	3,24	0,96	-0,14	-0,39
Prospecting	3,86	0,81	-0,74	0,59

The prospecting subcompetency is the highest-rated in this dimension ($M=3.86$; $SD=0.809$), with a distribution clearly skewed toward high values ($skewness=-0.74$), indicating that most students perceive themselves as capable of anticipating trends and visualizing future scenarios. The subcompetency of information search and analysis has an intermediate mean ($M = 3.48$; $SD = 0.776$) and is the most homogeneous of the three, with the lowest standard deviation in the dimension. Within this subcompetency, the items related to the strategic search for information on the internet ($M = 4.13$; $SD = 0.967$) and the clarification of personal goals and achievements ($M = 4.18$; $SD = 0.947$) stand out in particular, both ranking among the highest scores recorded across the entire dimension.

The subcompetency of creativity, by contrast, has the lowest mean ($M=3.24$; $SD=0.955$). Its distribution is practically symmetric ($skewness=-0.14$), indicating high actual heterogeneity among students: profiles with a low perception of their creative ability coexist with those who rate themselves highly. This variability is particularly evident in the item that assesses the current possession of specific innovative ideas likely to be realized in the future ($M = 3.04$; $SD = 1.119$), the lowest score in the entire dimension and the only one that approaches the midpoint of the scale.

Action Planning

The Action Planning dimension received the highest overall score in the entire model, with all three subcompetencies scoring above $M = 3.85$ in every case, distinguishing it as the dimension with the highest level of self-perceived competence in the sample (Table 3).

Table 3. Subcompetencies of the Action Planning dimension.

Subcompetency	M	DT	Skewness	Kurtosis
Achievement orientation	4,21	0,72	-1,21	1,5
Leadership	3,85	0,78	-0,68	0,45
Digital Identity Planning and Management	3,87	0,8	-0,6	0,1

The “achievement orientation” sub-competency is the highest-rated within this dimension and across the entire model ($M = 4.21$; $DT = 0.724$), with a markedly asymmetric distribution toward high values (skewness = -1.21) and high positive kurtosis (1.50), indicating that responses are concentrated at the higher end of the scale with little dispersion. The items regarding the importance of effective teamwork for a project’s success ($M = 4.44$; $SD = 0.841$) and the usefulness of digital technologies in project design ($M = 4.41$; $SD = 0.877$) are among the highest scores recorded across the entire scale. The low standard deviation of the subcompetency ($SD = 0.724$) reflects a high degree of homogeneity in the sample’s responses.

The subcompetency of digital identity planning and management shows a high mean ($M = 3.87$; $SD = 0.800$) with a moderate negative distribution (skewness = -0.60), indicating a general tendency toward scores above the midpoint. The kurtosis close to zero (0.10) indicates an approximately mesokurtic distribution, with no notable concentration at the extremes. This subcompetency reflects students’ ability to organize and project their presence and identity in digital environments for professional or entrepreneurial purposes.

The leadership subcompetency has the lowest mean score in the dimension ($M = 3.85$; $SD = 0.780$), although it remains at a medium-high level. Its distribution is negatively skewed (skewness = -0.68) with moderate positive kurtosis (0.45), indicating some concentration of responses at higher values, albeit with greater relative dispersion than achievement orientation. It is the subcompetency with the greatest variability within the dimension, along with digital identity planning and management.

Implementation and Collaboration

The Implementation and Collaboration dimension had the lowest overall score in the model, with greater variability among subcompetencies than in the previous dimensions and containing the item with the lowest score and greatest dispersion in the entire instrument (Table 4).

Table 4. Subcompetencies of the Implementation and Collaboration dimension.

Subcompetency	M	DT	Skewness	Kurtosis
Initiative	3,16	0,98	-0,1	-0,48
Communication and Collaboration	3,62	0,79	-0,46	0,04
Digital Value Creation	3,59	0,88	-0,45	-0,16
Responsibility and Commitment	3,88	0,77	-0,54	-0,02

The sub-competency of responsibility and commitment is the highest-rated in this dimension ($M=3.88$; $SD=0.773$), with a moderately negative skew (skewness= -0.54) and a kurtosis close to zero (-0.02), indicating a relatively symmetrical distribution around medium-to-high values. Within this subcompetency, the item referring to respectful behavior online stands out, obtaining one of the

highest scores in the entire instrument ($M=4.33$; $SD=0.918$), with a virtually unanimous response at the higher end of the scale.

The communication and collaboration subcompetency ranks second ($M = 3.62$; $SD = 0.785$), with moderate negative skewness (-0.46) and kurtosis close to zero (0.04), reflecting a balanced distribution centered on medium-to-high values and a homogeneous dispersion among participants.

The “digital value creation” subcompetency scored an average of 3.59 ($SD = 0.884$), with a negative skewness (-0.45) and a slightly negative kurtosis (-0.16), indicating a somewhat flatter distribution than the previous ones and, therefore, greater relative variability in the responses. It is the subcompetency with the second-highest dispersion in the dimension.

The “initiative” subcompetency has the lowest score in the entire dimension and one of the lowest in the model ($M=3.16$; $SD = 0.977$), with a nearly symmetric distribution (skewness = -0.10) and negative kurtosis (-0.48), indicating a flattened distribution with responses distributed heterogeneously across the scale. This subcompetency includes the item with the lowest score in the entire instrument, which refers to the actual intention to create a digital entrepreneurship project in the future ($M = 2.80$; $SD = 1.228$); it is also the item with the greatest dispersion on the entire scale, indicating a notable polarization in participants’ responses.

Management and Security

The Management and Security dimension groups five sub-competencies ranging from the ability to learn from experience and solve problems to ethical awareness and the motivation to sustain effort over time. The mean values for the five sub-competencies range from 3.60 to 3.71 , making this the most homogeneous dimension of the model in terms of the distance between sub-competencies (Table 5).

Table 5. Subcompetencies of the Management and Safety dimension.

Subcompetency	M	DT	Skewness	Kurtosis
Learning from experience	3,71	0,78	-0,51	0,33
Troubleshooting	3,63	0,75	-0,4	0,24
Planning and Organization	3,6	0,77	-0,31	-0,04
Techno-ethical vision	3,65	0,8	-0,47	0,22
Motivation and Perseverance	3,6	0,82	-0,39	-0,04

The sub-competency of learning from experience has the highest mean score in the dimension ($M=3.71$; $SD=0.777$), with a moderately negative skew (skewness= -0.51) and mild positive kurtosis (0.33), indicating a concentration of responses in the higher values with few extremely low scores.

The “techno-ethical vision” subcompetency ranks second ($M = 3.65$; $SD = 0.798$), with a negative skewness (-0.47) and moderate positive kurtosis (0.22). Within this subcompetency, the items related to the need to meet established deadlines ($M = 4.18$; $SD = 0.956$) and to ensuring the protection of personal data ($M = 4.07$; $SD = 1.000$) stand out, both ranking among the highest in the dimension, reflecting a high level of regulatory and ethical awareness among participants. In contrast, items referring to the

use of ICT as a tool to ensure digital security received significantly lower scores ($M=3.33$; $SD=1.137$), with the greatest dispersion recorded in this subcompetency, indicating a gap between awareness of the importance of security and self-perceived technical proficiency in ensuring it.

The problem-solving subcompetency has a mean of 3.63 ($SD = 0.747$) with a moderately negative skewness (-0.40) and mild positive kurtosis (0.24); it is the subcompetency with the lowest dispersion across the entire dimension, reflecting a relatively uniform assessment among participants.

The planning and organization subcompetency has a mean of 3.60 ($SD = 0.771$), with a negative skewness (-0.31) and slightly negative kurtosis (-0.04), indicating a distribution that is practically mesokurtic with a slight tendency toward higher values on the scale.

The subcompetency of motivation and perseverance has the lowest mean in the dimension ($M = 3.60$; $SD = 0.822$), with a moderately negative skewness (-0.39) and a kurtosis close to zero (-0.04). It is also the subcompetency with the greatest dispersion within the dimension, suggesting greater heterogeneity among participants in their perception of their ability to sustain effort and motivation over time.

3.2. Relationship Among the Dimensions of Entrepreneurial Competence

To examine the interdependence among the different dimensions assessed, a bivariate correlation analysis was conducted using Spearman's Rho coefficient. The findings reveal the existence of positive and statistically significant correlations ($p < 0.001$) among all the dimensions that make up the construct. The strongest association is observed between the Management and Security dimension and the Implementation and Collaboration dimension ($Rho = 0.431$), followed closely by the relationship between Management and Security and Opportunity Identification ($Rho = 0.422$). In contrast, the weakest correlation—though still significant—is found between Action Planning and Implementation and Collaboration ($Rho = 0.257$).

From a theoretical perspective, the presence of moderate-to-low correlations (ranging from 0.257 to 0.431) is consistent with a multidimensional model. These values indicate that, while the four dimensions share an underlying basis and reinforce one another—that is, greater proficiency in technical management or planning is associated with a greater ability to identify opportunities and engage in collaborative initiatives—they operate as empirically distinct facets. The absence of excessively high correlations (greater than 0.80) rules out multicollinearity issues and confirms that each dimension contributes unique variance to the model, justifying their independent evaluation within the framework of digital entrepreneurial competence.

4. Discussion

The main objective of this study was to analyze university students' self-perception of digital entrepreneurial competence by examining its constituent dimensions. The results reveal a fundamental dichotomy in the student profile: while there is a high perception of competence in the theoretical and strategic phases, there is a significant lack of intent to actually execute.

On the one hand, the dimensions of Action Planning and Opportunity Identification received the highest ratings. College students perceive themselves as highly capable of seeking strategic information online and recognize the value of technology-mediated teamwork. These findings are consistent with this demographic's status as heavy users of digital environments (National Observatory of Technology and Society, 2023). However, this instrumental mastery does not automatically translate into entrepreneurial initiative. The "Implementation and Collaboration" dimension received the lowest score in the model, with the statement regarding the actual intention to create a digital entrepreneurship project in the future being the item with the lowest score and greatest variation.

These findings are closely aligned with the research by García-Tudela et al. (2024) and Pérez-Paredes et al. (2022), who had already noted that college students lack the confidence and practical training necessary to bring entrepreneurial proposals to fruition. Similarly, they confirm the conclusions of Flores Oré (2023) regarding students' difficulties in moving from the conceptualization of ideas to the mobilization of resources. Although international studies such as those by Puad et al. (2025) or Moreira-Delgado et al. (2025) report moderate-to-ly high levels of general entrepreneurial competencies, the results of this study qualify this view: students feel theoretically prepared but lack the practical initiative (agency) to execute real projects.

From a theoretical and inferential perspective, Spearman's correlation analysis supports the multidimensional nature of the EmDigital model (Prendes-Espinosa and García-Tudela, 2020). The positive and moderate correlations demonstrate that the dimensions are interrelated but are independent constructs. This empirical finding is crucial for the social sciences and pedagogy: it confirms that digital competence (knowing how to use tools or manage security) does not, on its own, generate entrepreneurial competence (initiative and implementation). As Blázquez and Marín (2021) point out, technological integration without an entrepreneurial approach is insufficient.

5. Conclusions and future research

The implications of these findings for higher education are clear. Universities must not limit themselves to offering purely instrumental or theoretical training; it is imperative to promote experiential learning ecosystems. As the faculty members noted in the study by Prendes-Espinosa et al. (2020), motivation and practical experience are the true drivers of entrepreneurship. Therefore, university curriculum development must integrate digital entrepreneurship competencies across all disciplines, facilitating idea incubators, active methodologies (such as Project-Based Learning or Collaborative Learning), and simulations that reduce the fear of failure and encourage the actual implementation of solutions to social and economic problems.

Among the limitations of this study, it is worth noting the use of a self-report instrument, which may be subject to social desirability bias or an overestimation of theoretical abilities. As future lines of research stemming from the MAEDU project, it will be necessary to conduct multivariate inferential analyses that cross-examine these dimensions with sociodemographic variables (such as field of study or gender), as well as cross-referencing this data with the perceptions of university faculty (EmDigital-Prof)

and organizational policies (EmDigital-Org), to obtain a systemic overview that will enable the optimization of training for future graduates.

This research will be completed in subsequent phases with the analysis of data on faculty (EmDigital-Prof) and institutions (EmDigital-Org), information that will allow us to visualize, in an integrated and comprehensive manner, how digital entrepreneurship is being addressed at Spanish public universities. The purpose of defining this framework is to provide recommendations for the design of university education, taking into account the core competencies of degree programs. We also aim to design self-assessment and diagnostic tools. As for future projects, we are interested in expanding the research to include pre-university levels.

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