



VOL. 27, Nº 3 (Noviembre, 2023)

ISSN 1138-414X, ISSNe 1989-6395

DOI: 10.30827/profesorado.v27i3.27948

Fecha de recepción 24/04/2023

Fecha de aceptación 20/10/2023

AWARENESS AND KNOWLEDGE OF THE SUSTAINABLE DEVELOPMENT GOALS IN TEACHER TRAINING

Concienciación y conocimientos sobre los Objetivos de Desarrollo Sostenible en la formación del profesorado



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Abstract:

The urgent commitment of educational institutions to achieve Education for Sustainable Development leads us to propose studies such as this one. In particular, the main objective of this study is to analyze the degree of awareness and knowledge about the Sustainable Development Goals (SDGs) among students studying Education Degrees (Degree and Master) ($n = 153$) at a public university, and their perception of the possibilities of working with them. The mixed methodology and *ad hoc* questionnaire validated by experts allowed for a descriptive and inferential analysis of the data. The results suggest that there is a need to improve awareness, training, and implementation of the SDGs in university teacher training. Some improvement was perceived when comparing prior and final knowledge, with a significant association detected between the latter and the academic year. Of all the educational stages, Higher Education is considered the most favourable for working on the SDGs, with university students becoming promoters of this challenge. In general, they consider that SDGs 4, 5, 3, and 16 (in that order) require the most attention, with significant differences depending on the academic year. The study calls for a review of the curricula for Education Degrees, and for the implementation of more teaching, research, and institutionalization initiatives to address the challenges of the 2030 Agenda.



Key Words: *educational objectives; quality education; social responsibility; sustainable development; teacher education*

Resumen:

El compromiso urgente de las instituciones educativas para lograr una Educación para el Desarrollo Sostenible nos lleva a proponer estudios como éste. En particular, el principal objetivo de este estudio es analizar el grado de concienciación y de conocimientos sobre los Objetivos de Desarrollo Sostenible (ODS) entre el alumnado de las titulaciones de Educación (Grado y Máster) ($n = 153$) en una universidad pública, así como su percepción sobre las posibilidades de trabajar con ellos. La metodología mixta y el cuestionario *ad hoc* validado por expertos permiten realizar un análisis descriptivo e inferencial de los datos. Los resultados concluyen que hay una necesidad de mejorar la sensibilización, la formación y la implementación de los ODS en la formación docente universitaria. Se percibe cierta mejora al comparar los conocimientos previos y finales, y se detectó una asociación significativa entre ellos y el curso académico. De todas las etapas educativas, la Educación Superior se considera la etapa más adecuada para trabajar los ODS, siendo los estudiantes universitarios promotores del reto. Los ODS 4, 5, 3 y 16 (en ese orden) requieren la máxima atención, con diferencias significativas por curso académico. Este estudio nos invita a revisar los planes de estudio de las titulaciones de Educación y a implementar más iniciativas de enseñanza, de investigación y de institucionalización para abordar los desafíos de la Agenda 2030.

Palabras clave: *objetivos educacionales; educación de calidad; responsabilidad social; desarrollo sostenible; formación de docentes*

1. Presentation and justification of the problem

Global awareness and concern for building a more sustainable world is not a recent issue. In 2000, the United Nations Millennium Assembly adopted 8 Millennium Development Goals, and two years later, the Decade of Education for Sustainable Development was proclaimed (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2005).

At this time there is a firm commitment to develop competencies in sustainability (UNESCO, 2012), based on the pillars of Education (Delors, 1996), that connect, in turn, with the elements of the development of the human being: heart (feeling: emotion), head (thinking: cognition) and body (acting: behavior), which are essential to contribute to the development of the whole person (Martínez Domínguez et al., 2018).

For its part, the Conference of Rectors of Spanish Universities (CRUE, 2012) is also committed to incorporating Social Responsibility and Sustainable Development content in university degrees through transversal competences, among other things, to increase the awareness of the educational community.

In 2015, the United Nations established 17 Sustainable Development Goals (SDGs), and despite the difficult times we are living through because of the COVID-19 pandemic or the war in Ukraine, these goals must remain our roadmap for achieving sustainable development by 2030 (Arora-Jonsson, 2023; Sachs et al., 2022). It is therefore necessary for Higher Education to promote university teacher training adapted to the framework of the 2030 Agenda.

2. Theoretical Framework

2.1. Educational Social Responsibility in Higher Education

Educational Social Responsibility (EdSR) is the exercise of the profession with attitudes and behaviors based on a social conscience that contribute to the common good (Reig-Aleixandre et al., 2022). In this current moment characterized by uncertainty and planetary unsustainability, Vallaes and Álvarez-Rodríguez (2022) appeal to an international and trans-institutional macro ethics.

Universities need to promote actions in the field of EdSR in relation to teaching, research, management and infrastructures. For this reason, the university community must be offered an education that brings them closer to the needs of today, raises awareness and promotes responsible and fair citizenship (Calero et al., 2019; Gibbs et al., 2019; Hernández-Castilla et al., 2020; Pegalajar Palomino et al., 2022).

But it is also necessary to carry out research that responds to the emergence of a Science of Sustainability (Vilches & Gil Pérez, 2018). Pegalajar Palomino et al. (2022) highlight that, in Education Degrees, students generally have favorable attitudes towards sustainability and commitment to the environment. Furthermore, Reig-Aleixandre et al. (2022) corroborate that providing university training in degree courses through subjects such as “Education in Social Responsibility” generates significant differences in the degree of social responsibility as a future professional.

Along these lines, the Report by Mallow et al. (2020) shows that, from this stage, there is increasing the level of awareness of the SDGs and the commitment to the 2030 Agenda. However, they also recognize that the level of work is not the same in different universities and in different countries. According to several research studies (Alventosa-Bleda et al., 2020; Androshchuk et al., 2020), this challenge implies a change of mentality in the new generations and requires that society, family and educational institutions go hand in hand in this commitment (Martínez Domínguez et al., 2018).

2.2. Sustainable Development Goals and teacher training

The increase in interest and scientific production of studies on sustainable development affirms that the training received by future teachers in Higher Education must be in line with current needs and reality (Pegalajar Palomino et al., 2022).

However, this commitment is not new. Along these lines, CRUE (2012) proposes the revision of curricula in all university degrees with the aim of including cross-cutting content on sustainability. Alventosa-Bleda et al. (2020) analyze the curricular designs of the subjects of the Degree in Primary Education in different public and private universities. In general, the subjects that are worked on the most are: inclusive education, families and sustainability, whereas living together, citizenship and gender are the least integrated subjects. Figure 1 shows the SDGs classified by the main themes that encompass them.

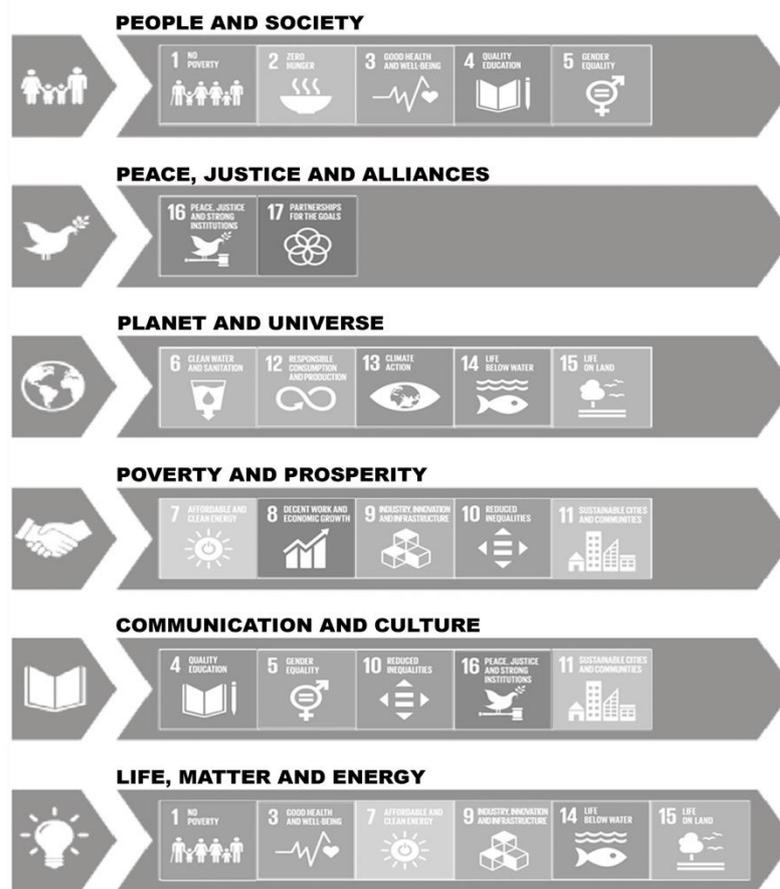


Figure 1. SDG building blocks.

Source: Moya, J., & Zubillaga A. (Eds.) (2020). *Un currículo para un mundo sostenible*. Anaya.

Institutional support, investment and national and international educational policy initiatives are also needed to drive this curriculum revision process (Calero et al., 2019; González Bravo & Vivar Quintar, 2022; Leicht et al., 2018; Mallow et al., 2020; Negrín Medina & Marrero Galván, 2021; Tarozzi & Mallon, 2019).

2.3. Teaching and learning about SDGs in teacher training

In relation to the knowledge and training received on these subjects in Education Degrees, in general, the research obtains similar results, revealing shortcomings in training (Alventosa-Bleda et al., 2020; García-Ceballos et al., 2021; Guardañó Juan et al., 2021; Martínez Scott, 2021), despite the fact that students are aware of what is happening in their environment, that is, they seems to be aware of it.

However, when an initiative is implemented, the results improve significantly, highlighting an overall positive impact, especially in the development of students' social commitment. Some studies provide evidence: Guardañó Juan et al. (2021) in the Degrees in Early Childhood and Primary Education and Master in Teaching at the University of Valencia through training workshops and projects; Martínez Scott (2021) in the Degrees in Early Childhood and Primary Education at the University of Valladolid,

after taking the subject “Education for Peace and Equality”; Medir Huerta and Serra-Salvi (2021) in the Degree in Primary Education, through “Society and Sustainability”; or De Dios Alija et al. (2022) after studying “Education for social responsibility” at the Francisco de Vitoria University.

For its part, UNESCO (2017) includes these competences among those of a transversal nature. So does Organic Law 3/2020, of 29 December, which modifies Organic Law 2/2006, of 3 May, on Education (LOMLOE), which takes them into account as new competences to be developed by students and teachers in training, and it states that “[...] by 2025 all teachers should be trained in the goals set out in the 2030 Agenda” (p. 122943). However, today in the academic curriculum of these degrees there is a deficit in the training of future teachers (Pegalajar Palomino et al., 2022).

Moreover, according to Wiek et al. (2016), these competences are usually worked on in a generic way. In this way, the teaching and learning methodology must be problem-based (real and current), solution-oriented (Escámez Marsilla & López Luján, 2019; García-Ceballos et al., 2021; Martínez Scott, 2021) and accompanied by evaluation processes that measure the impact of the initiatives. In this regard, the Spanish Network for Sustainable Development published a guide with tools to evaluate the contribution of Higher Education institutions to sustainable development and the achievement of the SDGs (Alba Hidalgo et al., 2020).

Therefore, teaching and learning processes need to be rethought with this new curricular approach inspired by a humanistic vision of education (Androshchuk et al., 2020; Leicht et al., 2018; Negrín Medina & Marrero Galván, 2021). To this end, it is necessary to take care of didactics (Medir Huerta & Serra-Salvi, 2021) and to transform learning environments and the roles of teachers and students (González Bravo & Vivar Quintar, 2022; Rieckmann, 2018), both in the initial training of teachers and in the in-service training of active teachers (Sancar et al., 2021; Vilches & Gil Pérez, 2018). In addition, it is also interesting to develop civic leadership that promotes social justice from the educational institution (Bolívar et al., 2022; Hernández-Castilla et al., 2020).

In terms of working with the SDGs, Medir Huerta and Serra-Salvi (2021) highlight that future teachers consider that the ones they work on the most are: SDG 1 (no poverty), SDG 2 (zero hunger), SDG 5 (gender equality) and SDG 12 (responsible consumption and production), and the least worked on are: SDG 8 (decent work) and SDG 11 (sustainable cities and communities). However, research by Mallow et al. (2020) highlights SDG 4 (quality education), SDG 5 (gender equality) and SDG 13 (climate action) as the most addressed by universities, and SDG 14 (life below water), SDG 2 (zero hunger) and SDG 12 (responsible consumption and production) as the least addressed. On the other hand, Guardeso Juan et al. (2021) state that the students of the Degrees and Master in Education highlight SDG 4 as the one that is most worked on in the educational stages, although they consider that the rest also have a place in all of them.

In order to listen to the voices of students and to understand their perception of the SDGs in the context of teacher training in Higher Education, information on their

level of awareness and knowledge at the beginning and at the end of the academic year is analyzed. This aims to promote the revision of current university curricula and adapt them to the reality of the 2030 Agenda.

3. Method

This study is part of the preliminary phase of a larger research project. In this first phase, a quasi-experimental design with cohort design and no control group was used to find out the behavior and cause-effect relationships of the group among students belonging to different educational levels. The intervention strategy carried out consists of giving a training seminar on SDGs to the participating students in the context of a core subject in the degrees involved to answer the research question posed. The methodology applied for data processing is quantitative, focusing on the descriptive analysis of the data in order to subsequently apply inference.

The aim of the research is exploratory in nature, as it is a first approach to the subject that concerns us in order to subsequently address it more broadly (Bisquerra, 2004). For this reason, this study aims to better understand the subject from the students' perception in order to be able to make proposals based on innovation and research.

3.1. Objectives and research question

- General objective (GO): To find out the degree of awareness of the SDGs among students of the Degrees in Early Childhood and Primary Education and the Master in Teacher Training at a public university in Madrid.
- Specific objective 1 (SO1): Analyze their knowledge (at the start and end of the current year) of the SDGs within the context of educational social responsibility.
- Specific objective 2 (SO2): To find out their views on the possibilities for working on the SDGs in different contexts and at different stages of education.

Our main research question is: are students of Education Degrees (future teachers of the 21st century), aware of and do they have sufficient knowledge about the SDGs and how to work with them at the different educational stages?

3.2. Participants

The study involved 153 students from the Rey Juan Carlos University (Madrid) from: Degree in Early Childhood Education, Degree in Primary Education and Master in Teacher Training in Secondary Education, Baccalaureate, Vocational Training (VT) and Languages. Table 1 shows the distribution of the sample.

Table 1
Sample.

Academic title	Number	Academic Year
Degree in Early Childhood Education (DECE)	40	1st and 2nd year (16) 3rd and 4th year (24)
Degree in Primary Education (DPE)	25	1st and 2nd year (10) 3rd and 4th year (15)
Master in Teacher Training (MAST)	88	
<i>Total (n)</i>	153	

In terms of sex, 74% of the total sample are women, and in terms of degrees, in both cycles of the Degrees in Education there are more women than men (18% and 29% of women in the 1st and 2nd cycles), but in the Master there are more men (69%) than women.

The type of sampling was non-probabilistic by convenience due to the possibility of access to the informants (Bisquerra, 2004).

3.3. Information collection instrument

The questionnaire was the instrument used to collect information. The questionnaire was designed *ad hoc* and created through the Microsoft Office Forms application, with an approximate duration of 5 minutes and administered in the 2021-2022 academic year, after the training intervention carried out. All participating subjects gave their informed consent before participating in the study, and the research has been endorsed by the Ethics Committee of the participating university, issuing a favorable report guaranteeing compliance with data protection law (Internal registration number: 2004202212922).

In order to guarantee the validity of the instrument, a content validation was carried out by four experts from the field of Pedagogy, the Degree in Early Childhood Education, the Degree in Primary Education and the Master in Teacher Training. Each professional completed a rubric in which they evaluated aspects of coherence (objectives-items), clarity (questions and answer options), relevance (items) and sufficiency. After feedback, the questionnaire finally consisted of 12 questions distributed in three categories and 11 variables. The type of questions were multiple choice, Likert-type scale (1: minimum- 5: maximum), multi-choice and open-ended questions (Table 2).

Previous studies (Alventosa-Bleda et al., 2020; García-Ceballos et al., 2021; Guardado et al., 2021) were used as a reference for its design. To measure the reliability of the questionnaire, the Cronbach's Alpha coefficient was calculated taking into account the variance of the items and obtaining a good reliability for the 10 parameters analyzed and the 153 responses (> .60). Therefore, it can be affirmed that the questionnaire has an acceptable internal consistency (George & Mallery, 2003).

Table 2
Categories, variables and items.

Categories	Variables	Number of Items
General data	-Gender	3
	-Degree	
	-Academic year	
Educational Social Responsibility	-Prior knowledge on EdSR	2
	-Final knowledge on EdSR	
	-Prior knowledge on SDGs	
	-Final knowledge on SDGs	
Sustainable Development Goals	-Possibilities for working on the SDGs in educational stages and contexts	7
	-Real work on the SDGs in educational stages	
	-Most needed SDGs	
	-Perception on SDGs	

3.4. Procedure and data analysis

The coding process and the analysis of the quantitative and qualitative data were carried out with the statistical programme DataViv from the LeSphinx software. Descriptive analyses were carried out with univariate analysis of the demographic variables, as well as cross analysis of these variables by means of frequency analysis. In this study, two non-parametric statistical tests, the Chi-square test and Fisher's exact test, were employed to assess the relationship between the selected variables. Additionally, the "d" measure of Cohen was used to compare the magnitude of a statistical effect between two groups. This measure is obtained by dividing the difference between the means of the groups by the combined standard deviation of the population.

As a complement to the quantitative analysis, a qualitative textual analysis is carried out, analyzing the opinions of the participants, through the categorization and frequency analysis of their comments.

4. Results

4.1. From a quantitative point of view

In order to find out the characteristics of the sample's distribution of the knowledge on EdSR and SDGs, a descriptive analysis of the data was carried out, comparing the measures of central tendency at the beginning and end of the academic year.

For both concepts it can be seen that the results on "Prior knowledge" and "Final knowledge" maintain values close to the average and, in general, there is little dispersion. Thus, observing the average score of 2 points out of 5: Median (Me) = 2;

Standard Deviation (SD) = 1.1, and comparing it with the scores obtained at the end of the academic year with an average of 3.8 out of 5 (Me = 4; SD = 0.9), leads us to think that the knowledge on EdSR has improved at the end of the academic year. Analyzing the sample as a whole, we see that 48 % of the students rated this improvement positively with 4 points out of 5, and 23 % rated it with 5 points.

The general trend is reflected in both the scores of the "Knowledge of the SDGs at the beginning of the course" (Mean=2.1 out of 5; Median=2; Standard Deviation=1.2) and the scores of the "End of the course" (Mean=3.7 out of 5 points; Median=4; Standard Deviation=1). This suggests a highly significant relationship (Chi2=150.4, with 4 degrees of freedom and a p-value <0.01). This finding is confirmed through the calculation of the Effect Size using the "d" measure of Cohen, which is 1.2 for the training related to the SDGs and 2 for the EdSR. This means that in both cases, the effect is of high magnitude.

In Table 3, the analysis of previous and final knowledge about EdSR and ODS is presented based on the studies carried out. After carrying out the titration analysis, a general improvement is observed in the "Knowledge of both topics" at the end of the course compared to the previous knowledge of the participants at the beginning of the study.

Table 3
Basic descriptives of the variables "Prior and final knowledge on EdSR and SDGs".

	Knowledge on EdSR					
	M		Me		SD	
	Prior K.	Final K.	Prior K.	Final K.	Prior K.	Final K.
DECE	2.2	3.6	2	4	1.2	1.4
DPE	2.2	3.6	2	4	1	0.9
MAST	1.8	4	1	4	1	0.7
	Knowledge on SDGs					
	M		Me		SD	
	Prior K.	Final K.	Prior K.	Final K.	Prior K.	Final K.
DECE	2	3.1	2	3	1.1	1.3
DPE	2.2	3.6	2	4	1.2	0.9
MAST	2.2	4	2	4	1.2	0.8

As the results show, the three titles improve the knowledge average in a similar way, although the students of the Degree in Early Childhood Education have less knowledge about the ODS, while those in the Master have less initial knowledge about EdSR. It is worth noting that the latter show a greater improvement in acquiring knowledge compared to their classmates in the Education Degrees.

Once we have analyzed the evolution of the level of knowledge on EdSR and SDGs from the beginning to the end of the academic year, we are interested in finding out if there is an association between the "Final knowledge", the "Academic year" in which the students are and the "Degree" they are studying. To this end, Fisher's test

is calculated, and the results indicate that only in the “Final knowledge on SDGs” a highly significant relationship is detected in relation to the “Academic Year” they are in (p -value < 0.01; Fisher = 10.5; Inter variance = 0.9).

Therefore, in order to know the complete cross-tabulation of variables, it is proposed the K-means classification based on the variables: “Degree” of the students (C1), to the “Academic year” (C2), and to the “Final knowledge on SDGs”.

Figure 2 shows the classification that groups individuals into two homogeneous classes or groups (A and B) according to the above variables.

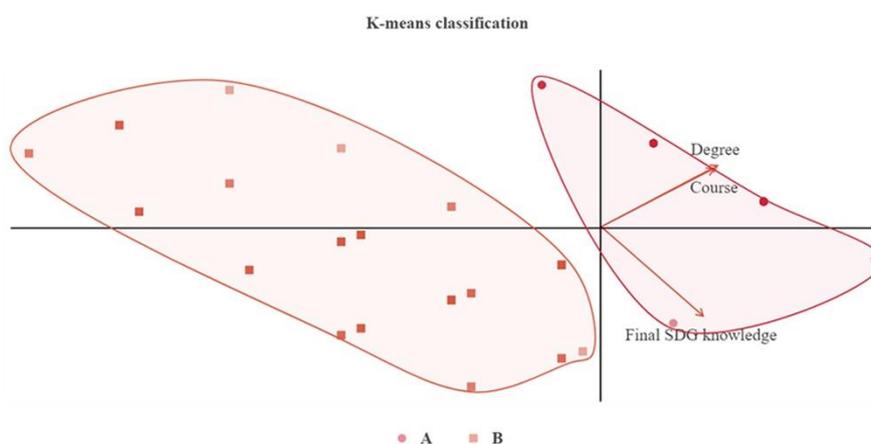


Figure 2. K-means classification among “Final knowledge on SDGs”, “Academic year” and “Degree”.
Source: Authors’ elaboration.

The classification groups students into homogeneous classes in terms of the variables considered (C1, C2 and C3). The calculation is performed randomly and the algorithm reallocates individuals to progressively improve the homogeneity of the classes/groups. Therefore, we have a division of the sample consisting of Group A (58 % of the sample) and Group B (42 %) with similar knowledge, academic year and degree. It is important to take this data into account when planning training based on the profile of students, in order to adapt them to their level of knowledge and their characteristics.

Furthermore, Table 4 shows that there is a significant difference between groups, with mean values (from 1 to 5) of 4.3 and 2.9 for the variables “Possibilities of working on the SDGs in the different educational stages and contexts” and “Knowledge on SDGs”. These values are significant according to Fisher’s test of the difference in means with a p -value < 0.01.

Table 4
Mean values of the variables for each K-mean class.

	Degree	Academic year	Knowledge on SDGs
Group A	3.989	2.989	4.034
Group B	2.328	1.594	3.281
<i>Total</i>	3.294	2.405	3.719

Finally, we wanted to find out how committed students are to the implementation of the SDGs at different educational stages and in different contexts. This means whether they are promoters, detractors or passive in the implementation of the SDGs. To do this, we analyze the NPS (Net Promoter Score), which is a metric that identifies the level of customer loyalty, which in our case corresponds to students as future teachers (de Oliveira et al., 2021). In this research, they were asked to rate from 1 to 5 the possibilities of working on the SDGs at different educational stages, classifying the responses into three profiles: detractors (scores 1 to 2), passives (3) and promoters (scores 4 to 5). This index is determined by the difference between the percentage of promoters and detractors (Table 5).

Table 5
Profiles of detractors, passives and promoters of working with SDGs.

	Early Child. Ed.	Primary Ed.	Secondary Ed. Baccalaureate, VT	Higher Education	Business, Association, Foundation
Detractors	12%	4%	4%	3%	4%
Passive	22%	17%	6%	6%	10%
Promoters	66%	79%	90%	91%	86%
<i>NPS</i>	54.2	75.2	86.3	87.6%	82.4

As can be seen, according to their perception, the level of promoters is found, above all, at the Higher Education stage, followed by Secondary Education, Baccalaureate and Vocational Training, and then Business, Associations and Foundations. It is in Early Childhood Education where there is a more passive attitude towards the implementation of the SDGs, which is the stage with the most detractors. The best figure is that of the university stage (87.6 %), which is very positive since the students consider themselves to be promoters at the current stage of their teacher training, despite the fact that they consider their knowledge to be scarce.

On the other hand, we wanted to know which SDGs they considered, in general, that they could work more on in the educational stages in which they are going to carry out their teaching work. In general terms, SDG 4 (80 %), SDG 5 (75 %), SDG 3 (58 %) and SDG 16 (54 %) stood out as the four most favorable to work on in educational institutions. When analyzing the data, it was found that the relationship between “Final knowledge on SDGs” and the “Degree” they study (DECE, DPE or MAST), is not significant (p-value = 0.1; Chi2 =64.7). However, this ranking changes in relation to the “Academic year” they are in, or whether they are studying in the Master’s Degree, with this relationship being significant. Therefore, the variables “Choice of SDGs”, “Degree” and “Academic year” were cross-checked (Table 6). It can be seen how the

score for each SDG increases based on the academic cycle in which it is found, but 3 of the 4 SDGs that belong to the “Poverty and Prosperity” block of the Moya and Zubillaga (2020) classification stand out in the DECE. However, this choice changes among students in the second cycle, focusing more on the SDGs related to “Planet and Universe”. Similarly, students in the first cycle of the DPE mostly select the SDGs related to the “Poverty and Prosperity” block, while in Higher grades they select the SDGs related to “People and Society”.

Table 6

SDGs that can be further worked on at different educational stages depending on the “Degree” and “Academic Year.”

SDGs	DECE		DPE		MAST
	1ST-2ND YEAR	3RD-4TH YEAR	1ST-2ND YEAR	3RD-4TH YEAR	
SDG 1. End poverty...	0 %	100 %	0 %	100 %	45 %
SDG 2. End hunger, food security...	40 %	60 %	33 %	67 %	36 %
SDG 3. Healthy lives and well-being for all...	54 %	46 %	42 %	58 %	47 %
SDG 4. Inclusive and equitable quality education...	46 %	54 %	47 %	53 %	59 %
SDG 5. Gender equality and empower...	41 %	59 %	40 %	60 %	56 %
SDG 6. Availability and sustainable management of water...	0 %	100 %	50 %	50 %	42 %
SDG 7. Access to affordable and sustainable energy...	17 %	83 %	100 %	0 %	30 %
SDG 8. Sustainable economic growth...	20 %	80 %	75 %	25 %	81 %
SDG 9. Resilient infrastructures, sustainable...	50 %	50 %	0 %	0 %	69 %
SDG 10. Reduce inequality...	56 %	44 %	25 %	75 %	60 %
SDG 11. Cities and human settlements inclusive...	50 %	50 %	75 %	25 %	68 %
SDG 12. Sustainable consumption patterns...	13 %	88 %	46 %	54 %	50 %
SDG 13. Combat climate change...	39 %	61 %	45 %	55 %	40 %
SDG 14. Conserve and sustainably use the oceans...	40 %	60 %	100 %	0 %	46 %
SDG 15. Sustainably manage forest, combat desertification...	33 %	67 %	75 %	25 %	41 %
SDG 16. Peaceful and inclusive societies...	38 %	62 %	50 %	50 %	60 %

- “[...] I would like that, given that we teachers have part of the responsibility in the education of young people, educational institutions should train us more in these subjects [...]” (student 38, MAST).
- “Education should not be limited to teaching subjects. Our commitment as teachers is to contribute to the formation of a more just and inclusive society [...]. The goals of the 2030 Agenda must be part not only of the great powers that have signed the agreement, but of each and every one of us” (student 69, MAST).

4.2.2. Category “Need for change”

- “I think the SDGs are not getting the visibility they deserve” (student 19, MAST).
- “More work should be done, there should be a change in this direction” (student 33, MAST).
- “These issues have helped me to change my point of view in many areas of my life” (student 38, DECE).
- “A lot of training is needed [...]. I haven't noticed much knowledge or recycling at the training center either [...]” (student 55, MAST).
- “The SDGs are fundamental for sowing a healthier world from the educational sphere” (student 64, DECE).

Of all the comments, only two students expressed a skeptical stance: “It seems to me that there are more concrete things than the SDGs that are more important to be dealt with in VT” (student 18, MAST); and “I think the SDGs are necessary, but in Secondary Education and Baccalaureate they are completely dispensable” (student 52, MAST).

4.3. Proposal for future initiatives after analyzing the results

After analyzing the results and subsequently drawing preliminary conclusions, a second phase of the study will develop initiatives to increase the awareness and involvement of students in Education Degrees in relation to the development of the SDGs. These proposals (Table 7) are based on the three areas of intervention proposed by the Spanish Network for Sustainable Development (Alba Hidalgo et al., 2020): (1) teaching, (2) research and (3) institutional policy and social leadership.

Table 7
Proposal of activities to implement the SDGs in Education Degrees.

CONTEXT	ACTION
Degrees´ s and Master's subjects	Review <i>teaching guides</i> to propose the inclusion of basic content on EdSR and SDGs in subjects related to these topics.
Traineeships	Include a new task in the <i>Traineeship Report</i> : Describe what the assigned training centre does to work on the SDGs. If the centre does not work on them, a proposal should be made to work on them at the centre.
Academic Credit Recognition Activities	<i>Training and awareness-raising activities</i> on SDGs, such as seminars, workshops, round tables, good practices, etc., can be organised by the education departments.
Research and/or Teaching Innovation Projects	Teachers will be encouraged to carry out <i>research and/or teaching innovation projects</i> that address the SDGs and that invite student participation, favouring cooperative and collaborative work. For example, <i>Solidarity Service-Learning Projects</i> could be an interesting framework to contextualise these initiatives.
Central Units and Services of the University	The different units and services of the university could support activities and projects to work on the SDGs, such as: Educational Social Responsibility Unit, University Office for Service Learning, Development Cooperation and Volunteering Unit, Unit for Attention to People with Disabilities and Special Educational Needs, etc.

Source: Author´s elaboration.

After carrying out the different didactic, innovation and research initiatives, the possible differences between students in the first phase of the study (without concrete actions on Education for Sustainable Development) and in the second phase (with planned actions) will be evaluated.

5. Discussion and Conclusions

The main research question we posed is whether students of Education Degrees (Degrees and Master), as future teachers of the 21st century, are aware of and have sufficient knowledge about the SDGs and how to work with them from the different educational stages. After analyzing the results, it can be concluded that, as in other similar studies (García-Ceballos et al., 2021; Guardeso Juan et al., 2021; Pegalajar Palomino et al., 2022), there is still much work to be done to raise awareness and implement the SDGs in university teacher training.

In relation to the GO on the degree of awareness of the SDGs among future teachers, it can be stated that, despite the fact that their prior knowledge is not very high at the beginning of the academic year, in general, they are interested and aware of the subject. Undoubtedly, this improvement in their training will allow them to develop in their future teaching practice a greater awareness towards their environment (Pegalajar Palomino et al. 2022; Rieckmann, 2018).

With regard to SO1 on the level of knowledge of the SDGs, shortcomings are detected in their initial training (Alventosa-Bleda et al., 2020; García-Ceballos et al., 2021; Martínez Scott, 2021; Pegalajar Palomino et al., 2022). This is because, in general, future teachers started with very little knowledge of EdSR and SDGs, in both cases with scores below average knowledge. However, after the end of the academic year, there is a similar improvement in both subjects, as in other research (Guardeño Juan et al., 2021; Martínez Scott, 2021). This improvement as university education progresses is corroborated by Mallow et al. (2020) who highlight a growing awareness and commitment of universities towards meeting the 2030 Agenda in general, and the SDGs in particular.

Even so, in the personal comments, many participants call for more training, especially at university. For this, it is essential that in-service teachers are also trained (Vilches & Gil Pérez, 2018).

One aspect to highlight is the significant relationship between the knowledge acquired at the end of the program with the academic year of each student profile, so that as the academic year or degree progresses, this knowledge increases.

In relation to SO2 on students' perception of the possibilities for working on the SDGs in different contexts and at different educational stages, students show their concern and interest in actively integrating them at all stages (García-Ceballos et al., 2021; Guardeño Juan et al., 2021). The results show that Higher Education is where the SDGs can be worked on the most, becoming promoters of this challenge. Followed by Secondary Education, Baccalaureate, Vocational Training and Business, Associations and Foundations, and not so much the infant and primary school stages.

According to some authors (De Dios Alija et al., 2022; Pegalajar Palomino et al., 2022; Sancar et al., 2021), the university should be an institution that, apart from providing academic and professional development, also contributes to the personal development and comprehensive training of the student. This favors the development of transversal competences related to knowing how to be and knowing how to live together, as defended by Delors (1996).

In relation to the perception of the most important SDGs to work on from the different educational stages, at a general level, the results of the study show that they are the following in this order: SDG 4 (quality education), SDG 5 (equality), SDG 3 (healthy lives and well-being) and SDG 16 (just and inclusive societies). Of these, SDG 5 coincides with one of the most important SDGs perceived in the study by Medir Huerta and Serra-Salvi (2020) and SDG 4 coincides with the study by Mallow et al. (2020). However, it can be seen that the relationship between the degree and the perception of the possibilities of working on SDGs in different contexts is not significant, although it is significant depending on the academic year. In this sense, students in the second cycle coincide with the study by Medir Huerta and Serra-Salvi (2020) in considering SDG 1 and SDG 2 as among the most highly valued. In general, three of the four SDGs that most interest our students belong to the "People and Society" block of Moya and

Zubillaga's (2020) classification. This suggests the intrinsic relationship between the SDGs and the lives of people in society.

In short, especially in the testimonies of the open-ended questions, the students are committed to a humanistic vision of education for sustainable development (Arora-Jonsson et al., 2023; Escámez Marsilla & López Luján, 2019; Hernández-Castilla et al., 2020; Leicht et al., 2018; Pegalajar Palomino et al., 2022). Therefore, from all contexts, it is necessary to break down the walls of the institution and build bridges between the reality of the classroom and the surrounding environment (Androshchuk et al., 2020; González Bravo & Vivar Quintar, 2022; Martínez Scott, 2021). In this context, the role of the teacher becomes important as a leader and agent of change and social transformation (Bolívar et al., 2022; García-Ceballos et al., 2021; Hernández-Castilla et al. 2020). However, this requires further training (Leicht et al., 2018; Tarozzi & Mallon, 2019; Pegalajar Palomino et al., 2022). Along with the latter, a change in teaching and learning methodology is needed (Escámez Marsilla & López Luján, 2019; García-Ceballos et al., 2021; Martínez Scott, 2021). After the literature review, we can see that including subjects related to Education for Sustainable Development and EdSR favors the acquisition of knowledge and the development of competences in sustainability (Gibbs et al., 2019; 2022; Reig-Aleixandre et al., 2022).

The main contribution of this paper is to show a study in the university training of future teachers (Degree and Master level) in order to find out whether current students are adequately trained to face the social challenges posed by the 2030 Agenda. Analyzing the level of awareness and knowledge acquired about the SDGs in the first and last years of the degree gives us clues about the changes we need to make and when to make them. Likewise, the analysis of the possibilities of working with them in the different contexts and stages allows us to know their interests in order to plan actions that address these issues.

One of the main limitations of the study is that, as it is a pilot study, we have focused on a single university institution. It would therefore be desirable to extend the sample to other degrees and other universities, as the study is easily transferable and would allow connections to be established between them.

Hence, the main line of research would be to extend the sample of students alongside that of university teaching staff, and to compare perceptions. Furthermore, we will develop the second phase of the study, carrying out the initiatives set out in Table 7 and analyzing through different instruments (questionnaires, interviews and focus groups) whether or not, after their implementation, students have improved their level of awareness and knowledge of the SDGs in relation to the students in this first phase (no planned actions). The implementation of the training will take into account the data obtained in each student profile.

In short, there needs to be a major effort from all contexts of society to integrate the principles of the 2030 Agenda into our intentions and actions. Higher Education undoubtedly faces the challenge of breaking down the walls of the classroom

and getting closer to the reality of the environment. To this end, it is necessary to raise awareness, sensitive and implement actions that enable the university community, in general, and students in training, in particular, to develop competences that favor their integral development as students, but, above all, as individuals.

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Author's contributions: Both authors have participated in the process of reviewing, planning and writing the article. M.G.-G. led the process of developing the theoretical framework and D.G.-L. led the process of data analysis. Both authors worked together in the interpretation of the results and in the development of the discussion and the conclusions.

Financing: This research did not receive external funding.

Acknowledgements: This study has been supported by the Fifth Research Promotion Plan of the Rey Juan Carlos University. The study is the result of collaboration between the *Innovation*

and Educational Improvement Research Group and Teaching Innovation Group Creating connections. *Creativity, Innovation and Neurodidactics* of the Rey Juan Carlos University (Madrid).

Conflict of interest: The authors have no conflicts of interest to declare.

Ethical declaration: The research has been endorsed by the Ethics Committee of the participating university (Internal registration number: 2004202212922).

How to cite this article:

Gómez-Gómez, M., & García-Lázaro, D. (2023). Awareness and knowledge of the Sustainable Development Goals in teacher training. *Profesorado, Revista de Currículum y Formación del Profesorado*, 27(3), 243-264. <https://doi.org.10.30827/profesorado.v27i3.27948>