DOI: 10.2478/jtes-2023-0007

sciendo

Journal of Teacher Education for Sustainability,
vol. 25, no. 1, pp. 98–115, 2023

Diagnosis of Blue and Sustainable Entrepreneurship in University Education in Spain: A Case Study

Fátima Poza-Vilches
University of Granada, Granada, Spain

Juan José Arjona-Romero and Juan Jesús Martín-Jaime
University of Malaga, Malaga, Spain

Abstract

University education, in terms of its social and environmental responsibility, plays an important role in promoting local and global sustainability from its fundamental corporate principles: "Mission, Vision and Values". Four dimensions associated with fourteen values related to blue and sustainable entrepreneurship were considered in this study: "Entrepreneurship values", "Personal values", "Social values" and "Environmental values" (the variables that are the object of this diagnostic study), which enabled the internal correlations that occurred between them to be seen, according to their level of presence in degree qualification syllabi at public universities in the region of Andalusia (Spain). The main conclusion we have found is the importance of prioritizing the "Personal" dimension in university education as an exogenous variable that conditions the social and entrepreneurship values, which also has a direct effect on the values related to the "Environmental" dimension, with the purpose of achieving a balanced and significant presence of values related to blue and sustainable entrepreneurship.

Keywords: Assessment, blue entrepreneurship, higher education, pro-sustainable values, sustainable teacher education.

Introduction

In this study, we have taken into account aspects related to the mission, vision and values held by the different universities that are the object of our research, as well as the principles and values of the social economy, which set the values for blue and sustainable entrepreneurship. To be more specific, the following values have been selected and grouped together in dimensions for subsequent analysis: environmental awareness, coexistence, democracy, human rights, empathy, decent employment, individual effort, ethical responsibility, involvement and commitment, social justice, participation, environmental protection, joint responsibility and transparency.

Pauli (2019) proposes the blue economy as a model that is based on producing goods and services in a sustainable and responsible way for the planet and future genera-

tions, where resources and energy are exploited to the full. For this reason, we believe that blue and sustainable entrepreneurship offers an interesting opportunity to meet the major socio-environmental challenges of the 21st century. It is also worth pointing out that this blue economy model is rooted in the new emerging economies that have successfully developed in the area of social economy, and which have even established themselves in Spanish regulations as an economic concept (Law on Social Economy, 2011), which is referenced in the Social Economy Charter of the European Conference of Cooperatives, Mutual Societies, Associations and Foundations (CEP-CMAF, 2002). The following social economy principles and values are included in this document: 1) primacy of people and of the social objective over capital; 2) voluntary and open membership; 3) democratic control by the membership; 4) the combination of the interests of members/users and society (general interest); 5) the defense and application of the principles of solidarity and responsibility; 6) autonomous management and independence from public authorities; 7) reinvestment of the essential surplus to carry out sustainable development objectives, services of interest to members or of general interest.

These principles and values undoubtedly condition the University 4.0 model that is currently on the rise. As Corrales (2007) points out, this university model forms part of our complex social fabric, and it is the result of life forces pushing development from an intellectual and volitional drive in an effort to achieve social transformation, which is created from the knowledge and transmission of values that promote sustainability (Aparicio et al., 2021) within the framework of sustainable innovation processes that, as Engelmann (2019) notes, can only come about through knowledge and values associated with skills. It is felt that the university can get involved and provide a positive influence in society through the development of skills related to sustainability and entrepreneurship to improve people's quality of life (Paleari et al., 2015; Mindt & Rieckmann, 2017; Salīte et al., 2021). In this regard, Velasco-Martínez et al. (2021) hold that university skills must be updated and adapted to meet the demands of today's job market and the requirements of the sustainable management practices promoted by the blue economy.

Tackling these issues in higher education is no easy task, so they must be built into university syllabi, prioritizing values related to sustainability throughout the curriculum and in the teaching-learning process (Aguayo-Arrabal & Gómez-Parra, 2022). It is also necessary to consolidate a process of lifelong university training to achieve social development that is closely linked with blue and sustainable entrepreneurship, according to the governing principles defined in each university's "mission, vision and values". As Rodríguez et al. (2020) point out, they must also guide the development of the university's strategic plans to adapt to new social needs, in keeping with current national and international guidelines. These three aspects shape the kind of social responsibility that must be promoted at Andalusian universities to improve people's quality of life (López-Alcarria et al., 2021).

Based on these premises, the mission, vision and values for the public universities in the autonomous community of Andalusia (Spain) that are part of this study are given below. This context is taken as a reference to characterize these universities' policy prescriptions within the framework of blue entrepreneurship (Figure 1).

Figure 1

Mission, Vision and Values of the Andalusian Public Universities

University of Almeria (UAL)

- Mission: To efficiently and effectively exercise a high-quality teaching and research role that contributes to economic and social development.
- Vision: To provide international higher education, transfer knowledge and culture, collaborate with sustainable development, continuous innovation and international research in the areas of food agriculture and the environment.
- Values: Respect, participation, transparency, responsibility...

University of Cadiz (UCA)

- Mission: Commitment to the environment, dissemination and transfer of knowledge and culture, comprehensive training, adaptation to changes in society.
- Vision: Socio-economic development, entrepreneurial culture, innovation, internationalisation, creation of cultural and social economic value.
- Values: Democratic principles, public ethics, effort, responsibility, honesty, professionalism, equality, justice and fairness,...

University of Cordoba (UCO)

- Mission: Teaching, research, transfer of knowledge, improving and transforming society with economic, cultural and social development.
- Vision: Quality teaching, continuous improvement, creative, dynamic and innovative research, promotion of transparency and entrepreneurial innovation, creation of technology-based companies that provide solutions to social, economic, cultural and environmental needs.
- Values: Internationalisation, transparency, quality, innovation, cooperation, solidarity, equality, sustainability...

University of Granada (UGR)

- Mission: In the performance of its functions, it strives to make significant contributions to the challenges facing humanity, training people of integrity, generating value for society, and leading the way in technological, economic and social transformation.
- Vision: To offer quality education, excellence in research, transfer of knowledge, joint creator of knowledge and innovation, socially inclusive, respectful of human rights, committed to principles of equal opportunities and gender equality, and to sustainable development goals.
- Values: Academic freedom and autonomy, dignity and respect, equality, diversity and inclusion, sustainable development,...

University of Huelva (UHU)

- Mission: Generation and transfer of knowledge, comprehensive training, environmental protection and the defence of peace.
- Vision: Teaching, research, culture, sustainable development in the productive sectors of industry, agriculture and tourism.
- Values: Solidarity, respect, commitment, responsibility, transparency, loyalty, self-improvement, equality.

University of Jaen (UJA)

- Mission: Continuous improvement in the areas of teaching, research, transmission of culture and transfer of knowledge.
- Vision: To lead the way in social change, transforming the socio-economic environment.
- Values Commitment, closeness, hard work, talent, social responsibility, planning,...

University of Malaga (UMA)

- Mission: To transmit knowledge, teaching, study and research, cultural, tourist and technological activity.
- Vision: Dynamic, innovation, prestige, leadership, participation and service provider, quality, excellence, professional insertion of graduates, competitive within Andalusia and at a national and international level.
- Values: Social responsibility, equality, sustainability, cultural diversity, free thinking, critical spirit.

Pablo de Olavide University (UPO)

- Mission To serve society and be a place of reflection and critical thinking, committed to contributing to progress, teaching respect for fundamental rights and civil liberties.
- Vision Reference among universities as regards teaching and research, and the social impact of higher education in the field of Social Sciences, at a national and international level, promoting competent, efficient, entrepreneurial professionals who are committed to social welfare, sustainable and personal growth.
- Values Social, economic and cultural progress, participation, environmental protection...

University of Seville (US)

- Mission: To technically and legally manage and support the technical and academic processes that are conducive to obtaining institutional objectives as regards the planning and management of teaching resources and academic management and planning resources.
- Vision Institutional reference, quality work, user-friendly organisation that is innovative, efficient and effective in its management.
- Values Public service, ethics, honesty, transparency, professionalism, quality, environmental protection, continuous learning,...

As Figure 1 shows, the public universities that are the object of our study offer a wide range of constructs, most of which are common to all and which, as Zgaga (2014) and Teicher (2015) propose, are aimed at educational excellence and innovative capacity for immediate application in different professional fields. It is also worth highlighting their impact on ethical aspects associated with social responsibility, which

is in line with the objective of sustainability in the socio-economic activities that the university graduates may subsequently engage or work in (López-Alcarria et al., 2021).

This documentary background was the reference for this research study, which was undertaken within the framework of the "Competence Assessment and Development for Blue Entrepreneurship (CA4BE)" Project, under the Agents of the Andalusian System of Knowledge in Andalusia (PAIDI, 2020) call, which has taken into account four dimensions associated with values related to blue sustainable entrepreneurship, to analyze their presence in university syllabi in Andalusia (Spain): "Entrepreneurship" dimension, "Personal" dimension, "Social" dimension, and "Environmental" dimension. The aim of this study was to diagnose the degree to which these dimensions were included in the transversal skills that came under the university syllabi, as well as in the different branches of knowledge at the universities in this region.

This research aims to value the inclusion of sustainability in the university syllabi as a key strategy to promote the professional development of teachers from the sustainability perspective. This study reaffirms the results obtained in other international research (Vaicekauskaite & Valackiene, 2018; Bikse et al., 2016; Bikse et al., 2014) that take entrepreneurship and the development of social and personal values as a reference to generate more environmentally sustainable universities, taking as a horizon both competencies in sustainability (UNECE, 2012) and the GreenComp (EU, 2022), placing sustainability as one of the guiding principles that should guide management, research, teaching and social responsibility in universities.

Methods

This diagnosis was carried out using a case study design that, according to López (2013), is an appropriate method for identifying causal relationships between the dimensions being researched in institutions. A statistical procedure was used that concluded with the establishment of a structural equation model to reveal the internal correlations that arose between the four established dimensions (personal, social, environmental, and entrepreneurship), also showing their degree of presence in the analyzed syllabi.

Sample

We analyzed 81 syllabi for different degree courses from the 9 Andalusian universities listed in Figure 1, with the following degree of presence (Figure 2).

By the branch of knowledge, we can point out that we analyzed 19 syllabi in the branch of Sciences, 13 syllabi related to Health Sciences, 15 in Engineering and Architecture, 21 in Social and Legal Sciences, and 13 in Arts and Humanities (Figure 3).

Figure 2

Distribution of Syllabi According to University

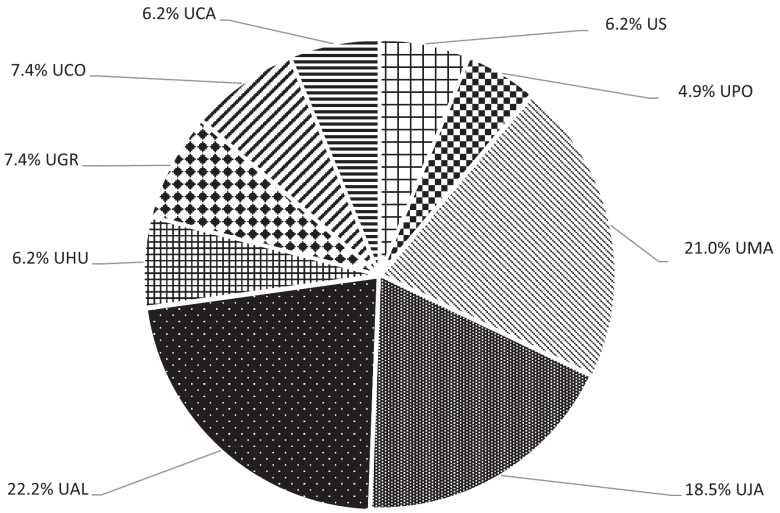
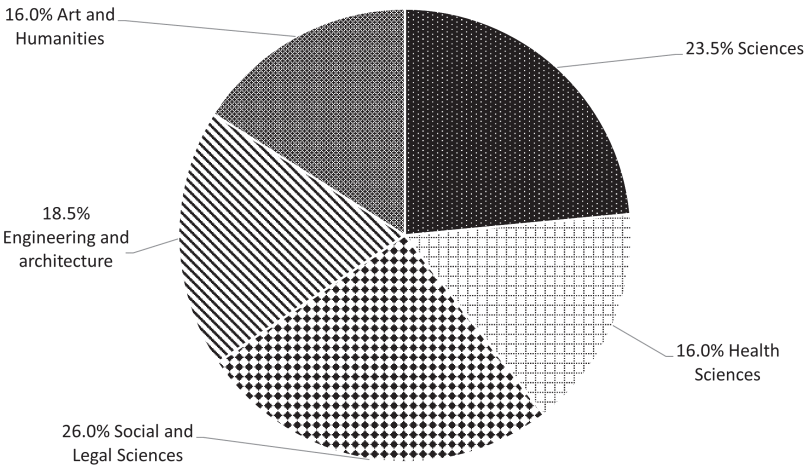


Figure 3

Distribution of Syllabi According to Branch of Knowledge



Some of the degree programs associated with these syllabi were:

- Sciences: Environmental Sciences, Nautical Studies and Maritime Transport, Physical Activity and Sports Sciences…
- Health Sciences: Nursing, Medicine…
- Engineering and Architecture: Computer Engineering, Telecommunication…
- Social and Legal Sciences: Pedagogy, Business Administration and Management, Primary Education, Psychology…
- Arts and Humanities: Degree in History, Fine Arts…

Instruments

The information was compiled using a rubric that was specifically designed within the framework of this research project, and which enabled us to analyze the degree of presence of the values associated with the blue and sustainable entrepreneurship skills in the syllabi we studied.

The rubric in question includes the independent variables: university, branch of knowledge, and relevant degree course, and it covers four dimensions: Blue and sustainable entrepreneurship competencies (ComESA); Blue and sustainable entrepreneurship perspectives/approaches/criteria (PECESA); Blue and sustainable entrepreneurship values (VESA); and Blue and social entrepreneurship contents (ConESA). Each of these dimensions is described by means of one scale with a progressive gradient, using a Likert scale ranging from the simplest levels, where the dimension to be analyzed is not considered (value 0) or considered in a very basic manner, to more complex levels, where they are all fully included (value 4).

This paper focuses on the results obtained for the VESA dimension in particular, and its presence in the syllabi contents. The 14 values that have been identified in this category are: Environmental awareness, Coexistence, Democracy, Human rights, Empathy, Decent employment, Individual effort, Ethical responsibility, Involvement and commitment, Social justice, Participation, Environmental protection, Joint responsibility and Transparency.

Lastly, regarding the quality of the instrument, the Cronbach's alpha is 0.924, which is a highly acceptable level, bearing in mind the tenets put forward by Nunnally (1978).

Data Analysis

Descriptive statistical analyses were carried out, as well as inferential analyses using SPSS v.27 software to find out the level of significance of the independent variables (university and branch of knowledge) and, in particular, the Kruskal-Wallis test, as when the Kolmogorov-Smirnov test was applied, the variables appeared not to follow a normal distribution ($p < 0.05$).

An exploratory factor analysis (EFA) was carried out on these items, using the principal component method, the Equamax rotation method with Kaiser normalisation with a significant value associated to Bartlett's sphericity test ($p < 0.0005$), thus enabling the null hypothesis between variables to be rejected. The Kaiser-Meyer-Olkin (KMO) measure gave a value of 0.900. According to this indicator, the data matrix is appropriate for factoring. The analysis achieved a factorial solution of 4 components (factors) that explained 76.84 % of the variance (Table 1).

After this EFA, we identified four factors or dimensions that, in line with the associated values, were named:

- Dimension 1. "Social values": Coexistence, democracy, human rights, individual effort, social justice and participation.
- Dimension 2. "Entrepreneurship values": Empathy, decent employment, joint responsibility, and transparency.
- Dimension 3. "Personal values": Ethical responsibility, involvement and commitment.
- Dimension 4. "Environmental values": Environmental awareness and environmental protection.

Table 1

Exploratory Factor Analysis (EFA)

Values		Dimensions			
		1	2	3	4
3.1.	Environmental awareness	.111	.138	.174	**.894**
3.2.	Coexistence	**.744**	.250	.331	.298
3.3.	Democracy	**.805**	.246	.291	.160
3.4.	Human rights	**.840**	.058	.210	.107
3.5.	Empathy	.540	**.573**	.221	.126
3.6.	Decent employment	.138	**.792**	.050	.297
3.7.	Individual effort	**.559**	.361	.325	.291
3.8.	Ethical responsibility	.167	.076	**.842**	.244
3.9.	Involvement and commitment	.197	.198	**.848**	.089
3.10.	Social justice	.315	.708	.322	.070
3.11.	Participation	**.593**	.380	.417	.214
3.12.	Environmental Protection	.096	.103	.115	**.915**
3.13.	Joint responsibility	.519	**.536**	.255	.362
3.14.	Transparency	.052	**.850**	.219	.131

Extraction method: principal component analysis.
Rotation method: Equamax with Kaiser normalization.
The rotation has converged in 7 iterations.

On the basis of this EFA, a Confirmatory Factor Analysis (CFA) was presented, supported by AMOS v.25 software, which showed a high correlation coefficient in all variables. R2 also justified the suitable grouping of the different values, confirming the analysis that was performed. The RMSEA value of 0.68 was an acceptable value according to the literature (acceptable between 0.4 and 0.8) (Bentler & Bonnett, 1980) as listed in Table 2, which showed the analysis for each dimension. Table 3 provides the correlation of variables, and Figure 4 demonstrates the relational map of variables derived from the aforementioned CFA.

Table 2

Analysis of Dimensions

Dimension	Item	Coef.	R2	Reliability	Variance
SOC.	Coexistence	0.879	0.772		
	Democracy	0.860	0.739		
	Participation	0.826	0.682	0.91	0.57
	Individual effort	0.777	0.603		
	Human rights	0.729	0.532		
ENV.	Environmental protection	0.819	0.671	0.87	0.76
	Environmental awareness	0.925	0.856		

See next page for continuation of table

Continuation of Table 2

PER.	Involvement and commitment	0.792	0.627	0.76	0.61
	Ethical responsibility	0.768	0.589		
ENTREP.	Decent employment	0.673	0.453		
	Social justice	0.752	0.566		
	Transparency	0.673	0.452	0.87	0.41
	Empathy	0.808	0.653		
	Joint responsibility	0.866	0.750		

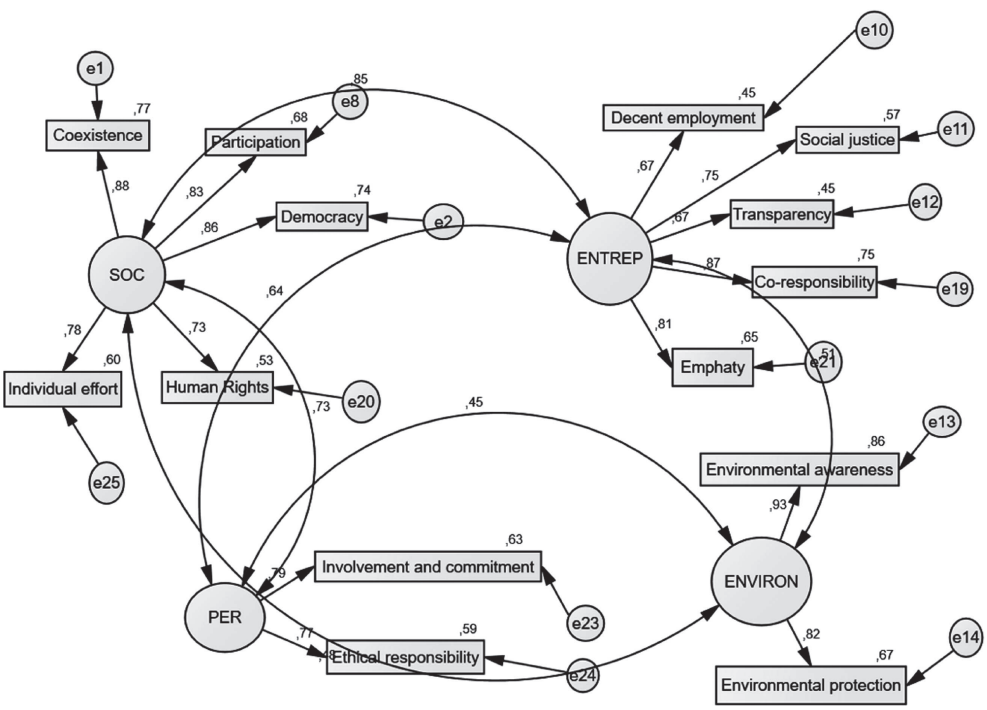
Table 3

Analysis of Correlations

			Estimate
SOC	<—>	ENTREP	.847
SOC	<—>	ENVIRON	.478
ENTREP	<—>	ENVIRON	.509
SOC	<—>	PER	.728
ENVIRON	<—>	PER	.446
ENTREP	<—>	PER	.640

Figure 4

Confirmatory Factor Analysis



Results

Value Dimension Degree of Presence in Andalusian University Syllabi

The four dimensions associated with values related to blue and sustainable entrepreneurship do not share the same degree of presence in the syllabi for the analyzed courses. Thus, in general and in line with a list of means (Table 4) regarding the presence of the dimensions in the 81 syllabi, we found the following:

Table 4

List of Means of the Blue and Sustainable Entrepreneurship Values

Values (Dimensions)	X	SD
Personal	1.99	1.26
Environment	1.54	1.37
Social	1.42	1.25
Entrepreneurship	0.96	1.01

On a scale of 0 to 4, where 0 is "does not appear" and 4 is "appears openly in the syllabi", we highlight the fact that the personal values (x = 1.99) associated with ethical responsibility and involvement and commitment are the most predominant in syllabi, compared to those that appear least, which are the values related to entrepreneurship, whose mean is less than 1 (0.96). These values related to entrepreneurship also get the lowest standard deviation, which indicates homogeneity in the answers and characterizes this dimension as the least present, in general, in the syllabi we analyzed.

Furthermore, when we carried out a cross analysis of these dimensions according to university and to branch of knowledge, we found that they had unequal presence, as shown in Tables 5 and 6.

Table 5

Degree of Presence of the Blue Sustainable Entrepreneurship (BSE) Values According to Branch of Knowledge

Values (Dimensions)	Sciences		Health sciences		Engineering and architecture		Social and legal sciences		Art and humanities	
	X	SD	X	SD	X	SD	X	SD	X	SD
Environment	2.55	1.32	0.70	0.78	1.9	1.48	1.07	1.16	1.23	1.20
Social	1.35	1.22	1.11	1.18	1.03	1.23	1.70	1.26	1.85	1.34
Personal	1.84	1.31	2.35	0.94	1.80	1.32	2.07	1.30	1.92	1.43
Entrepreneurship	1.08	1.11	0.97	1.05	0.76	0.96	0.89	1.06	1.09	0.93

In general, the "entrepreneurship" dimension is least present in the branches of knowledge. In fact, in some cases, such as in Health Sciences, Engineering and Architecture, or Social and Legal Sciences, it is below 1, with Engineering and Architecture being the area where it is least present, with a mean of 0.76 and a standard deviation

below 1, which proves the homogeneity of the results, and which has been constant in the analyzed syllabi.

The values associated with the personal dimension are the ones that characterize the analyzed syllabi in Health Sciences (x = 2.35 / SD = 0.94), Social and Legal Sciences (x = 2.07 / SD = 1.30), and Arts and Humanities (x = 1.92). Those values that are more related to environmental aspects have a stronger presence in the branch of Sciences, with a mean of 2.55.

In Engineering and Architecture, the environmental dimension is more prevalent (x = 1.90), which is at a similar level to the personal dimension (1.80).

The Sciences, Social and Legal Sciences, and Arts and Humanities are the branches with the highest presence of values, and Health Sciences, alongside Engineering and Architecture, are the branches that have most room for improvement.

Table 6

Degree of Presence of the Blue Sustainable Entrepreneurship (BSE) Values According to University

		Values (Dimensions)			
		Environment	Social	Personal	Entrepreneurship
UAL	X	2.19	2.31	2.83	1.75
	SD	1.40	0.87	0.62	0.82
UCA	X	0.80	0.52	1.00	0.16
	SD	0.67	0.63	0.5	0.18
UCO	X	0.08	0.07	0.83	0.13
	SD	0.20	0.10	0.41	0.16
UGR	X	1.67	0.9	2.00	0.57
	SD	1.40	1.13	1.58	1.60
UHU	X	1.40	1.68	1.40	1.32
	SD	1.47	1.35	0.96	1.25
UJA	X	1.63	1.60	1.83	1.20
	SD	1.27	1.30	1.30	1.08
UMA	X	1.76	1.01	2.09	0.80
	SD	1.59	1.11	1.37	1.08
UPO	X	0.5	0.5	0.88	0.35
	SD	0.58	0.20	0.25	0.25
US	X	1.40	2.72	2.9	0.24
	SD	0.96	1.40	1.67	0.54

In the distribution of these blue and sustainable entrepreneurship values according to university, we should point out that those values related to entrepreneurship are still the ones that are least present in the syllabi at different universities with very low means, such as the Universities of Cordoba and Cadiz, with a near zero level (means of 0.13 and 0.16, respectively), compared to personal values that are still the most significant as regards presence in syllabi at the different universities.

The University of Almeria has the most values present in its syllabi, and also to a greater degree. Particularly noteworthy are the figures for the personal dimension (x = 2.83) and the social dimension (x = 2.31), compared to the Universities of Cordoba, Cadiz or Pablo de Olavide, for example, which have a low level of presence of these values (particularly the UCO).

The University of Seville is the only one that has a high presence of personal values compared to other universities, where they are only scarcely included in the analyzed syllabi, as is the case with the University of Cordoba (0.83), Pablo de Olavide University (0.88) or the University of Cadiz (1.00).

Level of Significance of the Blue and Sustainable Entrepreneurship Values According to University

To refine the results given in the previous section, and after carrying out an inferential analysis, more specifically the Kruskal-Wallis test, we found that there were significant differences (level of significance $p < 0.05$) in the values related to the social ($p = .000$), personal ($p = .006$) and entrepreneurship aspects ($p = .003$).

These significant differences are expressed in their average values, and we found two universities in which the degree of presence of these values compared to the rest was very significant, namely, the University of Seville for the social (average range 65.00) and personal values (average range 57.80), and the University of Almeria for the entrepreneurship values (average range 58.50).

Level of Significance of the Blue and Sustainable Entrepreneurship Values According to Branch of Knowledge

After carrying out the Kruskal-Wallis test, taking the independent variable Branch of Knowledge as our reference, we found that there were only significant differences for this variable in the environmental values ($p = .001$).

These significant differences are expressed in their average values, where it is clear that these values have a strong presence in the branch of Sciences (average range 57.76), followed by Engineering and Architecture (46.90). They are least present in the branch of Health Sciences (27.15).

Defining a Model of Influence of Blue and Sustainable Values in Syllabi at Universities in the South of Spain

Using the CFA and the results obtained in this research study, we worked on a structural equation model in AMOS v.25 that enabled us to see the internal correlations that arose between the different types of values, taking into account their degree of presence in the analyzed syllabi, as shown in Figure 5.

This model shows that there is an exogenous variable that is characterized by the personal values, and three endogenous variables, which are the ones related to social, entrepreneurship and environmental values. The personal values are seen to have an effect on the social values, the latter affect the entrepreneurship values, which in turn have an effect on the environmental values.

This model is supported both by the correlations and the regression values (p value < 0.05) defined in Table 7.

Figure 5

Internal Correlations of the BSE Values in Syllabi

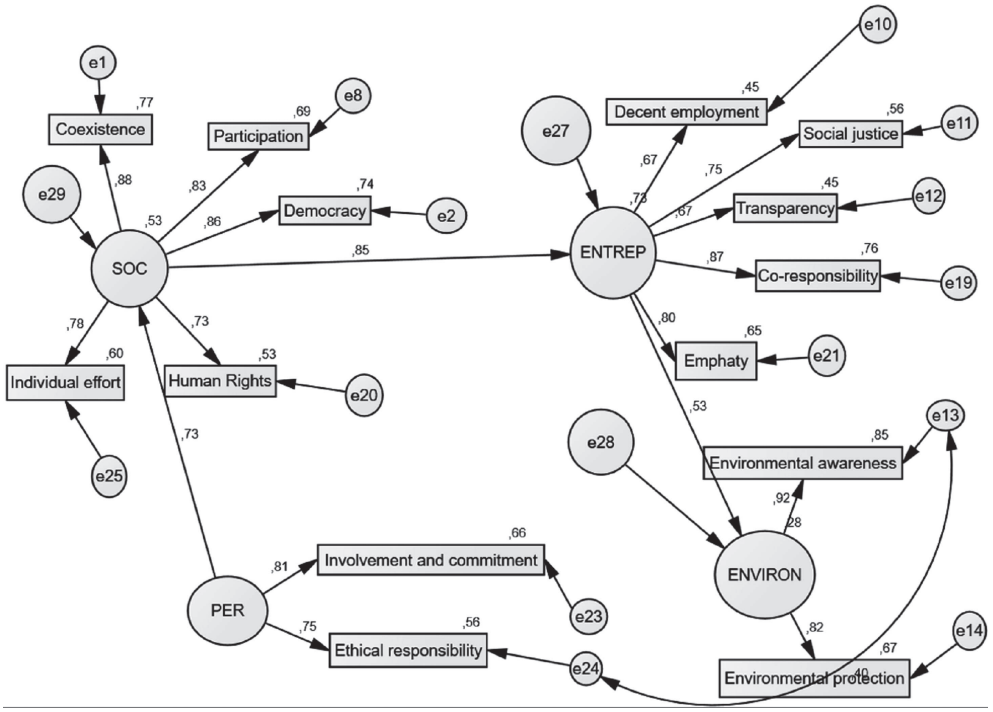


Table 7

Table of Regressions of the Blue Sustainable Entrepreneurship Values

			Estimate	S.E.	C.R.	P	Label
SOC	←	PER	.882	.169	5.224	***	par_14
ENTREP	←	SOC	.393	.064	6.087	***	par_11
ENVIRON	←	ENTREP	1.169	.290	4.028	***	par_12
@3.3. Democracy	←	SOC	.930	.090	10.365	***	par_1
@3.11. Participation	←	SOC	.834	.086	9.697	***	par_2
@3.6. Decent employment	←	ENTREP	1.000				
@3.10. Social justice	←	ENTREP	1.618	.271	5.977	***	par_3
@3.1. Environmental awareness	←	ENVIRON	1.000				
@3.8. Ethical responsibility	←	PER	.960	.173	5.550	***	par_4
@3.9. Involvement and commitment	←	PER	1.000				
@3.2. Convivencia coexistence	←	SOC	1.000				
@3.7. Individual effort	←	SOC	.811	.094	8.658	***	par_5
@3.4. Human rights	←	SOC	.844	.108	7.805	***	par_6
@3.12. Environmental protection	←	ENVIRON	.838	.153	5.465	***	par_7
@3.5. Empathy	←	ENTREP	1.767	.278	6.356	***	par_8
@3.13. Joint responsibility	←	ENTREP	1.999	.296	6.762	***	par_9
@3.14. Transparency	←	ENTREP	1.181	.218	5.408	***	par_10

The regression weights have values above 0.5, oscillating between .668 for the *Transparency* value and .921 for the *Environmental Awareness* value; as do the associated correlations, which oscillate between .447 for the *Transparency* value and .887 in the case of *Environmental Awareness*.

The CFI value (.967) is also greater than 0.9 and the RMSEA value (.062) is between 0.4 and 0.8, which are positive figures in the defense of the model (Bentler & Bonnett, 1980).

Discussion and Conclusions

The significant presence of values associated with the "social" dimension in practically all teaching programs for the analyzed degree courses, for example, ethical responsibility or involvement and commitment, is particularly relevant as they are key social values in university education (Xicoténcatl et al., 2020). We would also like to highlight the prevalence of the "environmental" dimension in all the universities in our study, which is very similar to the "personal" dimension, particularly in the syllabi of Health Sciences, Social and Legal Sciences, and Arts and Humanities. Likewise, in line with Arriola (2017), it is worth mentioning that there is a statistically significant relationship between the "Environmental awareness" and "Participation" values in university students. However, the four dimensions associated with values related to blue and sustainable entrepreneurship do not share the same degree of presence in the different syllabi for the analyzed courses. For this reason, we believe that the balanced and significant presence of these four dimensions in university education in Andalusia is still a long way from achieving the goals set in the Entrepreneurship Plan established by the Conference of Vice-chancellors of Spanish Universities (CRUE, 2017). More specifically, the "entrepreneurship" dimension is barely present in the teaching programs for all branches of knowledge at the studied universities. As Vaicekauskaite & Valackiene (2018) or Bell (2016) point out, it would be advisable to increase the entrepreneurial intention and evaluation aspect, offering positive reinforcement of university students' entrepreneurial skills and competences. In particular, Salas et al. (2020) emphasize the close relationship between individual effort and the development of sustainable entrepreneurial activities, which is highly relevant if we bear in mind the powerful influence that universities can hold when it comes to fostering proactive behavior and promoting participatory processes as part of their education (Besong & Holland, 2015). This is why it is important for universities to include entrepreneurship and corporate social responsibility in their syllabi and teaching programs across the board, regardless of the area of knowledge. They should do so on the basis of ethical reflections of human beings' commitment to their natural and social environment (Anđić & Vorkapić, 2017; Bikse et al., 2016) in the interest of sustainable social development.

The structural equation model obtained from the confirmatory factor analysis enables us to see the internal correlations that arise between the different types of value depending on their degree of presence in the syllabi we analyzed. On the basis of these results, the main conclusion we can draw is the importance of prioritizing the "Personal" dimension in university education as an exogenous variable that conditions the social values as well as the entrepreneurship values, having a direct impact on the values associated with the "Environmental" dimension. This is in line with the findings of Kovalcikiene & Buksnyte-

Marmiene (2021), who indicate that the values associated with the "Personal" dimension are the most important values in the context of higher education, also bearing in mind their effect on the "Social" dimension. Moreover, the structural equation model of this study established that the "Social" dimension has a direct influence on the "Entrepreneurship" dimension, which in turn conditions the promotion of values associated with the "Environmental" dimension. These are fundamental considerations to take into account as a strategy for including blue and sustainable entrepreneurship in the university syllabi under observation in this study, so that the socio-economic revitalization they promote can go hand in hand with business mentality that is more tied to sustainability (Martín-Jaime et al., 2021). All this is in line with a model of governance that is based on commitment and university social responsibility (Sutrisno, 2019), which advances towards a definition of a model of influence of blue and sustainable values within the European Higher Education Area. This is a model supported by the Conference of Vice-chancellors of Spanish Universities (CRUE, 2012), pointing out the importance of promoting sustainability at universities, through the development of transversal skills that cover the cognitive, methodological and attitudinal areas. They should be based on a coherent personal ethic that enables students to develop a sense of responsibility through a critical understanding of socio-environmental problems and encourages them to engage in professional entrepreneurial activity to solve those problems. Furthermore, this should be achieved by means of training, research, transfer and exchange of knowledge, and a culture of individual and collective entrepreneurship using conventional society or social economy formulas as reflected in section e) of art. 2 of the Title I Functions of the University System of the [Spanish] Organic Law 2/2023, of 22 March regarding the University System (BOE [Spanish Official Gazette], 2023).

The functions described in point 3 of art. 2 of that Title (BOE, 2023) regarding human rights, democratic heritage, promotion of fairness and equality, sustainability, the fight against climate change and the values of the Sustainable Development Goals, undoubtedly mark the road map for the development of blue and sustainable entrepreneurship in Spanish universities as is already being done in other European universities (Vaicekauskaite & Valackiene, 2018; Bikse et al., 2016; Bikse et al., 2014). This is why analyzing the impact of new higher education regulations in Spain in the interest of this more sustainable model of university can be seen as a way forward, based on the conclusions found in this study. It would also be interesting to consider extending the study to more wide-ranging syllabi, and to universities from other regions in the European Higher Education Area.

References

Aguayo-Arrabal, N., & Gómez-Parra, M. (2022). Open to better? Teachers' perceptions of curriculum integration in the Erasmus Mundus PETaL master's degree. *Journal of New Approaches in Educational Research*, *11*(2), 186–208. http://hdl.handle.net/10045/125295

Anđić, D., & Vorkapić, S. T. (2017). Teacher education for sustainability: The awareness and responsibility for sustainability problems. *Journal of Teacher Education for Sustainability*, *19*(2), 121–137. https://doi.org/10.1515/jtes-2017-0018

Aparicio, l., Bohorques, I., Paredes, D., & Escamilla, C. (2021). Los ODS como instrumento de aprendizaje: Una experiencia multidisciplinar en los estudios universitarios [The SDGs as a learning tool: A multidisciplinary experience in university studies]. *Educación y derecho*, 1 extraordinary, 307–332. https://doi.org/10.1344/REYD 2021.1EXT.37706

Arriola, C. (2017). La educación y el desarrollo de la conciencia ambiental en estudiantes de Ingeniería Civil de la Universidad César Vallejo [Education and development of environmental awareness in Civil Engineering students of the Cesar Vallejo University]. *Campus*, 24, 195–204. https://doi.org/10.24265/campus.2017.v22n24.05

Bell, D. (2016). Twenty-first century education: Transformative education for sustainability and responsible citizenship. *Journal of Teacher Education for Sustainability*, *18*(1), 48–56. https://doi.org/10.1515/jtes-2016-0004

Bentler, P. M., & Bonnett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*(3), 588–606. https://doi.org/10.1037/0033-2909.88.3.588

Besong, F., & Holland, C. (2015). The dispositions, abilities and behaviours (DAB) framework for profiling learners' sustainability competencies in higher education. *Journal of Teacher Education for Sustainability*, *17*(1), 5–22. https://doi.org/10.1515/jtes-2015-0001

Bikse, V., Lusena-Ezera, I., Rivza, B., & Volkova, T. (2016). The transformation of traditional universities into entrepreneurial universities to ensure sustainable higher education. *Journal of Teacher Education for Sustainability*, *18*(2), 75–88. https://doi.org/10.1515/jtes-2016-0016

Bikse, V., Rivža, B., & Brence, I. (2014). Competitiveness and quality of higher education: Graduates' evaluation. *Journal of Teacher Education for Sustainability*, *15*(2), 52–66. https://doi.org/10.2478/jtes-2013-0011

Conferencia Europea de Cooperativas, Mutualidades, Asociaciones y Fundaciones. (2002). *Carta de Principios de la Economía Social* [Charter of Principles of the Social Economy] (CEP-CEMAF). https://economia3.com/que-es-economia-social/

Conferencia de Rectores de las Universidades Españolas. (2012). *Directrices para la introducción de la Sostenibilidad en el Curriculum* [Guidelines for the introduction of Sustainability into the Curriculum] (CRUE). https://www.crue.org/wp-content/uploads/2020/02/Directrices_Sosteniblidad_Crue2012.pdf

Conferencia de Rectores de las Universidades Españolas. (2017). *Informe del Observatorio de Emprendimiento Universitario* [Report of the University Entrepreneurship Observatory] (CRUE). https://www.crue.org/wp-content/uploads/2020/02/20161201_Observatorio-de-Emprendimiento-Universitario_informe_web.pdf

Corrales, S. (2007). *La Misión de la Universidad en el Siglo XXI* [The Mission of the University in the XXI Century]. Razon y Palabra. http://www.razonypalabra.org.mx/anteriores/n57/scorrales.html

Engelmann, U. (2019). Conjunto de acciones de la Comisión Europea en favor de la Economía Social [Actions set of the European Commission in favour of the Social Economy]. *Mediterráneo Económico*, C*olección de estudios socioeconómicos*, *32*, 423–435.

European Union. (2022). *GreenComp: The European sustainability competence framework*. https://joint-research-centre.ec.europa.eu/greencomp-european-sustainability-competence-framework_en

Kovalcikiene, K., & Buksnyte-Marmiene, L. (2021). Doctoral students as future teachers at universities: Factors related to professional identity. *Journal of Teacher Education for Sustainability*, *23*(2), 45–61. https://doi.org/10.2478/jtes-2021-0016

López, W. O. (2013). El estudio de casos: Una vertiente para la investigación educativa [The case study: An aspect for educational research]. *Educere*, *17*(56), 139–144. https://www.redalyc.org/articulo.oa?id=35630150004

López-Alcarria, A., Poza-Vilches, M. F., & Pozo-Llorente, T. (2021). Socio-corporate impact of the Sustainable Development Goals in higher education: The case of public universities in Andalusia. In M. D. Olvera-Lobo, J. Gutiérrez-Artacho, I. Rivera-Trigueros, & M. Díaz-Millón (Eds.), *Innovative perspectives on corporate communication in the global world* (pp. 251–278). IGI Global. https://doi.org/10.4018/978-1-7998-6799-9.ch014

Martín-Jaime, J.-J., Velasco-Martínez, L. C., & Tójar-Hurtado, J. C. (2021). Evaluación del aprendizaje universitario en competencias sobre emprendimiento azul y trabajo cooperativo [Assessment of university learning on blue entrepreneurship and cooperative work skills]. In A. B. Barragán, M. M. Molero, A. Martos, M. Simón, J. J. Gázquez & M. C. Pérez-Fuentes (Coords.), *Innovación docente e investigación en educación: Nuevos enfoques en la metodología docente* [Teaching innovation and research in education: New approaches in teaching methodology] (pp. 947–955). Dykinson.

Mindt, L., & Rieckmann, M. (2017). Developing competencies for sustainability-driven entrepreneurship in higher education: A literature review of teaching and learning methods. *Teoría de la educación: Revista interuniversitaria*, *29*(1), 129–159. https://doi.org/10.14201/teoredu291

Ministerio de trabajo y Economía Social. (2011). Ley 5/2011 de Economía Social [Law 5/2011 of Social Economy]. BOE 76, 33023–33033. https://www.boe.es/buscar/act.php?id=BOE-A-2011-5708

Ministerio de Universidades. (2023). Ley Orgánica del Sistema Universitario [Organic Law of the University System]. BOE 70, 43267–43339. https://www.boe.es/buscar/act.php?id=BOE-A-2023-7500

Nunnally, J. C. (1978). An overview of psychological measurement. In B. B. Wolman (Ed.), *Clinical diagnosis of mental disorders* (pp. 97–146). Springer. https://doi.org/10.1007/978-1-4684-2490-4_4

Paleari, S., Donina, D., & Meoli, M. (2015). The role of the university in twenty-first century European society. *The Journal of Technology Transfer*, *40*(3), 369–379. https://doi.org/10.1007/s10961-014-9348-9

Pablo de Olavide University. (s.f.). *Visión* [Vision]. https://www.upo.es/transparencia/tema/la-upo/vision-2020/

Pauli, G. (2019). *La economía Azul: 10 años, 100 innovaciones, 100 millones de empleos* [The Blue Economy: 10 years, 100 innovations, 100 million jobs]. Tusquets. https://www.planetadelibros.com/libro-la-economia-azul/89633

Proyecto *Evaluación y Desarrollo de Competencias para el Emprendimiento Azul (CA4BE) I+D+I A*. (2020). [Assessment and Development of Skills for Blue Entrepreneurship Project. Call for Agents of the Andalusian Knowledge System]. Junta de Andalucía. https://turismoazul-seguro.uca.es/proyecto-uma-evaluacion-y-desarrollo-de-competencias-para-el-emprendimiento-azul-ca4be/

Rodríguez, H., Durán, M., Cevallos, L., & Mero, R. (2020). Consideraciones acerca de la sustentabilidad y sostenibilidad empresarial universitaria desde un enfoque económico-ambiental [Considerations about university business sustainability and sustainability from an economic-environmental approach]. *Revista Electrónica Formación y Calidad Educativa*, *8*(3), 175–190. https://refcale.uleam.edu.ec/index.php/refcale/article/view/3288/0

Salas, F. X. R., Ochoa, O. P. E., Díaz, M. P. R., & Villagómez, J. E. J. (2020). Descifrando la cultura dominante y preferida en el ámbito universitario desde el Modelo de Valores por Competencia [Deciphering the dominant and preferred culture in the university environment from the Values by Competence Model]. *Economía y Política*, (32). https://dialnet.unirioja.es/servlet/articulo?codigo=8393121

Salite, I., Fjodorova, I., Butlere, I., & Ivanova, O. (2021). More personal knowledge for more sustainable higher education. *Journal of Teacher Education for Sustainability*, *23*(1), 150–165. https://doi.org/10.2478/jtes-2021-0011

Sutrisno, A. (2019). Internationalizing the third mission of universities. In K. A. Godwin & H. de Wit (Eds.), *Intelligent internationalization* (pp. 168–171). Leiden. https://doi.org/10.1163/9789004418912_035

Teichler, U. (2015). Changing perspectives: The professional relevance of higher education on the way towards the highly-educated society. *European Journal of Education*, *50*(4), 461–477. https://doi.org/10.1111/ejed.12146

UNECE – United Nations Economic Commission for Europe. (2012). *Learning for the future: Competences in education for sustainable development*. http://www.unece.org/fileadmin/DAM/env/esd/ESD_Publications/Competences_Publication.pdf

University of Almeria. (s.f.). *Misión, visión y principios de gobierno* [Mission, vision and principles of government]. https://www.ual.es/planestrategico2021/mision

University of Cádiz. (s.f.). *Misión, visión y valores* [Mission, vision and values]. https://peuca3.uca.es/mision-visión-y-valores/

University of Cordoba. (s.f.). *Misión, visión y valores de transparencia* [Mission, vision and transparency values]. https://www.uco.es/transparencia/mision-y-visión

Universituy of Granada. (s.f.). *Misión y vision* [Mission and vision]. https://www.ugr.es/~rhuma/sitioarchivos/noticias/MisionVision

University of Huelva. (s.f.). *Misión, visión y valores* [Mission, vision and values]. http://transparencia.uhu.es/transparenciaUHU/catalogo/valores-0

University of Jaen. (s.f.). *Misión, visión y valores* [Mission, vision and values]. https://www.ujaen.es/gobierno/ptransparencia/informacion-institucional/mision-vision-y-valores.pdf

University of Malaga. (s.f.). *Plan Estratégico UMA. Misión, valores y visión* [UMA Strategic Plan. Mission, values and vision]. https://www.uma.es/plan-estrategico-uma/info/11030/mision-valores-y-vision/

University of Sevilla. (s.f.). *Misión de la Universidad de Sevilla* [Mission of the University of Sevilla]. http://transparencia.us.es/mision-de-la-universidad-de-sevilla

Vaicekauskaite, R., & Valackiene, A. (2018). The need for entrepreneurial education at university. *Journal of Teacher Education for Sustainability*, *20*(1), 82–92. https://doi.org/10.2478/jtes-2018-0005

Velasco-Martínez, L. C., Martín-Jaime, J. J., & Estrada-Vidal, L. I. (2021). Innovación educativa con los ODS como herramienta para el emprendimiento azul y sostenible [Educational innovation with the SDGs as a tool for blue and sustainable entrepre-

neurship]. In M. C. Pérez-Fuentes (Ed.), *Innovación docente e investigación en educación y ciencias sociales: Nuevos enfoques en la metodología docente* [Teaching innovation and research in education: New approaches in teaching methodology] (pp. 711–754). Dykinson.

Xicoténcatl Félix, M. Y., & Hernández Romero, G. (2020). Valores en una universidad pública [Values in a public university]. *Mendive*, *18*(2), 288–301. http://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/1868

Zgaga, P. (2014). The role of higher education centres in research and policy: A case from European periphery. *Studies in Higher Education*, *39*(8), 1393–1404. https://doi.org/10.1080/03075079.2014.949547

Correspondence concerning this paper should be addressed to Prof. Juan Jesús Martín Jaime, Dr. paed., University of Málaga, Calle Rocinante 43, 2190 Málaga, Spain. Email: jjmartin@uma.es