Article

Global Citizenship Education and Its Role in Sustainability at the University Level

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Abstract: The contents linked to the Sustainable Development Goals (SDGs) should be introduced in studies in the field of education. This research analyzes the knowledge of the Sustainable Development Goals (SDGs) and the 2030 Agenda among 477 participants from the University of Murcia and the University of Valencia in the Degree of Primary Education, Social Education, and the Master of Teacher Training in the Faculty of Education. A descriptive–comparative methodology with a quantitative approach was used based on an ad hoc questionnaire. The educational intervention included theoretical–practical modules on the SDGs and citizenship, with academic readings and case studies on the implementation of the SDGs in various sectors, which positively impacted future education professionals who were to be part of their initial training. The results showed significant differences in the knowledge of the SDGs between the experimental group and the control group at the end of the term, especially among the experimental group, which worked on the SDG concepts in the subjects taken. Greater knowledge was also observed among the students with a Social Education degree who took a subject related to this topic.

Keywords: education for sustainable development; higher education; sustainable development goals (SDGs); 2030 agenda; teacher education; equity; social justice; citizenship; gender equality; diversity

1. Introduction

Environmental sustainability, poverty alleviation, and social justice are some of the challenges facing society today. In this context, the United Nations General Assembly adopted the 2030 Agenda in September 2015, with a transformative orientation towards a sustainable future [1]. Sustainable development implies a long-term vision that intertwines economic development with environmental protection and social inclusion, involving all spheres of society. The 2030 Agenda includes 17 Sustainable Development Goals (SDGs), with 169 related targets and more than 232 indicators, which must be addressed through the prism of the principles of universality (they will apply to all nations and actors) and indivisibility (their implementation must be based on integrated approaches rather than isolated knowledge and policy formulation) [2].

In SDG 4 on inclusive and quality education, target 4.7 aims to ensure that students acquire the knowledge and skills necessary to promote sustainable development and sustainable lifestyles, human rights, gender equality, a culture of peace and non-violence, global citizenship, appreciation of cultural diversity, and the contribution of culture to sustainable development [3].

Within this global framework, the orientation towards sustainable development and global citizenship is particularly relevant as part of the training of future education professionals. Education for Sustainable Development (ESD) aims to provide students with the knowledge, competencies, values, and attitudes necessary to face current and future

challenges. It is also an opportunity to guide them towards an equitable lifestyle, leading to long-term positive social transformations [4,5]. It responds to the challenges of sustainable development, contributing to the present and future well-being of the global community [6–8]. As Roux and Dasoo [9] argue, it is necessary to design and regulate learning spaces in contexts of diversity that address gender equality, equity, and respect for human rights, which shape the values of citizenship education.

Today's education systems have an important role to play in building more sustainable, cohesive, and inclusive societies for the future [10]. Education drives societal change that can empower and contribute to a more just society [2]. In educator training, literature on issues of diversity, equity, and social justice practices is exceptionally scarce, especially considering the role of educators as change agents to support social justice and equity for all young adolescents in their homes, schools, and communities [11], as well as their power to connect and work with families [12].

In this context, Education for Sustainable Development must begin with the initial training of future education professionals. Spanish university legislation, specifically the laws governing the organization of university education and the procedure for quality assurance [13], establishes in its articles 4.1, 4.2, and 4.3 that the curricula of official university degrees must have social comprehensibility as a principle, democratic principles and values, and the Sustainable Development Goals as references, incorporating content and competences of a cross-cutting nature. Likewise, the Spanish General Law on Non-University Education [14] establishes in its sixth Additional Provision that, as stated in the fourth Sustainable Development Goal and the 2030 Agenda, Education for Sustainable Development and global citizenship will be taken into account in teacher training processes and in access to the teaching profession.

The university's role should be to generate knowledge through inquiry, aiming not only to prepare students for successful professional development but also to contribute to the development of society [15]. Education systems are responsible for defining relevant learning objectives and content through pedagogies that empower their students and encourage institutions to include sustainability principles in their management structures [16]. Critical thinking (CT) and effective personalities are particularly relevant in this regard. CT is one of the key competencies for sustainability, essential for living well and thriving in an uncertain and complex context [17].

To focus more directly on sustainable development and global citizenship, it is essential to

- Foster a Global Vision: To develop in students a deep understanding of global issues and their connection to local realities.
- Promote Values and Attitudes: Teach values such as justice, equity, solidarity, and respect for the environment.
- Promoting Action: Inspire students to take concrete action and be agents of change in their communities and beyond.

Implementing the SDGs in university curricula will enrich future professionals' education and contribute to creating a more just, equitable, and sustainable society. Graduates need to understand the complexity of sustainability, the urgency of global challenges, and the need for quality education [18]. As a result, more and more countries are including ESD in their education policies.

University research should also focus on solving scientific and social problems and developing innovative technologies that can be used to improve people's quality of life [19]. In this line, the report *Advances in Education for Sustainable Development (ESD) and Global Citizenship Education* [20] underlines the need to improve teacher training to build sustainable societies.

For all of these reasons, it is necessary to carry out institutional projects in educational environments in order to create a culture of Democracy, empowerment, and emancipation of girls and women and to urgently address not only environmental challenges but also their links to social and economic spheres and their impact on people's lives through education [3]. To strengthen inclusion, the practice of rights and duties, and interaction for

personal and collective growth, it is essential to consolidate identity, enhance possibilities for communication and collective thinking within the framework of pedagogy, participation, culture for peace, and diversity [10].

The 2030 Agenda and its Sustainable Development Goals (SDGs) are essential at the university level for their ability to promote global citizenship and sustainable development. Integrating the SDGs into higher education strengthens academic engagement with global challenges and prepares students to be agents of change in their communities and beyond. According to Leal Filho [21], Education for Sustainable Development in universities fosters critical awareness and systems thinking among students, crucial skills for addressing complex problems such as climate change and social inequality.

Based on these premises, universities have become not only centers of education but also key players in social and economic development, capable of influencing multiple aspects of community and global life. This framework has more critical paradigms, such as the post-development university. This approach proposes a radical transformation of higher education institutions, challenging traditional structures and epistemologies [22]. Making universities agents of change involves integrating sustainability into their core missions and operations. To this end, it is essential that university leaders promote a culture of sustainability, set clear goals, and align resources with these objectives [23]. In addition, they should advance methodologies that empower students to adopt behaviors and actions that lead to more sustainable lifestyles [24].

Incorporating the SDGs into the university curriculum also positively impacts citizenship education. As Tilbury [25] points out, citizenship education helps students understand their role in an interconnected world and provides them with the tools to contribute to a more equitable and sustainable future. In practice, this translates into service-learning projects, research to solve local problems with global implications, and the creation of international collaborative networks between teachers and learners.

The importance of global citizenship is highlighted in students' ability to actively participate in society and promote the values of justice, equity, and sustainability. Ruiz-Mallén [26] argues that higher education should foster civic engagement and social responsibility, preparing learners to address societal challenges. In addition, research by Michelsen and Adomßent [27] has shown that universities that integrate the SDGs into their institutional culture and academic practices achieve a greater impact on sustainability and the formation of leaders committed to social change. Implementing the SDGs and promoting global citizenship in universities enriches the educational experience and contributes to forming a generation of leaders capable of facing and solving the most pressing competencies of the 21st century. The strengths and weaknesses of this implementation include the following:

Strengths:

1. Curricular Integration: Incorporating the SDGs into university curricula allows students to understand and apply sustainability concepts in various fields of study. This helps to train professionals who are aware of and prepared to address global challenges. According to Leal Filho et al. [21], many universities have adopted policies and strategies to integrate the SDGs into their academic programs, promoting sustainability-oriented education.
2. Competency Development: Implementing the SDGs in higher education fosters the development of transversal competencies, such as critical thinking, problem-solving, and the ability to work in interdisciplinary teams. These competencies are essential for addressing complex problems and promoting sustainable development. Gough and Scott [28] emphasize that educational programs incorporating the SDGs help students develop the practical and theoretical skills needed to drive positive societal changes.
3. Fostering Research: The 2030 Agenda and the SDGs drive research in key areas for sustainable development, promoting interdisciplinary projects and international collaborations. This enriches academic knowledge and contributes to practical solutions

to global problems. Sterling [29] points out that universities that embrace the SDGs as part of their institutional mission are more likely to adopt the SDGs.

Weaknesses

1. Lack of Resources: Despite the SDGs' importance, many universities face financial and infrastructure limitations when fully implementing sustainability programs. This can restrict their ability to develop and deliver courses related to the SDGs. According to Leal Filho et al. [21], a lack of adequate funding is a significant barrier to the effective integration of the SDGs in higher education.
2. Resistance to Change: Implementing the SDGs may face resistance from some academic and administrative body members who prefer to maintain traditional teaching methods and content. Gough and Scott [28] mention that resistance to change and a lack of understanding about the relevance of the SDGs can hinder their integration into university curricula.
3. Inequality in Implementation: Not all universities have the same capacity or resources to implement the SDGs effectively, which can result in significant disparities between institutions. Some universities in developed countries may move faster than those in developing countries, perpetuating existing inequalities. Tilbury [25] highlights that inequality in SDG implementation can be a barrier to achieving globally equitable sustainable education.

2. Social Citizenship and the Challenges of the 21st Century

The SDGs and human rights are distinct but complementary concepts. International human rights law (IHRL) is based on a set of treaties, norms, and mechanisms; SDGs are based on other rules. But the two processes complement and interact. It is impossible to analyze the SDGs without considering IHRL on issues such as poverty reduction or inequality, gender equality, education, health, decent work, and the rule of law [30].

Ethical training of citizens for active participation in sustainable democracies is essential at the intersection of ethics, citizenship, and sustainability [31]. Similarly, Nussbaum [32] focuses on global citizenship education and its role in sustainability, arguing that an education focused on human development is crucial for addressing global challenges. Torres and Bosio [33] have investigated the perception of university students on global citizenship education, highlighting the importance of this education in the formation of citizens.

The idea that education is an engine of change to achieve a more just society is also linked to the concept of social justice. This concept should be understood in a complex sense, including ecological and environmental dimensions and dimensions of respect for cultural diversity [2]. Education for social justice should contribute to developing a more just society, working against injustices and oppressions by changing society with a socially just organization and functioning. Democratic Education and Education for Democracy are also a basic and essential element in education for social justice [34].

Belavi and Murillo [35] propose, in this sense, five dimensions to advance social justice and Democracy in schools: the redistribution of opportunities and benefits of education, the recognition of cultural values and social diversity, school governance based on the distribution of responsibilities, proactivity and cooperation in pluralistic networks, and a critical and participatory curriculum and democratic school culture.

This is why social justice education must be part of initial teacher education. Education professionals are agents of change and must be prepared and willing to oppose oppressive systems and practices and support social justice and equity in future generations [12]. They must also know the social reality, with the intention of being able to act upon it. Also, diversity, increasingly evident in educational settings, requires new approaches, which must be integrated into teacher training programs and teacher pedagogy in order to effectively address environmental racism and other social justice issues in schools and urban communities [36]. And this requires, in addition to knowledge, tools for reflection and indignation aimed at developing global citizenship [2].

Inclusive school environments are characterized by positive social experiences for learners [37], such as decreased bullying, reduced loneliness, and improved intergroup relations. In an increasingly globalized world, inclusive education can strengthen trust and a sense of belonging among citizens [11]. More equitable and inclusive education benefits learners by improving the quality of education because it is more child-centered and focused on achieving good learning outcomes for all. This involves providing a comprehensive view of lifelong learning and its importance for sustainable human development [38]. Likewise, university faculty must be committed to social and educational transformation in their teaching and research work so that research and teaching must be connected to address the needs of today's schools from a social justice perspective [39].

Based on this background, this study has the following objectives:

- To investigate and analyze the knowledge of undergraduate and graduate students about the SDGs and the 2030 Agenda.
- To compare the effects of a specific intervention on two groups of university students, evaluating changes before and after the intervention through detailed statistical analysis.
- To analyze the differences according to gender and type of studies around the basic constructs related to sustainability (gender equality, human rights, social justice, diversity, global citizenship, climate change, Agenda 2030, sustainable development, and SDGs) and after the educational intervention.

3. Methods

The present study corresponds to a descriptive–comparative methodology with a quantitative approach based on a questionnaire elaborated "ad hoc" addressed to students of different degrees and Master's Degrees in the field of education.

3.1. Participants

The research was carried out across different university degrees (Primary Education, Social Education, and Pedagogy) and the Master's Degree in Secondary Education at two Spanish universities (the University of Valencia and the University of Murcia), which were organized into two groups: experimental and control, at two different times (pretest and post-test) (Table 1).

Table 1. Participants.

University	Studies	Pretest Experimental	Post-Test Experimental	Pretest Control	Post-Test Control		
UV	Master's Degree in Secondary Education	32	24	35	31	122	209
	Degree in Social Education		18			18	
	Degree in Pedagogy	35	20	11	3	69	
		67	62	46	34		
			129		80		
UM	Master's Degree in Secondary Education			12	12		
	Degree in Social Education	35	22			57	268
	Degree in elementary education	143	56			199	
		178	78	12			
			256		12		
		245	140	46	46		477
			385		92		

The sample comprises 477 students, divided into a control group (CG) and an experimental group (EG). Of the total number of cases analyzed, 40.2% of the CG and 14.3% of the EG were men, representing 19.3% of the total sample.

With regard to age, the vast majority of cases are represented by the youngest group (18 to 25 years), with 67.4% in the CG and 87.3% in the EG. The youngest group also represents 83.4% of the total sample.

In relation to the degree they are studying, the highest number in the CG is represented by students with a Master's Degree in Teaching in Secondary Education (84.8%). Of the CG, 51.7% are studying for a degree in Primary Education. Of the total sample, 41.7% are studying for a degree in Primary Education, followed by a Master's Degree in Secondary Education with 28.1%.

Finally, in relation to the academic year, in all the segmentations, the first-year group leads among those who completed the questionnaire: 83.7% are in the first year of CG and 55.1% in EG. When the total sample is analyzed, 60.6% of the study participants are in the first year.

3.2. Research Design

This study employs a quantitative quasi-experimental method (non-randomized case selection). The design employed is longitudinal, observational, descriptive, and retrospective. The results are analyzed through the collection of surveys at two different times: pre- and post-intervention. There is no manipulation of the researcher in the criterion variables, so it is considered an observational design. It is longitudinal because the information is extracted from the sample at two different time points (time sequence), and it is retrospective since the analysis is carried out after data collection, evaluating the results after the time of data collection.

3.3. Instruments

The instrument used is an ad hoc questionnaire. The questionnaire reflects constructs related to competencies in Education for Sustainable Development through their response frequencies. The questionnaire asked participants for their degree of knowledge of basic constructs related to the Agenda 2030 and the Sustainable Development Goals: gender equality, human rights, social justice, diversity, global citizenship, climate change, Agenda 2030, sustainable development, and the SDGs. It is a questionnaire with different measurement scales (polytomous nominal scale and ordinal scale from -1, the lowest value, to 5, the highest) applied to different questions addressed according to predefined objectives. All pretest and post-test test responses were collected through Google Forms for subsequent analysis.

This questionnaire was previously assessed by expert judges in the field of education for sustainable development. With regard to the reliability of the instrument, taking into account that Cronbach's alpha above 0.8 indicates a good correlation among all the items analyzed, it is evident that there is a very good internal consistency of the instrument. This consistency contributes to making decisions regarding the use of the questionnaire in the sample, given that the significance of the coefficient must take into account the context in which it is applied.

Case Processing Summary			
		N	%
	Valid	477	100.0
Cases	Excluded [a]	0	0.0
	Total	477	100.0

[a.] Listwise elimination is based on all variables in the procedure.

Reliability statistics		
Cronbach's alpha	Cronbach's alpha based on standardized items	N of elements
0.875	0.878	23

In the reliability analysis segmented by control and experimental groups, we again show Cronbach's alpha above 0.8, indicating a good correlation among all the elements analyzed by the group.

Reliability Statistics			
Control and Experimental Group	Cronbach's alpha	Cronbach's alpha based on standardised items	N of elements
Control Group	0.835	0.840	23
Experimental Group	0.883	0.885	23

3.4. Procedure

The research followed three consecutive stages: a pretest, an intervention, and a post-test. The questionnaire used was the same in the pretest and the post-test, although one question was added to the post-test.

The first phase or pretest consisted of the participants' responses to the questionnaire in both the experimental and control groups. After the pretest phase, the intervention was carried out with the experimental groups, in which the concepts corresponding to the questionnaire were presented through texts, reflections, and applied activities.

The final phase consisted of replicating the questionnaire, including a new question. Participants were asked about the number of subjects in which competencies for sustainable development had been integrated, with answers ranging from "no subjects" to "all subjects".

This study followed all ethical guidelines, including obtaining informed consent from all participants. In addition, the confidentiality and anonymity of the data collected were guaranteed.

3.5. Data Analysis

The Statistical Package for the Social Sciences (SPSS) version 27.0 was used to analyze the information, carrying out a descriptive–comparative analysis of the data collected from the questionnaire. The aim of this study is to find out what knowledge the students of Bachelor's and Master's degrees in Education have about the 2030 Agenda and the Sustainable Development Goals and whether this knowledge varies according to gender, degree, and the educational intervention received in this area.

Descriptive techniques were used for the statistical analysis. For qualitative variables of a nominal nature, frequency analysis was included in achieving objectives. For discrete variables, measures of central tendency (mean and median) and dispersion (standard deviation, minimum, and maximum) were calculated to describe the characteristics of the sample.

Cross-tabulations and the Chi-square statistical test were used to compare frequencies according to respondent characteristics and determine whether there is an association between the variables studied.

In the comparison of ordinal variables under study according to classification variables (nominal), independent groups were compared using relevant non-parametric tests. In the case of comparison of two groups, the Mann–Whitney U test was used, and in the case of comparison of more than two groups, the Kruskal–Walli test was employed.

3.6. Experimental Group Intervention

In the subject, Contemporary Theory and Institutions of Education within the Primary Education degree (basic subject, 6 credits), as well as in the second-year subject of the Social Education degree (compulsory subject, 6 credits) at the University of Murcia, the importance of the Sustainable Development Goals of the 2030 Agenda, applied to each topic and included in the teaching guides for these subjects, was explained at the beginning of the semester. Among the selected ones, SDG 4 (Education for Quality), SDG 5 (Gender Equality), and SDG 10 (Reducing Inequalities and Peace, Justice, and Strong Institutions) were discussed in depth. The semester started with a pretest, with a questionnaire on brainstorming with different activities based on their theoretical and practical knowledge. Then, with each subject of the assignment, the SDGs were related according to the European Framework for Sustainability Competencies. In each subject, these and other SDGs were related. At the end of the semester, they were given a post-test and a theoretical–practical questionnaire to check how they had deepened their knowledge of these objectives by applying them with critical and decisive thinking.

Education in values is one of the main educational challenges of the present day. In recent years, all educational reforms in our cultural environment have contemplated the concept of themes, or transversal axes, as curricular elements introduced throughout the educational process to develop certain values [40]. Coordinating and dealing jointly with the values developed through the curriculum is important so that they are not decontextualized. Values are a personal frame of reference that guides people in their actions, opinions, and decisions [41].

To speak of civility is to speak of citizenship, a value that means much more than civility. Civility distinguishes a person who is interested in his or her role as a committed and supportive citizen within a common space of coexistence shared with other citizens. Society is built by citizens who are aware of their rights and duties and who know how to harmonize their personal freedom with responsibility and solidarity. Good manners and the rules of civility are important, but civility is more than that. It is not a formality to be complied with but an ethical feeling that allows the development of a culture of respect among people who share the same social environment. Educational institutions must be democratically organized to allow for decision-making and commitment and to put democratic values into action. Educating citizens (including the families themselves) involves prioritizing participation and responsibility within all school environments as a community that equally shares in a set of democratic rights of cooperation and communication [40].

At the University of Valencia, in the Social Pedagogy course, after presenting the 2030 Agenda and the SDGs, students chose a group. They designed a file with activities related to the SDGs and a service-learning project, which was put into practice. These activities were based on the three domains (cognitive, attitudinal, and action) and the UNESCO competencies. In the degree of Social Education, in addition to being a specific subject, sustainability, history, characteristics, and areas of intervention were studied in depth. In the Master's Degree in Secondary Education, in addition to the presentation of the SDGs and the 2030 Agenda, debates were held, and didactic units were designed that included the SDGs, domains, and UNESCO competencies.

4. Results

4.1. Descriptive Analysis

First, participants were asked to what extent they were aware of certain basic constructs linked to the Sustainable Development Goals (gender equality, human rights, social justice, diversity, global citizenship, climate change, Agenda 2030, sustainable development, and SDGs). The values for the responses ranged from 1 (the lowest value) to 5 (the highest value). Descriptive data for the control and experimental groups from the pretest and post-test (Table 2) show a trend towards improved knowledge and understanding of the basic constructs linked to the Sustainable Development Goals.

Table 2. Descriptive data of the control and experimental group.

		CG			EG		
		Media	**SD**	**Median**	**Media**	**SD**	**Median**
	3.1 Gender equality						
	Pretest	4.50	0.69	5	4.56	0.68	5
	Post-test	4.43	0.65	5	4.55	0.78	5
	3.2 Human rights						
	Pretest	4.35	0.85	5	4.39	0.73	5
	Post-test	4.43	0.65	5	4.40	0.76	5
	3.3 Social justice						
	Pretest	3.98	0.86	4	4.04	0.92	4
	Post-test	4.04	0.84	4	4.10	0.86	4
	3.4 Diversity						
	Pretest	4.20	0.75	4	4.34	0.77	4
	Post-test	4.33	0.79	4	4.45	0.82	5
	3.5 Global citizenship						
	Pretest	3.48	0.86	3	3.62	1.05	4
	Post-test	3.78	0.94	4	3.89	0.95	4
	3.6 Climate change						
	Pretest	4.26	0.83	5	4.17	0.88	4
	Post-test	4.59	0.58	5	4.24	0.85	4
	3.7 Agenda 2030						
	Pretest	3.26	1.34	3	3.42	1.24	3
	Post-test	3.65	1.04	4	3.77	1.10	4
	3.8 Sustainable development						
	Pretest	3.76	1.08	4	3.88	0.94	4
	Post-test	4.11	0.77	4	4.17	0.86	4
3. To what extent do you know and understand the following concepts linked to the Sustainable Development Goals?	3.9 Sustainable Development Goals						
	Pretest	3.63	1.14	4	3.78	0.99	4
	Post-test	4.07	0.88	4	4.23	0.81	4

Although the differences are small, this post-intervention improvement is evident in the CG. The most notable improvements are observed in the concepts of climate change, sustainable development, and sustainable development goals, where the post-intervention means are clearly higher than pre-intervention means. Similarly, the descriptive data for the experimental group show a positive trend in knowledge and understanding of the constructs analyzed. Although some improvements are small, there is a clear upward trend across all the concepts assessed in this case. The most notable improvements are observed, in this case, in diversity, global citizenship, Agenda 2030, sustainable development, and Sustainable Development Goals. These results suggest that the intervention effectively improved knowledge about the SDGs in several key areas.

In the statistical analysis for testing similar baseline knowledge, the hypothesis that both groups (CG and EG) do not differ in subject knowledge is tested. This hypothesis is confirmed as no statistical significance exists in any of the items. Therefore, there are initial equivalences.

With regard to the contrast between the pretest and post-test in the control group, which was not provided with experimental training, the results do not differ in terms of their assessments or knowledge after the end of this study. Therefore, the level of knowledge does not differ significantly between the pretest and post-test in the control group.

The comparison of equivalent medians in this non-parametric test indicates that items with sig. values below 0.05 indicate that there are significant differences in the ratings of those items depending on the pretest or post-test time. If we look at the results, we can see that there are significant differences between the pretest and post-test (higher scores in the post-test) in the experimental group.

It is also evident that there are significant differences in the assessment of the item between the experimental group and the control group. There are, therefore, significant differences between the two groups (higher scores in the control group) at the post-test moment.

This is why the treatment or experimental design may suggest that it has been relevant since the improvements occurred in the experimental group. In contrast, in the control group, there is no significant relevance in the students' pretest–post-test evolution (Table 3).

Table 3. Descriptive data by group and time.

		Pre: Control–Experimental		Pre–Post: Control		Pre–Post: Experimental		Post: Control–Experimental	
		p	d	p	d	p	d	p	d
	3.1 Gender equality	0.515	−0.051	0.522	0.069	0.760	−0.016	0.099	−0.138
	3.2 Human rights	0.995	0.000	0.927	−0.010	0.772	−0.016	0.965	−0.004
	3.3 Social justice	0.542	−0.054	0.702	−0.044	0.675	−0.024	0.694	−0.037
3. To what extent do you know and understand the following concepts linked to the Sustainable Development Goals?	3.4 Diversity	0.164	−0.118	0.306	−0.114	0.061	−0.103	0.193	−0.113
	3.5 Global citizenship	0.202	−0.113	0.075	−0.205	0.024	−0.132	0.525	−0.060
	3.6 Climate change	0.557	0.051	0.068	−0.197	0.419	−0.046	0.018	0.213
	3.7 Agenda 2030	0.446	−0.069	0.158	−0.166	0.008	−0.158	0.450	−0.072
	3.8 Sustainable development	0.547	−0.053	0.147	−0.167	0.002	−0.176	0.477	−0.065
	3.9 Sustainable Development Goals	0.432	−0.070	0.068	−0.212	<0.001	−0.257	0.277	−0.100

The effect size helps us interpret the quality of the fit between items. It is the most powerful or highly significant statistical significance—in absolute value—(>0.4 is already considered a high effect size).

The statistical analysis suggests that the educational intervention in the experimental group effectively improved knowledge and understanding of the concepts linked to the SDGs. The results show no significant changes in the control group, underlining the effectiveness of the treatment implemented in the EG.

The comparison of equivalent medians for the total sample (Table 4) indicates that there are no significant differences in the ratings of these items according to the control or experimental group, with the exception of the item climate change. There are differences in the comparison between the CG and EG groups, but in this case, it is not attributable to the intervention received by the experimental group.

Table 4. Descriptive data of the total sample by groups.

		CG					EG					Control–Experimental	
		Media	SD	Median	Minimum	Maximum	Media	SD	Median	Minimum	Maximum	*p*	d
3. To what extent do you know and understand the following concepts linked to the Sustainable Development Goals?	3.1 Gender equality	4.47	0.67	5	3	5	4.56	0.72	5	1	5	0.101	−0.093
	3.2 Human rights	4.39	0.76	5	2	5	4.39	0.74	5	2	5	0.982	0.001
	3.3 Social justice	4.01	0.85	4	2	5	4.06	0.90	4	1	5	0.508	−0.042
	3.4 Diversity	4.26	0.77	4	2	5	4.38	0.79	5	1	5	0.101	−0.099
	3.5 Global citizenship	3.63	0.91	4	2	5	3.72	1.03	4	1	5	0.285	−0.069
	3.6 Climate change	4.42	0.73	5	3	5	4.19	0.87	4	1	5	0.024	0.140
	3.7 Agenda 2030	3.46	1.21	4	1	5	3.55	1.20	4	1	5	0.502	−0.044
	3.8 Sustainable development	3.93	0.95	4	1	5	3.99	0.92	4	1	5	0.658	−0.028
	3.9 Sustainable Development Goals	3.85	1.04	4	1	5	3.94	0.95	4	1	5	0.513	−0.042

The statistical analysis suggests that the educational intervention in the experimental group effectively improved knowledge and understanding of certain concepts linked to the SDGs. The results show significant improvements in several items in the experimental group after the intervention, while the control group showed no significant changes. This indicates that the intervention positively impacted the knowledge of the experimental group.

The comparison of equivalent medians for the total sample (Tables 5 and 6) indicates, again, that items with sig. values below 0.05 indicate that there are significant differences in the ratings of those items as a function of pretest–post-test time. Therefore, there are significant differences between the passage of time and learning (higher scores on the post-test). Specifically, in relation to comparing the results according to the pretest and post-test time (Table 5), the post-test time had a positive and significant impact on knowledge about global citizenship. The improvement in the mean from 3.60 to 3.86 and a significant *p*-value (0.008) indicates that participants improved their knowledge on this topic over time. Similarly, it positively and significantly impacted participants' knowledge of Agenda 2030, sustainable development, and the Sustainable Development Goals. The increases in means and significant *p*-values suggest that the intervention effectively improved knowledge in these areas.

Statistical analysis suggests that the educational intervention in the experimental group effectively improved knowledge and understanding of several concepts linked to the SDGs. The results show significant improvements in several items for the experimental group after the intervention, while the control group showed no significant changes. This indicates that the intervention positively impacted the knowledge of the experimental group.

Table 5. Descriptive data of the total sample by time.

		Total Sample					Pretest–Post-Test	
		Media	**SD**	**Median**	**Mínimum**	**Maximum**	***p***	**d**
3. To what extent do you know and understand the following concepts linked to the Sustainable Development Goals?	3.1 Gender equality						0.808	0.011
	Pretest	4.55	0.68	5	1	5		
	Post-test	4.52	0.75	5	1	5		
	3.2 Human rights						0.757	−0.015
	Pretest	4.38	0.74	5	2	5		
	Post-test	4.41	0.73	5	2	5		
	3.3 Social justice						0.644	−0.024
	Pretest	4.03	0.91	4	1	5		
	Post-test	4.09	0.85	4	2	5		
	3.4 Diversity						0.056	−0.094
	Pretest	4.32	0.77	4	2	5		
	Post-test	4.42	0.81	5	1	5		
	3.5 Global citizenship						0.008	−0.138
	Pretest	3.60	1.03	4	1	5		
	Post-test	3.86	0.95	4	1	5		
	3.6 Climate change						0.071	−0.091
	Pretest	4.18	0.87	4	1	5		
	Post-test	4.33	0.80	5	1	5		
	3.7 Agenda 2030						0.004	−0.153
	Pretest	3.39	1.26	3	1	5		
	Post-test	3.74	1.08	4	1	5		
	3.8 Sustainable development						0.001	−0.169
	Pretest	3.86	0.96	4	1	5		
	Post-test	4.16	0.83	4	1	5		
	3.9 Sustainable Development Goals						<0.001	−0.240
	Pretest	3.75	1.02	4	1	5		
	Post-test	4.19	0.83	4	2	5		

Table 6. Descriptive data for the total sample, by groups, and by time point.

	Total Sample			Pre: Control–Experimental	Pre–Post: Control	Pre–Post: Experimental	Post: Control–Experimental
	Media	**SD**	**Median**	***p***	***p***	***p***	***p***
3.1 Gender equality	4.54	0.71	5	0.496	0.476	0.142	0.115
3.2 Human rights	4.39	0.74	5	0.603	0.775	0.309	0.476
3.3 Social justice	4.05	0.89	4	0.057	0.644	0.028	0.002
3.4 Diversity	4.36	0.79	5	0.928	0.658	0.645	0.431
3.5 Global citizenship	3.70	1.00	4	0.133	0.858	0.926	0.267
3.6 Climate change	4.24	0.85	4	0.815	0.315	0.901	0.545
3.7 Agenda 2030	3.53	1.20	4	0.498	0.633	0.721	0.629
3.8 Sustainable development	3.98	0.92	4	0.242	0.446	0.508	0.771
3.9 Sustainable Development Goals	3.92	0.97	4	0.258	0.388	0.899	0.733

Overall, participants understand the concepts analyzed, especially in areas such as gender equality, human rights, social justice, and diversity (Table 6). However, there is variability in the knowledge of some concepts, such as global citizenship, Agenda 2030, and sustainable development, with some respondents reporting very low levels of understanding. The high variability in certain concepts suggests a need for more education or intervention in these specific areas.

Most variables showed no significant differences between the control and experimental groups or in the pre–post comparisons within groups (Table 6). However, social justice was a notable exception, where significant differences were found both pre–post in the experimental group and post-test between the groups. This suggests that the intervention had a specific impact on social justice but not on the other areas measured.

Statistical analysis suggests that the educational intervention in the experimental group effectively improved knowledge and understanding of several concepts linked to the SDGs. The results show significant improvements in several items for the experimental group after the intervention, while the control group showed no significant changes. This indicates that the intervention positively impacted the knowledge of the experimental group.

4.2. Comparative Analysis

The data collected from the descriptive analysis were compared with some variables, such as gender and the degree studied by the participants. In relation to the gender variable, the comparison of equivalent medians using this non-parametric test indicates that there are no significant differences in any of the items according to gender. Therefore, these ratings do not vary according to gender.

Both men and women have good knowledge of the concepts analyzed, with slight differences between them. In most cases, women tend to have a slightly higher knowledge of the issues assessed. However, men also show a high level of understanding in specific areas such as human rights, social justice, and climate change. The variability in responses suggests that there are specific areas where education and intervention might be well distributed between the two genders.

Overall, students in the different education programs understand the concepts related to the Sustainable Development Goals (SDGs) (Table 7). However, there are variations in the understanding of specific concepts across different programs. This suggests that it would be beneficial to design tailored educational strategies to strengthen understanding of certain themes, such as social justice and global citizenship, especially for students with lower scores on these aspects. Furthermore, these results highlight the importance of integrating SDG education into all levels of formal education to ensure a sound understanding and effective action towards sustainable development.

Table 7. Comparison based on education. Test statistics.

		Primary Education Teacher			Master's Degree in Secondary Education			Degree in Pedagogy			Degree in Social Education			Total		
		Media	SD	Median	Media	SD	Median	Media	SD	Median	Media	SD	Median	Media	SD	Median
3. To what extent do you know and understand the following concepts linked to the Sustainable Development Goals?	3.1 Gender equality	4.55	0.71	5	4.56	0.68	5	4.41	0.79	5	4.60	0.70	5	4.54	0.71	5
	3.2 Human rights	4.40	0.76	5	4.42	0.70	5	4.22	0.86	4	4.51	0.62	5	4.39	0.74	5
	3.3 Social justice	3.99	0.95	4	4.11	0.80	4	3.94	0.91	4	4.21	0.81	4	4.05	0.89	4
	3.4 Diversity	4.32	0.81	5	4.40	0.74	5	4.20	0.90	4	4.53	0.64	5	4.36	0.79	5
	3.5 Global citizenship	3.53	1.06	4	3.73	0.94	4	3.65	0.97	4	4.16	0.85	4	3.70	1.00	4
	3.6 Climate change	4.14	0.91	4	4.48	0.70	5	4.03	0.86	4	4.27	0.83	4	4.24	0.85	4
	3.7 Agenda 2030	3.20	1.27	3	3.54	1.15	4	3.62	1.10	4	4.28	0.81	4	3.53	1.20	4
	3.8 Sustainable development	3.84	0.95	4	4.04	0.90	4	3.87	0.89	4	4.32	0.84	4	3.98	0.92	4
	3.9 Sustainable Development Goals	3.77	1.01	4	3.93	0.95	4	3.81	0.94	4	4.43	0.72	5	3.92	0.97	4

The average ranks represent the relative position of each program in terms of understanding the constructs analyzed, whereas higher ranks indicate apparently better understanding. In this respect, differences are evident between the degree programs (Table 8).

Table 8. Comparison based on qualifications. Ranks.

Ranks			
Degree You Are Pursuing		**N**	**Average Range**
3.1 Gender equality	Primary Education Teacher	199	241.32
	Master's Degree in Secondary Education	134	240.35
	Degree in Pedagogy	69	217.96
	Degree in Social Education	75	249.79
	Total	477	
3.2 Human rights	Primary Education Teacher	199	240.99
	Master's Degree in Secondary Education	134	240.57
	Degree in Pedagogy	69	213.77
	Degree in Social Education	75	254.13
	Total	477	
3.3 Social justice	Primary Education Teacher	199	232.77
	Master's Degree in Secondary Education	134	244.63
	Degree in Pedagogy	69	221.87
	Degree in Social Education	75	261.24
	Total	477	
3.4 Diversity	Primary Education Teacher	199	233.64
	Master's Degree in Secondary Education	134	243.22
	Degree in Pedagogy	69	217.83
	Degree in Social Education	75	265.17
	Total	477	
3.5 Global citizenship	Primary Education Teacher	199	218.85
	Master's Degree in Secondary Education	134	240.50
	Degree in Pedagogy	69	229.76
	Degree in Social Education	75	298.29
	Total	477	
3.6 Climate change	Primary Education Teacher	199	225.67
	Master's Degree in Secondary Education	134	274.86
	Degree in Pedagogy	69	204.13
	Degree in Social Education	75	242.37
	Total	477	
3.7 Agenda 2030	Primary Education Teacher	199	204.34
	Master's Degree in Secondary Education	134	238.87
	Degree in Pedagogy	69	246.24
	Degree in Social Education	75	324.54
	Total	477	

Table 8. *Cont.*

Ranks			
Degree You Are Pursuing		**N**	**Average Range**
3.8 Sustainable development	Primary Education Teacher	199	220.39
	Master's Degree in Secondary Education	134	247.50
	Degree in Pedagogy	69	218.41
	Degree in Social Education	75	292.14
	Total	477	
3.9 Sustainable Development Goals	Primary Education Teacher	199	219.25
	Master's Degree in Secondary Education	134	238.77
	Degree in Pedagogy	69	220.46
	Degree in Social Education	75	308.88
	Total	477	

The non-parametric H-Kruskal-Wallis analysis allows us to compare medians of multiple groups: it determines whether there are significant differences between the medians of 3 or more independent groups. The adjusted sig. value is used using the Bonferroni correction for non-parametric ANOVA with multiple testing or comparisons.

For the concepts of "Gender equality", "Human rights", "Social justice", and "Diversity", the *p*-values are greater than 0.05 (Table 9). This indicates insufficient evidence to reject the null hypothesis that no significant differences exist between programs for these concepts. For the concepts of 'Global Citizenship', 'Climate Change', 'Agenda 2030', 'Sustainable Development', and 'Sustainable Development Goals', the *p*-values are less than 0.05. This suggests that there are significant differences between the programs for these statements.

Table 9. Comparison based on degree. Test statistics.

Test Statistics [a,b]									
	3.1 Gender Equality	3.2 Human Rights	3.3 Social Justice	3.4 Diversity	3.5 Global Citizenship	3.6 Climate Change	3.7 Agenda 2030	3.8 Sustainable Development	3.9 Sustainable Development Goals
Kruskal–Wallis H	2.988	4.057	4.095	5.819	20.127	18.032	44.330	18.823	27.170
gl	3	3	3	3	3	3	3	3	3
Sig. asin.	0.393	0.255	0.251	0.121	0.000	0.000	0.000	0.000	0.000
ε^2	0.006	0.009	0.009	0.012	0.042	0.038	0.093	0.040	0.057

[a] Kruskal Wallis test; [b] Grouping variable: Degree you are pursuing.

Following the significant differences found in Table 9, posterior tests were carried out to determine which pairs of categories exhibit these differences. The results suggest that students with a Bachelor's Degree in Social Education show significant differences in their understanding of global citizenship compared to students with a Bachelor's Degree in Primary Education, Bachelor's Degree in Pedagogy, and Master's Degree in Secondary Education (Table 10).

Master's Degree students in Secondary Education show significant differences in their understanding of Climate Change compared to Bachelor's Degree students in Pedagogy and Primary Education (Table 11).

Table 10. Comparison based on qualifications. Global citizenship.

3.5 Global Citizenship

Pairwise Comparisons of Degree Courses Taken					
Sample 1—Sample 2	**Test Statistic**	**Desv. Error**	**Desv. Test Statistic**	**Sig.**	**Adjusted Sig. [a]**
Primary Education Teacher—Degree in Pedagogy	−10.912	18.439	−0.592	0.554	1.000
Teacher of Primary Education—Master's Degree in Secondary Education	−21.651	14.749	−1.468	0.142	0.853
Teacher of Primary Education—Degree in Social Education	−79.437	17.883	−4.442	0.000	0.000
Degree in Pedagogy—Master's Degree in Teaching in Secondary Education	10.739	19.557	0.549	0.583	1.000
Degree in Pedagogy—Degree in Social Education	−68.526	22.017	−3.112	0.002	0.011
Master's Degree in Secondary Education—Bachelor's Degree in Social Education	−57.787	19.033	−3.036	0.002	0.014

Each row tests the null hypothesis that the distributions of Sample 1 and Sample 2 are equal. Asymptotic significance is displayed (bilateral tests). The significance level is 0.050. [a] Significance values have been adjusted using the Bonferroni correction for several tests.

Table 11. Comparison based on degree. Climate Change.

3.6 Climate Change

Pairwise Comparisons of Degree Courses Taken					
Sample 1—Sample 2	**Test Statistic**	**Desv. Error**	**Desv. Test Statistic**	**Sig.**	**Adjusted Sig. [a]**
Degree in Pedagogy—Primary Education Teacher	21.543	17.790	1.211	0.226	1.000
Degree in Pedagogy—Degree in Social Education	−38.243	21.242	−1.800	0.072	0.431
Bachelor's Degree in Pedagogy—Master's Degree in Teaching in Secondary Education	70.728	18.868	3.748	0.000	0.001
Teacher of Primary Education—Degree in Social Education	−16.700	17.254	−0.968	0.333	1.000
Teacher of Primary Education—Master's Degree in Secondary Education	−49.185	14.230	−3.456	0.001	0.003
Degree in Social Education—Master's Degree in Teaching in Secondary Education	32.485	18.363	1.769	0.077	0.461

Each row tests the null hypothesis that the distributions of Sample 1 and Sample 2 are equal. Asymptotic significance is displayed (bilateral tests). The significance level is 0.050. [a] Significance values have been adjusted using the Bonferroni correction for several tests.

Students with a Bachelor's Degree in Social Education show significant differences in their understanding of the 2030 Agenda compared to students with a Master's Degree in Primary Education, a Master's Degree in Teaching in Secondary Education, and a Bachelor's Degree in Pedagogy (Table 12).

Table 12. Comparison on the basis of qualification. Agenda 2030.

3.7 Agenda 2030					
Pairwise Comparisons of Degree Courses Taken					
Sample 1—Sample 2	**Test Statistic**	**Desv. Error**	**Desv. Test Statistic**	**Sig.**	**Adjusted Sig.** [a]
Teacher of Primary Education—Master's Degree in Secondary Education	−34.524	14.932	−2.312	0.021	0.125
Teacher of Primary Education—Degree in Pedagogy	−41.897	18.667	−2.244	0.025	0.149
Teacher of Primary Education—Degree in Social Education	−120.198	18.104	−6.639	0.000	0.000
Master's Degree in Secondary Education—Bachelor's Degree in Pedagogy	−7.373	19.798	−0.372	0.710	1.000
Master's Degree in Secondary Education—Degree in Social Education	−85.674	19.269	−4.446	0.000	0.000
Degree in Pedagogy—Degree in Social Education	−78.301	22.289	−3.513	0.000	0.003

Each row tests the null hypothesis that the distributions of Sample 1 and Sample 2 are equal. Asymptotic significance is displayed (bilateral tests). The significance level is 0.050. [a] Significance values have been adjusted using the Bonferroni correction for several tests.

Students with a Bachelor's Degree in Social Education show significant differences in their understanding of the concept of Sustainable Development compared with the students of Primary Education Teacher, Bachelor's Degree in Pedagogy, and Master's Degree in Secondary Education Teaching (Table 13).

Table 13. Comparison based on degree. Sustainable development.

3.8 Sustainable Development					
Pairwise Comparisons of Degree Courses Taken					
Sample 1—Sample 2	**Test Statistic**	**Desv. Error**	**Desv. Test Statistic**	**Sig.**	**Adjusted Sig.** [a]
Degree in Pedagogy—Primary Education Teacher	1.986	18.205	0.109	0.913	1.000
Bachelor's Degree in Pedagogy—Master's Degree in Teaching in Secondary Education	29.090	19.308	1.507	0.132	0.791
Degree in Pedagogy—Degree in Social Education	−73.734	21.737	−3.392	0.001	0.004
Teacher of Primary Education—Master's Degree in Secondary Education	−27.104	14.562	−1.861	0.063	0.376
Teacher of Primary Education—Degree in Social Education	−71.748	17.656	−4.064	0.000	0.000
Master's Degree in Secondary Education—Degree in Social Education	−44.644	18.792	−2.376	0.018	0.105

Each row tests the null hypothesis that the distributions of Sample 1 and Sample 2 are equal. Asymptotic significance is displayed (bilateral tests). The significance level is 0.050. [a] Significance values have been adjusted using the Bonferroni correction for several tests.

Likewise, students with a Bachelor's Degree in Social Education show significant differences in their understanding of Sustainable Development Goals compared to students with a Master's Degree in Primary Education and a Master's Degree in Secondary Education (Table 14).

Table 14. Comparison based on degree. SDG.

3.9 Sustainable Development Goals					
Pairwise Comparisons of Degree Courses Taken					
Sample 1—Sample 2	**Test Statistic**	**Desv. Error**	**Desv. Test Statistic**	**Sig.**	**Adjusted Sig.** [a]
Teacher of Primary Education—Degree in Pedagogy	−1.210	18.328	−0.066	0.947	1.000
Teacher of Primary Education—Master's Degree in Secondary Education	−19.526	14.661	−1.332	0.183	1.000
Teacher of Primary Education—Degree in Social Education	−89.634	17.776	−5.043	0.000	0.000
Bachelor's Degree in Pedagogy—Master's Degree in Teaching in Secondary Education	18.316	19.439	0.942	0.346	1.000
Degree in Pedagogy—Degree in Social Education	−88.423	21.884	−4.041	0.000	0.000
Master's Degree in Secondary Education—Degree in Social Education	−70.108	18.919	−3.706	0.000	0.001

Each row tests the null hypothesis that the distributions of Sample 1 and Sample 2 are equal. Asymptotic significance is displayed (bilateral tests). The significance level is 0.050. [a] Significance values have been adjusted using the Bonferroni correction for several tests.

Finally, there is no association between the degree variable and the integration of competencies for sustainable development by the teaching staff. The evaluations given do not influence the degree taken. Regarding integrating competencies related to the SDGs and the 2030 Agenda, most respondents (50.8%) indicated that they have worked on competencies related to sustainable development in some subjects. A significant percentage (28.6%) claimed to have worked on them in most subjects. A smaller number of respondents (9.5%) indicated they had worked on these competencies in all subjects. Only a minority (8.7%) mentioned having worked on them in only one subject, while a small percentage (2.4%) stated that they had not worked on them in any subject. In summary, most respondents have worked on these competencies in at least some subjects, suggesting a varied distribution in acquiring these skills among respondents.

In the comparison by degree, among students with a Master's Degree in Secondary Education, the majority indicated having worked on competencies for sustainable development in some subjects (55.2%). Students with a Bachelor's Degree in Pedagogy showed a more uniform distribution of teaching these competencies by the teaching staff, with a similar proportion in all categories. Most students with a Bachelor's Degree in Social Education indicated working on these competencies in some subjects (52.4%).

In summary, it appears that there are differences in the distribution of work on competencies for sustainable development among the teaching staff of the different degrees. A higher proportion of students with a Master's Degree in Secondary Education indicate having worked on these competencies in some subjects compared to students with other degrees.

Finally, in the comparative analysis, the results indicate that there is no significant association between the degree program taken by the students and the acquisition of teacher

competencies since all the significance values are greater than the level of significance typically used (0.05) (Table 15).

Table 15. Association between degree and integration of competencies. Chi-square tests.

Chi-Square Tests			
	Value	**gl**	**Asymptotic Significance (Bilateral)**
Pearson's Chi-square	6.271 [a]	8	0.617
Likelihood ratio	7.162	8	0.519
Linear by linear association	0.004	1	0.949
N of valid cases	126		

[a] 7 boxes (46.7%) have expected a count of less than 5. The minimum expected count is 0.62.

On balance, students in the different educational programs understand concepts related to the SDGs. However, there are significant variations in understanding specific concepts, such as global citizenship and social justice. Students with a Bachelor's Degree in Social Education show a significantly better understanding of concepts such as global citizenship, Climate Change, Agenda 2030, sustainable development, and SDGs compared to students in other programs. In contrast, students with a Master's Degree in Secondary Education better understand Climate Change than those with a Bachelor's Degree in Pedagogy and Primary Education.

Statistical analyses show significant differences in the understanding of some key concepts:

- Global Citizenship: Social Education students stand out compared to Primary Education, Pedagogy, and Secondary Education students.
- Climate Change: Students in the Master's in Secondary Education better understand it than those in Pedagogy and Primary Education.
- Agenda 2030 and Sustainable Development: Social Education students understand better than Primary Education, Pedagogy, and Secondary Education students.
- SDGs: Similar to the above, Social Education students have a higher understanding than primary and Secondary Education students.

Therefore, it is advisable to design specific education strategies to improve understanding of issues such as social justice and global citizenship in the lowest-scoring programs. Integrating SDG education more effectively at all levels of education can help improve understanding and action towards sustainable development.

In summary, while students generally understand the SDGs well, notable differences between programs suggest that more personalized educational approaches are needed to address variations in understanding specific concepts.

5. Discussion

The results of the research point to the need to know and work on the basic constructs of the 2030 Agenda and the Sustainable Development Goals in studies linked to the field of education. The data collected in this study indicate that, in general, students with the analyzed Bachelor's and Master's degrees in education increase their knowledge of concepts related to sustainability throughout the course (as evidenced by the fact that both CG and EG increase their scores in the post-test). Even so, the differences are significant only in the EG. Therefore, a direct classroom intervention on sustainability positively impacts students. Other studies have also demonstrated the importance of direct intervention in this area [42], with a greater impact through infusion into the curriculum itself rather than through specific courses [43] and through the incorporation of transversal competencies [44]. The study results by Calvo et al. showed that a multidisciplinary project they carried out raised awareness of the SDGs and enabled students to visualize how to apply the competencies acquired. In this sense, there is a need to promote collaborative work across disciplines to engage teachers in the transition to sustainability [45].

An analysis carried out on the curricula for future educators in Spanish universities [46] showed a substantial presence of social justice in the competencies, both at the first and second levels of curricular specification. However, its distribution was uneven depending on the university, degree, course, the nature of the subject, and curricular elements. This calls for a reorientation of university leadership. Effective governance is crucial for implementing and sustaining sustainability initiatives. This includes establishing sustainability committees, including sustainability criteria in decision-making processes, and communicating achievements and challenges transparently. Participatory governance, involving all university stakeholders, is key to the success of these initiatives [23].

In this study, the comparative analysis clarified that the degree of knowledge is unequal depending on the degree studied. In our study, it is noteworthy that Social Education students show that they have more knowledge than the rest of the degrees, specifically in the concepts of global citizenship, Agenda 2030, sustainable development, and SDGs. It should be borne in mind that the students who are enrolled in this degree are in their fourth year and take a specific subject on education for sustainability. Therefore, we can understand the importance of explicit intervention, as demonstrated by the results linked to the Social Education group and the contrast between the intervention in the experimental group and the non-intervention in the control group.

Future education professionals should be aware of the importance of this knowledge. Pegalajar-Palomino et al. concluded in a systematic review study that university students have favorable attitudes toward Education for Sustainability and their commitment to the environment and a more just society. However, in the academic curriculum of the degrees in Education, there is a deficit in training for developing the professional competencies necessary to apply ESD in their professional teaching practice [47]. Along the same lines, Dahl's study, with a sample of 578 student teachers from different European countries, concluded that they feel well prepared to handle many aspects of teaching professionalism but less prepared to educate their students in sustainability [48].

Therefore, the involvement of university teachers in social and educational transformation is necessary [47], as seen from the present study, and their intervention directly impacts students. Undoubtedly, the methodological strategies for implementing Education for Sustainability are complex, and it is necessary to continue to insist on teacher training processes [49–51]. In short, universities can and should reorient their work to consider the challenges of the 21st century since these institutions can contribute significantly to a more just and equitable future. Each institution must find its own path to sustainability, aligning its resources and capabilities with local and global needs and challenges [23].

Contributions such as the post-development university are mainly oriented in two aspects: deinstitutionalization (freeing learning from rigid institutional structures, allowing a more autonomous and decentralized education) and the ecology of knowledge (plurality of epistemologies, rejecting the hegemony of Western academic knowledge) [22]. Still, they must face limitations in influencing development, such as resource constraints, institutional barriers, and political challenges [22].

6. Conclusions

We can conclude that the two objectives proposed in this study have been achieved. On the one hand, we have obtained significant data on the knowledge of undergraduate and master's degree students related to education about the Sustainable Development Goals of the 2030 Agenda. And on the other, it has been possible to compare which concepts related to the SDGs (gender equality, human rights, social justice, diversity, global citizenship, climate change, Agenda 2030, sustainable development, and SDGs) are affected according to the type of studies and the intervention received. Human rights, social justice, diversity, global citizenship, climate change, Agenda 2030, sustainable development, and SDGs are emphasized according to the type of studies and the intervention received. Students with a Degree in Social Education achieved higher scores in the aspects related to global citizenship, Agenda 2030, sustainable development, and the SDGs.

The results indicate the importance of training in these concepts for future professionals in the field of education, the need for their incorporation into the university curriculum, and the necessary involvement of university faculty in their theoretical and methodological training so that their students acquire them. In short, current challenges require collective action and commitment from all sectors of society to achieve sustainable development [22]. Among them, universities, specifically in studies linked to education, can make great contributions. Still, all this implies a rethinking of the very foundations of the institution.

References

1. UNESCO. Rethinking Education: Towards a Global Common Good? 2015. Available online: https://unesdoc.unesco.org/ark:/48223/pf0000232555 (accessed on 1 June 2024).
2. Hernández-Castilla, R.; Opazo, H. Editorial. Los objetivos de desarrollo sostenible: Aportes desde la investigación educativa comprometida. *Profesorado. Rev. Currículum Y Form.* **2020**, *24*, 1–8.
3. UNESCO. Education for Sustainable Development: A Roadmap. 2020. Available online: https://unesdoc.unesco.org/ark:/48223/pf0000374802 (accessed on 16 June 2024).
4. Joseph, T.; Said, R. Educación para el desarrollo sostenible: Hacia una visión sociopedagógica. *Controv. Y Concurr. Latinoam.* **2019**, *11*, 291–314.
5. Öztürk, H. Education for Sustainable Development: A Systematic Review. *Sustain. Dev.* **2017**, *25*, 123–145.
6. Heasly, B.; Lindner, J.; Iliško, D.; Salīte, I. From Initiatives, to Insights, to Implementation of the Sustainability and Securitability Agenda for 2030. *Discourse Commun. Sustain. Educ.* **2020**, *11*, 1–4. [CrossRef]
7. Sunthonkanokpong, W.; Murphy, E. Sustainability awareness, attitudes and actions: A survey of pre-service teachers. *Issues Educ. Res.* **2019**, *29*, 562–582.
8. Odell, V.; Molthan-Hill, P.; Martin, S.; Sterling, S. Transformative education to address all sustainable development goals. In *Springer Nature Switzerland AG 2019: Encyclopedia of the UN Sustainable Development Goals*; Leal-Filho, W., Ed.; Springer: London, UK, 2020; pp. 905–916.
9. Roux, C.J.; Dasoo, N. Pre-service teachers' perception of values education in the South African physical education curriculum. *S. Afr. J. Child. Educ.* **2020**, *10*, 1–8. [CrossRef]
10. Osoro, J.M.; Castro, A. Educación y democracia: La escuela como "espacio" de participación. *Rev. Iberoam. De Educ.* **2017**, *75*, 89–108. [CrossRef]
11. Mezzanotte, C. *The Social and Economic Rationale of Inclusive Education: An Overview of the Outcomes in Education for Diverse Groups of Students*; OECD Publishing: Paris, France, 2022.
12. Andrews, P.G.; Moulton, M.J.; Hughes, H.E. Integrating social justice into middle grades teacher education. *Middle Sch. J.* **2018**, *49*, 4–15. [CrossRef]
13. Government of Spain. *Royal Decree 822/2021, of September 28, Establishing the Organization of University Education and the Procedure for Quality Assurance*; BOE-A-2021-15781; Boletín Oficial del Estado: Madrid, Spain, 29 September 2021.
14. Government of Spain. *Organic Law 3/2020, of 29 December, Which Amends the Organic Law 2/2006, of 3 May, on Education*; BOE-A-2020-17264; Boletín Oficial del Estado: Madrid, Spain, 30 December 2020.

15. Tarrant, S.P.; Thiele, L.P. Enhancing and promoting interdisciplinarity in higher education. *J. Environ. Stud. Sci.* **2016**, *7*, 355–360. [CrossRef]

16. UNESCO. Education for Sustainable Development Goals: Learning Objectives. 2017. Available online: https://unesdoc.unesco.org/ark:/48223/pf0000247444 (accessed on 16 June 2024).

17. Merma-Molina, G.; Gavilán-Martín, D.; Baena-Morales, S.; Urrea-Solano, M. Critical Thinking and Effective Personality in the Framework of Education for Sustainable Development. *Educ. Sci.* **2022**, *12*, 28. [CrossRef]

18. Leal Filho, W.; Salvia, A.; Brandli, L.; Miranda Azeiteiro, U.; Wessel Pretorius, R. (Eds.) *Universities, Sustainability and Society: Supporting the Implementation of the Sustainable Development Goals*; Springer: London, UK, 2021.

19. Cisneros, P.F.; Mendoza, K.L. Vinculación Universidad—Sociedad: Espacio para generar creatividad e innovación. *Rev. Kill. Soc.* **2018**, *2*, 53–58. [CrossRef]

20. UNESCO. Global Citizenship Education: Preparing Learners for the Challenges of the 21st Century. 2016. Available online: https://unesdoc.unesco.org/ark:/48223/pf0000227729 (accessed on 12 June 2024).

21. Leal Filho, W.; Shiel, C.; Paço, A.; Mifsud, M.; Veiga Ávila, L.; Brandli, L.L.; Molthan-Hill, P.; Pace, P.; Azeiteiro, U.M.; Vargas, V.R.; et al. Implementing the United Nations' Sustainable Development Goals in Universities: Challenges and Opportunities. *Sustainability* **2019**, *11*, 59.

22. McCowan, T. *Higher Education for and beyond the Sustainable Development Goals*; Springer: London, UK, 2019.

23. Purcell, W.M.; Haddock-Frase, J. (Eds.) *The Bloomsbury Handbook of Sustainability in Higher Education*; Bloomsbury: London, UK, 2023.

24. Leal Filho, W.; Lange Salvia, A.; Frankenberger, F. *Handbook on Teaching and Learning for Sustainable Development*; Edward Elgar: Cheltenham, UK, 2021.

25. Tilbury, D. Education for Sustainable Development: An Expert Review of Processes and Learning. UNESCO. 2019. Available online: https://unesdoc.unesco.org/ark:/48223/pf0000191442 (accessed on 25 July 2024).

26. Ruiz-Mallén, I.; Heras, M. What sustainability? Higher education institutions' pathways to reach the Agenda 2030 goals. *Sustainability* **2020**, *12*, 1290. [CrossRef]

27. Michelsen, G.; Adomßent, M. *Higher Education for Sustainable Development: Practices, Challenges and Future Directions*; Routledge: London, UK, 2020.

28. Gough, S.; Scott, W. Education and Learning for Sustainable Development: A Theoretical Framework. *Int. J. Sustain. High. Educ.* **2020**, *21*, 35–48.

29. Sterling, S. Higher Education, Sustainability, and the Role of Systemic Change. *J. Educ. Sustain. Dev.* **2019**, *13*, 23–37.

30. OECD. *Equity and Inclusion in Education: Finding Strength through Diversity*; OECD Publishing: Paris, France, 2023.

31. Cortina, A. *Aporofobia, el Rechazo al Pobre: Un Desafío para la Democracia*; Paidós: Barcelona, Spain, 2019.

32. Nussbaum, M.C. *La Tradición Cosmopolita*; Un Noble e Imperfecto Ideal; Paidós: Barcelona, Spain, 2020.

33. Torres, C.A.; Bosio, E. *Global Citizenship Education at the Crossroads: Globalization, Global Commons, Common Good, and Critical Consciousness*; Springer: London, UK, 2020.

34. Belavi, G.; y Murillo, F.J. Educación, democracia y justicia social. *Rev. Int. De Educ. Para La Justicia Soc.* **2017**, *5*, 13–34. [CrossRef]

35. Belavi, G.; y Murillo, F.J. Democracia y Justicia Social en las Escuelas: Dimensiones para Pensar y Mejorar la Práctica Educativa. *Revista Iberoamericana Sobre Calidad Eficacia y Cambio en Educación.* **2020**, *18*, 5–28. [CrossRef]

36. Wiggan, G.; Pass, M.B.; Gadd, S.R. Critical Race Structuralism: The Role of Science Education in Teaching Social Justice Issues in Urban Education and Pre-Service Teacher Education Programs. *Urban Educ.* **2023**, *58*, 2209–2238. [CrossRef]

37. Nishina, A.; Lewis, J.A.; Bellmore, A.; Witkow, M.R. Ethnic Diversity and Inclusive School Environments. *Educ. Psychol.* **2019**, *54*, 306–321. [CrossRef]

38. UNESCO. Global Report on Adult Learning and Education. 2010. Available online: https://unesdoc.unesco.org/ark:/48223/pf0000186431 (accessed on 9 June 2024).

39. Vigo-Arrazola, M.B.; Dieste-Gracia, B.; García-Goncet, D. Formación de profesorado en y para la justicia social: Una investigación etnográfica. *Profesorado. Rev. Currículum Y Form. Profr.* **2019**, *23*, 88–107. [CrossRef]

40. Ortiz-Cermeño, E. *¿Cómo Evolucionan los Valores Cívicos en las Diversas Teorías e Instituciones Contemporáneas de la Educación?* Diego Marín: Murcia, Spain, 2020.

41. Paredes, E.; Ribera, D. *Educar en Valores*; Tibidabo: Barcelona, Spain, 2006.

42. Calvo, I.; Carrascal, E.; González, J.M.; Armentia, A.; Gil-García, J.M.; Barambones, O.; Basogain, X.; Tazo-Herran, I.; Apiñaniz, E. A Methodology to Introduce Sustainable Development Goals in Engineering Degrees by Means of Multidisciplinary Projects. *Educ. Sci.* **2024**, *14*, 583. [CrossRef]

43. Vera, F. La perspectiva de docentes sobre la infusión de la sostenibilidad en el currículo de la educación superior. *Transformar* **2022**, *3*, 17–37.

44. Bilbao-Goyoaga Arenas, A.; Barrenetxea Ayesta, M.; Barandiaran Galdós, M.; González Lasquibar, X. Integración de la sostenibilidad y el desarrollo de competencias transversales a través de metodologías activas en educación superior. *Rev. Andin. Educ.* **2023**, *6*, e201. [CrossRef]

45. Aznar, P.; Calero, M.; Martínez-Agut, M.P.; Mayoral, O.; Ull, A.; Vázquez-Verdera, V.; Vilches, A. Training Secondary Education Teachers through the Prism of Sustainability: The Case of the Universitat de València. *Sustainability* **2018**, *10*, 4170. [CrossRef]

46. Monge, C.; Gómez, P.; García-Barrera, A. La Justicia Social en la Concreción Curricular de los Grados de Maestro. *Rev. Int. Educ. Justicia Soc.* **2022**, *11*, 197–213. [CrossRef]

47. Pegalajar, M.d.C.; Burgos, A.; Martínez, E. Educación para el Desarrollo Sostenible y Responsabilidad Social: Claves en la formación inicial del docente desde una revisión sistemática. *Rev. Investig. Educ.* **2022**, *40*, 421–437. [CrossRef]

48. Dahl, T. Prepared to Teach for Sustainable Development? Student Teachers' Beliefs in Their Ability to Teach for Sustainable Development. *Sustainability* **2019**, *11*, 1993. [CrossRef]

49. García-González, E.; Jiménez-Fontana, R.; Azcárate, P. Education for Sustainability and the Sustainable Development Goals: Pre-Service Teachers' Perceptions and Knowledge. *Sustainability* **2020**, *12*, 7741. [CrossRef]

50. Lorente-Echeverría, S.; Canales-Lacruz, I.; Murillo-Pardo, B. Visión del docente universitario sobre la inclusión de la sostenibilidad curricular en la formación de maestros de Educación Física de la Universidad de Zaragoza. *Retos* **2023**, *50*, 583–592. [CrossRef]

51. UNESCO. Reimagining Our Futures Together: A New Social Contract for Education. 2021. Available online: https://unesdoc.unesco.org/ark:/48223/pf0000379707 (accessed on 20 July 2024).