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Service-Learning for Sustainability Entrepreneurship in Rural Areas: What Is Its Global Impact on Business University Students?

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Abstract: Service-Learning (SL) is a teaching innovation method that combines learning and social service objectives to improve educational quality and graduate employability. To date, there are hardly any studies on its global impact on university students. This paper describes and evaluates an SL experience for Sustainability Entrepreneurship in the context of Spanish Higher Education. Based on knowledge acquired in classrooms, multi-disciplinary teams of students from different subjects related to Business Administration offered support to potential entrepreneurs from rural municipalities in the complex task of writing a successful Business Plan for their projects for local sustainability. Within this academic framework, our study has two goals: (1) to assess the self-perception of university students about the improvement in their curricular development, professional skills and civic-social responsibility after participating in the SL experience; and (2) to estimate its possible effect on academic performance. The results show that the students acknowledged they had improved their social and sustainability commitment and their curricular development, and had acquired skills that society increasingly demands from future business professionals. Furthermore, service-students achieved significantly higher academic performance than a control group of non-participating students. These findings highlight the effectiveness of SL to provide a more holistic education for business university students.

Keywords: Service-Learning; Sustainability Entrepreneurship; rural areas; global impact; business university students; sustainable development

1. Introduction

Universities have traditionally adopted a teaching-learning process based on mere transmission of knowledge to students. However, the changes that have taken place over recent decades make it necessary to reconsider the role of universities in the society of the 21st century and to convert them into building blocks for economic progress, social transformation and sustainability [1]. If students are offered holistic university education covering the curricular, professional, civic and social areas, they can acquire the skills that society needs to live sustainably. This requires re-orientation towards a teaching-learning process based on both the acquisition of knowledge and competencies and the development of pedagogical approaches that lead students to actively participate in the construction of reality, becoming not only highly qualified professionals but also committed, thoughtful, critical, and socially responsible citizens [2].

To fulfil these responsibilities, universities need new teaching methodologies which, from a perspective of greater participation and solidarity, encourage knowledge to be built rather than just

transmitted. One such methodology is Service-Learning (SL), which links students' training with service to the local community [3,4], thus enhancing curricular learning, promoting the acquisition of labour skills in line with social demands and encouraging the development of civic values and ethical awareness among students [5–7]. SL thus becomes a powerful tool for learning and social transformation, although little research has been done to date on its academic impact in the context of Higher Education [8–10].

The use of SL in university studies in Business Administration helps to enrich the business management training that students receive, allowing them to acquire important professional competencies that are difficult to achieve using other teaching methods. It also allows them to receive education in line with the principles of ethics, social responsibility and sustainable development [11–13]. This explains why it is attracting so such interest at present, given the increasing emphasis on the use of teaching methods that promote civic responsibility and social commitment among university students in areas relating to business management, in reaction to a growing number of ethics scandals that have arisen in the corporate world over the past few decades [14,15]. Although there are individual studies on the application of SL in the general field of Business Administration, current research is insufficient to demonstrate its benefits for students [16,17]. In addition, to our knowledge, only two studies have applied it to the specific area of Entrepreneurship [18,19]. All these investigations about incorporating SL in business education have focused on the university context in the United States [20], merely describing both the practices adopted there and their outcomes for all participants—students, teachers and the local community. It is therefore necessary for empirical research to be carried out in the area of Entrepreneurship to try to evaluate the true effects of SL on the various groups involved, especially on university students [12]. In particular, this research gap seems to hold especially true for non-American environments, since SL is still said to be a US-American methodology that has not been globally taken up [13].

The creation and development of new firms is vital to counter unemployment and economic stagnation and can make a decisive contribution to wellbeing for society. It is a driver for innovation and growth, generating jobs, modernising the economy and increasing competitiveness [21]. Specifically, Sustainability Entrepreneurship can promote economic, social and environmental development in the areas where new companies are established [22]. Since it is the rural world that is most seriously affected in times of crisis, entrepreneurship for sustainable development becomes a possible work opportunity for rural inhabitants who are left without jobs or prospects for employment, and it can contribute to the socio-economic progress and sustainability of such areas [23,24]. However, it is difficult for most rural entrepreneurs to start up their business projects because they often lack the necessary knowledge, experience and even advice for writing the Business Plan that will enable them to explore and prove the viability of their business ideas.

After detecting this social need, we designed an SL experience for Sustainability Entrepreneurship in the context of Spanish Higher Education, whereby teams of undergraduate and graduate students from five subjects related to Business Administration collaborated with several rural town councils in the development of entrepreneurship projects for local sustainability. Specifically, based on the subject contents learned in class, the former offered their support to potential rural entrepreneurs when preparing the Business Plans for their projects. Within the framework of this SL experience, there are two goals of this paper: (1) to assess the outcomes of SL on university students based on a self-evaluation questionnaire about how they perceive the improvement in curricular development, professional skills, and civic and social responsibility; and (2) to estimate the possible effect of SL on academic performance, after a quasi-experimental design in two paired groups with pre-test and post-test evaluations.

Our main contributions to the literature are the following. First, since most of the previous empirical evidence on incorporating SL in business university studies has been set in the US-American environment [20], we fill the gap of research in this field for European countries by focusing on the context of Higher Education in Spain. Second, given that, to date, little international literature has been published on the application of SL both in the general area of Entrepreneurship [18,19] and in the specific area

of Sustainability Entrepreneurship [13], this article describes, for the first time, an SL project designed to support sustainable development of rural areas. Third, in view of the absence of prior empirical evidence on the educational impact of SL for Sustainability Entrepreneurship [25], our study evaluates both the students' self-perception of the benefits of an SL experience for sustainable rural entrepreneurship, covering the curricular, professional, civic and social dimensions, and the possible effect of participation in it on academic success, given the need to gain a better understanding of the global outcomes of SL in terms of training and social transformation [9,10]. Finally, since some researchers have suggested that more rigorous testing is required in order to determine the true effects of SL on university students [8,26], we aim to overcome the main previous statistical limitations regarding sample selection, experimental design, the measurement variables used, and the methodology applied.

From an institutional perspective and in view of the limited dissemination of SL projects in the area of Entrepreneurship, our study contributes by making known among the academic community a comprehensive experience in support of Sustainability Entrepreneurship education, which is: (a) *multi-disciplinary*, because students from five subjects participate, each of them closely linked to one of the main functional areas of business (Administration, Accounting, Finance, Marketing and Operations Management) and hence to one of the major sections of the Business Plan; (b) *collaborative*, because the students work in teams both within each subject and in multi-disciplinary groups; (c) *participatory*, because students actively participate in solving a real problem in their local community by applying the curricular content of the subjects; and (d) *based on solidarity*, because it aims to provide help free of charge to unemployed people and potential entrepreneurs from rural areas to start up their own businesses, contributing to sustainable development of these disadvantaged territories. This paper, therefore, provides other universities with some tools to facilitate the incorporation of SL into their study programmes in the context of a Higher Education for sustainable development.

2. Theoretical Framework

2.1. University SL

SL is an innovative teaching methodology that is generating great interest among educators from a range of levels and academic disciplines. According to Ngai et al. [6], it is an educational proposal that combines learning and community service in a single project based on the implementation of skills related to curriculum contents carried out in real contexts, where the main aim is improving students' critical capacity while offering a social benefit. This definition, as shown in Figure 1, includes four essential characteristics for a teaching activity to be considered SL: (a) the key role played by students in the processes of academic learning and social participation; (b) connection between the community service activities and curricular learning goals; (c) orientation towards social transformation; and (d) interaction with society through socially committed activities.

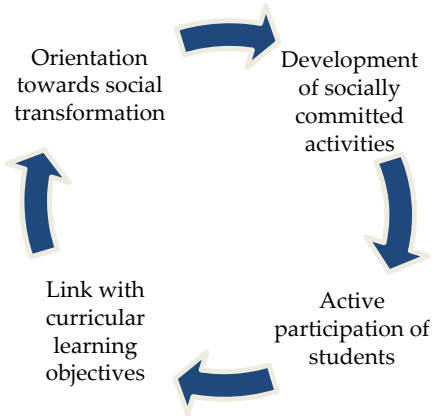

Figure 1. Characterisation of Service-Learning (SL).

At the university level, SL is an educational methodology that connects theoretical foundations and practice to generate both experiential learning and transformative learning among Higher Education students [27]. Experiential learning helps university students to learn the subject content and, subsequently, to develop professional skills. It enables them to discover things for themselves and to build meanings based on their own experience. Transformative learning brings together its three main characteristics: experience, as acquired by university students when they provide a service to the community; reflection and critical discourse, developed around the experience; and action, to be generated in students' future working life. Although other innovative teaching formats, such as problem-based learning (PBL)—an active learning method in which students learn the subject content through the experience of solving real-world problems [28]; challenge-based learning (CBL)—a collaborative learning approach in which teachers and students work together to solve a challenge about an essential question, such that they propose solutions, take action and then publish their solutions to a worldwide audience [29]; or design thinking (DT)—a methodology that engages groups of students in a process based on determining a real-world problem and then designing a solution through an experimental approach of thinking and making [30], can also provide an experiential and transformative learning process, SL differs from them in that it contributes to the civic and social development of university students by combining learning and social service objectives [4,5,7]. As a result, SL brings the fields of education and community service together and thus is a richer form of learning than PBL, CBL or DT.

The application of SL in the context of Higher Education is beneficial for all the agents involved, especially for participating students [3,5,31]. Over the last two decades, SL experiences have been linked to increased capacity for understanding theoretical concepts, applying theory to real life, critical thinking, and problem-solving [8,32,33]. SL also builds up students' self-esteem and confidence, as well as their skills in leadership, communication and teamwork [10,34]. Also, working on aspects such as social responsibility, solidarity and sustainability promotes their education in ethical and social values and encourages their citizen participation [1,9,35]. All this should lead to greater motivation and overall satisfaction for service-students and, ultimately, to an improved academic performance [6].

While anecdotal evidence on the benefits of SL is abundant internationally, little empirical research has been done to date on its effects on university students [8–10]. In addition, most of these previous studies are qualitative, so their objective is to analyse students' perception on the impact of such practices on their curricular, professional and social development based on their responses to a self-evaluation questionnaire. However, there are very few quantitative studies on the impact of SL on academic performance [6,8]. Among them, some find statistically significant differences in the marks obtained in the final exam and/or in the overall marks between the students who participated in SL projects and those who did not [36–38]; others conclude that service-students improved their marks more than non-participants throughout the semester [32,33]. There are, however, some studies that find no significant differences in the academic success of the two groups [8,39].

2.2. University SL in the Fields of Business Administration and Entrepreneurship

The field of Business Administration is ideal for incorporating the SL methodology into university degree curriculums for three reasons [14,15]: (a) its high practical content means this pedagogical tool can be applied directly and easily; (b) its link with the socio-economic development of territories makes it particularly suitable for establishing links with the community through comprehensive education of students in line with social demands; and (c) knowledge about extensive corruption and abuse of power on the part of emblematic firms worldwide has stepped up interest in the application of teaching methods that promote ethical values and civic-social responsibility among business students.

Applying SL in this field of knowledge complements the business education received by students, while also enhancing their curricular learning, professional development, civil training and social commitment and, therefore, providing them with important competencies that are currently demanded by society from business professionals [12,40]. SL should therefore be an essential component of

the training given by Economics and Business schools all around the world because it significantly contributes to the generation of business leaders with civic awareness and a commitment to ethics and sustainability [11,13]. Not only does it develop the personal and professional competencies that are required by employers today—communication skills, adaptability and capacity for action, analytical and problem-solving skills, capacity for teamwork, and planning and organisational skills, among others—but it also offers civic skills and incorporates an experiential approach for teaching business ethics [17].

The United States has pioneered the inclusion of this methodology in the study programmes of many Business schools and colleges, at both undergraduate and graduate levels [20]. For this reason, it is the reference country in most publications on the use of SL in this field. More specifically, if we distinguish between the various functional areas of a company, there are studies applied to several business disciplines, such as Administration [16,17], Accounting [41,42], Finance [40,43], Marketing [44,45] and Operations Management [46,47], most of which only describe the SL projects implemented but do not perform an empirical analysis of their impact on university students. In contrast, the research on the application and evaluation of SL in Entrepreneurship education is very limited in the United States [12]. Even though SL has been defended as a suitable pedagogical tool both for teaching the body of knowledge pertaining to the process of creation of new firms and for educating about a set of key entrepreneurial competencies [13], to our knowledge, only two American studies have been published on the use of SL in this business discipline [18,19]. Again, they both only explain the projects integrating this experiential learning technique into two Entrepreneurship subjects, without any empirical study of their effects on the students.

Europe has woken up to the SL methodology later than the United States, so this teaching method is still to be developed in the Business Administration field in most Higher Education institutions [20]. After a thorough review of the main international databases of peer-reviewed scientific literature, no studies were found on the application of SL in this general field of knowledge or in the more specific area of Entrepreneurship within European universities.

In Spain, although some SL projects were timidly introduced in the curriculum of university students in the 2003–04 academic year [48], and the Sustainability Committee of the Conference of University Rectors (CRUE) proposed in 2015 that SL should be institutionalised in Spanish universities to make the curriculum more sustainable, to contribute to the development of a fairer society and to improve academic and social learning that favours the further development of students' competencies, to date, there have been no studies on the design and assessment of SL in the context of Business Administration in general and Entrepreneurship in particular.

2.3. University SL for Sustainability Entrepreneurship: A Proposal for Rural Development

Although the line of research on Sustainability Entrepreneurship has expanded significantly over recent years, academics have not yet agreed on a common definition. Some scholars view an entrepreneurial activity as sustainable when both social and ecological dimensions are addressed at the same time [49], while others only consider either social or ecological aspects of sustainability [50]. We follow this last approach, by virtue of which Sustainability Entrepreneurship can be broadly defined as "*any entrepreneurial activity that contributes to generating a societal impact or solving societies' problems, which covers a variety of activities and approaches*" [13] (p.1). Entrepreneurship for sustainable development, therefore, includes social or ecological entrepreneurship as its goal is to support people and communities or to preserve the environment, while identifying and exploiting business opportunities and developing new products or services [24,25,51]. Consequently, this study assumes that sustainability entrepreneurs recognise, explore and exploit business opportunities that address social or ecological problems.

Given the increasing practical relevance of sustainability entrepreneurs as agents for change in our society today, Sustainability Entrepreneurship is generating considerable interest within the academic community [50]. Specifically, fostering sustainability-oriented entrepreneurial thinking is a task for the University [13], and SL is a promising method for teaching in Entrepreneurship for sustainable

development [2]. SL and Sustainability Entrepreneurship can therefore collaborate and generate unique synergies in the area of Higher Education, benefiting students and society alike. Indeed, through experiences in SL for Sustainability Entrepreneurship, it is possible to link high-quality university education with the development of entrepreneurial activity that aims to solve the social or ecological issues of the local community [52]. Thus, this innovative teaching method may be an effective way to educate about the various competencies needed by future sustainability entrepreneurs. However, this potential has not yet been fully exploited, and there has been practically no research on SL for Sustainability Entrepreneurship to date. After a thorough review of the international literature, only a recent study by Halberstadt et al. [13] focuses on this topic by examining the institutional and personal factors influencing the successful implementation of SL for Sustainability Entrepreneurship in Higher Education in German-speaking countries (Germany, Austria and Switzerland). To our knowledge, there have been no studies empirically analysing the effects of such experiences on university students.

To fill this gap in the literature, this study aims to assess the global impact of an SL project for Sustainability Entrepreneurship designed to promote sustainable entrepreneurship in rural locations, which are the areas that have suffered most from the recent economic crisis. In fact, creating a firm is one of the few work options available to people in the rural world and helps to hold back the rise in depopulation while galvanising economic and social progress [22,24]. In addition, sustainable rural development is vital to the economic, social and environmental sustainability of countries [23].

However, even if sustainability entrepreneurs have an innovative and potentially successful business idea, taking the step towards self-employment is not easy, especially in the rural world. Setting up a new firm requires that entrepreneurial opportunities exist, and these opportunities have to be properly identified, explored and exploited by entrepreneurs [53]. For this purpose, before starting up a business activity, it is key for potential entrepreneurs to be able to explore and prove its viability through a Business Plan. This document links up the technical, commercial, economic and financial aspects of a business project to give an integrating overview of it [54]. Although this plan is no guarantee of success, it is still essential for developing the business idea and proving its viability and, therefore, for actually setting up the new firm. Moreover, in the academic environment, the Business Plan is a magnificent tool for multi-disciplinary learning among business students as it combines the knowledge they have acquired in different subjects relating to the various functional areas of a firm (Administration, Accounting, Finance, Marketing and Operations Management). However, drafting a Business Plan requires specialist knowledge and/or prior experience, which most entrepreneurs do not have. This obviously increases the probability that their business projects will fail, so measures must be taken to provide them with support when developing such plans, especially in rural areas where they are unlikely to have access to advisory services.

After detecting this need in our nearby environment and considering the various ways in which our students could offer a useful service to the local community, we decided to develop an SL experience for Sustainability Entrepreneurship in which multi-disciplinary, interactive teams of students from five subjects, which are taught in different undergraduate and graduate degrees at the University of León (ULE, Spain), collaborated with various rural town councils to provide free support to local entrepreneurs with the aim of promoting sustainable rural development. The province of León is in north-west Spain. Its demographic situation is complicated because it has a low population density resulting from ageing and dispersion, a growing urban population to the detriment of rural areas, and a delicate economic situation with figures for employment, GDP per capita and industrial activity below the national averages [55]. In this context and with the guidance of the teachers involved in the SL activity, service-students used the knowledge acquired in classrooms to give workshops to unemployed persons and potential entrepreneurs on the keys to develop a successful Business Plan, so that the latter could prove the economic, social and environmental viability of their business projects aimed at promoting the sustainable development of the rural world.

3. Materials and Methods

The methods used in this study are in line with the rich tradition of research in educational contexts [56]. Regarding the first goal, our research methodology is descriptive, based on a qualitative approach, so data on different dimensions of the phenomenon to be investigated—the service-students' perception about the educational impact of our SL project for Sustainability Entrepreneurship—were measured, assessed, and collected through a self-evaluation questionnaire.

With respect to the second goal, a quasi-experimental design in two paired groups was employed, with pre- and post-test measures and intra- and inter-group comparative analyses, to investigate if there were statistically significant differences between the participating and non-participating students in the SL experience regarding their academic performance. Parametric statistics were used because both the experimental and control groups met the assumption of normal distribution necessary for parametric analysis. Firstly, "*intra-group*" comparative analyses, based on pre-test and post-test measures, were conducted on both the experimental and control groups. Specifically, the pre- and post-intervention performances were compared separately for each group using Student's *t*-test for paired samples. Then, an "*inter-group*" comparative analysis, based on a post-test, was carried out to compare the performance after the intervention between both groups using Student's *t*-test for independent samples.

In view of the small sample size of the experimental and control groups, to reach more rigorous conclusions that complement those obtained from intra- and inter-group comparative analyses, we also estimated what is known as the "*effect size*", that is, the size of the impact of an intervention variable on the change in a performance variable after the experiment. The indicator traditionally used to measure the effect size is Cohen's *d* [57], whose threshold values are 0.20 for small effects, 0.50 for moderate effects, and 0.80 for large effects. Another known indicator is the effect-size correlation *r*, that is, the biserial correlation between the intervention variable and the performance variable. The effect-size estimation has been largely limited in the field of educational research, even though it is considered a necessary condition for guaranteeing the scientific rigour of the results detected in Student's *t*-test statistical analyses [56].

3.1. University Context

This SL project for Sustainability Entrepreneurship was developed by teachers belonging to the "*Teaching Innovation Group for the Transfer of Knowledge between University and Business (GID-045)*" at ULE (León, Spain) during the fall semester of the 2015–2016 academic year. It covered five different university degrees—four at the undergraduate level and one at the graduate level— taught by the Faculty of Economics and Business Studies and the School of Engineering. More specifically, the participating students were enrolled in one of the following five subjects with 6 ECTS (European Credit Transfer System) credits, each of them closely related to one of the main functional areas of a company (Administration, Accounting, Finance, Marketing and Operations Management) and thus to one of the critical sections of any Business Plan:

- Fundamentals of Business Administration (1st year of the Bachelor's degree in Business Administration and Management)
- International Accounting Standards (2nd year of the Bachelor's degree in International Commerce)
- International Financial Markets (3rd year of the Bachelor's degree in Finance)
- Fundamentals of Business Administration/Marketing (2nd year of the Bachelor's degree in Electrical Engineering)
- Organisation of Industrial Enterprise (2nd year of the Master's degree in Industrial Engineering)

Participation in the various oral and written tasks related to the SL experience was considered in the formal evaluation process of the students from the five subjects involved (it accounted for 20% of the overall mark). Non-participating students had to perform different types of conventional practical activities that aimed to develop the same competencies in each subject.

3.2. Samples

The procedure for selecting the group of service-students participating in the SL project (experimental group) was based on a type of non-probability sampling called "*convenience sampling*", which implies selection by non-random methods of a sample whose characteristics are as similar as possible to those of the target population. Specifically, convenience samples use voluntary participation. Although this is the most common type of sampling in research in the field of Education [56], like other non-probability/non-random techniques, it has the following limitations [58]: (a) convenience samples may be biased because individuals who choose to participate in an experiment may not fully represent the population from which the sample has been selected; (b) when convenience samples are used, it is not possible to estimate the sampling error and the degree of representativeness of the sample because this sampling method does not operate on the principle of randomisation in the selection of elements from the population, and the population parameters' value is generally unknown; and (c) because convenience samples use voluntary participation, this fact increases the likelihood of researchers to recruit those individuals who feel strongly about the issue in question and may favor certain outcomes. Therefore, although this method can produce representative samples, statistical tools cannot be used to ensure sampling representativeness. However, university students may enhance research validity, especially if they represent a population of interest, because of their apparent homogeneity (age, field of knowledge ...), such that the existing quasi-similarity characteristics between the convenience sample and the population of interest may help to achieve that desirable representativeness [59].

In our study, once the teachers of the five subjects informed all their university students about the SL experience for Sustainability Entrepreneurship (rationale, characteristics, potential benefits and evaluation) and asked for their voluntary participation, the final sample of service-students was composed of seven students from each subject, given that it had been agreed with the rural town councils that seven workshops would be given to their potential entrepreneurs. In three subjects, it was precisely seven students that volunteered to participate, and in the remaining two, there was a larger number of volunteers, so the seven service-students were chosen according to their motivations as expressed in a letter, the results obtained in the standard test "*Study Habit Inventory*" [60] and their attendance at information sessions. Therefore, our experimental group of service-students is made up of 35 volunteer participants in the SL experience.

This sample is multi-disciplinary (seven students from each of the five subjects) and heterogeneous in terms of age and distribution by sex, knowledge field, and year of study. In particular, the average age of the students in the sample is 21.3 years (between 18 and 35), distribution by sex is 22 women (63%) and 13 men (37%), distribution by knowledge field is 21 Business students (60%) and 14 Engineering students (40%), and distribution by year of study is seven students in their first year of a Bachelor's degree (20%), 14 students in their second year (40%), and seven students in their third year (20%), as well as seven students in their second year of a Master's degree (20%). Precisely, this sample of 35 service-students was used to achieve the first goal of the paper related to the study of students' perception on the improvement in their curricular, professional and social development after participating in the SL project.

To achieve the second goal, that of quantitative estimation of the possible effect of SL on students' academic performance, a quasi-experimental design in two paired groups was chosen. This is because it is the most widely used statistical methodology for analysing the effect of new teaching practices in the context of educational research [56] and it has also proved to be the most valid in the specific area of SL [5]. In this regard, once the experimental group is created, before starting to develop the experiment, a control group of non-participating students must be chosen to compare their performance after intervention and to establish whether the reported results can indeed be attributed to the experiment and not to external factors.

For reducing any selection bias resulting from the use of a convenience sampling method to constitute the experimental group, so that the findings from the sample can be extrapolated to the population with greater accuracy, it is important for the experimental and control groups to be as

similar as possible regarding any baseline characteristics that might affect the outcomes [8]. In order to bring both groups to the same starting conditions prior to the SL experience, after selecting the seven service-students from each subject, the five teachers chose at random, among the remaining students who were not going to participate in the SL experiment, a twin group according to three matching variables: age, sex and initial academic performance. Therefore, for each service-student, one non-participating student was selected from the same class and hence of the same knowledge field and year of study, with the same age and sex, and with an initial academic performance similar or as close as possible. The latter was determined on the basis of the marks obtained in the first exam for each subject, which was held soon before starting to develop the SL project.

Our final sample therefore included a total of 70 university students, 35 in the experimental group and 35 in the control group (two of the volunteer students who were not finally selected to participate in the SL experiment were part of the control group). Both groups had the same average age and distribution by sex, knowledge field and year of study. In addition, after an "inter-group" analysis with pre-test data using Student's *t*-test (Z of Kolmogorov–Smirnov = 0.66; *p*-value = 0.78), it was confirmed that there were no statistically significant differences between them in their initial academic performance (mean in *experimental group* = 6.94 over 10 (SD = 1.83); mean in *control group* = 6.90 over 10 (SD = 0.75); Student's *t*-test (68) = 0.132; *p*-value = 0.895).

3.3. Procedure

Our SL experience for Sustainability Entrepreneurship took place in three stages, as shown in Figure 2:

- In the first stage of *planning*, the service to be provided to society and the context of the activity were determined. For this purpose, we first contacted various town councils in the province of León (Spain), all of them in rural municipalities with no entrepreneurial support service. Subsequently, once the number of local public institutions willing to collaborate in the SL project and the number of workshops agreed with them were known, both the experimental group and the control group were selected.
- During the second stage of *implementation*, first there was an initial group work activity with the seven students from each subject, under the guidance of the corresponding teacher, to obtain a deeper knowledge of the curricular content related to the specific section of the Business Plan linked to that subject (Administration, Accounting, Finance, Marketing or Operations Management). Then, seven multi-disciplinary groups were set up, each with five students, one from each subject. Therefore, all teams addressed the five main sections of any Business Plan, and the workshops given by them covered the full Business Plan. Subsequently, under the supervision of a teacher, each multi-disciplinary group prepared and gave a free workshop to unemployed people and potential entrepreneurs with business projects for local sustainability. Among these projects, it must be highlighted that there were some related to activities of ecological agriculture and livestock, green tourism, sustainable handicraft production (for example, manufacture of jewels using recycling plastics, manufacture of dolls with textile scraps, manufacture of home accessories using wild plants, forages and fallen tree leaves, etc.) or the provision of specific services for groups at risk of social exclusion (for example, sick or disabled people, elderly people, unemployed recent graduates, etc.). All these business projects were aimed at promoting the sustainable development of rural municipalities where potential entrepreneurs lived, fostering the creation of employment opportunities, which contributes to the reduction of the poverty and depopulation of these disadvantaged areas, and stimulating their social and ecological sustainability. The workshops given by the service-students covered both the most relevant theoretical aspects for drawing up a successful Business Plan and a practical application based on a study of the economic, social and environmental viability of a new firm to be set up in that rural area, and they ended with an interaction between students and potential entrepreneurs, which proved to be very useful for both participants since the former used the knowledge learned in class to solve the doubts

raised by the latter regarding the development of the Business Plans for their sustainable rural development projects.

- During the final stage of *evaluation*, three self-evaluation questionnaires were designed so that each group involved in the SL project for Sustainability Entrepreneurship—students, teachers and potential entrepreneurs—could assess their own perception of the impact of SL once the experience ended. For this purpose, a Likert-type scale was built with five response options and different items for each of the groups participating. To draw conclusions from our SL experience, two types of statistical analyses were developed: (a) one of a qualitative nature, to know the self-perception of the various groups involved in the activity from their responses to the questionnaires, although this article reports only the results regarding the group of participating students; and, (b) another of a quantitative nature, to determine if there were any statistically significant differences in the academic performance of the students who participated compared to those who did not. Statistical data processing was performed on the software *SPSS for Windows*, version 25.0 (SPSS Inc., Chicago, IL, USA).

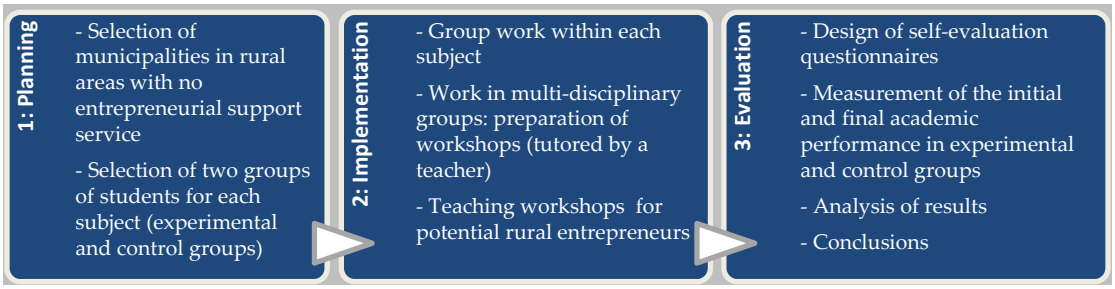

Figure 2. Stages of the Service-Learning (SL) project for Sustainability Entrepreneurship.

3.4. Instruments and Variables

The first goal of this study is to assess the self-perception of the educational impact of our SL project for Sustainability Entrepreneurship among the service-students. Considering that University SL is a global and multi-dimensional concept, three key dimensions for its self-assessment by students were used in this study:

- *Improvement in curricular development:* SL allows for raising the quality of the teaching-learning process in each subject because the theoretical contents studied in the classroom take on their full meaning when put into practice.
- *Improvement in professional skills:* SL allows the reorientation of learning towards the acquisition of the crosscutting skills that are in increasing demand from society for business sector professionals, such as team working, speaking in public, performing critical analyses, solving real problems in society, leading a group, etc.
- *Improvement in civic and social responsibility:* SL allows for increasing the commitment towards society, solidarity and sustainability.

A self-evaluation questionnaire comprising 12 items was drawn up, so that each of the three dimensions was measured using four items. Answers are given on a 5-point Likert-type scale from 1 ("totally disagree") to 5 ("fully agree"). The items in the scale are listed in Table A1 (see Appendix A). Specifically, the questioning was conducted during the last week of the semester once the service-students had completed the SL experience. The participating students were informed of the anonymity of the data collected, and all of them gave their written consent. Given that the present research did not imply any interventional study involving humans and that the collected data were both anonymous and untraceable, ethical approval was not required.

The questionnaire used is an adapted version of the survey proposed recently by Hébert et al. [8], who compiled the most relevant items for evaluating the effects of SL on curricular

development, practical and interpersonal skills, and civic responsibility. These authors showed the multi-dimensionality of their scale and the high degree of internal consistency of all its dimensions (Cronbach's alpha (α) coefficients are between 0.84 and 0.93). Moreover, our questionnaire was validated by a group of experts from the University SL Network in Spain (ApS-U). Its content validity can therefore be assumed.

Regarding the psychometric properties of the measurement instrument designed by this study, analysis of the internal consistency of the items in each dimension indicated that they are reliable (higher than the threshold value of 0.7) [61]. In fact, Table 1 shows that all Cronbach's α coefficients are above 0.9 and can be therefore considered excellent. In order to evaluate their construct validity, the convergent approach was used so that, for each dimension, the correlation between each of the items and the sum of all of them was analysed. The high maximum, medium and minimum correlations obtained, all of which were statistically significant at the 1% level (p-value < 0.01), suggest sufficient convergent validity of the measures of the three constructs.

Table 1. Psychometric properties of the tool used to measure the Service-Learning (SL) educational impact.

	Reliability		Validity *		
Dimensions	**Items**	**Cronbach's α**	**Maximum**	**Medium**	**Minimum**
Improvement in curricular development	4	0.948	0.958	0.945	0.918
Improvement in professional skills	4	0.941	0.953	0.927	0.874
Improvement in civic and social responsibility	4	0.927	0.964	0.942	0.930

n = 35 * Correlation coefficients (Pearson's r): all are significant at the 1% level (p-value < 0.01).

The second goal of the study is to estimate the impact of our SL project for Sustainability Entrepreneurship on the academic performance of students. After carrying out a quasi-experimental design in two paired groups (experimental and control), a pre-test and post-test methodology was used to analyse if academic success differs within each group (intra-group analysis) and between both groups (inter-group analysis). For this purpose, it was necessary to measure the initial and final performance of the students of each subject in both groups.

Since the sample is made up of students registered in five different subjects that form part of the curriculum of five different university degrees and correspond to different years of study, in order to guarantee homogeneity in the assessment of academic performance throughout the sample and thus avoid possible biases resulting from the use of different evaluation processes, the two performance variables were measured using the marks obtained by the participating and non-participating students in the two exams held during the semester in each of the subjects involved in the SL experience [8,37]:

- *Initial academic performance* (pre-test): measured by the marks obtained by the students in the first exam (between 0 and 10 points), which was performed when the SL experience was being planned, thus, a little before it began.
- *Final academic performance* (post-test): measured by the marks for the second exam (between 0 and 10 points), which was held after SL was over.

4. Results

4.1. Impact of SL on Curricular Development, Professional Skills, and Civic and Social Responsibility

Table 2 shows the results of the qualitative study based on the self-evaluation questionnaires completed by the service-students after the conclusion of the SL project. Specifically, it includes the maximum and minimum values and the measures of central tendency (mean) and dispersion (standard deviation) of the 12 items proposed to evaluate the educational impact of SL on the three dimensions

considered. The average value of the items varied between 3.89 and 4.71, and the standard deviation between 0.46 and 1.04.

Table 2. Self-evaluation of the educational impact of Service-Learning (SL): descriptive statistics.

Participation in the SL project has improved ...	n	Min	Max	Mean	SD
Curricular development (Mean = 4.11; Range = 0.257; Variance = 0.015)					
ACAD1. My understanding of subject content	35	3	5	4.23	0.60
ACAD2. My interest in the subject	35	2	5	4.06	0.68
ACAD3. My ability to reflect on my experience and learning	35	2	5	3.97	0.98
ACAD4. My ability to apply subject content outside of the classroom	35	2	5	4.20	0.76
Professional skills (Mean = 4.25; Range = 0.543; Variance = 0.066)					
PROF1. My critical thinking skills	35	2	5	3.89	0.72
PROF2. My problem-solving skills	35	3	5	4.43	0.61
PROF3. My verbal and written communication skills	35	3	5	4.43	0.61
PROF4. My teamwork skills	35	3	5	4.26	0.70
Civic and social responsibility (Mean = 4.36; Range = 0.714; Variance = 0.134)					
SOCI1. My understanding of the needs of others	35	3	5	4.63	0.60
SOCI2. My acceptance of people with characteristics different from mine	35	2	5	4.00	0.84
SOCI3. My commitment to society and to sustainability	35	4	5	4.71	0.46
SOCI4. My involvement in the local community	35	2	5	4.09	1.04

As the table shows, service-students acknowledged that their participation in the SL experience for Sustainability Entrepreneurship especially improved their civic and social responsibility (dimension's mean score = 4.36), followed by their professional skills (dimension's mean score = 4.25) and, to a lesser extent, their curricular development (dimension's mean score = 4.11). Of the 12 aspects that might improve after participation in SL, on average the service-students showed a greater degree of agreement with item SOCI3 ("*My commitment to society and to sustainability*"), while item PROF1 ("*My critical thinking skills*") obtained the lowest average score.

If the three dimensions of the scale are considered separately, for "*curricular development*", on average, the students agreed more strongly with the statement corresponding to the improvement in the understanding of subject content (4.23), while the item with the lowest average score is the one that refers to the development of the ability to reflect on their experience and learning (3.97). With respect to the improvement in "*professional skills*", the two items which showed, on average, the highest scores were problem-solving and verbal and written communication skills (4.43 in both cases), and the item with the lowest score was that for critical thinking skills (3.89). Finally, regarding the dimension on the improvement in "*civic and social responsibility*", on average, the increase in commitment to society and to sustainability received the highest scores (4.71), and greater acceptance of individual differences the lowest (4.00).

These findings are in line with those shown in Figures 3–5, which represent the proportion of students that chose the different response options for each of the four items measuring the three key dimensions for self-assessment of SL by students, respectively. For the sake of clarity, the five initial response categories (from 1 "totally disagree" to 5 "totally agree") were collapsed into three categories: agreement, indifference, and disagreement.

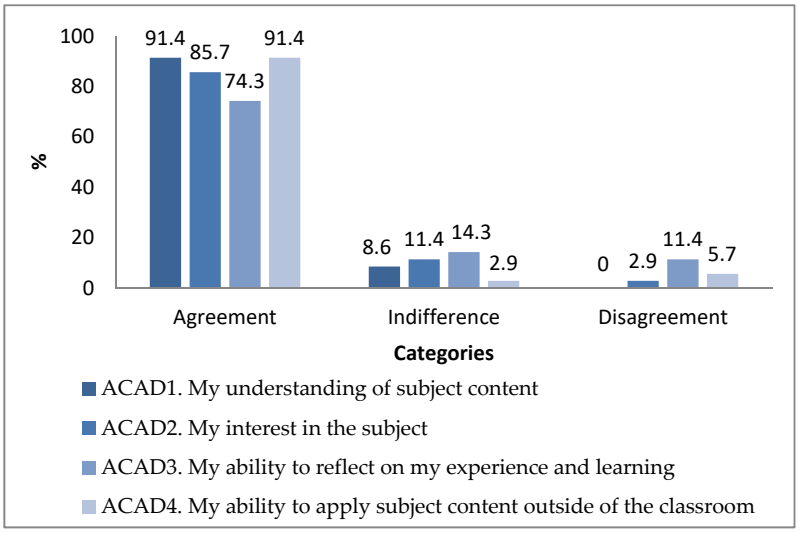

Figure 3. Impact of Service-Learning (SL) on curricular development.

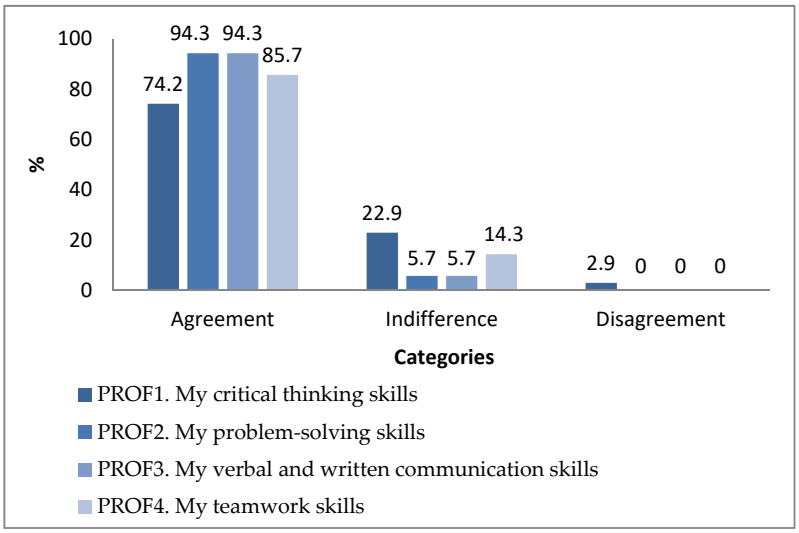

Figure 4. Impact of Service-Learning (SL) on professional skills.

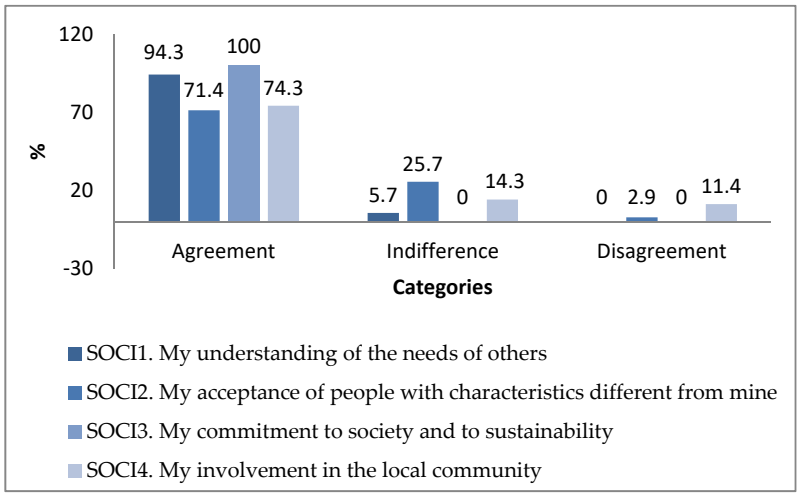

Figure 5. Impact of Service-Learning (SL) on civic and social responsibility.

4.2. Impact of SL on Academic Performance

Tables 3 and 4 show the results of the statistical analyses performed to determine if there are statistically significant differences in academic performance between the participating students (experimental group) and the non-participating students (control group) in the SL project for Sustainability Entrepreneurship.

Table 3. Student's *t*-test and effect size for paired samples.

Variable	Experimental Group (n = 35)		Control Group (n = 35)	
	Mean	**SD**	**Mean**	**SD**
Marks in the first exam (pre-test)	6.94	1.83	6.90	0.75
Marks in the second exam (post-test)	7.12	0.92	6.01	1.28
Student's *t*-test	t (34) = 0.697 *n.s.*		t (34) = −4.246 ***	
Effect Size				
Cohen's *d*	0.12		−0.85	
Effect-size correlation *r*	0.06		−0.39	

n.s. Not statistically significant; *** Statistically significant at the 1% level (*p*-value < 0.01).

Table 4. Student's *t*-test and effect size for independent samples.

Variable	Experimental Group (n = 35)		Control Group (n = 35)		
	Mean	**SD**	**Mean**	**SD**	**Student's *t*-Test**
Marks in the second exam (post-test)	7.12	0.92	6.01	1.28	t (68) = 4.163 ***
Effect size					
Cohen´s *d*	1.01				
Effect-size correlation *r*	0.45				
Cohen´s *U3*	84				

*** Statistically significant at the 1% level (*p*-value < 0.01).

Firstly, "*intra-group*" comparative analyses, based on pre-test and post-test measures, were performed separately for each group using Student's *t*-test for paired samples (Table 3). The average marks obtained in the first and second exams were considered to determine if, within each group, there is a statistically significant difference between students' pre- and post-intervention academic performance. After applying the Kolmogorov–Smirnov test, it was observed that, like the "initial academic performance" variable, the variable measuring the final performance also follows a normal distribution (Z of Kolmogorov–Smirnov = 0.63; *p*-value = 0.83), which allows for the use of parametric tests. Specifically, Student's *t*-test for paired samples was applied to both the participating and non-participating groups.

In the group formed by service-students, it is observed that the average marks are slightly higher after participation in the SL experience than before (mean in *pre-test* = 6.94 over 10 (SD = 1.83); mean in *post-test* = 7.12 over 10 (SD = 0.92)). After applying Student's *t*-test, the resulting *p*-value is 0.491, indicating that the difference between initial and final academic performance is not statistically significant.

In the control group, however, a *p*-value of 0.000 was obtained, so the alternative hypothesis can be accepted at a significance level of 1% (*p*-value < 0.01), suggesting that there is a statistically significant difference between the average marks obtained in the first and second exams by the non-participating students. Surprisingly, the difference observed is negative because the academic performance is higher

before the start of the SL project, in which they did not participate, than after its completion (mean in *pre-test* = 6.90 over 10 (SD = 0.75); mean in *post-test* = 6.01 over 10 (SD = 1.28)).

Given the small sample size of the experimental and control groups (n_1 and n_2 = 35), to reach more solid and rigorous conclusions, we decided to complement the "intra-group" difference analyses with the estimation of the effect size in each group, that is, the magnitude of the impact of participation in the SL project on the change in academic performance between before and after the experiment. Specifically, the effect size was estimated from the value of Cohen's *d* (the standard mean difference between the pre-test and the post-test, in this case) and the effect-size correlation *r* (using the means and standard deviations before and after participation). From the results, it can be concluded that the positive impact of participation in the SL project for Sustainability Entrepreneurship on the progress made by service-students' academic performance was of small magnitude (Cohen's $d = 0.12$ and $r = 0.06$), while the size of the negative effect of not participating in the SL experience was high for the students in the control group (Cohen's $d = -0.85$ and $r = -0.39$).

Finally, an "*inter-group*" comparative analysis was performed to compare the post-intervention academic performance between experimental and control groups using Student's *t*-test for independent samples (Table 4). After checking for homoskedasticity with the Levene's test, a *p*-value of 0.000 was obtained by Student's *t*-test, so it is possible to accept the alternative hypothesis at a significance level of 1% (*p*-value < 0.01). This means that there are statistically significant differences between both groups regarding the average mark obtained by students in the second exam, which was held after SL was over. Specifically, the final academic performance was higher for service-students than for those who did not participate (mean in *experimental group* = 7.12 over 10 (SD = 0.92); mean in *control group* = 6.01 over 10 (SD = 1.28)). These results therefore confirm the effectiveness of our SL experience for Sustainability Entrepreneurship for achieving academic success.

As in the prior analysis, the mean difference test was completed by calculating the effect size in order to quantify the relevance of the result obtained previously. Since Student's *t*-test for independent samples was applied, the effect size would indicate the magnitude of the positive impact of participation in the SL experience on the difference in final academic performance between the experimental and control groups, and is calculated from the value of Cohen's *d* (the standard mean difference between the experimental and control groups, in this case) and the effect-size correlation *r* (using the *t*-test score and the degrees of freedom). As Table 4 shows, the effect size seems to be large (Cohen's $d = 1.01$ and $r = 0.45$). However, to facilitate interpretation of the size of the difference between the means of two independent samples, there is increasing consensus that it is useful to transform Cohen's *d* into a measure of probability [56]. Among the different indicators that can be used, Cohen's *U3* stands out, which results from the multiplication of the "*d*" by a cumulative distribution function for the normal distribution, which makes "*d*" the probability that this value is below or above the mean of the second distribution. If we consider that in this case $d = 1.01$, *U3* would be approximately 84. This would mean that if a student in the experimental group were to stop participating in the SL project for Sustainability Entrepreneurship and were to join the control group consisting of non-participating students, then that student would move from the 50^{th} to the 84^{th} percentile regarding the mark obtained in the second exam, which was performed after the end of SL.

5. Discussion and Conclusions

This paper describes and evaluates an SL project for Sustainability Entrepreneurship designed by the "*Teaching Innovation Group for the Transfer of Knowledge between University and Business (GID-045)*" at the ULE (León, Spain) during the fall semester of the 2015–2016 academic year. The participants were teachers of five subjects related to Business Administration in different undergraduate and graduate degrees, 70 students (35 in the experimental group and 35 in a control group), and unemployed persons and potential entrepreneurs from rural municipalities in the province of León with no entrepreneurial support service. Under the guidance of the teachers, the students used the knowledge acquired in classrooms to provide a free service to potential entrepreneurs in the form of workshops. Specifically,

the former offered their support to the latter in the complex task of developing successful and viable Business Plans at an economic, social and environmental level in the rural world, thus contributing to its sustainable development.

In this academic framework, this study aimed to achieve two goals: first, to assess the results of our SL project through the students' self-perception of the improvement in curricular development, professional skills, and civic and social responsibility; and, second, to estimate the possible effect of SL on academic performance, after a quasi-experimental design in two paired groups and with pre- and post-test evaluations. Although the results obtained must be interpreted cautiously, mainly due to the limitations of the sampling method used to select the experimental group and the small sample size, they allow us to shed light on the global impact of an SL experience for Sustainability Entrepreneurship on university students.

Regarding the first goal, our findings show that the service-students perceived that their participation in the SL project improved, in decreasing order, their civic-social responsibility, their professional competencies and, to a lesser extent, their curricular training. The following conclusions can be drawn about the outcomes at these three levels:

- *At a civic and social level*, the workshops given free of charge to unemployed people and potential entrepreneurs from rural areas mainly increased the commitment of students towards society and sustainability, as well as their awareness and understanding of the needs of others. These benefits of SL were also found in some prior studies [1,9,35]. Specifically, this potential to contribute to the civic and social development of students makes it possible to distinguish SL from other experiential and transformative learning methodologies such as PBL [27], CBL [28] or DT [29].
- *At a professional level*, the interaction among the three groups involved in the SL experience—students, teachers and entrepreneurs—allowed the former to acquire important skills for finding their way in today's business world, which are difficult to achieve using other teaching methods. As in some previous studies [10,33,34], we found evidence that students place special value on the impact of SL on their improved ability to both solve problems and communicate orally and in writing.
- *At a curricular level*, the service-students acknowledged that, by responding to social demands from the potential entrepreneurs who attended the workshops, they learnt the content of the subjects in a practical and experiential way, improving their understanding of it and their capacity for applying it outside of classroom. Therefore, as in previous research, our findings showed that SL positively influences the learning and application of the theoretical contents taught during the course [8,32].

About the second goal, after using a quasi-experimental design in two paired groups (experimental and control) and confirming the absence of statistically significant differences between them regarding students' academic performance before the start of the SL experience, the following findings can be drawn:

- According to the results of "*intra-group*" comparative analyses, it can be concluded that our SL project for Sustainability Entrepreneurship had a favourable effect on the evolution of academic performance in the group of service-students. Specifically, their average mark was higher in the second exam, which was held after participation in SL, than in the first, which was carried out when the SL experience was being planned and thus had not yet begun, although the difference observed is not statistically significant. However, the academic performance of non-participating students decreased significantly between the start and the end of the SL project in which they did not participate. Our results are therefore in line with those of other authors [32,33]. Moreover, although the positive influence of participation in SL on the progress made by service-students' academic performance was small, the magnitude of the negative effect of not participating in it seems be large.
- After an *"inter-group"* comparative analysis, our results show the effectiveness of SL for achieving academic success to the extent that the service-students gained average marks in the second exam

that were significantly higher than those obtained by the non-participating students. Therefore, these findings coincide with those reported in previous research [36–38]. In addition, the size of the positive impact of SL on the difference in final academic performance between both groups was large. It can therefore be concluded that the dissimilarity observed in academic success between participating and non-participating students is not random and can be attributed to the involvement in the SL project for Sustainability Entrepreneurship and not to external factors.

5.1. Implications

While the extrapolation of the results beyond the context of this study should be made with caution, some practical implications for students, political and academic authorities, and the local community could be noted. For *business students*, the research findings show that SL projects for Sustainability Entrepreneurship can contribute to their comprehensive training. In addition to merely curricular benefits and greater academic success, the participating students perceive the experience as especially valuable for their civic-social and professional development. Therefore, SL to promote sustainable development may be useful for the future performance of students once they leave university, helping them to become business managers with a firm commitment to ethics, social responsibility and sustainability, which will be extremely important when making their professional decisions in today's globalising economy, and also with a set of labour skills that are increasingly demanded by society from leaders in the business world. The fact that students acquire the skills that society needs to live in a sustainable way is especially relevant today, considering the growing public awareness of the importance of fostering values relating to justice, ethics, civil responsibility, solidarity, cooperation, equality and mutual respect among the business community, as opposed to mere economic rationality, unlimited competition and unbridled selfishness.

Our results can also have implications for *political and university authorities*. In fact, this research shows that SL is an effective methodology that holds great promise for increased quality in Higher Education in general and in Business Administration studies in particular. It leads to an attractive teaching-learning process that is intellectually stimulating for students, increasing their academic performance. In addition, SL improves graduate employability and may bring with it an important social transformation. Political and academic leaders should therefore adopt measures to promote the adoption of this methodology by, for example, including SL projects in university degree curriculums, offering them as extra-curricular activities for students or providing incentives for teachers to implement them. Such measures would be particularly relevant for public universities, especially in an austerity context that requires increasingly efficient use of scarce public funding. Specifically, the application of SL in the specific area of Sustainability Entrepreneurship should be seen as a strategic decision both for the management of the University's sustainability policies, which should be encouraged in the various steps taken by the institutions themselves and the public administrations responsible for Higher Education, and for the development of a new entrepreneurial mind-set driven by a higher social and ecological commitment, which should be promoted in Entrepreneurship education.

Regarding implications for the *local community*, in the framework of the social mission of the University, the adoption of SL projects to promote entrepreneurship in general and Sustainability Entrepreneurship in particular can play a key role in creating links with society and becoming a foundation for progress and the construction of social justice. The support that our students provided to potential entrepreneurs from small rural municipalities when preparing the Business Plans for their sustainable development projects could bring clear benefits for these territories, contributing to curb their growing depopulation and to boost their necessary economic, social and environmental development.

5.2. Limitations and Future Research Lines

The main limitations of the study are the following: (a) the use of convenience sampling due to the impossibility of applying a random method to select the group of service-students, which may limit the extent of the implications of the study; (b) the small sample size, which may limit the generalisation of

the results to different institutional and cultural contexts; and (c) the consideration of a single academic year, meaning the global impact of SL can only be assessed in the short term; (d) the risk of self-reported biases in the answers of students to a questionnaire about themselves due to social desirability bias, which may skew the conclusions of the qualitative study; and (e) the possible bias derived from the use of different practical methods for applying the theoretical contents in each subject, which may distort the findings of the quantitative study (although the participating and non-participating students were evaluated through a similar second exam and theoretical contents were learned in class at the same time by both groups, the former applied them outside the classroom through an SL experience, while the latter did so in class through participation in different types of conventional practical activities done in each subject). All these methodological problems should be resolved in the future in order to advance in research on the true effects of this teaching innovation methodology. Another possible line of future research could be to expand the samples through networking with other Spanish or foreign universities to carry out multi-group analyses so that comparisons can be made nationally or internationally. Finally, it would also be useful to perform longitudinal monitoring of both the service-students, to detect the possible effect of SL experiences in their future professional lives, and the local entrepreneurs, to assess the impact of SL on the effective creation of new companies and on the sustainable development of the rural areas where they were set up.

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Appendix A

Table A1. Items used to assess the self-perception of students on the impact of Service-Learning (SL).

Participation in the SL project has improved ...
Curricular development
ACAD1. My understanding of subject content
ACAD2. My interest in the subject
ACAD3. My ability to reflect on my experience and learning
ACAD4. My ability to apply subject content outside of the classroom
Professional skills
PROF1. My critical thinking skills
PROF2. My problem-solving skills
PROF3. My verbal and written communication skills
PROF4. My teamwork skills
Civic and social responsibility
SOCI1. My understanding of the needs of others
SOCI2. My acceptance of people with characteristics different from mine
SOCI3. My commitment to society and to sustainability
SOCI4. My involvement in the local community

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