

## Article

# Sustainable Entrepreneurial Culture Programs Promoting Social Responsibility: A European Regional Experience

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**Abstract:** Currently in the European Union, regional policies and their related programs are aware of the importance of fostering social responsibility, whilst, at same time, they have to promote entrepreneurship. Promoting the culture of sustainable entrepreneurship could be the answer. In this article, the Spanish case-study of the Autonomous Community of Extremadura is analyzed to show the existing regional policies fostering voluntary educational programs devoted to entrepreneurship since 2012. In this context, a specific entrepreneurship project related to sustainability was developed in 2017–2018 in secondary schools with the leitmotiv to consider the Sustainable Development Goals from the United Nations. Using the Structural Equation Modeling method with a sample of 630 students under the umbrella of the project called Teenemprende, the study concludes by highlighting that sustainable entrepreneurial culture programs in the public educational system already have some positive effect on the students' attitude to social responsibility, thus empowering them to change the world for a better future.

**Keywords:** education; entrepreneurship; regional policy; social responsibility; sustainability; Spain

## 1. Introduction

Some authors have shown that education has a decisive impact on society to address the main challenges and opportunities brought by sustainable development. There are many specific works explaining the role of universities in fostering sustainable development [1–4]. In the same line, we can also find academic works in the field, but focused on secondary schools [5–8].

After the Millennium Development Goals (MDGs), the 2030 Agenda for Sustainable Development Goals (SDGs) is the global agenda adopted by the General Assembly of the United Nations (UN) for transforming the world towards a more sustainable future [9]. This new agenda contains 17 goals and 169 specific targets. The role of the education system in sustainable development has been clearly revealed by universal goal number four: providing inclusive and equitable education and lifelong learning opportunities for everybody.

The SDGs have been the leitmotiv of the last public program in the region of Extremadura, in Spain, fostering the culture of entrepreneurship. In line with the UN mandate, the global agenda, the aims, and themes, have been taken into account in this region for creating and developing the competing projects involved in the 2017–2018 educative regional annual program.

The main goal of this study was to assess whether the last program, that was focused on sustainability, effectively contributed to improving Social Responsibility (SR) competencies in students,

considering that, thanks to this program, they will become better responsible citizens able to improve the current regional entrepreneurial ecosystem. We should like to believe that the program that has been made will have some positive effect and bring some new competencies to these students. We address a general question: do sustainable entrepreneurial culture programs have some effect on the students' attitude to social responsibility? This study contributes to the academic literature by developing a causal model that links the development of classical competencies in students to the development of the new SR competencies for entrepreneurship. The cause-effect model is tested and validated for a program devoted to sustainability. In fact, to the best of our knowledge, it is the first theoretical model, and the first empirical case-study, demonstrating that including sustainability as the main axis of an educative entrepreneurial program is a guarantee to develop both, classical and SR competencies in students. Consequently, this work also will be useful as a good regional practice for a more responsible approach to fostering sustainability in public educational programs.

After this introduction, the article begins with an exposition of the European and Spanish background in relation to the spirit of entrepreneurship. Then, a theoretical model is presented to be tested in the next section with data from the Spanish region of Extremadura. The work ends by concluding that sustainability should be part of the culture of entrepreneurship, presenting limitations of the study and some research directions for the near future.

## 2. Context Overview

Sustainability education is already included in the best global business schools around the world, and some of them in Europe [10]. The role of universities in shaping management students' attitudes to make ethical and responsible decisions has also been recognised [11,12]. In the same line, ethics has been gradually incorporated with undergraduates, MBS and especially with working professionals, which benefit much more than others [13]. However, it is also true that sustainability is not still clearly permeating lower levels of education [14].

Related to entrepreneurship, the EU is committed to the incorporation of the spirit of entrepreneurship into the European Education System through the development of entrepreneurial competencies in students. Even universities, with the creation of the European Higher Education Area (EHEA), have undergone a significant transformation that is leading towards a new teaching and learning paradigm based on students' competencies [15–18].

The idea that student's competencies are as important as student's marks and qualifications has gained acceptance in academia [19]. In general terms, and according to the definition provided by the OECD (Organization for Economic Cooperation and Development), competence is the ability to successfully meet complex demands in a particular context [20]. It is the capability to carry out a determined function effectively. To become competent, a student needs to acquire key competencies. In other words, the student needs to acquire knowledge, skills, experience and all attributes considered necessary to carry out the expected functions. Competencies are described by Barth et al. [2] as learnable but not teachable. That is the reason to create specific programs and activities, sometimes out of the formal curricula, to create the right conditions for students to acquire entrepreneurial competencies for their future.

In 2000, the compromise of the European Council of Lisbon was to increase the investment in human capital to facilitate the creation of knowledge and to improve regional dynamism. Later, the final report of the expert group Education for Entrepreneurship [21] identified the strategic lines for promoting entrepreneurial attitudes and skills through Primary and Secondary education. At that time, efforts devoted by public administrations in promoting the spirit of entrepreneurship were not yet sufficient in most countries, and there was sometimes a lack of awareness or simply entrepreneurship was not considered as a priority. In parallel, the Council at the European Parliament in 2006 defined the personal qualities and key competencies which all individuals need for their personal fulfilment as employees and citizens in the EU [22,23]. Later in 2009, the OECD also defined key competencies for the 21st Century for young people [24]. In addition, some European reports related to entrepreneurship

were published [25,26] defending that education may include, between others, the development of personal qualities, attitudes and skills that form the basis of an entrepreneurial mindset and behavior (creativity, making decisions, communication, responsibility, risk-taking, independence, self-confidence, leadership or team spirit).

At this point, it is important to remark that the EU explicitly indicated that entrepreneurship spirit is not directly or necessary focused on the creation of new businesses; and/or specific training in how to create a business. However, the European Commission [27] published a report recognizing the growing awareness of the potential of European young people to launch and develop their own commercial or social ventures thereby becoming innovators in the areas in which they live and work. Entrepreneurship education is considered essential in the EU, not only to shape the mind-sets of young people in Europe but also to provide the skills, knowledge and attitudes that are central to developing an entrepreneurial culture related to employability.

Employability relates to unemployed people seeking work, but also relates to those in employment that are seeking better jobs with a different employer, by themselves as professionals or even looking to develop their careers within their current organizations [28]. At the moment, the general objective of the EU in relation to entrepreneurship is to encourage the development, improvement, relevance and quality of entrepreneurship education programs. In fact, at local and regional levels, employability is the foundation of many labor market policies [29]. In this context, the Spanish national definition of entrepreneurship education puts the focus on the knowledge and skills related to career and job opportunities. It also refers to financial education and the principles of business operation. Furthermore, it refers to the development of attitudes that lead to a change in the mind-set of students and contributes to the development of entrepreneurial attitudes, the ability to think in a creative way, and to manage risk and uncertainty [27].

Although there are few countries in Europe that include entrepreneurship education as part of their strategies for economic development, entrepreneurship and/or employment, one of them is Spain, with the new Act on Education in 2013 (called LOMCE). This act states that without prejudice to their specific treatment in some areas of this education level, entrepreneurship and civics and constitutional education must be delivered in all subject areas. Later, the Order ECD/65/2015 states that teaching methods have to include project-based learning, be focused on interests, case studies or problem solving and to contribute to active participation, experimentation and functional learning. The final goal is to promote the development of competences in young people, as well as to improve student motivation by means of knowledge transference.

At the regional level, entrepreneurial ecosystems consist of interacting components, in which one of them is public education policy, which fosters new firms and associated regional entrepreneurial activities [30]. In the regional context of promoting entrepreneurship, developing key competencies for sustainable development in students is needed [31–34] and it should be an added value to entrepreneurship programs. Although it has been recognized that there is little evaluation of entrepreneurship education programs outside of some output indicators [35], in order to contribute to the existing knowledge, the next section develops a theoretical model linking general competencies considered as classical or traditional, to competencies for SR.

### 3. Case-Study: The Autonomous Community of Extremadura

#### 3.1. An Initial Overview of the Entrepreneurship Issue and the Education System in Spain

A positive influence exists between entrepreneurship and the economic and social growth of regions [36–38]. The current strategy for entrepreneurship and youth employment of Spain aims to reduce the rate of youth unemployment and to deal with its structural causes by linking job creation to employability. The strategy includes actions specifically related to entrepreneurship education including the commitment to expand the curriculum content relating to entrepreneurship and career

opportunities, to implement entrepreneurship linked training programs and to promote a positive image of youth entrepreneurship [39].

This national policy ecosystem supporting entrepreneurship education is complemented at regional level, where many Autonomous Communities also have well-developed strategies. The existing seventeen Autonomous Communities in Spain offer a variety of programs on the personal, social, cultural and business dimensions of entrepreneurship education for students as they progress through the various years and stages of the education system. Thus, there are a number of specific entrepreneurial education strategies at the level of Autonomous Communities in Spain, such as Andalusia, Asturias, and Galicia. Other Autonomous Communities have entrepreneurship education linked to a broader strategy including Asturias, Extremadura, Navarra, Basque Country and Murcia. In the region of Extremadura, the education institutions are thereby contributing to the development of entrepreneurial competences (knowledge, skills and attitudes) as it will be presented in the following subsections.

### *3.2. Context: The Regional Development of Extremadura through the Culture of Entrepreneurship*

The Autonomous Community of Extremadura is a Spanish convergence objective NUTS II region characterized by being extensive and having strong rural presence. The geographical situation of Extremadura in southwest of Europe could be an obstacle to boost its national and European integration. However, in the last few years a great effort has been made to position the region in the European entrepreneurship map. For many years, the region has been committed to entrepreneurship and enterprise development as one of the pillars of its growth and convergence with other European regions. To this end, the region has always considered the guidelines marked from Europe and has adapted them to its territory. Its policies are inspired in the Small Business Act and the 2020 Entrepreneurship Action Plan [40], among many other references.

Since 2004, the Government of Extremadura has been working hard to provide an educational path to students mainly focused on the training and development of entrepreneurial skills. Against the idea that the notion of innovative and entrepreneurial behavior deals exclusively with economic phenomena, from the outset the Government of Extremadura has joined the most interesting advances in recent entrepreneurial behavior, in line with authors such as Steyaert and Hjorth [41].

The project Entrepreneurial Culture in Extremadura had its origin thirteen years ago before the economic crises started. The idea arises with the objective that everybody of all ages could enhance their entrepreneurial skills to convert them into capabilities and competencies. Based on creative and innovative approaches, and through sustainable and comprehensive proposals, the project seeks to add values to the teaching-learning process to promote active and dynamic societies based on knowledge.

Moving on from the European and the Spanish framework to the most specific legal regional context of Extremadura, the current Educational Act of Extremadura was the result of the political initiative and the active participation of the high majority of social and educational institutions in the region. According to González [42], it was a good opportunity to set up an educational model that was capable and promising, conciliatory, open to new trends, fair and socially cohesive. The challenge was to serve as a global exponent of progress towards diversity with a clear intercultural perspective to serve the purposes of our uncertain postmodern society.

Related to the topic of entrepreneurship, the mentioned educational guidelines of the region include emotional intelligence and entrepreneurial capacity as basic competences for students' development. This indicates the promotion of change in society. The development of the creative and enterprising capacity of students is one of the purposes that the educational system of Extremadura should pursue. There is a progressive change in the focus of objectives from the development of personal entrepreneurial competences in the first stages of education, towards the acquisition of specific skills related to the creation and running of companies in lower and upper secondary education (both general and vocational).

There are other actions related to the entrepreneurship culture promoted by the public administration in the region such as the inclusion of voluntary courses on the topic in all levels of the educational system. Teachers are also invited to participate in special training programs for them in order to develop their entrepreneurial skills and to learn how to promote this culture in the classroom. The Regional Government of Extremadura, in a creative and coordinate way, offers young people a rich combination of tools, activities, training courses and workshops for developing their vital project, for creating collective values and for being the protagonist of their near future at the whilst they contribute to the development of the region.

There exists a real and fruitful strategy that works involving different departments from the regional public administration, called *Young Initiative*. This strategy takes place against a philosophical backdrop where individuals are the focus of attention [43]. The program *Young Initiative* allows the introduction of the entrepreneurship spirit into the educational system to promote the talent of students. An attractive itinerary has been created and developed along the formal curriculum, from primary school to higher education, with the aim to foster the individual capacity of students to be creative, to be able to imagine a different world, with equality, solidarity, inclusive, sustainable, and is, in all, a better world. This commitment is for schools, teachers and students, but also attains to the family, other public institutions, firm managers, entrepreneurs and other social agents that work for promoting regional development.

All current programs under the umbrella of the Young Initiative, are voluntary, for students and for teachers involved and all of them receive formal recognition and training for participating in each new edition. As follows, we detail the description of the main programs to offer a global vision of the situation and to discuss what to do in the future.

In this context, the program JuniorEmprende is focused on students from primary education. The program TeenEmprende has been created for students from basic vocational training and secondary education. Finally, the program ExpertEmprende is oriented to students from vocational training of middle and higher grade and also, a specific program exists for high schools trying to complete an itinerary of entrepreneurial skills. All the mentioned programs are characterized by the technological support, the high quality of the students' participation, the development of educational research programs and, the development of didactic materials. These materials are specifically incorporated into the programs as a source of innovation based on the idea that students need didactic materials to develop their intelligence and to become "nomads of knowledge" [44].

### 3.3. Developing SDG in Secondary School in Extremadura

The program TeenEmprende fosters entrepreneurial culture in secondary school and vocational training for students from 12 to 16 years old. The program was the response to the European Union recommendation in 2016 to develop a European entrepreneurship competence framework [45]. The "EntreComp" framework, as it was called, proposes a shared definition of entrepreneurship as a competence. The objective was to create a consensus between member states to build bridges between educational systems and the European labour market. The framework can be used as a basis for the development of curricula and learning activities fostering entrepreneurship as a competence. Also, it can be used for the definition of parameters to assess learners' and citizens' entrepreneurial competences.

Following the EntreCoop framework, TeenEmprende interrelates and interconnects three competence areas: "ideas and opportunities", "resources" and "into action". Each area is made up of five competences as follows: (a) Ideas and opportunities: spotting opportunities, creativity, vision, valuing ideas, ethical and sustainable thinking; (b) Resources: self-awareness and self-efficacy, motivation and perseverance, mobilizing resources, financial and economic literacy, mobilizing others; (c) Into Action: taking the initiative, planning and management, coping with ambiguity, uncertainty and risk, working with others, learning through experience.

The program TeenEmprende is mainly focused on leadership, proactivity skills and team work. The program seeks the active participation of students to develop a project into a network with their



teachers. At the moment, this project counts on valuable didactic resources available freely on line. During the last academic period, the program was devoted to the SDGs. The program had three stages. The first one was the stage for self-knowledge, the second stage was group empowerment and the third stage was the election of one SDG for each group to work on. Considering the evolution of technology and taking into account the new communication channels for teenagers, the program included the creation of a blog and an Instagram account per group. The blog served as logbook and the account in Instagram divulgates the work done day by day. These two tools created a real sense of belonging to a common project.

TeenEmprende also included a live session at the end of the year. All participating teams that had completed the project had the opportunity to present their results to the rest of participants. This session had significant impact in participants in order to improve the learning process regarding entrepreneurship.

#### 4. Theoretical Background

There is rich literature on CSR that goes back as far as the 1930s [46,47]. However, the proliferation of studies related to CSR appeared with the publication by Bowen [48] of “Social responsibilities of the businessman”. In the 1960s, the literature sought to provide a clearer definition of CSR [49] that was followed by many others in the 1970s [50]. It was in the 1980s when the focus shifted to a more in-depth study of related subjects such as business ethics or stakeholder management [51]. In the 1990s, Carroll [52] stated that a socially responsible company makes profits, obeys the law and behaves ethically as a corporate citizen. The twenty-first century has been characterized by the institutionalization of ethics and CSR [53]. Nowadays, CSR is considered a global phenomenon [54,55]. In the new context of business, companies realize that they have to work actively towards CSR, as not only is it a business opportunity for them in line with the classical very famous Stakeholder Theory [56–58], but also for a sustainable world [59]. In fact, sustainability is our main challenge as society. To contribute to sustainability, it has been recognized that education, even in early stages [60], is a key process for generating responsible citizens [61]. These citizens will follow the journey of sustainability in the labor market as intrapreneurs [62] or as entrepreneurs, to create global awareness of the environmental, social and economic challenges of the present times [60].

Sustainability and Corporate Social Responsibility (CSR) are directly linked as it has been widely demonstrated in the specialized academic literature [63–65]. Both terms are, at the same time, starting to be intrinsically connected with a new model of capitalism [66,67]. Nowadays, we are living in the era of entrepreneurship [68]. The new model of capitalism emerges characterized by entrepreneurs [69] as means of strategic insertion into global, unpredictable and highly competitive markets [70]. In this new context, entrepreneurship has been defined as a mechanism through which the current economic inefficiencies can be mitigated [71]. In regions such as Extremadura, where economic opportunities are restricted, especially for young people, promoting a culture of sustainable entrepreneurship is relevant for regional development [72].

To understand the new capitalist spirit, it is important to realize that entrepreneurship is, as with all human action, the result of external factors but also cognitive and motivational internal factors. According to Locke [73], cognitive factors include ability, intelligence and skills. On the one hand, and despite the fact that entrepreneurship activities and intellectual skills are not the same, they can reinforce each other [74]. We can say that intellectual skills are needed for entrepreneurial activities. Nowadays, when we are experiencing an increasingly complex context of doing business dominated by innovation and high technology, it is assumed that intellectual competencies are becoming very useful for reinforcing entrepreneurship. In the same line, academic literature devoted to entrepreneurship education has also focused on skills related to processes and outcomes such as the ability for goal setting, planning or self-efficacy [75–77].

On the other hand, Shane et al. [78] explicitly defended the idea that entrepreneurial activity strongly depends on the decisions that people make. Consequently, the authors concluded that human

motivation has an important role in entrepreneurship. Personal competencies are important for entrepreneurship because entrepreneurial activities are often characterized by ambiguous situations in which planning, effort, flexibility and persistence are needed. An individual with strong motivation to be entrepreneur, with a clear vision of the future, high self-efficacy, autonomy and flexibility for a specific set of tasks, will set higher goals, better plans and strategies, will exert more effort than others, will persist through setbacks and for a greater length of time [78].

In addition, social competencies have also been considered determinant for successful entrepreneurship in academic literature. For instance, several works have established a direct relationship between social skills and team work [79–81], social skills and leadership [82,83], or social skills and effectiveness [84,85]. More concretely, Baron and Markman [86] explained the role of social skills on enhancing an entrepreneur's success. According to these authors, specific social competencies such as the ability to adapt to a wide range of situations or the ability to be persuasive for instance, can help to expand the personal network of someone, to contribute to increasing his/her social capital and may reap important benefits. In the same way, other authors have corroborated the direct link between social competencies and entrepreneurial competencies [87–90].

Moving now to the competencies related to the SDGs, it is true that schools have been traditionally considered vital institutions where education for democratic citizenship is concerned [91]. Nowadays and going forward, we are living in a time when educational practices increasingly emphasize sustainability and SR [31,92]. In this respect, a growing number of works are dealing with these issues. For instance, very popular terms are emerging such as “greening” the school [93], the curriculum [94] or the education [95], or focused ethics such as “ethical school” [96], “ethical education” [97] and “education for sustainable development” [98], between others. All these terms are, in fact, closely associated to the construction of new knowledge related to sustainability, and the ability of developing sustainable practices and actions for the near future but there is no agreement about the best combination of competencies for this end. For these reasons, students are starting to be educated to support the SDGs with critical reflection on the reality of the situation in order to be able to change the world by developing what we called SR competencies of individuals. According to this argument, we can expect that students with a social and environmental education, thanks to sustainable entrepreneurial culture programs, are likely to have different (and better) attitudes concerning SR than those without such education.

To conclude, acknowledging the lack of consensus to identify and measuring competences [99,100], especially competencies related to sustainability [2], we have developed a generic theoretical model shown in Figure 1. Personal competencies are considered as independent variable having direct and indirect positive causality effects in the other variables. In the model, personal competencies (PC) have a direct and positive relationship with intellectual competencies (IC), social competencies (SC) and process and output competencies (POC).

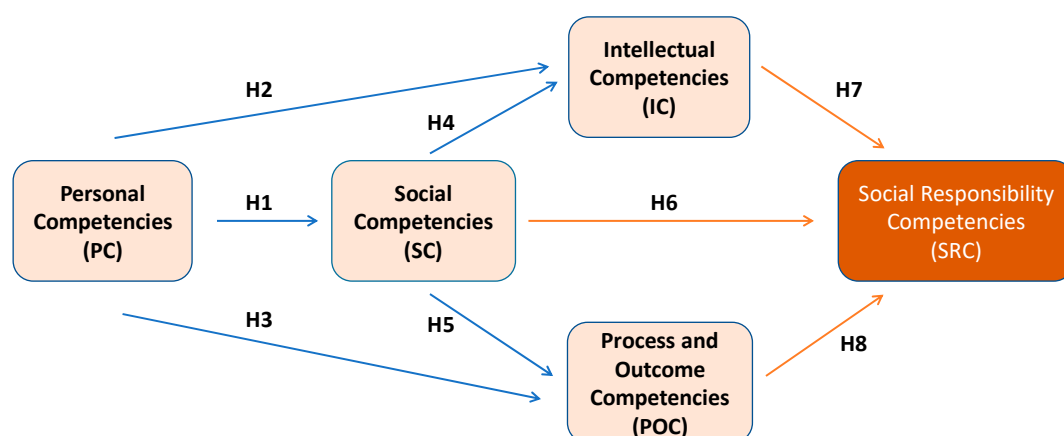


Figure 1. Structural model.

According to the Self-Determination Theory (SDT), people are centrally concerned with how to move themselves or others to act [101–105]. In other words, SDT represents a broad framework for the study of human motivation and personality. We assume that SDT is an organismic dialectical approach in education as, when applied to educational setting, it proven to be a productive promise [106]. When SDT is applied to the realm of education, it is concerned primarily with promoting to students an interest in learning, a valuing of education, and a confidence in their own capacities and attributes [101].

In this Positive Psychology framework [107], personal competencies are assumed to have some effect on the other competencies in the program. The process begins with the assumption that students are active organisms, with evolved tendencies toward growing, mastering ambient challenges, and integrating new experiences into a coherent sense of self-confidence and efficacy [108,109]. Improvements in personal competencies help students to flow. Following Ryand and Deci [110] and Csikszentmihalyi [111], we can say that stronger personal competencies make the students to experience intrinsic motivation and satisfaction to be absolved in developing the activities of the entrepreneurship program. The following hypotheses show these cause-effect relationships:

**H1:** *Personal competencies (PC) have a direct and positive influence on the social competencies of individuals (SC).*

**H2:** *Personal competencies (PC) have a direct and positive influence on the intellectual competencies of individuals (IC).*

**H3:** *Personal competencies (PC) have a direct and positive influence on the process and outcome competencies of individuals (PCO).*

At the same time, under the SDT framework [108,112], SC are considered determinant in the new entrepreneurial landscape and it is assumed that SC positively and directly influences both, IC and POC.

**H4:** *Social competencies (SC) have a direct and positive influence on the intellectual competencies of individuals (IC).*

**H5:** *Social competencies (SC) have a direct and positive influence on the process and outcome competencies of individuals (POC)*

Finally, the three variables, IC, SC and POC will influence positively the SRC of individuals. Consequently, in the model, the conjoint effect of developing traditional competencies in individuals on SRC and also the intermediary effect of SC, IC and POC in the relationship between PC and SRC is hypothesized.

**H6:** *Social competencies (SC) have a direct and positive influence on the social responsibility competencies of individuals (SRC).*

**H7:** *Intellectual competencies (IC) have a direct and positive influence on the social responsibility of individuals (SRC).*

**H8:** *Process and outcome competencies (POC) have a direct and positive influence on the social responsibility of individuals (SRC).*

## 5. Method

The method used to explore the linkages between the research variables of the theoretical structural model was the structural equation modeling (SEM), through the technique of Partial Least Squares (PLS) and the SmartPLS software, developed by Ringle et al. [113].

SEM was chosen after reviewing specific literature on this topic because the method offers the possibility of combining and confronting theory with empirical data from individuals by performing multiple regressions between the variables included in the study, considering they are not directly observable. Our approach to use PLS-SEM is the Wold's [114] view of PLS, considering that the technique has special abilities that make it more appropriate than others, when analyzing data with non-normal distributions [115], as it is the case.



### 5.1. Sample and Procedure

We drew on a primary source to build the data set for the study through a questionnaire addressed to students from secondary school enrolled in the TeenEmprende project. Teachers participate voluntarily carrying the program that was integrated in their current tasks and duties with their students, but students were not selected. A total amount of 1500 students were enrolled on TeenEmprende, because their teachers decided to enrol their students. We randomly sampled 630 students in the Region of Extremadura. Data was collected in June 2018 at the end of the project. The participation index was 42% and the maximum error sample 3% (95% confidence level). It has been considered a good sample for testing the theoretical model (presenting 8 arrows and 5 constructs) according to the guidelines suggested by Marcoulides and Saunders [116] and Hair et al. [117]. Table 1 shows the technical data-sheet with the details of sample and procedure of the study.

**Table 1.** Technical data sheet.

Item	Data
<b>Geographical scope</b>	Region of Extremadura (Spain)
<b>Population census</b>	1500 students enrolled on TeenEmprende (Academic year 2016/17)
<b>Period under study</b>	June 2017
<b>Method of gathering information</b>	Electronic questionnaire
<b>Sample</b>	630
<b>Participation index</b>	42%
<b>Maximum error sample</b>	3%
<b>Confidence Level</b>	95% $p = q = 0,5$

Source: Own work.

### 5.2. Measures

In developing the survey scales, we drew on existing measures previously used in the regional context of Extremadura to evaluate the efficiency of the entrepreneurship culture programs and we built an improved version of the traditional system of indicators. The renewed scales follow a logical scheme of second order constructs and sub-constructs [118], with two, three or four indicators, depending the case as it will be shown as follows, following the EU framework.

We took several steps to ensure the content validity of our measures. Firstly, we established the reflexive nature of the indicator specification according to their most common conceptualization in exploratory studies [119]. Secondly, we tested and refined an initial set of indicators for each construct by interviewing small groups of students checking whether they understood the meaning of any word and any sentence. Appendix A lists the final measures of the key constructs used in the study.

In line with the experience in measuring each program effectiveness in the region and considering the academic literature on the topic, the scale for measuring personal competency (PC) comprises 5 sub-constructs and a total of 10 indicators: Motivation (PCM1 and PCM2); Vision (PCV1 and PCV2); Self-confidence (PCSC1 and PCSC2), Autonomy (PCA1 and PCA2) and Flexibility (PCF1 and PCF2). Process and outcome competency (POC) counts on 4 sub-constructs with a total of 9 indicators as follows: Working capacity (POCW1 and POCW2); Planning (POCP1 and PCOP2); Commitment (POCC1, POCC2 and POCC3); Quality (POCQ1 and POCQ2). The scale for approaching the intellectual competency (IC) of students comprises 5 sub-constructs and 10 indicators distributed as follows: Exploratory capacity (ICEC1 and ICEC2); Creativity (ICC1 and ICC2); Innovation (ICI1 and ICI2); Problem solving (ICOS1 and ICOS2); Self-learning (ICSL1 and ICSL2). And the social competency (SC) comprises four sub-constructs: Commercial orientation (SCCO1, SCCO1, SCCO3 and SCCO4); Communication (SCC1 and SCC2); Team work (SCTW1 and SCTW2); Empathy (SCE1 and SCE2) and Leadership (SCL1 and SCL2). Finally, the social responsibility competency was considered a first-order construct counting on 2 indicators (SR1 and SR2).

## 6. Results and Discussion

To analyze and interpret a PLS model, two stages are needed [120]. First, the estimation of validity and reliability of the measurement model. Second, the estimation of the structural model to evaluate the weight and magnitude of the hypothesized relationships between different constructs.

### 6.1. Evaluation of the Measurement Model

The validity of the measurement scales used for the constructs and sub-constructs of the model were verified. We analyzed whether the theoretical concepts were properly measured through the observed indicators. The analysis consisted of demonstrating the validity attribute (testing whether we were actually measuring what we wanted to measure), and reliability (testing whether we were measuring it in a stable and consistent way). Thus, and following the common process, we calculated the individual reliability of each item, the internal consistency or reliability of the scales, the analysis of average variances extracted (AVE), and the discriminant validity. Figure 2 shows the main results obtained when evaluating the measurement model.

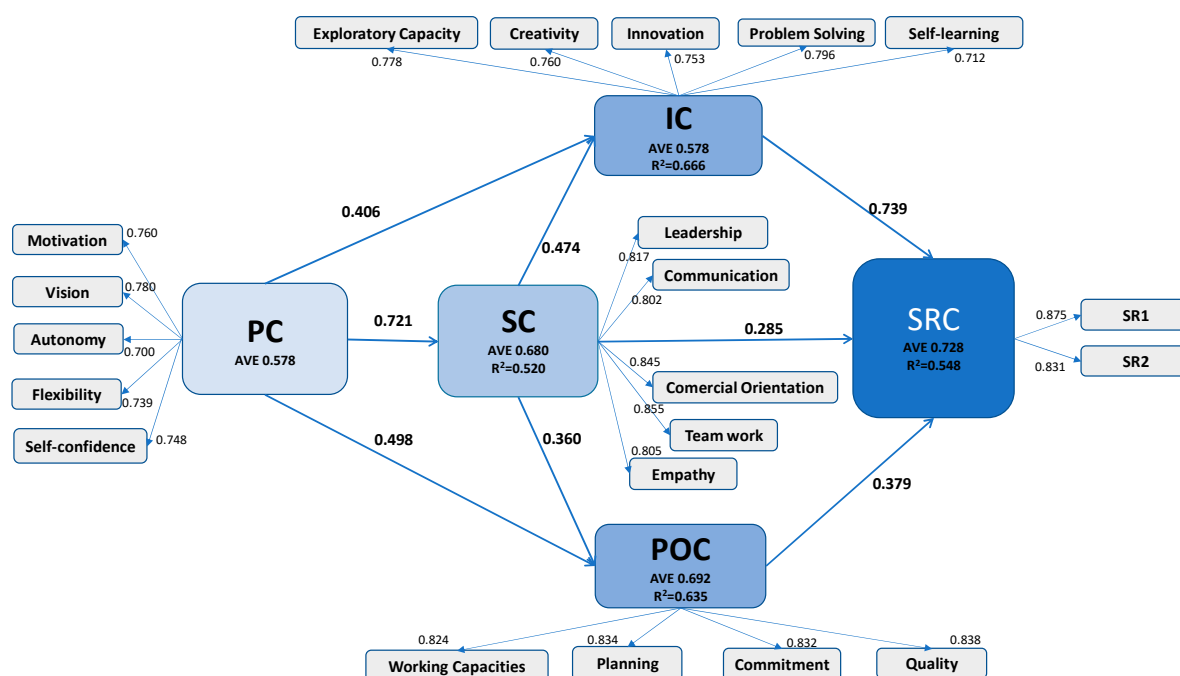


Figure 2. Measurement model. *Source:* Own work.

The individual reliability of the items was estimated by inspecting the loadings  $\lambda$  or single correlations of the measurements between observable variables with their corresponding constructs. To accept an observable variable as part of the construct, the value of the individual reliability of such variable must be greater than 0.7 [121], which implies that shared variance between a construct and observable variables is greater than the error variance. All indicators complied with this criterion and it was not necessary to eliminate any item [120].

Another consideration is communality of an observable variable, and which part of its variable explained by the construct should be higher than 0.5 [122]. The reliability of a construct verifies consistency of all the indicators when measuring the concept. In our case of latent variables with reflective indicators, it was estimated by inspecting the Cronbach's Alpha which value must be greater than 0.7 [123]. Convergent validity was measured through the average variance extracted (AVE) [124] that must be higher than 0.5, establishing that more than 50% of the variation of the construct is due to its indicators. Finally, the calculated discriminant validity coefficients (Table 2) demonstrated at

all constructs were more strongly correlated with their own measures, than with any other of the constructs, suggesting good discriminant validity [125,126].

**Table 2.** Discriminant Validity (Fornier & Larker criteria).

Construct	IC	PC	SC	POC	SCR
IC	0.760				
PC	0.747	0.746			
SC	0.766	0.721	0.825		
POC	0.795	0.757	0.719	0.832	
SCR	0.661	0.587	0.666	0.697	0.853

Source: own work.

## 6.2. Evaluation of the Structural Model

The structural model evaluates the weight and magnitude of the relationship between the constructs of the model. Chin [126] proposes values exceeding 0.2 for the  $R^2$  value (explained variance). The obtained values greatly exceed the established satisfactory limits with values greater than 0.52.

To evaluate the hypotheses, for confirmation or rejection, the common procedure is to use the nonparametric bootstrap resampling technique that provides values for both, the standard error and Student's  $t$ . Table 3 shows the hypotheses, the structural paths posited in the model and the positive results obtained.

**Table 3.** Hypotheses testing.

Hypothesis	Effect	Path Coefficient ( $\beta$ )	Standard Deviation	T-Statistic	p Value	Significance
H1	PC→SC	0.721	0.027	26.791	0.000	Yes ***
H2	P→IC	0.460	0.038	10.601	0.000	Yes ***
H3	PC→POC	0.498	0.040	12.496	0.000	Yes ***
H4	SC→IC	0.474	0.039	12.132	0.000	Yes ***
H5	SC→POC	0.360	0.045	8.075	0.000	Yes ***
H6	SC→SRC	0.285	0.055	5.148	0.000	Yes ***
H7	IC→SRC	0.142	0.064	2.222	0.026	Yes **
H8	POC→SRC	0.379	0.061	6.265	0.000	Yes ***

Note: For N = 5000 subsamples, for T-distribution (499) Student's in single queue: \*  $p < 0.05$  (T (0.05;499) = 1.64791345);

\*\*  $p < 0.01$  (T (0.01;499) = 2.333843952); \*\*\*  $p < 0.001$  (T (0.001;499) = 3.106644601) Source: Own work.

From the results obtained in the sample, we found that the PC developed by the students involved in the educational program TeenEmprende in the region of Extremadura, positively influences the final development of SRC through different paths: impacting in IC ( $\beta = 0.406$ ;  $t = 10.6$ ); IS ( $\beta = 0.721$ ;  $t = 26.7$ ); and POC ( $\beta = 0.498$ ;  $t = 12.4$ ). At the same time, SC positively impact IC ( $\beta = 0.474$ ;  $t = 12.1$ ); POC ( $\beta = 0.36$ ;  $t = 8$ ) and the final development of SRC ( $\beta = 0.285$ ;  $t = 5.1$ ). To conclude, both IC ( $\beta = 0.142$ ;  $t = 2.2$ ) and POC ( $\beta = 0.379$ ;  $t = 6.2$ ) impact directly and positively in SRC. We can say that focusing the attention on the SDGs helped the educational program to develop classical competencies (PC, IC, IS, POC, SC), that also positively impacted SRC in the students. The program under study in Extremadura was not only positive considered taking into account the development of the expected classical competencies developed by any entrepreneurial program that affect students' employability, but also the competencies derived from the sustainability mandate.

## 7. Discussion and Conclusions

This study adds to the existing literature to date on sustainable entrepreneurial culture programs with an empirical contribution in a specific region where the regional entrepreneurship ecosystem is considered crucial by public policy for regional development [39]. More specifically, it completes previous research on sustainable education in the following subjects.

Firstly, rooted in the SDT, we have explored the relationship between the traditional competences developed in students by entrepreneurial programs and the individual attitude to SR developed by a new sustainable entrepreneurial culture program of a sample of 630 students drawn from the region of Extremadura, a Spanish region in Europe. We have addressed the general question: do sustainable entrepreneurial culture programs have some effect on the students' attitude to SR?

Secondly, to answer the question, we have developed a theoretical framework based on competencies development. The theoretical, measurement and structural models presented, jointly evaluate the logic, the measurement scales, the weight and the magnitude of the relationships between the constructs. According with the results, we can say that the global model has high predictive power. Supporting the hypothesis of this work, we can observe that the latent variable PC and the other variables in the model—IC, SC, POC—account for around 54% of the SRC (Table 4).

**Table 4.** Predictive power.

Direct Effect	Path Coefficient ( $\beta$ )	Correlation	% of Variance Explained
IC $\rightarrow$ SRC	0.142	0.661	9%
SC $\rightarrow$ SRC	0.285	0.666	19%
POC $\rightarrow$ SRC	0.379	0.697	26%
Total effect 54%			

Source: own work.

With respect to the research question, our evidence suggests that, broadly, the social responsibility of students appear to be influenced by personal, intellectual, social, process and outcome competencies. This is based on the fact that causal relationships have been found between these competencies.

Thirdly, although it has been recognized that there is little evaluation of entrepreneurship education programs outside of some output indicators [35], this study provides a measurement system and statistical evidence supporting the convenience to sustain the current entrepreneurial education program in the region of Extremadura. We think that, with renewed clear objectives and considering this measurement framework, or an improved one, support for sustainable entrepreneurial programs in public education may be not difficult to sustain.

The main contribution of this study has been to validate empirically a structural model that links traditional competencies with the SR of students through specific sustainable entrepreneurial programs in public schools to promote SDGs. To the best of our knowledge this is the first academic contribution offering an empirically demonstration of the positive link between the competencies and their effect on students to feel that they should change the world.

As far the limitations are concerned, it is necessary to comment on the following three. There are limitations derived from the novelty of the questionnaire used. In the absence of valid scales generally accepted for the competencies considered in the study, we had to design a survey. There are also limitations derived from the students who responded to the questionnaires. Being aware of the responsibility of teachers, father and mother and relatives, in educating students, the idea would be to complement the student's view with these others agents involved in developing their competencies. Finally, it should be noted that the number of students participating in the study was good enough for the application of the statistical technique used, but it is small for generalizations, even when they are from the same country and the same region. In addition, and for the near future, the study should be extended to other geographical contexts and other provinces and regions to overcome its regional nature and so that the outcomes could be more generalizable.

Acknowledging the limitation, in general terms we believe that the results provided here suggest further research will be fruitful. Our analysis suggests that SDGs may play a significant role in shaping the social responsibility of students as citizens and future professionals and entrepreneurs aware of sustainability concerns.

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## Appendix A Scales of Measure

### *Personal Competencies (PC)*

- **Motivation** I like applying my ideas and doing my tasks without depending on the decisions of others (PCM1) When I want to do something (idea or project), I find a way to carry it out (PCM2)
- **Vision** I believe that situations of change in life are always opportunities for improvement (PCV1) I am able to understand new situations, anticipate what may happen, or even make it happen (PCV2)
- **Self-confidence** I propose ideas and solutions to problems although they may be different than expected (PCSC1) I rather prefer to be wrong than to do nothing (PCSC2)
- **Autonomy** I appreciate independence and to be able to do what I like (PCA1) I am a determined person able to make difficult or hasty decisions (PCA2)
- **Flexibility** When something does not go as expected, I do not get discouraged and try again in a different way, as many times as necessary (PCF1) I accept risk and uncertainty (PCF2)

### *Process and Outcome Competencies (POC)*

- **Working capacity** Whenever I can I finish what I start (POCW1) In a situation of hard work, I do my best to finish on time (POCW2)
- **Planning** When I have to do something new I try to clarify the objective and to assess how much it will take me (time and effort) in order to organize myself (POCP1) It is good to share tasks and responsibilities with others even if you slightly lose the control (POCP2)
- **Commitment** I assume responsibilities (POCC1) I like sharing responsibilities when something involves the whole team (POCC2) When I have to do something that I do not like, I prefer to do it as soon as possible (POCC3)
- **Quality** I always try to improve everything I do (POCQ1) I am satisfied by doing my tasks very well and with quality (POCQ2)

### *Intellectual Competencies (IC)*

- **Exploratory capacity** I like the challenge of doing something new (ICEC1) When facing a new task, I always try to be informed and to document everything as much as I can (ICEC2)
- **Creativity** When I have a problem, it is buzzing in my head until I find a way to solve it (ICC1) I like following my intuition although sometimes it leads me to apparently irrational or pointless approaches (ICC2)
- **Innovation** I like essaying new ways of doing things although the common way was good (ICI1) Information is important for being proactive and planning the future (ICI2)
- **Problem solving** When I have a problem, first I analyse it and then I think how to solve it (ICPS1) I like sharing relevant information with my classmates to put it into practice (ICPS2)
- **Self-learning** Facing an error, I try to understand the situation and learn from the error (ICSL1) I want to learn when something is interesting and important for me (ICSL2)



### Social Competencies (SC)

- **Commercial Orientation** Team working is a pleasure for me, even when I do not know the team because I love meeting new people (SCCO1) When I am working in a team I try to observe and learn from others (SCCO2) If necessary I can be a convincing and persuasive person (SCCO3) I like making friends and to have a network to be in touch (SCCO4)
- **Communication** When I get new information or knowledge, I share it with the team (SCC1) Speaking in public is easy for me and I am able to transmit what I want (SCC2)
- **Team work** I am good at working as a team and I like it (SCTW1) I have initiative and I participate actively in the teams as coordinator (SCW2)
- **Empathy** I try to be close to the members of my team, to understand their opinions and reactions and to do my best for everything going well (SCE1) I am aware of my emotions and I can control my mood to care my relationship with other members (SCE2)
- **Leadership** Team members seek my opinion because it encourages them and helps them achieve the common goals (SCL1) I know when someone has talent and I like helping people to share ideas (SCL2)

### Social Responsibility Competencies (SRC)

In everything I do I try to balance between my benefit and that of others (SRC1)

I learned at school how to improve my local context and to transform the world in a better place for living (SRC2)

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