



**Examining the Integration of SDGs in a First-Year
Methodology Course: A Case Study in Social Education by
Admission Pathway**

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Examining the Integration of SDGs in a First-Year Methodology Course: A Case Study in Social Education by Admission Pathway

Abstract

Purpose – This study analyses how Sustainable Development Goals (SDGs) are incorporated into a first-year Social Education methodology course at a Spanish public university, assessing its impact on students' understandings of sustainability and its relevance to socio-educational research and future careers.

Design/methodology/approach - A case study with 110 students incorporated SDGs into a methodology course. Students' knowledge and perception were measured before and after the teaching experience, employing an online questionnaire. Differences based on admission pathways (CFGS and PAU) were explored.

Findings - Initially, students had a low understanding of sustainability and SDGs, lower for those entering through PAU, improving significantly after teaching in both groups but following an inverse pattern of differentiation. Although students recognized the importance of SDGs in their careers, their personal involvement with them in daily life appeared moderate.

Research limitations/implications - The assessment tool, based on validated surveys, aims for better accuracy in measuring university students' knowledge and perception of sustainability. Future research may broaden its scope to assess effectiveness in different courses and among diverse student groups.

Practical implications – The variations in student knowledge and perception about sustainability and the SDGs, before and after the teaching experience, and across different admission pathways, highlight the important role of higher education institutions in shaping future change agents' perspectives.

Originality/value – These findings reveal how innovative educational experiences promote sustainability and social responsibility among university students, emphasising the crucial role of ongoing assessment in ensuring effective sustainability education within higher education.

Keywords: Assessment, Sustainability, SDGs, Teaching Innovation, University Admission Pathway

1. Introduction

Various authors (Abellán, 2017; Alonso-Sainz, 2021; Gallardo-López and García-Lázaro, 2021; Hernández-Castilla *et al.*, 2020; Torres, 2021) have emphasized the universal, transdisciplinary, indivisible, and dynamic nature of the Social Development Goals (SDGs) adopted by the United Nations in 2015. These goals constitute a universal call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity by 2030. Comprising 17 distinct objectives, the SDGs aim to foster sustainability, peace, and prosperity through diverse, inclusive, and equitable approaches, considering three fundamental dimensions: economic, social, and environmental. These dimensions are integral to various programs across different areas of knowledge. The ongoing incorporation of SDGs in diverse areas of knowledge and practice seeks to encourage the participation and commitment of individuals toward their environment, cultivating an active citizenry engaged with socio-environmental challenges (Gallardo-López and García-Lázaro, 2021).

Higher education institutions have likewise committed to integrating the SDGs into both education and research endeavours. They aim to cultivate professional skills related to sustainability and the SDGs in their curricula, while also conducting research and transfer

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3 knowledge on these topics to society (Alonso and Alcaraz, 2019; Leiva-Brondo *et al.*, 2022;
4 Purcell *et al.*, 2019; Ramos Torres, 2021). Efforts aimed at incorporating sustainability and the
5 SDGs into university curricula acknowledge the necessity for a comprehensive integration of
6 these concepts across various degrees, fields of study, and individual courses. There appears to
7 be a link between students' interest in acquiring sustainability competencies, their pro-ecological
8 perspectives, and their choices of field of study (Hyytinen *et al.*, 2023). These initiatives generally
9 seek to enhance students' literacy in sustainability and motivate them to adopt sustainable
10 practices and behaviours.
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13 In parallel, various scholars have emphasised the important role of higher education
14 institutions in addressing global sustainability challenges. They advocate for the inclusion of a
15 diverse array of sustainability skills and competencies in educational programs, such as systems
16 thinking, value-thinking, anticipation, strategy, and collaboration, among other more generic
17 academic competencies such as critical thinking or problem solving (Brundiers *et al.*, 2021;
18 Lozano *et al.*, 2017; Wiek *et al.*, 2011). Moreover, they argue that sustainability education should
19 be intertwined with broader academic proficiencies and expertise (Leal Filho *et al.*, 2019). This
20 perspective emphasizes the interdisciplinary nature of sustainability and recognizes the
21 interconnectedness of environmental, social, and economic dimensions. By integrating
22 sustainability principles across various academic disciplines, students can develop a holistic
23 understanding of sustainability and its relevance to their respective fields of study.
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26 However, amidst these efforts to embed sustainability into higher education, there are
27 authors who advocate for a shift in perspective. Authors like Alonso-Sainz (2021) stress the
28 importance of reframing sustainability and the SDGs as facilitators of education rather than
29 viewing education solely as a means to achieve sustainability goals. They argue that sustainability
30 education should not be approached as a separate agenda but rather integrated into the broader
31 educational framework. This perspective, in line with the Paulo Freire's critical pedagogy (1970;
32 2000), emphasizes the transformative potential of education in fostering sustainability mindsets,
33 values, and practices among students, thereby contributing to broader societal change beyond
34 the attainment of specific sustainability targets.
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36 37 *1.1 Integrating sustainability into Spanish social education degrees: bridging curriculum gaps and* 38 *promoting equity*

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40 In Spain, efforts to integrate sustainability into university curricula have taken various
41 forms, as highlighted by Sánchez-Carracedo *et al.* (2021). These efforts range from incorporating
42 sustainability topics across different technical subjects to offering specific courses focused on
43 socio-environmental education. The Sectorial Sustainability Commission of the Conference of
44 Rectors of Spanish Universities (CRUE) has played a significant role in guiding these integration
45 efforts. Initially published in 2005, with subsequent updates in 2011 and expansions in 2012 and
46 2015, the CRUE guidelines provide specific directives for incorporating sustainability into
47 university curricula.
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50 These guidelines outline four key competencies related to sustainability that should be
51 incorporated into all university study programs. First, there is a focus on critical contextualization
52 of knowledge, encouraging students to understand interconnectedness of social, economic,
53 environmental, local, and global issues. Second, there is an emphasis on sustainable resource
54 utilization, urging students to consider the environmental and social impacts of resource use and
55 to adopt practices that minimize negative effects. Third, active participation in community
56 sustainability efforts is promoted, encouraging students to engage in initiatives that promote
57 sustainable development within their communities. Finally, adherence to ethical principles
58 aligned with sustainability values is highlighted, urging students to conduct themselves ethically
59 in personal and professional contexts (CRUE, 2012).
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3 The commitment of Spanish universities to sustainability is not only evident in their
4 efforts to integrate sustainability into their curricula but also in their alignment with the United
5 Nations' 2030 Agenda for Sustainable Development, aimed at achieving the SDGs. Previous
6 studies (Blasco *et al.*, 2020) have highlighted several factors that influence Spanish universities'
7 ability to make meaningful contributions to the SDGs. These include the university's online
8 presence, internationalization efforts, and the financial resources allocated for research and
9 infrastructure by regional governments. found the importance of the presence on the internet,
10 the internationalization of the university and the financial resources for research and
11 infrastructure received from regional governments for Spanish public universities to make a
12 greater contribution to SDGs.
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15 Despite these commitments and efforts, Sánchez-Carracedo *et al.* (2021) found that
16 sustainability is indeed present in the curricula of various education degrees in the Spanish
17 universities, such as early childhood education, primary education, pedagogy, and social
18 education. However, the degree of development and uniformity varies considerably across
19 universities. While some universities demonstrate a strong commitment to developing
20 sustainability competencies, others still lack a clear compromise towards achieving them.
21 Further research has demonstrated a deficiency in the provision of sustainability training within
22 Education degree programs at Spanish universities (Busquets *et al.*, 2021; Sánchez-Carracedo
23 *et al.*, 2021, 2020). Faculty training in sustainability education, alongside a notable lack of
24 awareness among faculty members and limited institutional support have been
25 emphasised. These results suggest that there is room for improvement in ensuring a more
26 consistent and comprehensive integration of sustainability principles across all university
27 programs. Addressing these disparities can enhance sustainability education, advancing
28 contributions to the SDGs and sustainable development.
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31 Social education, a discipline within pedagogy, focuses on enhancing the well-being of
32 individuals and communities through various forms of education and social intervention. It aims
33 to influence individuals' socialization within their contexts by providing training in social skills
34 that facilitate proper coexistence and participation in society (Gallardo-López and García-Lázaro,
35 2021). Given its objective to meet contemporary socio-educational needs, social education
36 degrees serve as an ideal platform for promoting sustainability and the SDGs. However, previous
37 studies have identified a deficiency in current Social Education curricula regarding the
38 incorporation of sustainability and SDGs (Alba *et al.*, 2020). Hence, there is a pressing need to
39 integrate the SDGs into social education teaching plans and research agendas to effectively
40 address global challenges and promote social transformation and sustainability.
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43 Moreover, research indicates that non-traditional university access pathways, such as
44 Advanced Vocational Training Programs (CFGS), tend to attract a higher percentage of students
45 from low socioeconomic backgrounds, thereby enhancing social diversity within higher
46 education institutions (Gairín and Rodríguez-Gómez, 2019; Pérez-Maldonado and Gairín, 2020).
47 However, universities face the challenge of redefining their role not only in terms of contributing
48 to sustainable development but also from an equitable perspective, to address the needs of an
49 increasingly heterogeneous and complex society. This redefinition aims to improve access,
50 retention, and success rates in higher education for underrepresented groups and non-
51 traditional students, irrespective of their admission pathway, whether it be through Advanced
52 Vocational Training Programs (CFGS) or University Entrance Exam (PAU).
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58 1.3 Aims and research questions 59 60

The present study aims to examine the impact of incorporating sustainability and the SDGs into a methodology course in the first year of the Social Education degree. It explores students' knowledge and perception regarding sustainability and the SDGs, as well as their importance for socio-educational research and future career development. Additionally, the study analyses possible variations in students' knowledge and perception regarding sustainability and the SDGs based on the university admission pathway to address curriculum gaps and promote equity. The main research questions are:

RQ1. What is the extent of student's knowledge and perceived importance of sustainability and the SDGs at the beginning and end of the course, in relation to socio-educational research and future career development?

RQ2. How do students' knowledge and perceived importance regarding sustainability and the SDGs, as well as their relevance to research and future career development, vary based on their admission pathway?

2. Methods

According to Hernandez-Castilla *et al.* (2020), the contributions of dedicated educational research play a crucial role in gauging the progress of the research field's commitment to sustainable development. The present study, evaluating the teaching experience of integrating the SDGs into a methodology course in the first year of the Social Education degree, aligns with the principles of committed educational research. Employing an enabling approach (Hernández-Castilla *et al.*, 2020), it aims to foster knowledge and research in sustainability and social responsibility within the field of social education.

The research objectives were threefold:

- To identify students' thematic preferences related to the Sustainable Development Goals (SDGs) and their favoured areas of socio-educational action.
- To evaluate the degree of students' knowledge and perception regarding sustainability and the SDGs at the beginning and end of the course, along with their perceived importance for socio-educational research and future career development.
- To explore variations in students' knowledge and perception regarding sustainability and the SDGs based on the university admission pathway: Advanced Vocational Training Programs (CFGS) and University Entrance Exam (PAU).

The survey was a part of a wider effort to develop an innovative teaching experience that integrates research with sustainability within an undergraduate methodology course in the Social Education degree program. Its primary objective was to assess students' understanding of sustainability and the SDGs, as well as their significance in the context of research and career development within the socio-educational field. The course, titled "Research and Evaluation in the Socio-Educational Field", is a 6 ECTS credit course focusing on fundamental aspects of scientific research in social sciences, including literature review, conceptual operationalisation, design and implementation of qualitative and quantitative research techniques, and data analysis. It targets undergraduates enrolled in the Social Education degree programs. Data for this study were collected via an online survey during the second semester of 2022-2023 academic year (see Appendix for the details). The survey was administered in class, with students provided direct access to the survey link and QR code. Questionnaires were made available in both Spanish and Catalan, reflecting the languages of instruction at the University of Barcelona. Participation in the survey was voluntary, and measures were taken to assure informed consent and the anonymity of participants, with these protocols communicated clearly to respondents (the [UB's Code of Conduct for Research Integrity](#), 2020).

2.1 Study sample

To achieve these objectives, an online survey was administered to two groups of undergraduate students (N=110) who were enrolled in the compulsory 6 ECTS methodology course, at the end of the teaching experience. We finally gathered empirical evidence from a sample of 70 students out of a total of 110 enrolled students. The age range of the study participants was between 18 and 26 years, reflecting the undergraduate student population. The gender distribution of respondents was predominantly female (86%). Out of the 70 respondents, 40% gained admission through Advanced Vocational Training Programs (CFGS), whereas 60% entered via University Entrance Exam (PAU).

2.2 Questionnaire

The questionnaire was meticulously designed to measure students' knowledge and perception at the beginning and end of the course regarding sustainability and the SDGs, and to explore possible differences based on the university admission pathway. Additionally, it aimed to gauge the perceived importance of addressing these topics from a socio-educational research perspective and their relevance for future career development.

In constructing the questionnaire, we drew inspiration from the study conducted by Leiva-Brondo *et al.* (2022) on the awareness and perception of SDGs among university students from various STEM degrees. This strategic approach ensured the alignment of our measurement tool with established methodologies and facilitated the comparability of results. To measure students' awareness and perception of SDGs at the beginning and end of the teaching experience, we incorporated a question on the level of familiarity with the SDGs before and at the conclusion of the course. Moreover, we included other questions assessing the teaching experience and the overall satisfaction level with it.

2.3 Statistical analysis

The analyses were conducted using JASP 0.18.3, a user-friendly statistical software that supports both classical and Bayesian analyses. Two non-parametric tests were applied in the analyses: Independent Sample Test (Mann-Whitney test), used to compare the differences between two independent samples when the sample distributions are not normally distributed and the sample sizes are small ($n < 30$); and Paired Sample Test (Wilcoxon signed-rank test), used to evaluate the median difference between two paired samples.

The effect size was given by the rank biserial correlation, which is used when you want to find a correlation between dichotomous (binary) nominal data and ordinal (ranked) data. Significant differences were determined based on a p-value threshold of less than .05.

3. Results

We worked with two groups in the first year of the Social Education degree at the Faculty of Education of the University of Barcelona. The teaching process linked data collection and analysis to the 17 SDGs. The students formulated their research topics and questions aligned with one of the 17 SDGs. To facilitate this, the teachers developed a matrix aligning the SDGs with different areas of socio-educational action (Araujo, 2020): Family education and community development; Education for mediation and social integration; Education of leisure, animation, and sociocultural management; Socio-educational intervention in childhood and youth; Education for adults and seniors; Socioeducational attention to diversity.

3.1 Prevalence of Themes Related to Education, Gender Equality, and Health and Well-being

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3 Previous results emphasise the prevalence of three SDGs more commonly addressed or better
4 ranked in universities, namely SDGs 4, 5, and 3 (Ramos Torres, 2021). For Social Education
5 students at the University of Barcelona, these same objectives proved to be more significant to
6 their research interests and socio-educational activities: SDG 4 (49); SDG 3 (17); and SDG 5 (14).
7 SDGs 7, 9, 15, and 17 were not selected. From a professional perspective, socio-educational
8 intervention in childhood and youth (60), socio-educational attention to diversity (16), and
9 education for mediation and social integration (10) took precedence (Table 1).
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11

12 **Table 1.**

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16 *3.2 Students' Degree of Awareness of SDGs*

17 Various authors (Gifford and Nilsson, 2014; Kirby and Zwickle 2021) suggest that personal or
18 social factors can predict the degree of knowledge about sustainability and the environment. In
19 our study, we found some age-related differences, which were, in fact, related to the university
20 admission pathway. Students from CFGS were, on average, 1.85 years older than those admitted
21 through PAU (Table 2).
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23

24 **Table 2.**

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27 In all group comparisons (CFGS and PAU), ordinal scales (e.g., I know it well, only by
28 name, I don't know them) were converted into scale variables to conduct paired samples T-Test
29 and independent samples T-Test, with standardized values ranging from 0 to 1.
30
31

32 Tables 3 and 4 present the results of the two groups before and after the experience.
33 Significant differences are observed ($p < .001$), with an increase (delta) in knowledge and
34 perception of the SDGs higher in the PAU group (before $m = 0.30$, after $m = 0.92$) in comparison
35 with the CFGS group (before $m = 0.40$, after $m = 0.84$).
36
37

38 **Table 3.**

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41 **Table 4.**

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45 The differences in the final knowledge of the SDGs by university admission pathway
46 implied that those who entered through the PAU expressed higher level of final knowledge of
47 the SDGs compared to those who entered through the CFGS (Figure 1). This result could be
48 related to the higher novelty level of the SDGs among students who entered through the PAU.
49
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51

52 **Figure 1.**

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55 *3.3 Students' Perception about the SDGs*

56 The analysis of students' perception of the SDGs involved questions aimed at gathering their
57 opinions on all 17 goals and their significance in their daily lives. Among the 17 SDGs, the
58 majority (12) were equally understood by both groups, with no significant differences. The most
59 understood SDGs were SDGs 5, 4, 10, 3, 1, 2, and the least clear SDGs 17, 15, 14, and 9. These
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3 results broadly coincide with the findings of Leiva-Brondo's study (2022), which also emphasizes
4 SDGs 5, 4, 10 as the most understood and SDGs 14 and 17 as the least understood. One possible
5 reason for this is that these SDGs are more or less understandable by their own SDG names
6 (Leiva-Brondo et al., 2022). However, SDGs 9, 10, 11, 12, and 13, which are more directly related
7 to sustainability and social responsibility, appeared to be better understood by PAU students
8 than CFGS students, with a significant difference noted (Table 5).
9

10 11 **Table 5.**

12
13 Regarding the importance of each goal in daily life, for participants, the most important
14 SDGs, from highest to lowest, were SDGs 5, 10, and 4, and the least important were SDGs 14 and
15 9. These results partially coincide with the findings of Leiva-Brondo et al. (2022), especially
16 regarding SDG 4 as the most important and SDGs 14 and 9 as the least important (Table 6).
17 However, there were no significant differences in the importance of each SDGs by admission
18 pathway.
19

20 21 **Table 6.**

22
23 In terms of opinions on the level of achievement of each SDG in Spain, both groups of
24 students (CFGS and PAU) showed a consensus in expressing low agreement with Spain's
25 fulfilment of the 17th SDGs (Table 7). Nevertheless, PAU students appear to express a higher
26 level of agreement regarding Spain's fulfilment of SDG 4, Quality Education. According to the
27 latest report from the National Institute of Statistics (INE, 2021) on indicators of the 2030
28 Agenda for sustainable development in Spain, out of the 17 Goals, 12 have a coverage equal to
29 or greater than 50%, such as SDGs 15, 3, 8, 4, 5, 6, 9, 11, 16, 17, 7, and 1. Among these, SDG 15
30 stands out, with a coverage of 86%. On the contrary, SDG 14 has the lowest coverage, with only
31 10% of available indicators. These data highlight the participants' misconception about Spain's
32 degree of fulfilment of some goals, especially SDGs 15, and 1.
33
34

35 36 **Table 7.**

37
38 Questions about students' expectations regarding the implementation of the SDGs,
39 applied to their decisions regarding their municipality, university, workplace, or level of
40 involvement, received relatively high ratings from both groups of participants (Table 8). Our
41 students usually prefer sustainable places of residence and are more attracted to a university or
42 workplace committed to fulfilling the SDGs. The lowest rating was recorded concerning active
43 participation in fulfilling the SDGs. The results obtained align with the findings of previous
44 studies (Leiva-Brondo *et al.*, 2022), prioritizing current desires over future projections, and we
45 found some significant differences by admission pathway, as PAU students seem to be more
46 drawn to sustainable residence municipalities than the CFGS students.
47
48

49 50 **Table 8.**

51 52 *3.4 Students' Satisfaction with the Integration of the SDGs in the Educational Experience*

53 Questions regarding the extent to which the educational experience achieved specific
54 objectives, such as increasing knowledge about sustainability and the SDGs, promoting social
55 responsibility, fostering research skills, teaching innovation, and peer assessment competences,
56 received relatively high ratings from both groups of participants (Table 9). However, PAU
57 students expressed a higher agreement with the fulfilment of most of these objectives
58 compared to CFGS students. One possible explanation, based on class evidence, could be that
59
60

CFGS students had already received some form of methodology training in their previous educational programs, which may have influenced their overall satisfaction with the course.

Table 9

Questions related to students' individual evaluation of the educational experience received varied ratings from both groups of participants (Table 10). However, PAU students exhibited a higher and significant agreement with the contribution of individual tasks, such as the literature review on a topic related to the SDGs, in enhancing their understanding of global challenges. Additionally, they expressed more satisfaction with the group task involving the development of research techniques and instruments for analysing a topic related to the SDGs. It is worth noting that the lower satisfaction level of CFGS students with the teaching innovation might be influenced by their prior methodology knowledge.

Table 10.

The overall satisfaction level with the incorporation of the SDGs into the educational experience of the course was relatively high, at 7.52 on a scale of 1 to 10 (1 being "very low" and 10 being "very high"). We observed differences in the overall satisfaction level based on the university admission pathway. Individuals entering through the University Entrance Exam (PAU), generally younger on average, displayed a higher degree of satisfaction (8.05) compared to those who entered through the Higher Vocational Training Cycle (CFGS) (6.75) (Figure 2).

Figure 2.

4. Discussion

In this study, we examined students' knowledge and perception regarding sustainability and the SDGs, as well as their importance for socio-educational research and future career development, by admission pathway. Our findings indicate that initially, students had a limited grasp of sustainability and the SDGs, with comprehension levels notably lower among those admitted through the University Entrance Exam (PAU). However, at the end of the teaching experience, there was a significant improvement in understanding observed in both groups, albeit with an inverse pattern of differentiation.

The integration of SDGs into a first-year Social Education methodology course has proven to be a transformative educational experience, significantly impacting students' awareness and perceptions. Despite low initial sustainability knowledge, a substantial increase was observed post-teaching, with a more pronounced effect on students who entered through the University Entrance Exam (PAU). This finding confirms the challenge universities face in redefining their role to promote not only sustainability but also equity (Gairín and Rodríguez-Gómez, 2019; Pérez-Maldonado and Gairín, 2020). Moreover, thematic preferences, such as inclusive education, gender equality, and health and well-being, closely mirrored specific SDGs, indicating a strong connection between student interests and the relevant global goals, in line with previous research (Leiva-Brondo *et al.*, 2022).

Despite a high level of awareness about the importance of SDGs, there remains a noticeable gap between this awareness and the actual engagement in sustainable practices. PAU

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3 students displayed a particular inclination toward municipalities actively engaged in
4 sustainability efforts. Satisfaction levels with the SDGs integration and teaching innovation were
5 higher among PAU students, highlighting the need for tailored approaches that consider the
6 diverse academic backgrounds of students. Previous research (Sánchez-Carracedo *et al.*, 2021,
7 2020) has indicated a deficiency in the provision of sustainability training within Education
8 degree programs at Spanish universities. This inadequacy in training may contribute to the
9 observed lack of personal engagement in sustainable practices among graduates. Therefore,
10 addressing this gap in sustainability education is crucial for fostering greater participation in
11 sustainable behaviours among university students and graduates.
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13

14 This study highlights the pivotal role of educational institutions, particularly those
15 offering Social Education programs, in shaping the knowledge and attitudes of future change
16 agents in accordance with previous studies (Gallardo-López and García-Lázaro, 2021). While
17 positive impacts were evident, continuous improvements in sustainability education are
18 essential. The effectiveness of sustainability education is not always evident and uniformly
19 distributes across Spanish university contexts. To address this, ongoing assessment,
20 interdisciplinary approaches, and long-term behavioural evaluations should be prioritized.
21 These measures are essential for improving the overall effectiveness of sustainability education
22 within university programs, ensuring that students are adequately equipped to address complex
23 sustainability challenges in the future.
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26 4.1 Limitations

27
28 The empirical results obtained in the study have several limitations. Firstly, the response rate of
29 the survey was not 100%, as only two out of the existing three class groups participated, and not
30 all students in those groups responded. This incomplete participation likely impacts the
31 collected data and the possibility to generalise its results. Thus, the findings of this study should
32 not be interpreted as an accurate prediction of the entire student population enrolled in the
33 first-year methodology course in Social Education at the University of Barcelona. Additionally,
34 the sample was not entirely representative in terms of undergraduate methodology courses in
35 the Social Education degree program, as only freshman students were included in the study.
36

37 However, the findings of this study contribute to a deeper understanding of
38 sustainability education and provide insights into the differences in students' knowledge and
39 perception regarding sustainability and the SDGs following a teaching innovation, as well as their
40 significance for research and future career development, based on admission pathway.
41 Therefore, further studies with larger datasets on this subject should be conducted to expand
42 upon these findings.
43

44 Furthermore, the study is limited by a lack of robust instruments for measuring students'
45 knowledge and perception about sustainability and SDGs, as well as the absence of a coherent
46 theoretical framework. For example, there are various definitions of sustainability education
47 and competencies. Therefore, developing a consistent instrument to measure and compare
48 these aspects would be important in future research.
49
50

51 4.2. Future research implications

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53 Despite these limitations, the findings of this research lay the groundwork for future
54 investigations into the comparative effectiveness of diverse pedagogical interventions in
55 sustainability, considering variations in knowledge retention, behavioural changes, and long-
56 term societal impact. The study encourages a nuanced understanding of the diverse student
57 population and advocates for targeted educational strategies. By addressing curriculum gaps
58 and promoting equity, these strategies can help bridge the divide between awareness and
59 sustainable action.
60

5. Conclusions

This study sheds light on the evolving landscape of sustainability education within Spanish university programs, particularly within the realm of Social Education. The study assesses students' knowledge and perception regarding sustainability and the Sustainable Development Goals (SDGs), along with their significance for socio-educational research and future career development, by admission pathway. The findings revealed an initial deficiency in students' understanding, especially among those admitted through the University Entrance Exam (PAU). However, through the integration of SDGs into a first-year Social Education methodology course, a remarkable improvement in awareness and perceptions across all students was noticed, particularly among PAU entrants.

Additionally, the study emphasises the crucial role of higher education institutions in shaping future change agents, despite challenges in consistently integrating sustainability principles across university programs. Disparities in sustainability education highlight the need for ongoing assessment and interdisciplinary approaches to enhance effectiveness. Addressing the gap in sustainability training within Education degree programs is vital to promote greater engagement in sustainable practices among students and the overall population. Prioritizing continuous improvements in sustainability education is essential to equip students with the skills to tackle complex challenges and contribute to a more sustainable world.

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3 **Tables and figures. Article IJSHE**
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6

7 **Table 1.**

8 Research topics related to the 17 SDGs by socio-educational field
9

	Fam. edu. and comm. dev.	Edu. for med. and soc. integr.	Edu. of leisure, anim., and sociocult. manag.	Socio-edu.interv in childhood and youth	Edu. for adults and seniors	Socioedu. att. to diversity	Total
1 No poverty		1		4		1	6
2 Zero hunger	3						3
3 Good health and wellbeing	1	1	4	8	2	1	17
4 Quality education	1	1	3	27	4	13	49
5 Gender equality		2		12			14
6 Clean water and sanitation				1			1
8 Decent work and economic growth		1				1	2
10 Reduced inequalities	1	2		1			4
11 Sustainable cities and communities	1			1			2
12 Responsible consumption and production	1			1	1		3
13 Climate action	1			3			4
14 Life below water			1	1			2
16 Peace justice and strong institutions		2		1			3
Total	9	10	8	60	7	16	110

48 Source: personal elaboration
49

50 **Table 2.**

51 Descriptive statistics of the participants
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	CFGS	PAU
n	28 (40%)	42 (60%)
Age mean [SD]	20.97 [1.45]	19.21 [1.30]

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Age min - max	19 - 26	18 -23
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Source: personal elaboration

Table 3.

How well did you know the SDGs before/after starting the course?

Paired Samples T-Test CFGS

			W	z	p	effect size	SE effect size
(CFGS)	before - after		7.000	-3.659	< .001	-0.933	0.25
(PAU)	before - after		6.500	-4.896	< .001	-0.977	0.197

Note. Wilcoxon signed-rank test, effect size is given by the rank biserial correlation

Table 4.

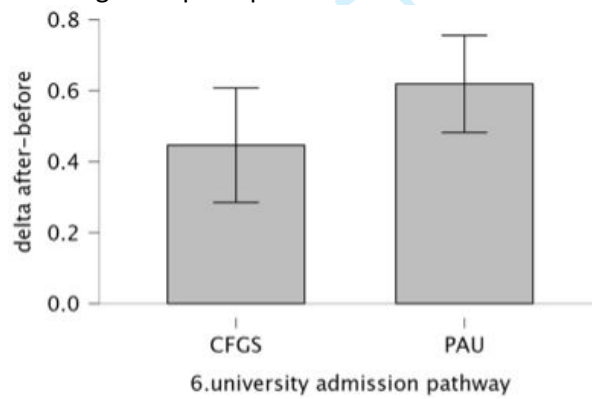
Descriptive statistics CFGS & PAU, before/after starting the course

		N	Mean	SD	SE	CV
(CFGS)	before	28	0.40	0.39	0.074	1.001
	after	28	0.84	0.24	0.045	0.283
(PAU)	before	42	0.30	0.38	0.059	1.289
	after	42	0.92	0.22	0.034	0.238

Source: personal elaboration

Figure 1.

Increase in students' knowledge and perception of SDGs



Source: personal elaboration

Table 5.

Independent Samples T-Test. To what extent do you understand the content of each SDG?

	W	p	effect size	CFGS Mean [SD]	PAU Mean [SD]
SDG 1 No poverty	528.5	0.21	.101	4.29 [0.85]	4.45 [0.77]
SDG 2 Zero Hunger	522.5	0.19	.111	4.21 [0.92]	4.41 [0.83]

SDG 3 Good Health and Wellbeing	539.5	0.26	.082	4.32 [0.82]	4.43 [0.83]
SDG 4 Quality Education	553.5	0.31	.059	4.54 [0.64]	4.57 [0.70]
SDG 5 Gender Equality	505.5	0.11	.140	4.5 [0.69]	4.64 [0.73]
SDG 6 Clean Water and Sanitation	597.5	0.55	.016	4.25 [0.89]	4.24 [0.85]
SDG 7 Affordable and Clean Energy	624	0.68	.061	4.14 [0.93]	4.07 [0.84]
SDG 8 Decent Work and Economic Growth	565.5	0.39	.038	4.00 [1.05]	4.12 [0.86]
SDG 9 Industry, Innovation and Infrastructure	454	0.05	.228*	3.36 [1.03]	3.76 [1.01]
SDG 10 Reduced Inequalities	437.5	0.02	.256*	4.29 [0.76]	4.64 [0.58]
SDG 11 Sustainable Cities and Communities	454	0.04	.228*	3.89 [1.07]	4.33 [0.85]
SDG 12 Responsible Consumption and Production	435.5	0.02	.259*	4.04 [0.92]	4.45 [0.80]
SDG 13 Climate Action	416.5	0.01	.292*	3.96 [0.88]	4.43 [0.70]
SDG 14 Life Below Water	524.5	0.22	.108	3.61 [1.17]	3.79 [1.28]
SDG 15 Life on Land	481.5	0.09	.181	3.64 [1.19]	4.02 [1.05]
SDG 16 Peace, Justice and Strong Institutions	499	0.19	.120	4.00 [1.00]	4.21 [0.93]
SDG 17 Partnerships for the Goals	458	0.05	.221*	3.64 [1.10]	4.10 [0.82]

Note. For the Mann-Whitney test, effect size is given by the rank biserial correlation. * Significant differences < .05. Source: personal elaboration

Table 6.

Independent Samples T-Test. To what extent do you think each goal is important in your daily life?

	W	p	effect size	CFGs Mean [SD]	PAU Mean [SD]
SDG 1 No poverty	548	0.30	.068	4.29 [0.81]	4.38 [0.80]
SDG 2 Zero Hunger	576	0.44	.020	4.29 [0.90]	4.33 [0.87]
SDG 3 Good Health and Wellbeing	540	0.21	.082	4.57 [0.79]	4.76 [0.53]
SDG 4 Quality Education	622.5	0.76	.059	4.86 [0.45]	4.79 [0.52]
SDG 5 Gender Equality	514.5	0.09	.125	4.75 [0.44]	4.86 [0.42]
SDG 6 Clean Water and Sanitation	584	0.48	.007	4.46 [0.74]	4.45 [0.80]
SDG 7 Affordable and Clean Energy	551.5	0.31	.062	4.39 [0.79]	4.50 [0.67]
SDG 8 Decent Work and Economic Growth	550	0.37	.042	4.50 [0.75]	4.56 [0.71]
SDG 9 Industry, Innovation and Infrastructure	494.5	0.12	.159	3.39 [1.26]	3.79 [0.90]
SDG 10 Reduced Inequalities	552.5	0.38	.026	4.85 [0.36]	4.86 [0.42]
SDG 11 Sustainable Cities and Communities	540	0.26	.082	4.29 [0.90]	4.45 [0.77]
SDG 12 Responsible Consumption and Production	596.5	0.55	.014	4.39 [0.83]	4.38 [0.83]
SDG 13 Climate Action	551	0.30	.063	4.46 [0.79]	4.52 [0.8]
SDG 14 Life Below Water	591.5	0.52	.006	3.82 [1.16]	3.81 [1.13]
SDG 15 Life on Land	536.5	0.32	.065	3.96 [1.14]	4.10 [1.07]
SDG 16 Peace, Justice and Strong Institutions	609.5	0.62	.037	4.46 [0.88]	4.45 [0.80]

SDG 17 Partnerships for the Goals 584 0.48 .007 4.04 [1.26] 4.10 [1.14]

Note. For the Mann-Whitney test, effect size is given by the rank biserial correlation. * Significant differences < .05. Source: personal elaboration

Table 7.

Independent Samples T-Test. How would you rate Spain's level of fulfilment of each SDG?

	W	p	effect size	CFGS Mean [SD]	PAU Mean [SD]
SDG 1 No poverty	636	0.74	.082	2.32 [0.82]	2.19 [0.74]
SDG 2 Zero Hunger	596.5	0.55	.014	2.61 [0.88]	2.57 [0.89]
SDG 3 Good Health and Wellbeing	492	0.11	.163	2.96 [0.84]	3.14 [0.78]
SDG 4 Quality Education	410	0.01	.303*	2.71 [0.90]	3.17 [0.85]
SDG 5 Gender Equality	511	0.14	.131	2.86 [0.76]	3.00 [0.63]
SDG 6 Clean Water and Sanitation	552	0.33	.000	2.79 [0.92]	2.91 [1.12]
SDG 7 Affordable and Clean Energy	500.5	0.13	.149	2.61 [0.83]	2.76 [0.88]
SDG 8 Decent Work and Economic Growth	537.5	0.26	.086	2.54 [0.74]	2.60 [0.80]
SDG 9 Industry, Innovation and Infrastructure	571.5	0.42	.028	2.89 [0.88]	2.88 [0.71]
SDG 10 Reduced Inequalities	438.5	0.03	.254*	2.36 [0.83]	2.67 [0.90]
SDG 11 Sustainable Cities and Communities	553.5	0.33	.000	2.57 [0.96]	2.64 [0.85]
SDG 12 Responsible Consumption and Production	572.5	0.42	.026	2.43 [1.00]	2.41 [0.80]
SDG 13 Climate Action	536	0.25	.088	2.46 [0.84]	2.55 [0.77]
SDG 14 Life Below Water	569.5	0.41	.031	2.21 [0.92]	2.24 [0.91]
SDG 15 Life on Land	543.5	0.28	.076	2.25 [0.93]	2.31 [0.75]
SDG 16 Peace, Justice and Strong Institutions	512.5	0.17	.128	2.61 [0.92]	2.76 [0.91]
SDG 17 Partnerships for the Goals	483.5	0.10	.178	2.46 [0.96]	2.71 [0.97]

Note. For the Mann-Whitney test, effect size is given by the rank biserial correlation. * Significant differences < .05. Source: personal elaboration

Table 8.

Independent Samples T-Test. How much do you agree with the following statements?

	W	p	effect size	CFGS Mean [SD]	PAU Mean [SD]
I hope that the municipality in which I currently live actively engages in the SDGs.	554.5	0.26	.057	4.75 [0.65]	4.83 [0.49]
I hope that the university to which I currently belong actively engages in the SDGs.	578	0.42	.017	4.86 [0.36]	4.81 [0.59]
If I had to move to a different place in the future, I wish to live in the municipality that actively engages in the SDGs.	490.5	0.05	.166*	4.54 [0.84]	4.79 [0.47]
If I had to get a job or change occupations, I	538	0.34	.051	4.52 [0.7]	4.57 [0.67]

wish to work for an entity that is actively involved in the SDGs.

I actively participate in the SDGs 562.5 0.38 .043 3.79 [0.92] 3.93 [0.81]

Note. For the Mann-Whitney test, effect size is given by the rank biserial correlation. * *Significative differences < .05. Source: personal elaboration*

Table 9.

Independent Samples T-Test. In what degree has the educational experience of the subject achieved the following objectives?

	W	p	effect size	CFGS Mean [SD]	PAU Mean [SD]
Increase knowledge about sustainability and the ODS	419.5	0.02	.287*	3.93 [0.81]	4.29 [1.00]
Promote social responsibility	381.5	0.01	.327*	3.59 [0.97]	4.12 [0.99]
Foster research skills through work with the SDGs (theory, research techniques and instruments)	431.5	0.03	.248*	3.79 [0.92]	4.2 [0.81]
Teaching innovation in learning/teaching methods through work with the SDGs	440.0	0.03	.252*	3.57 [1.10]	4.05 [0.91]
Provide competence in peer assessment (validation, co-evaluation)	476.0	0.12	.160	3.52 [1.05]	3.88 [0.89]

Note. For the Mann-Whitney test, effect size is given by the rank biserial correlation. * *Significative differences < .05. Source: personal elaboration*

Table 10.

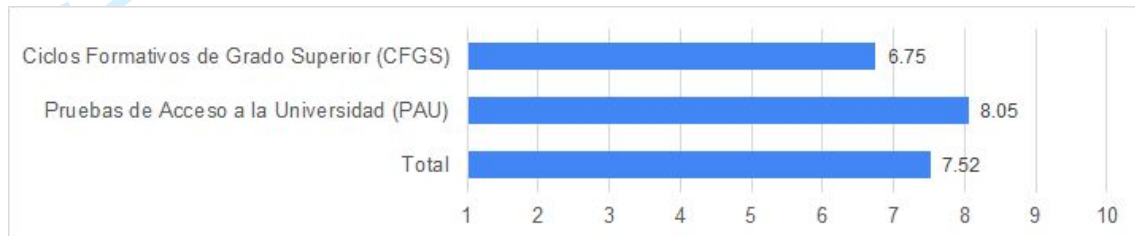
Independent Samples T-Test. How much do you agree with the following statements about your educational experience?

	W	p	effect size	CFGS Mean [SD]	PAU Mean [SD]
It required a lot of effort.	621	0.67	.000	3.93 [0.81]	3.86 [0.72]
It is difficult to relate the SDGs to a specific socio-educational problem.	667	0.84	-.134	3.00 [1.25]	2.69 [1.20]
The pedagogical applicability of the SDGs in a methodology course is not understood.	679.5	0.93	-.198	2.85 [1.32]	2.36 [1.01]
Individual work on the SDGs has contributed to a better understanding of global challenges	443.5	0.03	.246*	3.68 [0.98]	4.05 [0.88]
The utility of working on the SDGs in the Social Education degree is not understood.	724	0.96	-.231	2.07 [1.12]	1.62 [0.85]
Working in groups with the SDGs has been a positive experience.	378	0.01	.357*	3.64 [0.99]	4.26 [0.91]
There have been difficulties in the communication with the teachers.	755.5	0.98	.285	2.75 [1.14]	2.17 [1.01]

Note. For the Mann-Whitney test, effect size is given by the rank biserial correlation. *
Significant differences < .05. Source: personal elaboration

Figure 2.

Overall Satisfaction with the Integration of the SDGs in the Course



Source: personal elaboration