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Research Article

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## Impact of Entrepreneurial Education Programs on Total Entrepreneurial Activity: The Case of Spain

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### ABSTRACT

There is a need to evaluate entrepreneurial education programs (EEPs) to see the impact they have on a country's development. Previous work has focused mostly on entrepreneurial intentions, mainly in a university context. Additionally, literature reviews on the impact of entrepreneurial education have not yet been conclusive, mainly due to the use of subjective indicators and a low consideration of objective indicators. The purpose of this article is to respond to some of these challenges. Specifically, this study used an objective indicator, Total Early-Stage Entrepreneurial Activity (TEA), in a non-university context. A database was created that included programs categorized by autonomous communities. The analysis showed that EEPs significantly influenced the entrepreneurial activity of autonomous communities. This implies that entrepreneurial education should be a prioritized objective in the educational policy of these communities. The recommendations derived from these results are, among others, to promote role models, continue supporting the financing of entrepreneurial initiatives through education and training, continue implementing government policies to support entrepreneurship, and carry out evaluations on the impact that these programs have on skills acquired in the short and medium terms, as well as their maintenance over time.

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## 1. INTRODUCTION

Education on entrepreneurship in the Spanish educational system follows the European strategy, which favors developing an entrepreneurial culture. The Organization for Economic Co-operation and Development (OECD) and the European Council (2006) have proposed strategies to improve methodologies in schools, giving more opportunities for students to acquire key competencies for life, among them promoting a sense of initiative and entrepreneurial spirit. Entrepreneurship education is a pedagogical response to the times and economic, social, and political challenges imposed by job markets (Gibb2007; Saptono2018).

This type of education aims to develop key competencies (Area et al.2012) associated with specific learning, as indicated in the Eurydice Report (2012) on education for entrepreneurship in educational centers. This report emphasized that it is essential to promote skills, knowledge, and attitudes for the development of an entrepreneurial culture in Europe.

These skills and knowledge in entrepreneurship must provide practical, meaningful knowledge that can be applied in new work environments and that respond to the new demands required by society (Confederación Española de Organizaciones Empresariales2017). With this, a competency-based educational approach becomes the link between employment and progress. This is what today challenges demand from labor markets: practical knowledge and competent entrepreneurs. Entrepreneurial skills are developed in specific programs adapted to their corresponding educational level. This is an idea that has been assumed by all countries committed to entrepreneurial education (Sánchez-García and Hernández-Sánchez2015). Spain has not been

unaware of this situation. The Spanish education system is transferred to the different autonomous communities that compose it, which means programs in entrepreneurial education taught in one community may differ from those taught in another. Systematic studies are required on these programs, as well as on their dissemination, since the practices being developed in entrepreneurial education are not well known. The dissemination of knowledge is important, given that it can allow for benchmarking in other communities. The literature shows that there have already been works that have tried to respond to this need (Alemany et al.2011;Deveci and Seikkula-Lein2016;Oksanen et al.2018), although they are scarce.

Another problem found when analyzing entrepreneurial education programs is the scant analysis of their effectiveness. To what extent do entrepreneurial education programs actually promote entrepreneurship? Do countries with more entrepreneurship programs have more entrepreneurs?

The literature is scarce and presents certain contradictions. This topic has been researched in Spain (Sánchez2011), as well as in other countries, such as Indonesia (Gustomo2018;Marliyah2018), Bulgaria (Cardoso et al.2018), Hong Kong (Chi-Kim2008), Bahrain (Sarea and Hamdan2018), and Turkey.

Thus, the objective of this article is to analyze the impact of non-university entrepreneurial education programs on the total entrepreneurial activity rate in Spain. This work provides two important contributions. First, it compiles the programs on entrepreneurship education developed in Spain. Some previous studies have described entrepreneurial education programs (Maritz and Brown2013;Maritz2017), but usually did so in the university context (Hasan et al.2017) and, specifically, in the business field (Fayolle et al.2011;Musteen et al.2018), or in specific programs promoting entrepreneurship in other areas (Lans et al.2013;Barba-Sánchez and Atienza-Sahuquillo 2018). There have been a few studies that have developed a comprehensive review of programs in entrepreneurial education at non-university educational levels (Sánchez2011).

The challenge presented in this paper was to collect as much as possible of the existing programs on entrepreneurship education being developed in Spain at the non-university level. This challenge has been addressed in a similar way in other works (Duval-Couetil2013). However, these studies were specifically designed to describe the programs, with a limited time frame and without analyzing the impact that these programs can have on the level of entrepreneurship across the region. Consequently, a clear contribution of this article is extending temporal limitations (the programs analyzed were programs that currently are being developed) in the analysis of these programs.

Second, this paper analyzes the impact of the entrepreneurial education programs collected. There have already been previous works that have analyzed the impact, but they did it on entrepreneurial intentions (Rojas et al.2013;Kritskaya2016) and mainly in a university context (Wu and Wu2008;Fayolle et al.2011;Zhang et al.2014,2015). On the other hand, a literature review on the impact of entrepreneurial education has not yet been conclusive (Lee et al.2005;Fayolle and Benoit2008;Martin et al.2013).

The structure of the article is the following: Section 2 presents a general theoretical framework on entrepreneurship education followed by a more specific framework for entrepreneurial education programs. Section 3 describes the methodology. Section 4 presents the results and the discussion.

Lastly, some conclusions and future work are presented in Section 5 finalized by pointing out the limitations of this study.

## 2. LITERATURE OVERVIEW

### 2.1. Entrepreneurial Education

It is common in articles on entrepreneurship to start the discussion on its importance in the economic and social development of a country. We are not going to do any less. Indeed, in the last decades, the subject of entrepreneurship has gained considerable relevance (Fontenele2010;Parra 2013) in the academic and professional fields. All of this has been due, fundamentally, to it being considered part of the solution to current economic situations (White and Reynolds1996;Storey1999Audretsch and Thurik2001;Reynolds et al.2005) and a driver of social development and innovation in a country. Given this scenario, many governments have implemented policies, strategic plans, and programs aimed at strengthening and developing entrepreneurship.

We can summarize the importance of today's entrepreneurship with the following aspects: (A) It improves the economy. Enterprise is a synonym for pursuing financial growth. The majority of entrepreneurship is done to obtain higher economic stability. It follows logically that, if a country has a high entrepreneurship rate with dedicated, high-quality entrepreneurs, this will result in a country high on productive enterprises. This means that this can potentially strengthen its economic stability, even more so if it also exports its goods. (B) Innovation: This leads to new products and, although not all new business needs to be innovative, entrepreneurs aim to become so more as each day passes. If there were no entrepreneurs, innovation would not be possible: Who would take the initiative to do it? (C) Improve society's development: Competitiveness leads entrepreneurs to

improve their products or services, meaning they also improve the quality of development within a society. (D) Entrepreneurs also focus on solving problems, or at least making them easier to solve: Only satisfied clients can bring profit. Because of this, entrepreneurship also brings solutions to many problems that otherwise would be hard or nearly impossible to solve. This means entrepreneurs not only benefit themselves, but also the rest of society.

Many studies have shown the relationship between the economic development of a country and its capacity to create new businesses and jobs (Holmgren and From2005Wennekers et al.2005Van Praagand Versloot2007; Álvarez et al.2014). The European Commission has referred to entrepreneurial activity as the backbone of Europe, as it represents 99% of all business in Europe and is responsible for 85% of new jobs and two-thirds of total employment in the private sector in the European Union. In summary, entrepreneurial activity represents one of the most important engines of economic growth, being the force behind the creation of any new company, the growth of existing ones, and a large part of employment creation.

To this economic and social interest, we must also add the interest reflected in the educational field. Entrepreneurial education (EE) has been, and still is, a subject of debate in the international sphere. For example, for some time now the European Union has recommended to its member states that they carry out specific actions to promote entrepreneurship among students. Currently, one can find documents and recommendations that call on public authorities, business associations, and schools, etc., to promote entrepreneurship in education. This is mainly because, first, EE is seen as one of the main drivers of innovation, competitiveness, and economic and social development (Carree and Thurik2003;VanStel et al.2005;Wennekers et al.2005;Amor ós et al.2016); and second, because EE assumes that –entrepreneurs can be made, i.e., that entrepreneurship can be taught and that it is possible to learn to be an entrepreneur (Erikson2003). In other words, entrepreneurial skills can be acquired and are not fixed traits of a personality (Vaziriet al.2014).

For a summary of the debates and recommendations done on EE, one can find the Nice forum from 2000, where a report was realized that highlighted as objectives for EE (especially in primary and secondary education) the following:

- Promoting problem-solving skills which means improving the capacity for planning and decision-making, as well as the willingness to acquire responsibilities. These are normally included in management skills;
- Cooperating, networking, and learning to assume new roles, which are related to social competencies;
- Developing self-confidence and the motivation to act and learning to think critically and independently, which relates to personal competencies;
- Developing personal initiatives, creativity, and proactivity, which prepares people to face risks.

These are typically regarded as entrepreneurial skills.

There have also been recent reports that have tackled EE, such as –Rethinking educationl (2012), the –Entrepreneurship 2020 Action Planl, the –Eurydice Reportl (2012), –Entrepreneurship Education: A Road to Successl, –Entrepreneurship Education at School in Europe, and –Taking the future into their own hands: Youth work and entrepreneurial learningl, among others, all collected on the website of the European Union (<http://europa.eu>). All of them have expressed a clear need to define and describe entrepreneurial activity as a competency, to develop its components in terms of knowledge, skills, and attitudes, and to offer the appropriate tools to effectively develop and assess it.

This means being an entrepreneur is seen as a key, transversal competence that is necessary for society and that facilitates employability, mainly of young people (European Commission Eurydice 2016). Hence, the need to promote this competency, in its aspects of knowledge, skills, and attitudes through specific programs on entrepreneurial training, is advocated by different authors (European Commission Eurydice2012;Greene and Brush2014;Gielnik et al.2015;European Commission Eurydice2016;Paço et al.2016;Papagiannis2018).

In the case of Spain, several initiatives have already been developed during the past few years on the creation of business in secondary education and on vocational training centers in many autonomous communities. Some of them collaborate with each other, or even share methodology and educational materials, as is the case with the EmpresaJovenEuropa (EJE) and Emprender en mi Escuela (EME)Programs created by Valnalón in Asturias and implemented in many other autonomous communities. There has also been important work being done by the Junior Achievement Foundation since its establishment in Spain back in 2001: It collaborates directly with schools throughout Spain in order to prepare and inspire young students to have success in a global economy, generating entrepreneurial spirit through different educational activities and competitions.

The sum of these and other experiences was the starting point of –Promotion of the Entrepreneurial Spirit in School (Spanish: Fomento del EspírituEmprendedor en la Escuela) (High Council of the Chambers of

Commerce and the Ministry of Education, Social Policy, and Sport (2009)), which analyzed the situation in Spain, reflecting on some experiences and good educational practices, such as the work of Sánchez-García et al. (2013), Bernués et al. (2013), Soria-Barreto et al. (2016), and Sousa (2018).

Taking these references as a framework and identifying and reviewing existing good practices as well as their updates (Sánchez-García and Hernández-Sánchez 2015), we reached the following conclusions:

- The Organic Law of Education (LOE) decides when EE programs are systematically introduced, especially in teaching of vocational training cycles;
- The initiative to implement these programs comes from the educational centers themselves, meaning their own administrations are the ones responsible for arranging partnerships and obtaining resources for EE from other private entities;
- There are a good number of curricular and extracurricular activities in all autonomous communities;
- There is not enough horizontal information (between teaching centers, between autonomous communities) in relation to existing experiences in EE;
- There are hardly any studies that have assessed the impact of these programs either on students' entrepreneurial intentions or on the economic and social development of a country.

This paper tries to respond to this last point, therefore analyzing the impact that EE programs have on entrepreneurial activity across the country, in this case its autonomous communities.

## 2.2. *Impact of Entrepreneurial Education*

One of the assumptions underlying EE is that entrepreneurial skills can be taught and are not fixed personality traits. EE programs aim, among other things, to teach how to put theory into practice. In this way, they assume that students gain confidence and motivation, are more proactive and creative, and learn to work in teams, all of which are important in business creation.

These programs can influence variables related to entrepreneurial intentions and therefore can be designed and assessed according to their impacts on the attitudes and intentions participants express toward entrepreneurial behavior. Some studies have argued that models of intention can be used as pedagogical guides and as tools for evaluating educational actions whose purpose is to develop entrepreneurial skills (Shapiro and Sokol 1982; Krueger et al. 2000; Audet 2004). It has also been argued that these programs, as learning objectives, promote entrepreneurial self-efficacy and entrepreneurship perception, as well as impact the creation of an entrepreneurial mentality (Aliaga and Schalk 2018).

Given these potential benefits of EE, it is not surprising that a multitude of programs have emerged that value and try to put into action these objectives. For example, Hasan et al. (2017) have recognized that EE impacts both students and society. However, despite the importance of these programs and their widespread use, there is a lack of understanding of their effectiveness. Evaluating the learning outcomes of EE is essential to determine the degree to which skills, attitudes, and business knowledge are successfully developed in the classroom, although this has been understudied (Duval-Couetil 2013) given the challenge that it represents.

It is true that evaluating EE programs has proven to be a challenge because of the complexity of the education system, the multiplicity of programs, the differences between countries, etc. In addition, the most visible results, such as starting a business, only materialize several years after the educational intervention and, therefore, require a longitudinal evaluation. To these challenges we can add others, such as whether the results of learning are significant and real, the allocation of resources for these programs, the assessment of the programs themselves (Nwambam et al. 2018; Devenci and Seikkula-Lein 2016), etc. These difficulties should not limit the need to study and to truly know the impact that EE programs have, since teachers, professionals, and government entities must know, in the short term, how they influence their students in order to adjust and improve their teaching tools and methods; and, in the long term, how to analyze employability, entrepreneurial spirit, and other economic and social impacts of the programs. Entrepreneurial education is perceived as one of the key challenges in modern educational systems, as well as for socioeconomic growth and development (Wach 2014). It also has a key role in supporting entrepreneurial spirit in youth (Rantanen et al. 2015). This perceived impact of entrepreneurship education in countries outside of Spain is either weak or average, but some authors have argued it could improve when including tertiary education (Wach and Wojciechowski 2016; Sarkar and Perényi 2017).

Empirical evidence on the impact of EE has not reached definitive conclusions, as recent reviews have suggested both positive and negative effects (Dickson et al. 2008; Thompson and Scott 2010; Fayolle 2013; Martin et al. 2013; Nabi et al. 2017). These have tended to argue that the contradictory results found have largely been due to methodological limitations (such as the use of cross-sectional questionnaires, a lack of control groups), contextual factors, the variety of methods and pedagogical interventions used, as well as a focus on subjective impact indicators (for example, entrepreneurial intention) and a lack of objective indicators, as manifested in the review of Fellnhöfer (2019).

The work we present here seeks to respond to some of the challenges that the literature has shown, such as the use of objective measures to assess the impact of EE programs. Specifically, this study uses one of the criteria used in the Global Entrepreneurship Monitor (GEM), Total Early-Stage Entrepreneurial Activity (TEA), which takes the characteristics of the entrepreneurial dynamics of a country and measures all existing entrepreneurial initiatives of less than 3.5 years in the market (in our case, in the autonomous communities considered). We understand that this work provides added value to the field of knowledge from an angle seldom studied: the relationship between EE programs and the rate of entrepreneurial activity. Based upon the literature review explained before, and the arguments stated here, our hypotheses were the following:

**Hypothesis 1.** There is a significant relationship between EE programs and TEA.

**Hypothesis 2.** EE programs determine the TEA in each of the autonomous communities considered.

### 3. RESEARCH METHODS

The objective of our research was to analyze the training programs of Spain’s autonomous communities and their average rate of entrepreneurial activity and to evaluate the influence that these entrepreneurial education training programs have on their rate of entrepreneurial activity.

#### 3.1. Sample Selection

Spain is comprised of 17 autonomous communities and two provinces, Ceuta and Melilla. Contact was made by telephone and e-mail with the main institutional representatives, center directors, and technicians who are most directly involved in the development and implementation of formative and educational programs of entrepreneurial education at different educational levels.

The institutions, organizations, and centers contacted were the Ministry of Education; universities; Chairs of Entrepreneurship; Education Councils; General Directorates of Vocational Training; the Ministries of Industry, Innovation, Economy, and Employment; Economic Development Institutes; European Centers for Enterprise and Innovation (ECEIs); entrepreneurship support entities; provincial councils; town halls; local and regional development agencies; rural development groups; Chambers of Commerce; banks; foundations; associations; companies; media; federations of entrepreneurs; young entrepreneurs associations (YEAs); schools; and federations of schools, teachers, and independent promoters. A total of 250 institutions were contacted, and 96 responded (which means the response rate was 38.4%). They represented all autonomous communities (Table1).

**Table 1.** Participating entities by region.

Participating Entities by Region	No.
Andalusia	5
Aragon	2
Cantabria	6
Castilla La Mancha	5
Castile and Leon	2
Catalonia	21
Community of Madrid	15
Valencian Community	5
Extremadura	2
Galicia	2
Balearic Islands	2
Canary Islands	3
La Rioja	3
Navarre	2
Basque Country	9
Asturias	6
Region of Murcia	6

#### 3.2. Instruments and Materials

A total of 200 questionnaires were distributed. This questionnaire was original and was created for this study. Two methods for data collection on the existing programs in entrepreneurial education in the autonomous communities were used, both online. First, four types of online questionnaires were created through the application of Google forms, a component of Google Drive. Each questionnaire corresponded to a specific type of program: (1) student programs, (2) teacher training programs, (3) work programs with parents or families, and

(4) programs in vocational training centers. Second, for those entities that, due to technical problems, could not complete the online questionnaire (that being the case, they notified us), we had the same online questionnaire in Word format.

In each of these questionnaires, different variables were considered in accordance with the targeted program. In all the questionnaires, an open question was placed at the end so that respondents could leave their suggestions and provide complementary documentation. The variables included were the following:

a) Education level. This comprised of seven response options about non-university study levels: infant/primary, secondary, baccalaureate, vocational training, adults, nonregulated, and others (such as Special Education);

b) Program Type. This comprised of six response options related to the course type included in the program: mandatory, optional, during class hours, outside of class hours, mixed (during and outside class hours), and others;

c) Entrepreneurship Type. This comprised of six response options regarding the different types of entrepreneurship that could be included in the programs: business, social, business and social, innovation, art and culture, and others;

d) Hours by academic year. This comprised of five response options about the total hours per academic year dedicated to the program: less than 10 hours, 11 to 34 h, 35 to 70 h, 71 to 100 h, and more than 100 h;

e) Number of students. This referred to the total number of students enrolled since the program started;

f) Language. This comprised of six response options referring to the language used in the program: Spanish, Euskara, Catalan, Galician, English, and others;

g) Country. This comprised of four response options referring to the program's country of origin: Spain, Great Britain, the United States of America, and others;

h) Exportation. This referred to whether the program was administered in a geographical location other than its origin, such as in other countries or regions. If the answer was yes, we requested an estimation of the number of students that had participated since the program started, as well as those in the latest academic year;

i) Institutions involved. This comprised of eight response options referring to the institutions involved in making the program possible: the Ministry of Education, the Ministries of Industry/Economy/Employment, the city council, the management team, the educational center, professors, and groups of professors;

j) Student/Environment relationship. This comprised of five response options related to the means used by students to learn competencies: institutional visits, participation and/or expositions through markets, visiting banking entities or enterprises, marketing studies, and others;

k) Teacher training. This referred to whether there existed any teacher training program. If yes, we requested the provision of information about the program;

l) Teaching personnel. This comprised of four response options regarding the personnel in charge of imparting the program: professorship within the education center, professorship outside the education center, volunteers, and others;

m) The year when the program started;

n) Teaching materials used in the program. This comprised of four response options: textbooks and/or journals, webpages, blogs, social networks, and others;

o) Evaluation. This referred to whether any type of evaluation of the programs had been carried out. If the answer was yes, we requested an explanation of why and how it was done;

p) Competency assessment. This measured the degree to which the program had led to the development of the following twelve competencies self-confidence, initiative spirit, creativity, perseverance, time and task management, problem-solving and decision-making skills, risk/uncertainty management, opportunity assessment, leadership skills, teamwork, communication skills, and networking skills. Responses were measured using interval metrics with a Likert scoring of five points, ranging from -low to -high development. Table 2 specifies the aforementioned variables.

### 3.3. Data Gathering

Data collection lasted four months, from September to December. We collected more programs after this date that will be included in later studies, since we had a deadline established due to time constraints. A formal letter was prepared with a detailed description of the study, in which collaboration was solicited. The letter included the URLs for the online questionnaires we created, so that they could be answered by the different collaborating entities. In those cases in which the corresponding hyperlink could not be opened, a Word

document was sent via e-mail, and we proceeded afterwards to enter the answers into the online format, as this allowed us to have all the information collected in a single format and thus facilitated the subsequent analysis.

**Table 2.** Variables used in the study.

Variable Name	Response/Alternatives
<i>Education level</i>	Infant/primary, secondary, baccalaureate, vocational training, adults, nonregulated, and others (such as special education)
<i>Program Type</i>	Mandatory, optional, during class hours, outside of class hours, mixed (during and outside class hours), etc.
<i>Entrepreneurship Type</i>	Business, social, business and social, innovation, art and culture, etc.
<i>Hours by academic year</i>	Less than 10 hours, 11 to 34 h, 35 to 70 h, 71 to 100 h, more than 100 h
<i>Number of students</i>	Place number
<i>Language</i>	Spanish, Euskara, Catalan, Galician, English, etc.
<i>Country</i>	Spain, Great Britain, the United States of America, others
<i>Exportation</i>	Yes/no
<i>Institutions involved</i>	Ministry of Education, Ministries of Industry/Economy/Employment, city council, management team, educational center, professors, and groups of professors
<i>Student/environment relationship</i>	Institutional visits, participation and/or expositions through markets, visiting banking entities or enterprises, marketing studies, etc.
<i>Teacher training</i>	Yes/no
<i>Teaching personnel</i>	Professorship within the education center, professorship outside the education center, volunteers, etc.
<i>Year when the program started</i>	Place number
<i>Teaching materials used in the program</i>	Textbooks and/or journals, webpages, blogs, social networks, etc.
<i>Evaluation</i>	Yes/no
<i>Competence assessment</i>	Likert scoring from one to five

### 3.4. Data Analysis

With the information collected, a database was created (using SPSS) that included the programs categorized by autonomous community (independent variable) and according to the educational level at which they were oriented. Likewise, total entrepreneurial activity (TEA) was included for each of the autonomous communities starting from 2003 and later averaged (dependent variable).

To determine the relationship between entrepreneurship training programs and the entrepreneurial activity rate, we performed correlation and regression analyses.

## 4. RESULTS

Table 3 shows the distribution of the number of programs by autonomous community and by type of program (infant/primary, secondary, Spanish baccalaureate, vocational training, and nonregulated training). Catalonia and the community of Madrid were the two autonomous communities located at the top of the rankings regarding the number of programs taught. The communities with the fewest active programs were Castile and León, La Rioja, and Navarre.

As for the programs themselves and the development of entrepreneurial skills (self-confidence, initiative spirit, creativity, perseverance, time management and task organization, problem-solving and decision-making skills, risk management/uncertainty, opportunities assessment, leadership skills, teamwork, communication, and networking), all indicated high scores. The use of webpages was the most common of the didactic materials used (present in 64 programs). Regarding the institutions involved in the development of the programs, many did not indicate who the participating institutions were, so that the data collected were not representative for this study.

The vast majority (88%) of the entrepreneurship programs were aimed at students and to a lesser extent, at teacher training (9%), family training (2%), or business incubator programs in vocational training (1%). Another highlight was the low percentage of programs (37%) that performed self-assessments of their effectiveness, satisfaction, etc.

**Table 3.** Entrepreneurship education programs by autonomous community.

Autonomous Community	Education Level					Ranking
	A	B	C	D	E	
Andalucia (14)	7	8	5	7	1	8.38%
Aragon (6)	1	4	1	3	0	3.59%
Cantabria (8)	5	4	1	2	1	4.79%
Castilla La Mancha (9)	4	4	1	2	1	5.38%
Castile and Leon (4)	1	3	1	1	0	2.39%
Catalonia (25)	10	13	6	10	1	14.97%
Community of Madrid (18)	6	10	6	9	1	10.77%
Valencian Community (7)	2	4	1	2	0	4.19%
Extremadura (6)	2	3	1	1	0	3.59%
Galicia (9)	4	5	2	3	0	5.38%
Balearic Islands (7)	2	5	0	2	0	4.19%
Canary Islands (6)	4	2	0	1	1	3.59%
La Rioja (4)	2	2	0	1	0	2.39%
Navarre (4)	1	2	0	2	0	2.39%
Basque Country (14)	1	5	4	5	0	8.38%
Asturias (15)	7	7	3	3	1	8.98%
Region of Murcia (11)	4	7	4	6	0	6.58%
Total (167)	63	88	36	60	7	
Percentage (%)	37.72	55.69	21.55	35.92	4.19	

Note: A: infant/primary; B: secondary education; C: Spanish baccalaureate; D: vocational training; and E: nonregulated training.

Regarding programs with students, more than half (55.69%) of the programs were taught in secondary education, followed by primary education (37.72%) and vocational training (35.92%). These programs were taught in the school during class hours (68%), and the type of training was in business entrepreneurship (34%) and social entrepreneurship (33%), the rest being instrumental. Regarding the time dedicated to impart these programs, most of them ranged between 35 and 70 h. In Table 4, we present descriptive statistics (mean, standard deviation), as well as correlations.

**Table 4.** Descriptive statistics and correlations.

	Mean	SD	1	2	3	4	5	6	7
<b>1. <math>\Sigma P</math></b>	30.61	11.60							
<b>2. TEA</b>	6.21	0.92	0.78 **						
<b>3. EEEP</b>	507,463	349,612.8	0.92 **	0.84 **					
<b>4. Infant/primary</b>	7.68	2.94	0.96 **	0.73 **	0.91 **				
<b>5. Secondary</b>	9.86	3.67	0.99 **	0.78 **	0.95 **	0.95 **			
<b>6. Baccalaureate</b>	4.72	1.84	0.96 **	0.69 **	0.81 **	0.87 **	0.92 **		
<b>7. Vocational training</b>	7.51	3.14	0.98 **	0.81 **	0.90 **	0.90 **	0.96 **	0.97 **	
<b>8. Nonregulated</b>	0.84	0.36	0.71 **	0.51 **	0.55 **	0.77 **	0.65 **	0.65 **	0.62 **

\*\* Correlation is significant at the 0.01 level (bilateral).

As for the regression analyses, these allowed us to observe the influence these programs had on the rate of entrepreneurial activity in their communities. At first we considered the total number of programs ( $\Sigma P$ ) and their influence on TEA (average). The regression analysis showed significance,  $R^2$  (adjusted) = 0.62,  $\beta = 0.79$ ,  $p < 0.000$ . This result showed that entrepreneurial education programs significantly influenced the entrepreneurial activity in the autonomous communities.

When considering each of these programs, the percentage of variance explained was 86%, and all showed significance. The percentage of variance explained and the standardized coefficients for each of these programs were, respectively, infant/primary:  $R^2$  (adjusted) = 0.54,  $\beta = 0.73$ ,  $p < 0.000$ ; secondary:  $R^2$  (adjusted) = 0.62,  $\beta = 0.78$ ,  $p < 0.000$ ; Spanish baccalaureate:  $R^2$  (adjusted) = 0.48,  $\beta = 0.69$ ,  $p < 0.000$ ; vocational training:  $R^2$  (adjusted) = 0.66,  $\beta = 0.81$ ,  $p < 0.000$ ; nonregulated training:  $R^2$  (adjusted) = 0.26,  $\beta = 0.51$ ,  $p < 0.000$ . Therefore, vocational training and secondary education explained the highest percentage of variance and had the most weight in relation to TEA.

Considering the independent variable (the effect EE programs (EEEP: number of students trained) had on TEA) yielded significant results, with a value of  $R^2$  Adj. = 0.71,  $\beta = 0.84$ ,  $p < 0.000$ .

In sum, the variables that showed the most relation to the entrepreneurial activity rate were the number of students trained, vocational training programs, and secondary programs. In Table5, we summarize our results.

**Table 5.**Regression analyses.

Regression Analyses	IV	DV	R <sup>2</sup> Adj.	β	p <
1	ΣP	TEA	0.62	0.79	0.000
2	Infant/primary	...	0.54	0.73	0.000
	Secondary	...	0.62	0.78	0.000
	Baccalaureate	...	0.48	0.69	0.000
	Vocational training	...	0.66	0.81	0.000
	Nonregulated training	...	0.26	0.51	0.000
3	EEEP	...	0.71	0.84	0.000

## 5. CONCLUSIONS AND FUTURE WORK

The main objectives of this article were (a) to compile existing information on entrepreneurial training programs in non-university education settings and (b) to analyze the extent to which these programs are predictors of the economic activity rate (TEA).

Regarding the first objective, this work involved an extension, deepening, and updating of previous works (Sánchez-García et al. 2017).

Regarding the second objective, we can affirm that, according to the knowledge of the authors, this was the first time that the study of the relationship between entrepreneurial education programs and the rate of entrepreneurial activity has been addressed in Spain. Until the present, most of the works that have analyzed the impact of entrepreneurial education have been limited to the university environment and have focused on entrepreneurial intentions. Faced with this criterion (which was still subjective), this work provided an objective criterion: entrepreneurial activity measured over a certain period of time, which gave a clearer picture of the role EE has in actual entrepreneurship.

The results presented in this article offer more than sufficient justification to affirm that entrepreneurial education programs are generally effective. This implies that entrepreneurial education should be a prioritized objective in the educational policy of the autonomous communities. This study shows that these programs are closely related to the entrepreneurial activity of a community: It can be deduced that, if an autonomous community is interested in increasing its TEA, it should launch entrepreneurial programs in its educational curriculum and at all educational levels. Nonregulated training obtained the least weight in relation to TEA, so it is important that this training is included within a curriculum and is not optional.

Another conclusion we can draw is to further enhance EE programs at the baccalaureate level, as this was the second variable with the least weight in the relationship with TEA. This result may be reasoned, since the vast majority of students at this level of education are more inclined to continue their education at university than to consider creating companies. This was not the case with the level of vocational training, which was the second most important variable. The typology of these students in this educational level is more predisposed to create a business than to pursue university studies, hence its relationship with TEA. It is also of interest to highlight the importance of entrepreneurial education at the secondary level. This result can be explained if we consider that at this level, due to the age range, students do not have a clear idea of their work orientation, meaning entrepreneurship training at this level is clearly important.

In summary, the main contributions that this work makes to the scientific community can be synthesized as follows:

- Existing entrepreneurial education programs in Spain's autonomous communities should be systematized.
- Entrepreneurial education programs have a significant influence on the entrepreneurial activity rate of an autonomous community.
- Faced with subjective criteria (such as entrepreneurial intention) that have been defended by a large number of authors in analyzing the influence of entrepreneurial education, this work took into consideration an objective and longitudinal criterion (the average of several years of entrepreneurial activity).

### 5.1. *Implications for Policies and Practitioners*

The recommendations that derive from the results of this work are the following:

- Change the subjects taught in class hours from optional to mandatory, since it is important to take into account talent at formative stages, such as at the secondary level, and not focus exclusively on instrumental competencies;
- Promote role models. Both parents and teachers are necessary and mandatory reference groups. Hence, promote active participation from the entire educational community as a whole, from families to educational centers and their corresponding teachers. Studies on educational excellence have indicated that success in education lies in the quality of teachers, the best guarantee that the initiatives that stimulate entrepreneurial talent achieve their objectives (Pellicer et al.2013);
- Continue supporting the financing of entrepreneurial initiatives through education and training, and continue implementing government policies to support entrepreneurship (Peña et al.2016);
- Governments must develop policies specifically targeted at promoting entrepreneurial education programs. These programs should be designed to be included within an educational curriculum, and not as optional subjects;
- Governments must opt into training teachers in entrepreneurial education. Teachers must have an appropriate curriculum and be fit to teach these programs. University centers for teachertraining must design subjects on entrepreneurship, so that necessary skills are acquired and can be transferred to students in non-university educationcenters;
- There must be a transversal and longitudinal planning of entrepreneurial education training. From the children's level to the university, specific programs must be designed to meet the specific needs of a developmental stage. Governments should establish guidelines in the design of these programs so that training is properly planned and consistent. The programs we examined were presented as isolated, unrelated to each other, and without a specific criterion for progressive knowledge development;
- It is important to adapt programs to the specific requirements and needs of the students within their developmental stage;
- Of course, evaluations should be carried out on the impact that these programs have on skills acquired in the short and medium terms, as well as their maintenance over time. If we want entrepreneurial education programs to be viable and effective, a continuous evaluation of them is necessary in order to identify both strengths and weaknesses in order to implement actions that enhance them or, where appropriate, modify them.

### 5.2. *Limitations and Future Directions*

Our study presented some limitations that should be addressed in future research. Our results demand longitudinal and transversal research to examine the impact of the programs we examined on entrepreneurial skills and entrepreneurial intention medium- and long-term. Our study focused on an analysis of these programs and their impact on the entrepreneurial activity rate of autonomous communities: It would also be desirable to consider how these programs impact the attitude of students toward entrepreneurship, how entrepreneurial skills are enhanced by these programs, as well as which of these programs at what educational level are most effective. Likewise, it would be interesting to do pretest–post-test designs with a control group that provides a good level of internal validity (better than typical cross-sectional designs), and sampling from different studies would add external validity to our findings.

In relation to EE, we suggest that future research should also study topics such as the existence of other potential benefits that derive from these programs other than those indicated in this study. For example, what do students learn about themselves and what they would like to be (self-fulfillment)? That is, do learning resources and incubation help them take a step in their intention to act?

Our study raised some questions that future research should answer. For example, researchers could ask what types of emotions students experience during a business training program, how these emotions relate to the concept of –business passion, and how emotional stimulation affects cognitive rationality, as Cardon et al.(2009) have suggested that intense emotions can hinder cognitive reality. Another important question would be how the programs we considered strengthen the decision to start a business, etc. That is, it is not enough to learn competencies, but the –neurological entrepreneurial drive in students must be developed and promoted (Florin et al.2007). These authors defined –entrepreneurial drive as an individual's perception of the convenience and viability of proactively seeking opportunities and creatively responding to challenges, tasks, needs, and obstacles in an innovative way. In this sense, this aspect should be developed and researched more in the EE context, as it would allow for understanding new antecedents of entrepreneurial intentions to create new businesses and provide a favorable climate in which entrepreneurship can flourish. Finally, we also encourage EE programs to

include components that help aspiring entrepreneurs to evaluate and develop versatility in their thinking style (Groves et al.2011).

In sum, in this work we provided what we believe is the first study of the relationship between EE programs and the rate of business activity in Spain for non-university students. Our results support the idea that the entrepreneurial activity rate of a region is influenced by entrepreneurial education programs. This is important, given the previous equivocal review of the narrative literature on the subject, particularly in light of immense growth and investment in EE on a global scale. We also provided recommendations in order to expand on the literature and improve the value of future research in EE.

### Conflicts of Interest:

The authors declare no conflicts of interest.

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