

## EDUCATION STUDENTS' PERCEPTIONS OF SUSTAINABILITY TRAINING AND THE USE OF ACTIVE METHODOLOGIES: AN EXPLORATORY STUDY

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### Abstract

Today, it is imperative to prepare committed and competent professionals to address the most pressing global environmental, economic and social challenges. Education for Sustainable Development (ESD) is a priority to transform society, fostering competencies such as systems thinking, anticipation, collaboration, critical thinking, strategic action and responsibility. In this process, university students, graduates in the near future, become key actors and must play an active role as agents of change, contributing to the construction of a more sustainable future. Therefore, the aim of this study is to analyse the perception of university students on the training they have received on issues related to sustainability and its relationship with the use of active methodologies in their respective degrees. For this purpose, a descriptive and analysis of variance and post-hoc comparisons were carried out, with a quantitative design, applied to a sample of 460 students enrolled in the degrees of Education at the University of Jaén. The instrument used was a questionnaire, designed ad hoc, with Likert-type questions on a scale ranging from strongly agree (5) to strongly disagree (1). The data collected were analysed using the SPSS programme. The findings showed that the majority of students are aware of the SDGs and understand what they consist of (82.6%); they consider that active methodologies facilitate the development of sustainability competences (83.1%); and they value positively the role of teachers in the implementation of education for sustainable development (80.6%). ESD should be promoted and opportunities should be provided for students to get involved in ESD-related projects so that they can become agents of change to ensure a more sustainable future.

**Keywords:** *Active methodologies, sustainability, SDG, education, students.*

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### 1. Introduction

The Sustainable Development Goals (SDGs) are presented as an opportunity to act on the environmental, economic and social challenges of greatest global concern, becoming a roadmap for a more just and prosperous future for all (UN, 2015). University students play a fundamental role in achieving these goals, contributing significantly, with their knowledge and skills, to the construction of a more sustainable society (Maoela et al., 2024). It is therefore essential to develop a comprehensive education in which the SDGs provide a frame of reference that goes beyond the strictly academic, fostering critical thinking and global awareness.

The inclusion of the SDGs in university curricula plays a crucial role in increasing student knowledge and awareness (Fošner, 2025). The presence of subjects or modules dedicated to sustainability and the SDGs is crucial, as by engaging in SDG-related projects, students develop key skills such as teamwork, problem solving, creativity and leadership (Seva-Larrosa et al., 2021). Access to clear and concise information on the SDGs, both inside and outside the university, is also considered key, and extracurricular activities, participation in projects, volunteering and student organisations related to sustainability, among others, can help increase knowledge, interest and motivation (SDSN, 2020).

Likewise, the interest and motivation of teachers in conveying the importance of the SDGs influences student learning. Therefore, university institutions should focus their efforts on making the goals of the 2030 Agenda visible and including them in teaching guides and programmes, so that progress is considered as evidence for the assessment of the level of implementation and adequacy of the goals (CRUE, 2019). In this line, the need to use active and experiential methodologies, such as service-learning projects, case studies or simulations, which allow students to apply their knowledge in real situations and develop practical skills for sustainability, is highlighted (Lozano & Figueredo, 2021). Using more innovative methodologies helps students to achieve curricular competences related to sustainability, fosters their personal and social engagement, connects learning experiences with real practice and improves the use of teaching materials and resources (Martín et al., 2021).

## 2. Design

This study has used a quantitative design, employing a descriptive method through surveys to collect data on the knowledge of the Sustainable Development Goals (SDGs) among university students of Education, and the way in which this knowledge is linked to the use of teaching methodologies that encourage active participation. The instrument used was an ad hoc questionnaire with Likert-scale questions, applied at two time points (pre-posttest) to identify changes in the variables. For the design of the questionnaire, a review of the literature on the subject was carried out in order to prepare a first draft which was reviewed by expert judges. Once the proposed modifications had been made, the online form was sent to the students using the Google Form tool. Students were informed of the purpose of the research, and informed consents were obtained. The final instrument was structured in five dimensions:

**1.** Sociological data of the students (10 items). **2.** Knowledge about the SDGs (6 items). **3.** Information channels to learn about the SDGs (5 items). **4.** Knowledge and experience of active methodologies and sustainability in undergraduate studies (11 items). **5.** Assessment of the teaching staff's work in the development of Education for Sustainable Development (5 items).

## 3. Methods

The aim of this study was to analyse the degree of knowledge and assessment of university students towards the use of active methodologies that promote Education for Sustainable Development (ESD). The sample consisted of 460 students of the Education degrees of the University of Jaén. This purposive sample is mainly composed of women (82.6%), comprising the 18-25 age group (96.9%). Access to the respective degrees is almost equally divided between Baccalaureate (54.2%) and Vocational Training (44.5%). In this study, the Bachelor's Degree in Early Childhood Education (EChildEd) is the most represented (62.7%), followed by Primary Education (PrimEd) (21.9%) and Social Education (SocEd) (15.4%). The first (53.4%) and second (43.8%) years are those with the highest number of participants.

## 4. Results

### 4.1. Knowledge about the SDGs

Students in Education degrees at the University of Jaén show moderate awareness of the 2030 Agenda ( $M=2.9$ ;  $SD=1.336$ ), with significant differences across degrees ( $F(2, 458) = 3.424$ ,  $p = .033$ ). Post-hoc comparisons indicate that PrimEd students ( $M=3.61$ ,  $SD=0.96$ ) have significantly lower awareness than EChildEd students ( $M=3.99$ ,  $SD=0.99$ ;  $p=0.036$ ).

Regarding SDG understanding, 81.3% of students grasp their role in education ( $M=3.507$ ;  $SD=1.104$ ). SocEd students ( $M=3.760$ ) exhibit greater comprehension than EChildEd ( $M=3.278$ ;  $p=0.003$ ) and PrimEd students ( $M=3.502$ ;  $p<.001$ ). However, only 50.5% identify sustainability-related values, with PrimEd students ( $M=3.123$ ) showing a lower capacity than EChildEd students ( $M=3.381$ ;  $p=0.040$ ).

Notably, 93.7% of students recognize sustainability's multidimensional nature ( $M=4.043$ ;  $SD=0.931$ ). Significant differences emerge ( $F(2, 458) = 6.091$ ,  $p=0.002$ ), with SocEd students ( $M=4.214$ ) perceiving sustainability more broadly than EChildEd students ( $M=3.789$ ;  $p=0.002$ ). Additionally, SocEd students ( $M=4.405$ ) acknowledge sustainability's influence on personal lifestyle more than EChildEd students ( $M=4.206$ ;  $p=0.016$ ).

Regarding professional practice, 80% of students agree that SDGs should shape their careers ( $M=4.144$ ;  $SD=0.86$ ). EChildEd students ( $M=3.868$ ) show lower agreement compared to SocEd students ( $M=4.144$ ;  $p=0.047$ ).

### 4.2. Information channels to learn about the SDGs

Education students report receiving more SDG-related training during their university studies ( $M=3.527$ ;  $SD=1.15$ ) than in compulsory education ( $M=2.95$ ;  $SD=1.36$ ) or through mass media ( $M=2.854$ ;  $SD=1.13$ ). ANOVA reveals significant differences ( $F(2, 458) = 15.469$ ,  $p<.001$ ). EChildEd ( $M=3.557$ ) and PrimEd ( $M=3.871$ ) students receive significantly more sustainability training than SocEd students ( $M=2.915$ ;  $p<.001$ ).

### 4.3. Knowledge and experience of active methodologies and sustainability in undergraduate studies

Students show a solid understanding of active methodologies, with high participation rates in cooperative learning (90-95%), critical thinking (87-93%), and play-based learning (85-96%). They associate these methods with meaningful and motivating learning, quality education, and enhanced student engagement. SocEd students rate active methodologies higher than PrimEd students, particularly regarding personal development ( $p=0.021$ ), ICT integration ( $p=0.025$ ), and research skills ( $p=0.043$ ).

#### 4.4. Assessment of the teaching staff's work in the development of Education for Sustainable Development

Students recognize faculty as agents of social change ( $F(2, 458) = 3.952, p=0.020$ ), with SocEd students ( $M=4.22; SD=0.59$ ) scoring higher than EChildEd students ( $M=3.94; SD=0.73; p=0.023$ ). Significant differences also emerge in the perception of faculty fostering sustainability-related active methodologies ( $F(2, 458) = 6.131, p=0.002$ ), with SocEd students ( $M=3.86; SD=0.85$ ) scoring higher than PrimEd students ( $M=3.50; SD=0.84; p=0.025$ ).

Although no significant differences are found in overall satisfaction with sustainability training, PrimEd students report slightly higher satisfaction ( $M=3.90; SD=0.866$ ) than EChildEd ( $M=3.76; SD=0.930$ ) and SocEd ( $M=3.19; SD=0.950$ ). However, SocEd students express greater satisfaction with the use of active methodologies ( $M=4.17; SD=0.74$ ) compared to PrimEd students ( $M=3.84; SD=0.92; p<0.001$ ).

#### 5. Discussion and conclusions

Awareness of the Sustainable Development Goals (SDGs) among university students is a topic of growing interest. As sustainability becomes a global priority, future generations, largely represented by university students, are expected to be familiar with these goals and be willing to contribute to their achievement. Several research studies have explored the level of knowledge and perceptions of university students about the SDGs, showing that students from Social Sciences and Education-related majors tend to be more knowledgeable about the SDGs compared to those from more technical majors, and also more engaged (Zamora-Polo et al., 2019).

In our study, students in Education degrees are familiar with the SDGs, with variability in their knowledge of the SDGs (Cachero et al., 2023). Despite not having in-depth knowledge, students perceive the importance of the SDGs and their influence on their lives, indicating a positive attitude towards the SDGs and their importance for their future careers (Leiva-Brondo et al., 2022). Furthermore, this positive attitude towards the SDGs is related to a strong motivation to contribute to their development and a high willingness to participate in related activities (Nusrat & Zul, 2020).

On the other hand, we highlight that the majority of students have a global vision of the areas covered by sustainability, beyond environmental issues, taking into consideration the social, economic and cultural dimension. Likewise, most of them state that they have received training on the SDGs in their respective degree studies, with the following sources of information being social networks and the media (López et al., 2024).

As in other studies (Gutiérrez-Fresneda & Verdú-Llorca, 2018), students value active methodologies positively, perceive them as facilitators for the achievement of the SDGs (Aparicio et al., 2021) and consider that teachers play a fundamental role as agents of social change and drivers of ESD (Gómez-Gómez & García-Lázaro, 2023).

We must educate global citizens who can take on the challenges facing humanity, developing knowledge and skills in sustainability, fostering social responsibility and critical thinking, offering meaningful learning experiences and implementing university policies that promote these approaches.

#### Acknowledgments

This work was supported by the Operational Plan for Research Support of the University of Jaén (HUM427\_2023; Action 1b); and the Vice-rectorate for Coordination and Quality of Education of the University of Jaén, PID2024\_011 (PIMED-UJA Plan 2019-2023).

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