Assessment of the Quality Education Awareness Competence of Pre-Service Educators Using Vignettes

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Abstract: For decades, higher education institutions have been incorporating sustainability principles. Spanish universities have considered it important that sustainability principles are integrated into the university curriculum, in order to contribute to the education of socially-responsible professionals. The present research aims to estimate pre-service educators' awareness of selected challenges posed by Sustainable Development Goal 4 (SDG 4), and it identifies the learning experiences that contribute the most to these students' awareness of quality education. Moreover, the study aims to explore the potential of the use of the vignettes approach for the evaluation of students' awareness. The study drew on a sample of $n = 202$ first year students pursuing education-related degrees at a Spanish university. The data was collected using a vignette survey, and the data analysis was conducted using quantitative and qualitative techniques. The results show a high degree of awareness within the context of most of the challenges posed by SDG 4 and, in the search for the factors that contributed to the degree of awareness in the students, personal interests and classes taken at the university stand out. In addition, the study provides the methodological implications of the use of the vignette approach in the assessment of students' awareness. This paper discusses the practical implications for universities of the integration of Education for Sustainable Development (ESD) competences into the curriculum.

Keywords: quality education awareness; pre-service educators; vignette question design

1. Introduction

The adoption of the 2030 Agenda for Sustainable Development [1] is lending new impetus to Education for Sustainable Development (ESD), and has led to the implementation of new educational initiatives around the world.

One of the key Sustainable Development Goals (SDGs) for those of us who are involved in education at any level is SDG 4: Quality Education for All. This goal represents an ambitious educational program to "ensure inclusive, equitable and quality education and promote lifelong learning for all" ([1], p. 19). In this way, ESD can serve as a fundamental means of achieving the Sustainable Development Goals.

United Nations Educational, Scientific and Cultural Organization's (UNESCO) well-known report, 'Rethinking Education: towards a global common good?' [2], presents a vision for the reformulation of education in light of renewed concepts for human and social development, ensuring it is both fair and accessible. The report suggests that education can and ought to contribute to global sustainable development ([2], p. 32). Against this backdrop, two trends converge within global ESD policy. On the one hand, we can see the efforts made by the drivers of ESD, who use education as a tool for sustainable development. On the other hand, there are the efforts made by educational actors to integrate sustainable development principles into education systems [3].

For decades, higher education institutions have been incorporating sustainability principles into their institutional structures using statements, chapters, and associations [4]. The United Nations Conference on Sustainable Development-Río +20 [5] outcome document, alongside the UNESCO document for the implementation of education-related SDGs [6,7] point to higher institutions as relevant agents for the integration of a holistic and comprehensive approach to sustainable development. Following this, universities around the world have incorporated sustainable development into their educational agendas [8–10], and have produced a series of recommendations to encourage the adoption of sustainable principles and competencies [11]. Moreover, the number of sustainability study programmes and curricula that incorporate these principles has grown significantly worldwide [12]. Despite this progress, countries are far from reaching the 2030 education targets, and new challenges are arising. The COVID-19 pandemic is deepening the education crisis and widening existing educational inequalities [13].

In Spain, the Conference of Rectors of Spanish Universities (CRUE) approved a document proposing sustainability-based core competencies [14]. According to this document, it is vital that sustainability principles are integrated into the university curriculum. In addition, the CRUE recently issued a statement urging universities to strengthen their commitment to the SDGs [15]. Spanish universities, like universities in other countries, work toward the SDGs in a similar way [16]. The CRUE action reports [17,18] show the commitment towards the achievement of the SDGs, establish the mechanisms of accountability (studies, reports, analysis, and good practices), and summarise the new alliances (national and international) with other social agents to contribute to the 2030 Agenda. The integration of the sustainability principles into the university curriculum is strongly recommended but non-compulsory. The latest statement of the CRUE [19] on this matter shows that 51 of the 76 Spanish universities (67%) have stated that they have adopted—or are working on a specific strategy in relation to—the 2030 Agenda.

Ultimately, if socially-responsible professionals are trained at university, it is more likely that they will identify more strongly with the 2030 Agenda and its SDGs. Without a doubt, today's professionals must be capable of understanding the ways in which their professional activities interact with society and the environment, both locally and globally, with the aim of identifying possible impacts, risks and challenges. When it comes to future educators, offering training that is underpinned by sustainability principles is even more important, given that they must incorporate these principles into their own professional activities and pass them on to future generations through education [20–22]. Moreover, student teachers will became agents of change towards a sustainable development [23,24]. However, there are few studies on the ways in which university students perceive education for sustainable development [25,26]. In line with these premises, the present research aims to respond to the following questions:

- How aware are university students pursuing education-related degrees of the challenges posed by SDG 4?
- What are the most effective learning experiences for increasing these students' awareness of the targets included in SDG 4?
- What potential uses do vignettes have for the evaluation of students' awareness towards quality education?

2. Theoretical Framework

2.1. The Sustainability Competencies of Education Professionals

The creation of the European Higher Education Area has implicitly led to the adoption of a competence approach. Although certain issues still exist when it comes to the definition of this concept, the majority of Spanish universities have found a way to use and incorporate it into their curricula.

It should be acknowledged that the incorporation of sustainability into teaching curricula is not a new phenomenon. Universities have also included sustainability-focused content, activities,

methodologies, and resources into the training of future professionals, although most of this has been implemented in a cross-functional, indirect, or implicit way.

In this sense, the antecedents of sustainability competencies are certain soft skills, namely "interpersonal, human, people or behavioural skills needed to apply technical skills and knowledge in the workplace" ([27], p. 356).

Currently, numerous researchers have examined and developed different competency frameworks for sustainability. These competency frameworks define the main competencies that individuals should acquire and develop in order to change their lifestyle and contribute to social change by adopting sustainability principles. For example, Wals [28] distinguishes four dimensions within the sustainability competency: the dynamics and content of sustainability, the critical dimension of sustainability, the change and innovation dimension of sustainability, and the existential and normative dimension of sustainability. Another key reference point in this area is the work conducted by Wiek [29], who defines the following competencies: systems thinking competence, anticipatory competence, normative competence, interpersonal competence, strategic competence, and integrated problem-solving competence. On the other hand, Glasser and Hirsh [30] identify five key competencies: affinity for life, knowledge about the state of the planet, wise decision-making, the modelling of sustainable behavior, and transformative social change.

In an attempt to harmonise these different frameworks, Bruniders et al. [12] carried out a study with the aim of redefining the key sustainability competencies. The results pointed to the following: integrated problem-solving competency, interpersonal competency, implementation competency, strategic-thinking competency, values-thinking competency, future-thinking competency, and system-thinking competency.

Different studies have demonstrated how best to integrate sustainability competencies into the university curriculum [31–33]. When it comes to educators' initial education, the evidence suggests that sustainability competencies should be included in teacher training [34–36]. The achievement of the ESD objectives implies a transformative vision for education, one that requires educators to acquire a new set of competencies [37]. The possession of these competencies is crucial for future educators, as their influence goes well beyond the classroom, contributing to a more sustainable society [7].

Educators' sustainability competencies are gathered within different international competency frameworks, one of the most important being that proposed by United Nations Economic Commission for Europe (UNECE) [7]. This competency framework establishes four basic competencies, following the four-pillar structure proposed by the Delors report [38]: learning to know, learning to do, learning to live together, and learning to be. In addition, it includes three essential ESD dimensions: a holistic focus, a vision of change, and transformation. This document aims to offer a series of recommendations to stakeholders in order to orientate and guide the teacher training on sustainability [7]. However, the researchers also recognize the obstacle of the fact that there is no definition of specific ESD competencies for educators [39]. Additionally, it is clear that the efforts made in the preparation of future educators through the implementation of ESD has not made sufficient progress [6]. To that end, researchers have created alternative, more specific competency frameworks for educators. For example, Cebrián and Junyent [39] conducted a study to redefine sustainability competencies in the field of teaching. These authors propose the following competencies: (1) envision future/alternative scenarios; (2) contextualising; (3) work and live with complexity; (4) thinking critically; (5) decision-making, participation and acting for change; (6) clarifying values; (7) establishing a dialogue between disciplines; and (8) managing emotions ([25], p. 38). Moreover, UNESCO has more recently defined certain teaching objectives derived from the SDGs ([6], p. 52). They have also identified a series of specific learning objectives for educators. These learning objectives include: learning about sustainable development; developing a holistic view of the SDGs targets and the challenges they pose; understanding the current discourse and putting ESD into practice; and acting as change-makers in the institutional framework for sustainable development.

The integration of these elements into teacher training involves changes to content and structure, but also poses significant challenges in the assessment of said competencies. In the next section, we will address some of the issues related to the evaluation of sustainability competencies.

2.2. Evaluating Sustainability Competencies

While there is an ample body of theoretical studies on sustainability competency frameworks [40], few discuss the ways in which to evaluate these competencies and/or learning outcomes [41]. The specialised literature focused on learning outcomes uses different terms to refer to the attributes that university students should develop. Some terms include 'skills', 'abilities', 'dispositions' and 'competencies'. According to Riesco-González ([42], p. 86) within the Spanish university system, competencies are understood to be a combination of knowledge, skills (intellectual, manual, social, etc.), attitudes and values that train a graduate to confidently resolve problems and intervene in a given academic, professional or social issue.

In this study, we use the term 'competency' as an encompassing term that includes the knowledge, skills and attitudes that manifest themselves in students' conduct when faced with a problem in a particular area.

According to Rieckmann [40], sustainability competence depends on the interrelationship between skills, values, motivations, and opportunities. While competencies describe the ability or willingness to act in a particular way in the face of challenges, they do not necessarily imply that the individuals will act in a particular way in a specific situation. As such, in order to turn abilities into actions, individuals must acquire values and corresponding motivations that mobilise said actions. In addition, sustainability competence is related to each individual's circumstances and their understanding of the opportunities to take actions that go beyond self-control [40].

The evaluation of competencies involves designing instruments for students to demonstrate (with evidence) that they can carry out the tasks that are implicit to that competency. When completing this, the student should mobilise knowledge, skills, and attitudes that, holistically, provide the best response to a specific situation. For logistical reasons, it is difficult to access the evidence directly generated by a given student's actions. For this reason, many studies are conducted using questionnaires and rating scales in which the student provides a self-assessment of their competency level. Currently, there are a number of tools that have been developed in order to measure competencies related to sustainability. Internationally, there is the Sustainability Literacy Test (the SuLiTest) [43] and the Sustainability Consciousness Questionnaire [44], while in Spain we have the Self-perception Skills in Sustainability (SQSS) [45] questionnaire. A literature review of the tools used to evaluate sustainability competencies indicated that, among these tools, there is an overrepresentation of the evaluation methodology based on self-assessment questionnaires [41]. There are certain limitations in the relation of self-assessment with conduct, because of the response bias that self-reported measures surveys may pose [46].

At the same time, techniques are being developed to evaluate competency levels by "putting the student in the situation" and asking them for an answer to a given hypothetical scenario. Among these techniques, the vignette methodology is gaining force. Vignettes offer the chance to explore complex issues related to a participant's point of view, beliefs, and understanding of a particular situation [47]. In addition, vignettes bring authenticity and realism, heightening the internal and external validity of the measure [48] and allowing students to manifest the competency in a real-hypothetical situation [41].

A vignette will often present a simple statement that describes a hypothetical, more or less complex situation, in which respondents must select two or more responses according to what they believe should happen or how they would respond in the given situation [49]. The vignette technique can be used for different research purposes, and some authors differentiate it from similar terms, such as scenarios, case studies, stories, or other variations [47]. Following the definition of Skilling and Stylianides [47], in this study, we will consider vignettes as an identifiable stimulus that realistically

simulates a determined and familiar situation for the research participant, with the aim of provoking a response.

Vignettes—as a technique for the evaluation of students' competencies—are frequently used in the fields of health [50], psychology [51], and education [52]. In the field of sustainability, few studies have been completed using this methodology to evaluate competencies [41]. Sandri et al. [53] and Holdsworth et al. [54] completed a study on the learning outcomes of university graduates using an evaluation instrument based on vignettes/scenarios. In this study, the authors developed four vignettes/scenarios that were related to the learning outcomes proposed by the university. The authors argue that this methodology allowed them to efficiently engage with the participants: the language used was direct and accessible, and it permitted the authors to measure participants' possible responses to a given situation. In another study, Cebrián and Junyent [36] used scenarios to gather insights into sustainability competencies in education for students undergoing teacher training. In this study, the authors posed a familiar situation to students: a task to design a school project on sustainability. They accompanied this with a series of guiding questions in order to extract the underlying reasoning behind the participants' decisions.

Building on this foundation, our study aims to understand how aware Spanish university students in the first year of their teacher training are of quality education, within the framework of the challenges posed by SDG 4. To this end, the study focuses on the assessment of one key component of Cebrián and Junyent's competency framework: "decision-making, participation and acting for change" ([24], p. 2771), described as the capacity of moving from awareness to action, sharing responsibilities, and engaging in joint action. Moreover, this competence component is in line with the dimension of "achieving transformation"—to change the way in which people learn and the systems that support learning—included in the UNECE competency framework ([7], p. 13). Secondly, the study aims to identify the ways in which students acquire and develop this competency, and which previous learning expediencies contributes the most to their development. Thirdly, the study aims to design a vignette-based evaluation instrument and assess the potential of its implementation in the present context. Below, we present the methodology adopted in this study.

3. Methodology

3.1. Context

The Universitat Rovira i Virgili (URV) in Spain has endorsed the SDGs through its Social Engagement office [55], which boosts the educational community's participation in social, cultural, and environmental impact initiatives. To this end, it carries out certain actions aimed at enhancing social welfare, as well as improving the training of environmentally and socially responsible professionals. In addition, the curricula of all of the degrees taught by the University feature common core competencies for the entire student body, including ethics and social responsibility as a professional and citizen. Furthermore, in addition to these core competencies, the curricula include cross-functional competencies that are not exclusive to one particular discipline, such as teamwork, creativity, and environmental awareness. Finally, different degrees have specific competencies that relate to that particular discipline. In the case of education qualifications, this includes certain competencies related to sustainability principles, such as valuing social and collective responsibility in the pursuit of a sustainable future.

Although these competencies could be considered to be aligned with sustainable development principles and ESD, we do not have enough evidence of the ways in which these competencies integrate into subjects, nor do we know how students are learning these competencies. Out of all of the degrees offered by our university, we focused on the four degrees related to formal and informal education. We believe that it is imperative that these future educators adopt the principles of SDG 4 so that they can transmit these ideas to future generations throughout their professional careers. More specifically, we analysed first year students' awareness of quality education for all, with the aim of conducting a

diagnostic evaluation and developing these competencies until these future educators complete their university training.

3.2. Participants

The total study population (*n* = 247) consists of first year URV students studying Pedagogy (41 students), Social Education (50 students), Early Childhood Education (79 students), and Primary Education (77 students). A sample (*n* = 202) was obtained, representing 81.8% of the population. Below, Table 1 breaks down the sample group according to age, gender, the path taken to university, and the study programme.

Table 1. Sample description (*n* = 202).

Age	Mean	SD
	20.1	**4.3**
	n	**%**
Gender		
Male	31	15.3
Female	171	84.7
Path taken to university		
PAU	119	58.9
FP2, MP3, CFGS	64	31.7
Other university studies	12	5.9
Disability	3	1.5
Access over 25 years old	3	1.5
Access over 45 years old	1	0.5
Study Programme		
Primary Education	62	30.7
Pre-school Education	56	27.7
Social Education and Pedagogy	84	41.6

3.3. Instrument

The use of vignettes as a tool to gather information must be conceptually aligned with the research goals and participants' characteristics. The purpose of using the vignettes technique in this study was to capture the intended behaviour that students would adopt in the face of certain situations, reflecting their awareness of quality education. In this sense, this method allows us to elicit responses concerning participants' awareness of quality education in a context-specific situation, moving away from the abstracted approach of attitude and belief surveys [49]. Used in conjunction with other questions, the vignette technique offered us the opportunity to gather information from the perspective of the individual [47], but also allowed us to collect comparable data [53].

Building the vignettes is an iterative process that simultaneously develops the key research concepts and the details of its construction [47]. From the perspective of our design, we have followed the framework proposed by Skilling and Stylianides [47], following three stages: conception, design, and administration.

In the conception stage, we revised the theoretical framework and existing literature, and looked for practical situations that reflect our research objectives. In order to do so, we based our work on the instrument created by Sandri et al. [53], and adapted it to the context of the students in our field. Considering our first objective, to estimate the extent to which university students in the education field are aware of the challenges of SDG 4, we created each hypothetical situation using existing literature about international educational indicators [56–59] and in compliance with challenges 4.1, 4.3, 4.4, and 4.5 of SDG 4 (see Table 2). We choose these four SDG 4 challenges because our study

was focused on students in their first year, and these were connected with the learning outcomes of two introductory subjects of the programme (Society, Family and Education, and Educational Processes and Contexts).

Table 2. Targets of SDG 4 (Quality Education) selected in this study.

Targets of SDG 4
4.1 Free Primary and Secondary Education: ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.
4.2 Equal Access to Quality Pre-Primary Education.
4.3 Equal Access to Affordable Technical, Vocational and Higher Education: ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university.
4.4 Increase the Number of People with Relevant Skills for Financial Success: substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.
4.5 Eliminate all Discrimination in Education: eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations.
4.6 Universal Literacy and Numeracy.
4.7 Education for Sustainable Development and Global Citizenship.
4.A Build and Upgrade Inclusive and Safe Schools. 4.B Expand Higher Education Scholarships for Developing Countries. 4.C Increase the Supply of Qualified Teachers in Developing Countries.

Four vignettes in total were created (see Table 3). These succinctly describe particular educational situations related to the four selected challenges included in SDG 4. For example, Vignette 1 refers to gender inequality and the inequality of opportunities to access education throughout an individual's life. Vignettes 2 and 4 allude to acquiring relevant basic skills. Finally, Vignette 3 refers to acquiring relevant skills for employment and participation in lifelong learning. We designed only four vignettes, considering the length and complexity of each vignette and its responses, and the cognitive demands these might place on participants [47]. The response to each vignette requires a conscious answer based on reflection, and the inclusion of more vignettes might have resulted in automatic responses. Moreover, other similar studies using this technique tended to use a small number of vignettes/scenarios questions [36,47,53].

Table 3. Vignettes.

Vignettes
Vignette 1: In a school on the periphery of a medium-sized city, a 16-year-old girl is performing high in reading, math and science. His mother and father, employed in low-skilled positions, have helped her find a job in a shop in the neighbourhood where they live, so she will probably not continue studying.
Vignette 2: In a middle-class urban school, a group of students in second grade is achieving very low results in all subjects. The school serves families from medium and high socio-economic backgrounds. The students do not have any type of learning disability or learning problems.
Vignette 3: María has been working in a company for 10 years. Her job requires low qualifications. María thinks that applying other types of work processes could improve her results, but for that, she needs to take a specialized training course, for which she needs money and time.
Vignette 4: In the school where you work, students' learning outcomes are low. The reasons for these poor results can be diverse: lack of resources, lack of motivation, little coordination between the teacher staff, low salary of professionals, little family involvement, precarious working conditions, various training needs, etc. However, the institution seems to be doing nothing about it.

Once the hypothetical situation was introduced, the answers followed a fixed-choice format, with the addition of an open-ended question in which the participants could indicate a different type of response that they would adopt [47,49]. The responses to the closed-ended questions were equivalent to the criteria proposed by Sandri et al. [53] with regards to one's awareness to act sustainably (see Table 4). The vignettes are formulated to be answered from the participants' own point of view. In addition, the participants were asked to justify their answer, with the aim of identifying the underlying reasoning behind the chosen answer.

Table 4. Level of attribute attainment, adapted from Sandri et al. [53].

		Descriptor
Non-awareness		Does not recognise social impact.
Awareness 1		… however, does not believe change is necessary.
Awareness 2		… and sees that some level of change may be necessary, however leaves responsibility to others to take responsibility.
Responsibility 1	Recognises social impact	… and takes minimum action to make changes to practice.
Responsibility 2		… and takes active responsibility for taking action to reduce these impacts.
Leadership 1		… and makes changes and supports others to do the same.
Leadership 2		… and creates and implements change projects that influence others in community or workplace.

Our second research question was intended to identify the ways in which the awareness of quality education was developed and acquired through various prior learning experiences and contexts, and to establish how effective these are. To this end, a multiple-choice question was included about students' prior experiences in both formal and informal educational contexts.

A pilot test was administered to eight students in order to ensure that the language used was understandable and appropriate. Minor adjustments were then made to the instrument. The final version of the instrument (see Appendix A) consisted of three types of questions: (1) descriptive questions (age, gender, path taken to university and study programme); (2) vignette questions, with four hypothetical situations and fixed-choice answers; (3) a justification question, with an open field to elaborate on the reasons of their answers to the vignette; and (4) prior learning experiences. All of the study's participants completed these four types of questions.

The instrument was administered in the form of an online questionnaire, accessible via the online platform Lime Survey, at the end of the 2019–2020 academic year. The questionnaire included an informed consent form for the participants, and ensured that the data were ethically used. The students had two weeks to answer the questionnaire. In order to obtain a higher response rate, we sent them two reminders during this period.

We considered several aspects of the validity and reliability of the instrument. Regarding the content validity, we relied on an expert evaluation as a face validity criterion [60]. Once a first draft of the instrument was designed, this was then subjected to expert evaluation in order to assure that the questions measure the concepts they were intended to measure. Moreover, we evaluated the construct validity of the instrument by conducting a common factor analysis in order to estimate the homogeneity of the measure [60]. The results of this analysis indicated a single-factor solution:Kaiser-Meyer Olkin (KMO) = 0.69; Bartlett's test of Sphericity = 86.47, df. 6, $p < 0.000$, where a KMO greater than 0.5 is acceptable and a significant Bartlett's test indicates that factor analysis is appropriate [61], and that the factor loadings ranged from 0.592 to 0.473, representing 46.98% of the variance. Finally, the reliability was assessed through the internal consistency of the items [60]. For this purpose, we calculated the Cronbach's alpha coefficient, obtaining a reliability level of 0.62, which is considered acceptable for measures with less than 10 items [62].

3.4. Data Analysis

The quantitative data processing was carried out using descriptive statistics (frequencies) and linear regression analysis. First, a descriptive analysis of the frequencies was carried out for the four vignettes, and for participants' prior learning experiences. In addition, the data collected through the vignettes were combined as a composite measure in order to indicate the degree to which students would be aware of quality education in specific situations. This measure was analysed in conjunction with the participants' prior learning experiences, applying a linear regression analysis in order to identify the extent to which these experiences contributed to students' awareness. The data were analysed with the program SPSS (v.22.0).

The qualitative processing of open-ended questions was carried out through a content analysis using the ATLAS.ti program, which selected the text quotes that best illustrated participants' answers. The instrument was created in Catalan, and the research team translated the selected quotes into English.

In order to ensure full confidentiality, we identified the author of each quote using the IDXXX format, where XXX corresponds to a sequential number between 001 and 202.

4. Results

We analysed three aspects in this research study: the degree to which the students would act in compliance with quality education in certain hypothetical situations, their previous experiences of learning about the targets included in SDG 4, and whether there is a connection between the two.

4.1. Students' Awareness of Quality Education

In order to answer the first research question, we present the results of the analysis of the students' responses in the four vignettes, and the explanation behind their choices.

Most of the participants showed a high degree of quality education awareness in Vignettes 2 and 3, with 58.2% and 53% of the responses being in Leadership Level 2. On the other hand, in Vignette 1, most of the participants showed a medium degree of awareness, with 52% of the responses being in Responsibility Level 2. Regarding Vignette 4, most of the participants showed a high degree of awareness, with 32.2% and 38.1% of the responses being in Leadership Levels 1 and 2, although the percentage of the medium level responses is also relevant, with 21.8% of the responses being in Responsibility Level 1. The number of participants who showed a low degree of quality education awareness is negligible. Table 5 shows a summary of the descriptive results.

Table 5. Vignette descriptive analysis: percentage of responses.

Level of Awareness	Vignette 1	Vignette 2	Vignette 3	Vignette 4
No awareness	0	0.5	0	0
Awareness 1	1	0	0	0
Awareness 2	0.5	1.5	1.5	0.5
Responsibility 1	0	2	12.4	21.8
Responsibility 2	52	13.4	17.3	4.5
Leadership 1	16.8	21.3	14.4	32.2
Leadership 2	24.3	58.9	53	38.1
Missing data	5.4	2.4	1.4	2.9
Total	100	100	100	100

In Vignette 1, the students in Responsibility Level 2 recognised the problem and took responsibility for being part of the solution. When defending their choices, most of the participants' discussed the importance of listening to the woman's desires and motivations, arguing that "the young woman must decide her own future and no one else should interfere" (ID021). They also talked about offering the young woman and her family guidance and information on scholarships and funding in order to "show the wide range of options available for her to continue her studies" (ID071). Lastly, most agreed

that "the final decision is up to the young woman and her family" (ID055). The actions of the students in Leadership Level 1 would be geared towards convincing the family to change their mind. To that end, they would "hold several meetings with the young woman and her family to explain that their daughter is performing well and should not stop studying. I would also inform them of the different financial aid and support options that exist to help her continue studying" (ID116). Finally, the students in Leadership Level 2 would pursue a strategy that incorporated talent recruitment and educational guidance so as not to focus exclusively on the young woman's case, but rather "to detect talented young people and thus help many students who are in the same or a similar situation" (ID146). In this way, their actions would have a broader impact.

In Vignette 2, everyone agreed that the jobs (whether the required a qualification or not) held by families do not dictate their children's academic success or failure. The majority of the students would be considered to be in Leadership Level 2. Their actions would be focused on involving the entire educational community: "an optimal solution would be to talk to the entire teaching staff, the directors and the families to explain the problem and come up with a strategic solution together" (ID084). These participants place importance on involving family members: "if we involve students' families in the educational process, it is scientifically proven that academic results improve" (ID134). As such, "the best method for making these changes is to combine the faculty's professional perspective with the families' emotional and social perspective" (ID157). In addition, they would focus on "designing proposals for ways to modify the teaching-learning processes" (ID080) in order to "change the way we work, the methodology, and adapt it to the needs of the group, motivating them and improving performance" (ID108). In turn, those at Leadership Level 1 emphasised collaboration: "with the help of other professors who teach subjects in different areas, we can discover new methodologies to improve results" (ID016). They would also consider the perspectives of faculty and directors, operating "with the support of the entire team of professionals, as those are decisions that must be made together" (ID011), but unlike those at the previous level, they wouldn't consider the participation of families. Finally, the students at Responsibility Level 2 alluded to individual initiatives; they would prioritise "investigating possible shortcomings" by themselves (ID046) and "exploring potential causes of poor performance and discussing them with students" (ID055).

In Vignette 3, the participants agreed to the defense of the student's right to continuing education. Most of the students would be considered as falling within Leadership Level 2, and would focus on talking to the company and the employee, claiming that María's training is a benefit for both parties: "the business would gain greater effectiveness and quality, and María will feel more fulfilled, capable and motivated" (ID049). These students believed that "it is necessary to adapt to new, emerging technologies" (ID038). In addition, "not only would she benefit, but the company's entire team could gain new skills and knowledge" (ID077). At Leadership Level 1, the students would focus on encouraging her to continue her education and providing her with guidance to improve her training, but they would leave it up to her to talk to her company about it. In contrast, the students at Responsibility Level 2 would focus exclusively on María, without mentioning the company whatsoever. For example, they would refer her to the Employment Office, arguing that "it is the best advice she can receive for her future training" (ID172) and that "it is important to learn from professionals and experts on the subject" (ID197).

Lastly, on Vignette 4, most of the students would fall between Leadership Level 1 and 2. They would all agree on their responsibility as educators, and the need to get involved and contribute to a solution. The students at Leadership Level 2 thought that "when it comes to changes at the institutional level, everyone must be involved: teachers, students and families" (ID082) in order to find a solution. With everyone's cooperation, "the solution would be found faster and more creatively. It would also contribute to group cohesion" (ID084). They emphasise the importance of "putting our heads together" (ID095) to work towards "a common goal" (ID135). At Leadership Level 1, they agreed that "starting to change the way we do things ourselves is the best way to make a greater change" (ID027). They would cast aside the shared responsibility among the educational community in favour of individual action

to "improve my own actions and try to get my peers to do it too" (ID017). These students are aware of their limitations: "I can change my educational practice, but I can't change the whole institution. I would offer support to colleagues who need it" (ID018). In order to "change the situation, I must start by modifying my own educational practice and encouraging others to do so. In this way, we would achieve a change in methodology that would boost students' performance" (ID073). At Responsability Level 1, they would rely on communicating the problem to the institution's directors in order to improve the situation before taking any actions themselves or changing their teaching methods.

4.2. Prior Learning Experiences

In this section, in order to answer the second research question, we present the results of the analysis of the students' responses to questions related to previous learning experiences about SDG 4 (see Table 6).

Table 6. Previous learning experiences regarding quality education.

	n	**Percentage**
I have not learned enough to be able to answer these questions	32	9.4
I've learnt about it at other educational levels (Bachelor, Professional Training, etc.)	124	36.4
I've read a lot about sustainable development out of my personal interest	17	5
I've learnt about it through the media	40	11.7
I've learnt about it at work	23	6.7
I've learnt about it in the subjects taken in the university degree	95	27.9
I've learnt about it through Public Administration's campaigns	3	0.9
I've learnt about it through my participation in community initiatives related to sustainable development	7	2
Total	341	100

As was previously mentioned, most of the participants (36.4%) indicated that they had learned about quality education prior to coming to university, and 27.9% considered university classes to be catalyst spaces for such learnings. The other ways to learn about quality education indicated by the participants included the media (11.7%), previous work experience (6.7%), personal interest (5%), participation in community initiatives (2%), and, least notably, public administration campaigns (0.9%). It should also be noted that some of the participants indicated that they had not learned enough on this subject to respond to the situations presented (9.4%).

4.3. Relationship between the Degree of Awareness and Prior Learning Experiences

The data collected through the vignettes was combined as a composite measure in order to indicate the degree to which the students would respond to specific situations related to quality education. This measure was analysed in conjunction with previous learning experiences in quality education by applying a linear regression analysis, in order to establish a relationship between the two.

By combining the responses from the four vignettes, we obtained an average of 6 points on a scale of 7, with a standard deviation of 0.7, a minimum of 3.3, and a maximum of 7 points. This composite measure shows a high degree of quality education awareness among the participants within the context of the challenges posed by SDG 4. Table 7 shows the linear regression analysis that was carried out in order to relate this measure to participants' prior educational experiences on the topic of quality education.

The results of this analysis highlight two learning experiences that are closely related to the degree of awareness of quality education expressed by the participants. These include (1) learning experiences in university courses (B = 0.212, p = 0.006), and (2) learning experiences driven by personal interest (B = 0.155, p = 0.37). In both cases, this relationship is positive. It is also worth noting—due to the unexpectedness of the outcome—the negative, though not significant, relationship between learning experiences at previous educational levels and the degree of quality education awareness (B = −0.136, p = 0.073).

Table 7. Linear regression analysis: the degree of awareness of quality education and previous learning experiences.

	b	SE	B	t	Sig.
(Constant)	6.023	0.118		51.148	0
I have not learned enough to be able to answer these questions	−0.15	0.163	−0.072	−0.925	0.356
I've learnt about it at other educational levels (Bachelor, Professional Training, etc.)	−0.209	0.116	−0.136	−1.8	0.073
I've read a lot about sustainable development out of my personal interest	0.424	0.201	0.155	2.106	0.037
I've learnt about it through the media	−0.022	0.145	−0.012	−0.154	0.878
I've learnt about it at work	−0.143	0.176	−0.059	−0.81	0.419
I've learnt about it in the subjects taken in the university degree	0.32	0.114	0.212	2.799	0.006
I've learnt about it through Public Administration's campaigns	0.352	0.444	0.058	0.792	0.429
I've learnt about it through my participation in community initiatives related to sustainable development	0.3	0.317	0.069	0.946	0.345
$R^2 = 0.11$					
$F = 2.82 (192, 8)$ $p = 0.006$					

Note—dependent variable: awareness of quality education.

5. Discussion

First, related to the first research question, our study shows that students pursuing education degrees express a high degree of quality education awareness within the context of the challenges posed by SDG 4. Most of the people who make up the sample exhibit a high level of leadership, judging by their responses to specific situations of educational inequality, especially when these situations generate poor academic results. This trend is consistent with the results of Sandri et al. [53], who observed a high level of sustainability leadership in a sample of university graduates in a different context to ours. However, our results differ from those obtained by other studies, especially those which used other research instruments or looked at other personal and vocational interests of the participants. This is the case with Cebrián et al. [36], in which—using an instrument based on other types of scenarios—a disconnect was identified between the theoretical frameworks related to sustainability and competencies in sustainability, and the degree to which students recognise and incorporate their principles into an educational project. In our study, this is also related to our use of a global approach to the assessment of quality education awareness competence from a holistic approach. As such, there are other specific competencies within the framework of sustainability that we have not evaluated here.

Secondly, related to the second research question, our study identifies the quality education-related learning experiences most referenced by students pursuing education-related degrees: classes taken at university and studies carried out prior to coming to university.

On the other hand, when seeking the factors that contributed to the degree of awareness of quality education in students, two significant and positive relationships stand out:

- Personal interest, which represents a minor source of learning and is difficult to change, because it essentially depends on personal factors (interests and intrinsic motivations).
- Classes taken at university: this result could be initial evidence that classes are starting to incorporate certain aspects related to the SDGs and, when it comes to the field of education, particularly to SDG 4. University-level education degrees are integrating certain competencies related to quality education into curricula, especially by training students to acquire core and cross-functional competencies. However, other studies are required in order to obtain evidence on the ways in which curricular content contributes to the development of the indicated competencies. Moreover, it would be interesting to know what kind of methodologies are used in these classes in order to promote ESD.

Thirdly, related to the third research question, our study uses a vignette-based data collection technique as an instrument for the study of the behaviours that participants would adopt in specific hypothetical situations. The vignettes are carefully chosen cases designed to make the participant reflect and carry out a critical self-assessment of their attitude in response to specific scenarios [63]. However, as with other instruments of self-assessment, it cannot be automatically assumed that the participants' responses reflect the behaviours they would actually adopt in those situations [53]. Nevertheless,

a well-designed instrument will help mitigate these barriers. In addition, vignettes describe a specific context, allowing participants to respond to a situation that is familiar to them. In this way, the answer has greater clarity and less ambiguity than it would if the question simply asked for the participants to assess their own competency level. In this sense, vignettes offer added value by providing greater contextualisation of the behaviour chosen, and further require the participants to make a critical assessment of their own choice [53]. Thus, we asked the participants for a justification of their response, allowing us to gather data on the reasoning behind each answer. In order to develop this instrument, future research could incorporate cognitive interview techniques [64].

The vignette technique is a novel approach because it allows us to collect comparable data from a large population (such as students and university graduates). If it were developed further, the instrument could be used to compare results from different university programmes and diverse geographical contexts.

6. Limitations

The present study is not without limitations. First, our study focused on a single institution, but it would be interesting to extend its application to other universities in order to obtain a broader understanding of educators' degree of quality education awareness. Second, in our study, we used a diagnostic approach to the students' quality education awareness in the context of the challenges posed by SDG 4, but it would be ideal to incorporate other quality education-related challenges as well. Third, we should also consider the participants' experience in responding to this technique, as it is reasonable to assume that the students without previous experience might spend more time trying to understand how to deal with the questions, rather than concentrating on the content of them. In our study, the participants did not have experience in dealing with vignette questions, so this could be a limitation of our study.

7. Conclusions

We would like to conclude by defending the crucial role that education plays in achieving a sustainable world, socially, environmentally, and economically. This inevitably necessitates the identification, incorporation, development and assessment of the skills needed for sustainable development. Specifically, universities have a responsibility to train professionals who explicitly contribute to the sustainable development of society [65,66]. Therefore, university students must have opportunities to consolidate the skills necessary to promote and sustain positive changes in their surroundings and society at large, that is, to act as 'truly sustainable citizens' [67,68].

This has many implications for students' time at university. In order for their university experience to act as a catalyst for these processes, specific efforts must be made to learn about sustainability competencies, to identify their key aspects [33], and to develop the evaluation of them through:

- Flexible curricula that explicitly incorporate sustainability competencies. The programme should include and emphasise the basic building blocks for the development of such skills (critical thinking and individual and collective responsibility). From the very first courses, professors should present students with situations that incorporate these elements.
- Methodologies that give a central role to the skills and knowledge proposed by ESD [69]. The idea is that students cease to be merely 'recipients of knowledge' who play a passive role in their education, and instead become 'producers of knowledge'. Active learning strategies can be varied using case studies, problem-based learning, and service-learning, but they must be focused on meaningful and experiential learning.
- Allowing students in education-related programmes to feel highly responsible in various educational situations. Without in-depth reflection on these aspects, it is impossible to respond adequately to the many problems posed by the current ecological and social crisis and, in particular, to the danger of social segregation that has arisen [70].

Future graduates, especially future educators, must play the role of active professionals who are capable of influencing sustainability transitions, and of building and maintaining healthy socio-ecological systems [71]. This will not be possible without a determined response from universities, who are presented with the challenge of creating a formative educational model that uses a practical and thoughtful methodology to put quality education awareness competence at the forefront.

Appendix A

Appendix A.1. Vignette 1

In a school on the periphery of a medium-sized city, a 16-year-old girl is performing high in reading, math and science. Her mother and father, employed in low-skilled positions, have helped her find a job in a shop in the neighbourhood where they live, so she will probably not continue studying.

As an educator, how would you respond to this situation?

Select one of the following alternatives:

The decision would be indifferent to me.
I would be sorry if a young woman with good performance ended up working in a low-skilled position, but nowadays, having a job is a good opportunity.
I would be sorry if a young woman with good performance ended up working in a low-skilled position, but it is not up to me to do something.
I would consider it a pity that the young woman cannot continue studying and would speak with other colleagues about this situation.
I would recognize that it would be a shame if a young woman with good performance could not continue her studies, so I would encourage her and her relatives to look for other options so that she can continue studying.
I would investigate on my own what are the options to obtain a scholarship for young people to continue post-compulsory studies and discuss them with her and her family.
It would design an educational orientation strategy to detect talented young people and offer them information on scholarship opportunities to continue post-compulsory studies.
I would do something else: (complete)

Brief justification for the choice:

Appendix A.2. Vignette 2

In a middle-class urban school, a group of students in second grade is achieving very low results in all subjects. The school serves families from medium and high socio-economic backgrounds. The students do not have any type of learning disability or learning problems.

As an educator, how would you respond to this situation? Select one of the following alternatives:

The situation would be indifferent to me, many young people have poor performance in school and it is not the end of the world.
I would consider this to be a worrying situation, but the families of these students have enough resources to support them and offer them opportunities to continue post-compulsory studies.
I would be concerned that poor performance in school could translate into a shaky career path, but it is up to other people to make a decision.
I would be concerned for the situation and discuss it with other colleagues.
I would investigate on my own the reasons for the low performance of these students and try to manage some other type of educational support to improve their academic results.
I would talk to other teachers and the direction team to create a personalized and comprehensive plan to improve the academic performance of the entire group.
I would design an educational intervention plan together with teachers, administrators and families involved in order to improve the academic results of the entire group.
I would do something else: (Complete)

Brief justification for the choice:

Appendix A.3. Vignette 3

María has been working in a company for 10 years. Her job requires low qualifications. María thinks that applying other types of work processes could improve her results, but for that, she needs to take a specialized training course, for which she needs money and time.

As an educator, what would you think about this situation? Select one of the following alternatives:

The situation would be indifferent to me.
It is a pity not to be able to continue training, but Maria should be satisfied with having a job in a situation where many people are unemployed.
Maria should have the opportunity of further training, but in the current circumstances, companies and governments are the only ones responsible.
I could talk to Maria and encourage her to share with her employer her desire to improve her skills.
I would suggest that Maria turn to the Employment Service to find information on what options she has to improve her skills.
I would help Maria to find the best option to continue her training.
I would work with Maria and her employer to find training options and funding opportunities that benefit both of them.
I would do something else: (Complete)

Brief justification for the choice:

Appendix A.4. Vignette 4

In the school where you work, students' learning outcomes are low. The reasons for these poor results can be diverse: lack of resources, lack of motivation, little coordination between the teaching staff, the low salary of professionals, little family involvement, precarious working conditions, or various training needs, etc. However, the institution seems to be doing nothing about it.

What would you do? Select one of the following alternatives:

I do not think that the learning results are as bad as they say; after all, other schools obtained similar results.
I acknowledge that the results are not what I expected, but I do think I can do nothing about it.
I recognize that the results are not what I expected, but I believe that others should take the initiative to do something to improve.
I would talk to someone with greater responsibility and I would propose some ideas to improve the results.
I would adjust my educational practice in order to improve results.
I would change my educational practice to improve results and support others to do so too.
I would propose an institutional strategy to improve results and would involve the entire institution and community agents.
I would do something else: (Complete)

Brief justification for the choice:

Where have you learned about sustainability to answer these questions? (You can select more than one option)

I have not learned enough to be able to answer these questions
I've learnt about it at other educational levels (Bachelor, Professional Training, etc.)
I've read a lot about sustainable development out of my personal interest
I've learnt about it through the media
I've learnt about it at work
I've learnt about it in the subjects taken in the university degree
I've learnt about it through Public Administration's campaigns
I've learnt about it through my participation in community initiatives related to sustainable development
Others (specify)

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