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EXPLORING THE ENTREPRENEURIAL PROFILE, COMPETENCIES, INTENTIONS AND ATTITUDES

EXPLORANDO EL PERFIL, LAS COMPETENCIAS, LAS INTENCIONES Y LAS ACTITUDES EMPRESARIALES

Fernando Almeida*
https://orcid.org/0000-0002-6758-4843 (ORCID iD)
ISPGAYA and University of Porto, Portugal

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ABSTRACT

Entrepreneurship education aims to contribute to the emergence of innovative skills, abilities, and competencies in people, in the most diverse sectors and branches of activity of contemporary society, regardless of the intention to establish a new start-up. This study explores the development of entrepreneurial competencies, intentions and attitudes offered by a higher education institution through the adoption of the eValueComp assessment tool. It offers significant contributions to the business education field particularly aimed at higher education professors who intend to place the student in a more active position and provide an entrepreneurial education, which will be useful for their future professional career. The findings revealed a significant increase of entrepreneurial competencies, general entrepreneurial attitudes, and perception of entrepreneurial feasibility. However, entrepreneurial intentions have evolved only marginally. Furthermore, the age and number of years of professional experience are two correlated factors that contribute to students having a greater perception of the risks associated with the entrepreneurship process.

KEYWORDS

entrepreneurship, start-up, business, education, entrepreneurial competencies

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*Corresponding author: almd@fe.up.pt
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RESUMEN

La educación emprendedora tiene como objetivo contribuir a la aparición de habilidades, destrezas y competencias innovadoras en las personas, en los más diversos sectores y sectores de actividad de la sociedad contemporánea, independientemente de la intención de establecer una nueva empresa. Este estudio explora el desarrollo de las competencias, intenciones y actitudes empresariales que ofrece una institución de educación superior mediante la adopción de la herramienta de evaluación eValueComp. Ofrece importantes contribuciones al campo de la educación empresarial, especialmente dirigidas a los profesores de educación superior que pretenden colocar al estudiante en una posición más activa y proporcionarle una educación empresarial, que le será útil para su futura carrera profesional. Los resultados revelaron un aumento significativo de las competencias empresariales, las actitudes empresariales generales y la percepción de la viabilidad empresarial. Sin embargo, las intenciones empresariales sólo han evolucionado marginalmente. Además, la edad y el número de años de experiencia profesional son dos factores correlacionados que contribuyen a que los estudiantes tengan una mayor percepción de los riesgos asociados con el proceso emprendedor.

PALABRAS CLAVE

empresariado, start-up, negocios, educación, competencias emprendedoras

INTRODUCTION

The relevance of education for entrepreneurship has been researched by several authors (Bae et al., 2014; Lin & Xu, 2017, Millman, 2010). The pertinence of combining these two concepts arises because education is a fundamental pillar of society, which allows providing citizens with the necessary tools to contribute to the progress and development of society add source or literature. Furthermore, the entrepreneurial activity allows people to contribute to a better-integrated development of citizens. Entrepreneurship has progressively become an important discipline in major universities in the USA and Europe (Volkmann, 2004). Although, entrepreneurship was aimed exclusively at students in the field of management and economics, its coverage to all areas is increasingly imperative, due to the positive effects it can have on the economy and society. Rather, it is believed that entrepreneurship can be promoted through an entrepreneurial culture, with teaching playing a privileged role in this respect. Furthermore, Gurau (2015) states that current business education paradigms have some limitations, namely the excessive focus on short-term profitability, low specialization and lack of connection with other areas of study. Entrepreneurship is an area of specialization that simultaneously allows the inclusion of students with multidisciplinary skills and in which the success of potential businesses can be accessed from multiple perspectives. In this sense, the teaching of entrepreneurship assumes a high potential area in business education.

Several higher education institutions have encouraged and established programs of activities related to entrepreneurship. These activities aim to foster

entrepreneurship through learning by doing activities (Fayolle & DeGeorge, 2006; Moberg, 2011). This view argues education is a process of reconstruction and reorganization of acquired experiences that will influence future experiences (Bot et al., 2005). Autonomous learning is one of the pillars of learning by doing, thus, instead of showing a single path to a solution, the teacher should present questions and challenges that help to guide the student through the different possibilities (Ceylan, 2015). In this way, the student is encouraged to actively participate in the discovery process, arousing and gaining confidence to take their own steps and cooperating with classmates. In entrepreneurship this model allows students to use imagination, creativity, and innovation in the development of new products and/or services (Karmokar, 2016).

The European Union recognizes the spirit of initiative and entrepreneurship as one of the eight key competencies for lifelong learning, considering it essential for the citizens of a knowledge-based society (Bacigalupo et al., 2016). It is, therefore, essential for higher education institutions to bring highly qualified professionals to the market from a technical point of view, but also to develop competencies in students that encourage active participation in society as it is recognized in Díez-Martín (2019). As such, entrepreneurship disciplines play an important role in the development of multidisciplinary competencies that may be fundamental to the entrepreneurial success of students. In this sense, this study seeks to explore and assess the impact of an entrepreneurship course developed in a polytechnic higher education institution in Portugal in which over two academic years (i.e., 2017/18 and 2018/19). For this purpose, the eValueComp assessment tool developed by the Organization for Economic Co-operation and Development (OECD) and European Commission (EC) was used to characterize the entrepreneurial profile, competencies, intentions, and attitudes of students. The manuscript is organized as follows: Initially, a theoretical contextualization of entrepreneurial education is carried out considering the development of competencies, entrepreneurial intentions, and attitudes. Next, the study methodology is presented considering the applied methods and the structure of the research design. Consequently, the results are explored and discussed. Finally, the conclusions are presented and some indications for future work are given.

LITERATURE REVIEW

Education is the foundation for the development of the country and for having more participatory, aware, and productive citizens in society. Calzado-Barbero et al. (2019) recognize that one of the pillars in this education that places the student at the center of the learning process is entrepreneurial education. This educational model is in line with current scientific and technological development, and is fundamental for students to stimulate socio-cognitive skills (e.g., creative thinking, design thinking, innovative abilities) while preparing for the demands of the labor market (Sundararajan, 2019). In this sense, exploring this phenomenon second multiple perspectives such as increasing students' entrepreneurial proclivity, increasing students' ability to identify new business opportunities or experiential teaching based on the learning by doing model have been topics increasingly discussed in the international literature (Fernández-Portillo, 2018).

For any professional activity, there is a set of necessary competencies for the development of the activity, which may be transversal to other dimensions of life.

The competence is seen by Sá and Serpa (2018) as the ability to operationalize a set of knowledge, attitudes, and skills in a concrete situation, in order to be successful, while the transversal competencies are those common to several activities. This vision is complemented by Kawshala (2017) with the concept of key competencies that are not only important for the performance of professional activities, but also to the different dimensions of life and social coexistence. This perspective gives the key competencies a dynamic character, allowing individuals to permanently build and reconstruct knowledge according to organizational contexts.

It is worth looking at the key competencies fundamental to entrepreneurship. The entrepreneur must have personal qualities and characteristics that contribute to the effective action of the business and the creation of tangible and intangible value for society (Mitchelmore and Rowley, 2010). The set of entrepreneurial skills is formed by a combination of components. First, some components are intensely related to the personal characteristics of the entrepreneur such as personal traits, personality, and attitudes. Second, we have a set of competencies that are related to the entrepreneurial process, to entrepreneurship that goes from the idea to business growth (Hazlina et al., 2010). It should be noted that Fellnhofer (2017) and Hahn et al. (2017) consider that both the most behavioral skills and those most linked to the conduction and management of the entrepreneurial process have high potential to be worked and somehow learned by the entrepreneur.

Within the theme of entrepreneurial competence, several authors have been concerned with creating typologies or models that enable researchers to identify knowledge, skills, attitudes, in short, skills necessary for the development of their activities. According to Dyer et al. (2008), the entrepreneur must have the ability to have ideas and detect opportunities, manage to bring together human, technical and financial resources to achieve innovative products and services. Having initiative is another key competence to achieve success in an entrepreneurship project. Nsereko et al. (2018) state that people with an entrepreneurial attitude have, as a matter of principle, a capacity for initiative, feel the need to act and assume a proactive behavior to solve situations or take advantage of a favorable condition. Additionally, the entrepreneur is constantly making decisions, which may imply new courses of action requiring a good capacity for analysis and reasoning regarding people and present and future activities. Therefore, Nandram et al. (2018) highlight the role of decision making in an entrepreneur, which involves setting priorities and making choices. Finally, to achieve objectives, it is necessary to rely on the collaboration of other people. The involvement of other people creates a contagious motivation that helps to create synergies and overcome obstacles (Hernandez et al., 2018).

In this sense, it is important to explore whether the proposed entrepreneurship course allowed students to develop their key entrepreneurial competencies considering its multiple dimensions. Accordingly, the following research question was defined:

RQ1: Has the entrepreneurship course improved the key entrepreneurial competencies of students?

Another perspective looks at the effects of entrepreneurship education on entrepreneurial intentions and attitudes. Fayolle and Gailly (2004) consider the entrepreneurial intention as a previous and determining element of entrepreneurial behavior. Vázquez et al. (2011) emphasize that one of the

fundamental objectives of entrepreneurial education is to stimulate the entrepreneurial spirit of students, making them more creative, self-confident and socially responsible. However, this education should not be focused on the immediate and sole objective of creating a new business (Cuervo et al., 2007; Shane and Venkataraman, 2000). These authors argue that entrepreneurial training should above all lead students to make a conscious self-assessment if they want to choose an entrepreneurial career or employ the newly acquired skills in companies. Regardless of the students' choice to set up their own company, the students' entrepreneurial capacity is expected to be increased (Weber, 2012).

Although research in entrepreneurship education has increased substantially in recent years, the effects of entrepreneurship education on entrepreneurial intention and attitude are contradictory. The findings obtained by Fayolle and Gailly (2015), Gerba (2012), Küttim et al. (2014) and Von Graevenitz et al. (2010) indicate positive effects on the increase in entrepreneurial intention among students, but not transversally supported in all individuals attending higher education, indicating a great heterogeneity in their success. Therefore, this study also sought to explore the contribution of entrepreneurial intentions and attitudes training in entrepreneurship among students. Therefore, the following research question was defined:

RQ2: Has the entrepreneurship course increased the entrepreneurial intentions and attitudes of students?

The contradictory and unsustainable effects of the impact of entrepreneurship education programs on the entrepreneurial intentions and attitudes of the students are essentially due to the heterogeneous profile of students attending these training programs. In this sense, Cumming and Zhan (2018) stress the importance of teachers to know in depth the context of students attending an entrepreneurship course. Several factors and characteristics are not consensual. Küttim et al. (2014) conclude that factors such as gender and action have a residual impact on entrepreneurial intentions. However, Fayolle and Gailly (2015) emphasize that entrepreneurial education may have significant counter effects on students with previous experience as entrepreneurs. Another aspect that should be considered is the multidisciplinary profile of students (Almeida, 2018; Hamouda and Ledwith, 2016). Yet, this factor is also contradictory. Garcia-Rodríguez et al. (2012) highlight the role of multidisciplinarity in the success of an entrepreneurship course, and the success of these courses is higher when it is attended by students with multidisciplinary competencies and by teachers with multidisciplinary training in the technical and scientific component. Nonetheless, the attendance of these courses by students with different backgrounds also brings some challenges at the level of communication, and in the organization and division of work (Buzady and Almeida, 2019). Despite these obstacles, the results of the study conducted by Fiore et al. (2019) identify slight improvements in the students' perception of their teamwork skills and the increase in entrepreneurial intentions. The profile of students attending an entrepreneurship course is necessarily different and, therefore, it becomes relevant to explore its role in students' entrepreneurial intention. Accordingly, this study explores the relevance of the students' profile in the evolution of their intentions and attitudes. The following research question was defined:

RQ3: Has the students' profile impacted on the entrepreneurial intentions and attitudes of students?

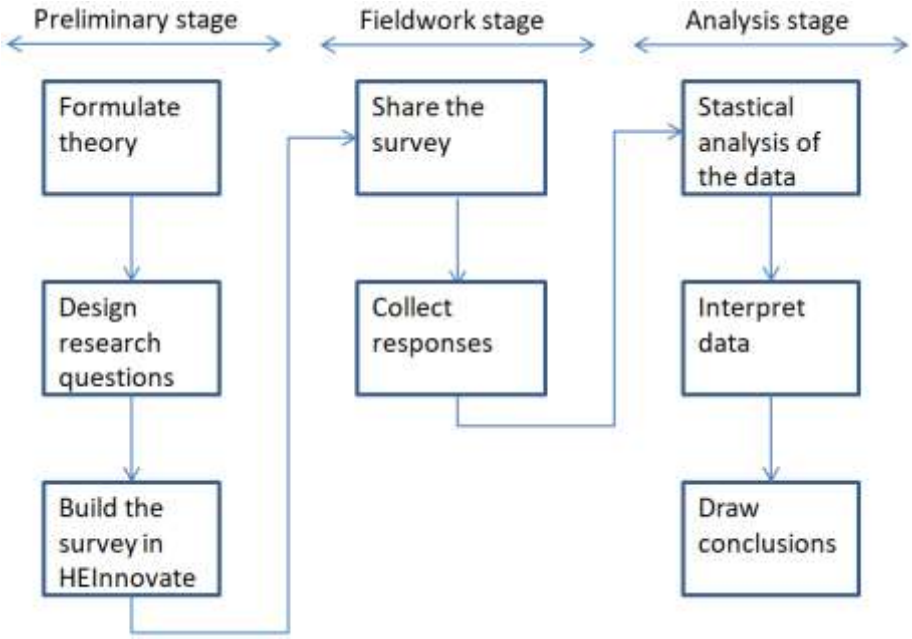
METHODOLOGY

Research design

The study adopts the quantitative methodology to explore the role of entrepreneurship education. A descriptive survey was used for data collection and descriptive statistics, correlational statistics, and comparison of the impact of entrepreneurship education considering students' perception before and after entrepreneurship education was used in data analysis. The quantitative approach is related to the collection of data on the motivations of groups of individuals to understand and interpret their behaviors, opinions, and expectations (Creswell, 2014). This view is complemented by Queirós et al. (2017) in stating that quantitative research looks mainly to find relationships between variables, make descriptions using the statistical treatment of the collected data, test theories, and draw conclusions. Descriptive and inferential statistics were used to assess and demonstrate how an entrepreneurship course attended had an impact on the development of students' entrepreneurial competencies, intentions, and attitudes.

Figure 1 provides a global and concise view of the three phases (i.e., preliminary stage, fieldwork stage, analysis stage) of the adopted methodology.

Figura 1. Phases of the adopted methodology



Source: own source

In the preliminary stage, a contextual and exploratory analysis of the problem domain was performed. Thus, a literature review is carried out in the field of entrepreneurship education and the research questions of this study are formulated regarding the state of the art in this area of knowledge. Still, at this stage, the survey is constructed through the electronic Value Competencies (eValueComp) assessment tool in the Higher Education Innovative (HEInnovate) platform. HEInnovate is a joint initiative of the European Commission and the OECD that makes available to higher education institutions (e.g., universities, university colleges, polytechnics, etc.) material and mechanisms that allow these

institutions to assess their entrepreneurial and innovative culture. Kampylis et al. (2015) establish that HEInnovate covers eight thematic areas: (i) leadership and governance; (ii) organizational capacity; (iii) entrepreneurial teaching and learning; (iv) preparing and supporting entrepreneurs; (v) digital transformation and collaboration; (vi) knowledge exchange and collaboration; (vii) internationalization; and (viii) impact assessment. The eValueComp assessment tool available on the HEInnovate platform allows the creation of personalized surveys that can cover these eight thematic areas.

The fieldwork stage is responsible for distribution of the survey to the students. Two access accounts are created for this purpose: one for the teacher and one for the students. The teacher's access account allows visualizing the students who answered the survey and to collect their data, which was then migrated to the SPSS software. Accordingly, the teacher account has only permissions to access and manage the data. They have not filled any survey. The students' accounts only allow them to access the survey link and answer the online survey. Each student can only answer the survey once. The date on which each student answered the questionnaire is recorded in the system. The students answered the survey after the completion of the entrepreneurship course for three weeks. During this period, two reminders were sent to increase the participation rate of students. A total of 92 students attended the entrepreneurship course during the 2017/18 and 2018/19 school years, 79 of whom answered the questionnaire, which represents a participation rate of 85.87%.

Finally, in the analysis stage, we started by statistically analyzing the data in the SPSS v.21 software. Two statistical techniques were employed: descriptive statistics and inferential analysis. The descriptive statistical analysis allowed us to have a comprehensive analysis of the behavior of the responses, namely the mean, standard deviation and the difference between the end and start of the entrepreneurship course. The inferential analysis turned possible to assess whether the difference between the results obtained after the end of the entrepreneurship course was statistically relevant and to explore the relevance of the results considering the students' profile (i.e., gender, age, years of experience, scientific field). The obtained findings are then discussed and compared with the literature in the area and the main conclusions of the study are extracted.

Course structure and students' profile

Attendance of the entrepreneurship course is mandatory in the context of the 3rd year of the BSc. in Management and BSc. in Computer Science Engineering. The entrepreneurship course has a total duration of 45 attendance hours of which 15 hours are theoretical and 30 hours are practical. The theoretical component is taught at the beginning of the semester. The greater weight of the practical component follows the recommendations of Neck et al. (2014) who argue that an entrepreneurship course should use a hand-on approach that encourages the active participation of students in the learning process.

The syllabus of the entrepreneurship course is composed by five modules with the duration of three hours: (i) introduction to innovation and entrepreneurship; (ii) identification of a business opportunity; (iii) principles of marketing; (iv) viability evaluation and financial management; and (v) protection of intellectual property. This structure follows the general guidelines of the recommendations made by Jones and English (2004) and Winkel et al. (2013), in which the duration of each

module was reduced considering the total of 15 hours defined for the theoretical component.

The practical component of the course consists fundamentally in the development of a business plan that allows students to present a new business in the information technology sector. This approach allows students to be divided into multidisciplinary workgroups, and alongside with the development of the business plan, they can acquire skills in group work and the development of soft skills. According to Andrews and Higson (2008) and Suarta et al. (2017), these competencies are fundamental in the labor market.

Table 1. Profile of the students

Dimension	Absolute frequency	Relative frequency
Scientific field		
Management	32	0.4051
Computer science engineering	47	0.5949
Gender		
Male	53	0.6709
Female	26	0.3291
Age		
[18, 25]	33	0.4177
[25, 35]	22	0.2785
[35, 45]	15	0.1899
[45, 55]	9	0.1139
Years of professional experience		
0	31	0.3924
[1, 5]	16	0.2025
[5, 10]	20	0.2532
> 10	12	0.1519

The profile of the students is presented in Table 1. Only the 79 students who responded to the survey were considered. The findings indicate that the majority of students, approximately 60% of students, come from BSc. in Computer Science Engineering. The gender distribution is also not entirely homogeneous because the majority of the students are male. Finally, approximately 18 to 25 years old segment has the majority of students, and approximately 40%, have no work experience. However, a total of 12 students have more than 10 years of work experience.

Survey structure and reliability analysis

A survey was designed to be distributed among students to evaluate the entrepreneurial profile, competencies, intention, and attitudes of students who attended the entrepreneurship course. The HEInnovate framework was used to establish the survey dimensions, sub-dimensions, and questions. The survey is organized into two main dimensions (see Table 2): (i) entrepreneurial competence; and (ii) entrepreneurial intentions and attitudes. The "entrepreneurial competence" dimension is composed of three sub-dimensions: (i) ideas and opportunities; (ii) resources; and (iii) into action. These sub-dimensions seek to explore several types of key competencies for the entrepreneurial activity, such as the ability to identify new business ideas, analyze the sustainability of these ideas, the entrepreneur's technical capacity to manage a new business and to find the right people to the project, or the capacity to deal with uncertainty and risk. The "entrepreneurial intentions and attitudes"

dimension explores four perspectives: (i) entrepreneurial intentions; (ii) entrepreneurial desirability; (iii) general entrepreneurial attitudes; and (iv) entrepreneurial feasibility. In total, the survey has 16 items. The idea was to have a relatively short questionnaire to motivate students to fill it in and that could be completed in less than 15 minutes. This was also a relevant aspect to obtain a high response rate (i.e., 85.87%).

Table 2. Survey structure and associated questions

Dimensions	Sub-dimensions	Questions
Entrepreneurial competence	Ideas & opportunities	Q1. Identify opportunities for value creation within your field of expertise
		Q2. Come up with new and different solutions
		Q3. Assess the social and ecological impact of your ideas
		Q4. Apply sustainability values to your own practice
	Resources	Q5. Perform tasks that you are unfamiliar with
		Q6. Continue to work on tasks despite setbacks and failures
		Q7. Find the right people to assist you in various tasks
		Q8. Estimate a budget for a new project
	Into Action	Q9. Be the one who takes the initiative
		Q10. Deal with uncertainty when implementing new activities
		Q11. Work with many different people
		Q12. Look for new opportunities to develop new knowledge and skills
Entrepreneurial intentions and attitudes	Entrepreneurial intentions	Q13. My goal is to become an entrepreneur
	Entrepreneurial desirability	Q14. My goal is to be my own boss
	General entrepreneurial attitudes	Q15. Entrepreneurship is negative or positive
	Entrepreneurial feasibility	Q16. I'm able to start my own company

Cronbach's Alpha test was used to determine the reliability of the survey dimensions. The results obtained using the SPSS indicate a Cronbach's Alpha of 0.815 for the "entrepreneurial competence" dimension and 0.729 for the "entrepreneurial intentions and attitudes" dimension. These values are higher than 0.7, as suggested by Taber (2018) to ensure a good internal consistency of the items.

RESULTS

Table 3 presents a descriptive statistical analysis of the survey conducted among students. In this sample, only the 79 students who answered the survey were considered. For this purpose, the mean, standard deviation and the difference between the averages (delta) recorded before and after attending the entrepreneurship course were calculated.

Table 3. Descriptive statistical analysis of the findings

Sub-dimension	Mean		Mean		Delta
	Before	After	Before	After	
Ideas & Opportunities	4.3	6.7	0.456	0.389	2.4
Resources	4.4	6.6	0.396	0.382	2.2
Into Action	4.8	7.2	0.375	0.397	2.4
Entrepreneurial intentions	4.3	5.1	0.780	0.729	0.8
Entrepreneurial desirability	4.4	5.1	0.725	0.716	0.7
General entrepreneurial attitudes	6.4	8.1	0.455	0.394	1.7
Entrepreneurial feasibility	4.0	6.8	0.679	0.491	2.8

It can be assessed that there was a significant and relatively homogeneous evolution in the development of entrepreneurial competencies in its three sub-dimensions and, consequently, we can answer RQ1 and reveal that the entrepreneurship course improved the key entrepreneurial competencies of students. However, in the "entrepreneurial intentions and attitudes" dimension there is great heterogeneity in the obtained findings. Nevertheless, the results obtained allow us to address RQ2 and conclude that there was a relatively marginal evolution of the entrepreneurial intentions and attitudes of students. Additionally, there has been a very significant evolution especially in the perception of entrepreneurial feasibility.

An analysis of the linear correlation between the Average Development of Skills (ADS) recorded after attending the entrepreneurship course and the Grade Point Average (GPA) obtained by the student was also performed. The GPA was obtained from the students' final grades in the entrepreneurship course and converted to a scale of 1 to 10. ADS and GPA both follow a linear and standardized scale. With this approach, the authors sought to explore the impact of the evolution of students' academic performance in the perception of the development of entrepreneurial skills and attitudes. The findings revealed a Pearson correlation coefficient equal to 0.338 and a determination coefficient (R^2) equal to 0.114. Following the reference adopted by Triola (2017), it can be concluded that the correlation between the two dimensions (ADS and GPA) is weak and only 11.4% of the variance is explained by the model. This correlation is residual and, therefore, the results are consistent with the findings obtained by Johansen (2014) that revealed that teaching entrepreneurship has no impact on the academic performance of students. This evidence is important in concluding that students with higher GPA values are not always the most prepared and skilled to become an entrepreneur.

The authors also explored the effect of students' profile on the findings. For this purpose, an analysis of variance (one-way ANOVA) was performed considering each students' characteristics as proposed in RQ3, which results are summarized in Table 4. The following variables were tested: (i) gender equal to male; (ii) age between 45 and 55 years old; (iii) years of experience is higher than 10; and (iv) scientific field from the management course. The application of ANOVA becomes possible when the observations are independent, the groups compared are independent and have the same variance, and the errors are independent and come from a normal distribution (Triola, 2017). Fulfilling the required conditions through the collection of data based on a survey, a significance level of 5% was defined (α=0.05) in the interpretation of the results.

Table 4. ANOVA analysis considering students' profile

Sub-dimension	Sig.			
	Gender = M	Age = [45, 55]	Years of experience > 10	Scientific field = Management
Ideas & Opportunities	0.698	0.379	0.279	0.672
Resources	0.582	0.315	0.218	0.730
Into Action	0.421	0.467	0.359	0.278
Entrepreneurial intentions	0.832	0.098	<1e-3	0.645
Entrepreneurial desirability	0.810	0.023	<1e-3	0.523
General entrepreneurial attitudes	0.245	0.185	0.159	0.189
Entrepreneurial feasibility	0.421	0.002	<1e-3	0.399

The findings suggest that there are no behavioral differences for students considering their gender and scientific field. Therefore, students of both genders show similar entrepreneurial propensity and attitudes regardless of their course of origin. Students coming from the management course have similar behavior as students from the information technology course. However, this is no longer the case for a student's age and years of experience, in which in some dimensions there are significant differences in behavior, such as "entrepreneurial intentions", "entrepreneurial desirability" and "entrepreneurial feasibility". It is important to analyze these results from two perspectives. Older individuals are also those with more experience, hence the interpretation of the results of these two variables should always be carried out together. Secondly, students with greater professional experience have higher values of entrepreneurial intention and desirability. Likewise, it is also these students who have a more accurate perception of entrepreneurial feasibility.

DISCUSSION

In general, the main objective of the entrepreneurial feasibility analysis is to determine whether a business idea is viable. This was a topic in which students had an unclear perception of how this indicator could be determined or assessed, which increases their perception of the high risk associated with an entrepreneurship project. It was therefore important for students to understand that the feasibility of a business data can be previously analyzed, even though the feasibility analysis of an entrepreneurship project has a high risk according to studies conducted by Magnani and Zucchella (2018) and Pomerol (2018). However, this process is also important for the entrepreneur to obtain more accurate and detailed information about his/her business to make a conscious decision. Students were asked to analyze the feasibility of a project from multiple perspectives, as proposed by Kuratko (2016), which includes the analysis of the entrepreneurs' profile according to the business needs (i.e., entrepreneurial feasibility), market potential of a new business (i.e., external feasibility), technical capacity and adequacy of available technologies (technological feasibility), quality of production processes (i.e., operative feasibility), and capacity to obtain financial resources at the beginning of the project and also over time (i.e., economic and financial feasibility).

From another perspective, the "entrepreneurial intentions" and "entrepreneurial desirability" sub-dimensions were those that recorded a smaller increase, in both cases below 1 value. The findings obtained by Fayolle and Gailly (2015) and Gerba (2012) could not be fully verified since the students' motivation

and intention after attending the entrepreneurship course was not significantly improved. Only the general entrepreneurial attitudes component showed a very positive behavior, which is in line with the model advocated by Vázquez et al. (2011) and Sousa (2018), who argues that one of the fundamental objectives of entrepreneurial education should be to increase creativity, leadership, teamwork skills and decision-making initiative, which are important for the labor market, regardless of whether the students are entrepreneurs or not in the future.

The role of professional experience in the development of entrepreneurial intentions and attitudes has been sporadically analyzed by some previous studies. We highlighted the work carried out by Parker (2009) and Rider et al. (2013) that the work experience is a key determinant of entrepreneurial transition. However, both studies do not look at the perspective of entrepreneurial education. Another relevant study exploring the role of experience in the process of entrepreneurial learning was conducted by Gabrielsson and Politis (2012) with a panel of 291 Swedish entrepreneurs, established a link between career experience and the development of entrepreneurial knowledge and also concluded that professional experience helps entreprenuers in the process of generating new business ideas. The results obtained in this study indicate that students with greater experience have greater intention and desirability to create their own business, although the specifics of the students' professional experience were not explored, namely whether they held technical or managerial positions.

CONCLUSIONS

Entrepreneurship education has enabled students to develop entrepreneurial skills that are both fundamental in the process of planning and establishing a start-up, but also of great importance for the labor market. The findings led to the conclusion that students developed skills in the process of identifying new business opportunities, in valuing ideas, in the planning and management process, and also in managing uncertainty. Furthermore, entrepreneurship education fostered financial literacy and the process of learning through experience, since the teaching process based on the conception of new businesses for the Information Technology (IT) field promoted interaction between students from multidisciplinary areas and increased their motivation and perseverance.

The entrepreneurship course also allowed assessing the evolution of students' entrepreneurial intentions and attitudes. In this dimension, the results were contradictory and reflected some characteristics of the students who attended this course. Unequivocally the entrepreneurship course promoted a greater perception of entrepreneurial feasibility among students and also contributed to the development of general entrepreneurial attitudes. However, the development of entrepreneurial intentions and desirability was relatively residual. In this sense, it is suggested that entrepreneurial education should be carried out in conjunction with other initiatives to bridge the gap between the classroom and the business market, such as the involvement of incubators or technology parks. Through this approach, entrepreneurial projects with the greatest potential could be more quickly migrated to the business market. It also appears that the age of the students and the number of years of experience are two factors that significantly

affect their desire and motivation to create their own business. These students have a higher perception to identify the entrepreneurial feasibility of a new business.

This study has substantial theoretical and practical contributions. From a theoretical perspective, it explores the role of professional experience in the development of entrepreneurial intentions and attitudes through the teaching of entrepreneurship. Students with more professional experience, even though many of them have stable employment contracts, manifest greater intention and desirability to create their own business. This means that previous knowledge in a specific technical field and practical management expertise increase the propensity of these individuals to launch a startup. In the practical component, this study describes the process of developing a course of entrepreneurship that is attended by multidisciplinary students from the scientific areas of management and computer science. This model can be replicated by other educational institutions that intend to offer entrepreneurship training that encourages the emergence of new businesses in the IT field. Furthermore, the model can be extended to other business areas in other engineering fields. The same assessment model could be adopted, with only the group work dynamics and the potential assessment models of each prototype being reviewed. The holistic approach provided by HEInnovate enables its adoption in a very diverse set of scenarios and contributes to change the paradigm that teachers and students look at entrepreneurship.

One of the main limitations of this study is the number of students considered in this sample since this course has been running only since 2017. Another limitation is that the results of this study do not explore the role of the course structure (e.g., syllabus, number of contact hours, the profile of the teachers) in the process of developing competencies and motivation for entrepreneurship. In this sense, and as future work, the authors intend to consider and test various models of an entrepreneurship course structure. Additionally, it would be relevant to explore in greater detail the role of professional experience, particularly if this is a factor that on the one hand promotes the emergence and establishment of new start-ups, but that can also reduce the diversity of these business ideas, considering the professional profile of their promoters.

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