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Do Spanish Students Become More Sustainable after the Implementation of Sustainable Practices by Universities?

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Abstract: Higher Education Institutions (HEIs) are a critical component to develop and promote sustainable solutions for both society and the planet. A challenge to HEIs is to provide students with the knowledge and skills required to achieve Sustainable Development (SD), as they are important stakeholders. In order for a person to take responsibility for a sustainable future, it is not only important to implement SDs in higher education, but to follow the progress of the individuals' awareness of the sustainable world and lifestyle. This study aimed to analyze students of Universidad Autónoma de Madrid (UAM), focusing on their attitudes, behaviors, and level of knowledge concerning education for sustainable development (ESD), to better understand the situation of students in terms of learning and applying sustainability. The students' perception of the University practices and initiatives, as well as pedagogical methodologies for promoting and learning SD, were also examined. An online survey was applied to undergraduate students from several faculties at UAM, and a sample of 504 students returned from a total population of 30,000 students. Descriptive and inferential analyses were carried out and included Chi-square tests, correlation analyses, and ANOVA analyses for independent and repeated measures. The results reveal good levels for the three dimensions (global Index > 3.5), with consistency demonstrating the highest correlation between attitudes and behaviors, although differences between faculties were identified. Knowledge has the highest score among all faculties. In addition, the results point to a need to better communicate the initiatives promoted, as well as to realign some learning methodologies with students' preferences. The most important contributions of the paper are as follows: Shedding fresh light on the knowledge, attitudes, and behavioral dispositions of university students and improving strategies concerning education in higher education institutions. Furthermore, it is relevant to say that UAM has pushed sustainability in environmental management and education, so it is also important to assess the impact of these initiatives. Our research aimed to help understand how students incorporate sustainability into their attitudes and behaviors, and whether this incorporation depends on the type of faculty. It also makes it possible to verify whether the sustainability measures implemented by universities are identified and applied by their students.

Keywords: higher education institutions; education for sustainability; students knowledge; students attitudes; students behaviors; scientific areas; learning methodologies

1. Introduction

The dynamics of change that society faces due to globalization, the development of technologies, and climate change, among other things, are relentless. In 1987, the World Commission on Environment and Development through the Brundtland Commission Report "Our Common Future" set a benchmark to address the aforementioned changes based on Sustainability. The term "Sustainability" was originally defined as: "The development that meets the needs of the present without compromising the ability of future generations to meet their own needs" ([1], p. 17). This definition laid the groundwork for the subsequent discussion of Sustainability, although still from a very anthropocentric perspective.

Since then, there have been many conferences and meetings on Sustainability, which developed the discussion on various aspects of the concept (its dimensions, its characteristics, its implications, etc.) and how to integrate it into society. In these efforts, the level of the commitment not only depends on governments and organizations, but on the population in general. Achieving Sustainability includes the three pillars: Economic, social, and environmental.

Therefore, Education for Sustainability (EfS) in Higher Education (ESHE) has been increasing society's awareness and is a key enabler for sustainable development and an integral element of quality education [2,3]. This is partly due to the fact that EfS was placed at the center of the 2030 Sustainable Development Agenda [4,5] and has been widely recognized. The Sustainable Development Goals (SDG), adopted by the United Nations in 2015, and in particular, SDG 4, are additional drivers for the implementation of Sustainability in Higher Education Institutions (HEIs) in an integral way [4–8].

In addition, EfS in HEIs articulates the possibility of setting an example in the operation of a city on a "small scale" (many HEIs have been considered as such), such as institutions which recruit large numbers of people tasked with a diversity of activities within the organization [9,10].

The proliferation of studies to understand ESHE has been growing in recent years. One of the topics that stood out in this regard concerns university stakeholders, in particular, the students who are the fundamental nuclei of these institutions. The integration of Sustainability in HEIs depends greatly on understanding the different profiles of existing students as regards Sustainability and how they integrate it during their journey at the University. There have been related studies of student self-perception from various perspectives, for example, knowledge, attitudes, and behaviors, but in most cases, they only focus on one single perspective [11–13].

The objective of this investigation is to analyze the knowledge, attitudes, and behaviors of the students concerning ESHE to better understand if students are embedding Sustainability. A case study was performed for this article, based on the students of the Autonomous University of Madrid (UAM, Spain). We chose UAM because it is a public university (in the capital of Spain), and because it "has been placed among the top universities for its levels of excellence in national and international rankings" ([6], p. 10).

This study will help to guide and inform HEIs to train competent students to become professionals who will embed Sustainability in their future activities.

The most important contributions of this paper are as follows: Shedding fresh light on the knowledge, attitudes, and behavioral dispositions of university students after the implementation of different sustainable practices and initiatives by the university; and improving strategies regarding education for sustainability in higher education institutions.

The paper is structured in the following way: First, we focus on the conceptualization of the EfS with emphasis on sustainability literacy, attitudes, and the behavior of students; thereafter, we examine the methods and present the findings. The paper is finalized with a discussion and closing remarks.

2. Theoretical Framework

2.1. Education for Sustainability in Higher Education (ESHE)

Education for Sustainability consists of learning an approach that contributes to future leaders being able to cooperate when facing challenges originating from uncertainties that arise from the

complex and dynamic global environment in which they are inserted [14]. This learning approach has developed at "all levels of the educational system, including higher education" [15].

Higher Education Institutions (HEIs) have been generally considered significant contributors to the promotion of Sustainability [16], which means that these institutions play an important role in transforming societies. This contribution includes the integration from a holistic approach to Sustainability in each dimension related to HEIs: University governance, education (referring to courses and curricula), research, operations, outreach, assessment, and reporting [17,18]. The integration of the "sustainability" theme in the training process offered by HEIs includes the dimensions related to the "so-called Education for Sustainability (ES), also known as Sustainability Education or even, Education for Sustainable Development (ESD)" [19].

In addition, the commitment to Sustainability must be supported by different stakeholders in HEIs in such a way that forces both inside and outside the University align. This means that "advances can only be made along the path towards sustainability with the engagement of HEI leaders (rectors, presidents, and directors), faculty (researchers and professors), students (students and alumni) and external entities (local or regional level)" ([20], p. 1666). Keeping in mind that the "students are one of the biggest groups of stakeholders at universities and could make a significant impact on Sustainability" [21]. Universities have a special societal responsibility, in particular, with regard to youth training and public awareness about sustainability [22]. This responsibility means that "as future decision makers, problem solvers, and agents of change, students will benefit from learning about Sustainability through total immersion" [23]. The challenge for universities is to critically evaluate themselves and reorient their approach in order to commit to the sustainability agenda ([14], p. 342). Furthermore, experimental learning methods in the domain of sustainability have been proposed, tested, and described [9,10].

This challenge also implies that they are capable of setting an example within the development of the dimensions mentioned above and "to create a more effective and integrated approach requires examining how students understand aspects of sustainability, and more importantly, how their coursework affects their perceptions and attitudes". This is corroborated by Warburton, who indicated that "the challenge for educational institutions is not simply to teach concrete facts about the environment but to create an active, transformative process of learning that allows values to be lived out and debated, and permits a unification of theory and practice" ([24], p. 55). Consequently, in ESHE, it is necessary to unite "the efforts to rethink and revise educational programs towards Sustainability … " ([25], p. 307). In addition, when considering ESHE, we have to bear in mind that "today's sustainability problems require a transdisciplinary approach, rather than mono- or inter-disciplinary methods to establish an effective society". In other words, "the field is broad and by nature transversal among disciplines and contexts [26]. Consequently, while ESHE may include discipline-specific learning, the context is one of enabling students to develop holistic, systemic, connective, and ecological ways of thinking and learning ([27], p. 22).

According to Adams et al. [28], there has been considerable effort expended in the re-design of curricula, in greening campuses, and building local, regional, and international networks to influence behavior, all with the idea that students acquire a broader vision of what their decisions mean for society. In this way, HEIs can prevent students from being overwhelmed by the nihilism and hopelessness of the current dramatic situation while promoting effective skills acquisition and values of connectedness between humans and nature [29]. Therefore, HEIs are a key part of society because they hold the power to promote both economic growth and sustainable development given that "a highly educated human capital will benefit employment opportunities, enhance competitiveness, and could be a catalyst for sustainable economic growth" ([30], p. 22).

In brief, HEIs can be a valuable means of promoting Sustainability throughout the university community and need to pay special attention to its largest group, i.e., students. For this reason, universities must give an example of how Sustainability is to be embedded both inside and outside of their infrastructure, and have a keen awareness of how this transformation takes place within the

student-training process. ESD focuses on the economic, social, and environmental dimensions by developing individual attitudes, knowledge, skills, and abilities through a holistic and integrated approach that helps the individuals make decisions in a sustainable manner whilst improving quality of life [2].

2.1.1. Sustainability Literacy

One of the dimensions is sustainability literacy, which is considered as "an umbrella term for the perspectives and insights that enable students to 'understand the symbiotic relationships between environmental, social and economic dimensions of sustainable development" [31]. Sustainability literacy can be defined as the "knowledge, skills, and mindsets that help to compel an individual to become deeply committed to building a sustainable future and allow him or her to make informed and effective decisions to this end" [26]. The effect of this dimension on the students "was considered of paramount importance" [32].

This has led some institutions and researchers to look for ways to measure it, not just as a diagnosis, but as an approach to sustainability literacy. This dimension has been incorporated into different forms of evaluation, rankings, and reports that have been created to track the evolution that occurs in organizations, for example, in [31,33–36]. One of the tools that tries to measure and specifically evaluate this dimension in organizations is known as SULITEST (The Sustainability Literacy Test). The SULITEST enables higher education institutions (HEIs) to assess whether they are producing sustainability-literate graduates, and to engage multiple stakeholders in accelerating the integration of Sustainability in higher education standards and beyond [26].

Sustainability literacy has gradually become more notable on the agendas of HEIs. Even so, this process has not been easy because of the following: The meaning and understanding of the term and its scope; lack of resources for ambitious initiatives and curriculum time; and the weight or relevance of Sustainability to certain disciplines. In addition, the role of competencies has to be taken into account given that "learning solely about sustainability is insufficient and that sustainability literacy must take into consideration students' attitudes and dispositions in order to develop their strategies for reasoned decision-making" [31].

2.1.2. Sustainability Attitudes and Behavior

Attitudes and behavior when talking about Sustainability in HEIs have been studied in different disciplines, contexts, and involving different stakeholders (e.g., [15,37–40]).

A holistic and integral approach to sustainability in HEIs must focus on the development of attitudes and behavior in the university community, in particular, in the students who will become the professionals of tomorrow.

In this context, attitudes are defined as "the result of a socialization process, partly determined by the (social) environment and partly by the learner's individual characteristics, limiting the horizons for action" ([41], p. 131). In other words, "they are part of the affective domain and influence people's choice of actions" [42].

Examples of previous studies that tried to understand attitudes and behavior in the context of sustainability in HEIs were performed in lecturers/researchers [15,38] and students [37,39,43]. The previously mentioned group, i.e., students, developed scales to better understand attitude [44], including scales specific to areas of study. This is the case for the study performed by [44], which focuses on business students.

However, "it is difficult to measure attitude due to its subjective and abstract nature and also because there are less directed methods to measure the attitude of the students towards certain phenomena" [7]. If you consider the behaviors of the students, the valuation expands, even more so when "a gap between attitude and behavior is apparent" [28]. On the basis of the theory of planned behavior, Ajzen [42] proposed that attitudes lead to behavior change only when individuals perceive that they have had sufficient control over their actions and that certain rules suggest that they should

act differently down the road. This highlights the need to encourage students to take sides and carry out activities that involve real immersion in what Sustainability means in order to promote better awareness and a more complete development of their sustainability expertise.

In summary, Ambusaidi and Al Washahi [45] emphasized the role and importance of Education in achieving Sustainability Development and stated that there is a need to change the attitude and behavior of people in every field of life, and that this is not possible without the active role of education in the development of people's attitudes and behaviors at the individual and social level.

3. Case Study

The Autonomous University of Madrid (UAM) is a public institution, which was founded in June 1968. The University consists of eight schools and 11 research institutes. Most of the specialized faculties are located on the Cantoblanco campus, 15 km north of Madrid. This University was declared an International Campus of Excellence, along with the Spanish Research Council (CSIC), in 2009.

3.1. Sustainability at UAM

UAM considers the cultivation of knowledge and the development of analytical and creative skills essential to solving local and global problems in all areas of sustainable development.

Coupled with the fact that education has been considered a determining instrument with which to obtain advancements regarding SDGs and vital to the integration of Sustainability in society, this notion has transformed the working procedures in more and more higher education institutions.

In light of its advocacy in matters of Sustainability, it is worth mentioning that not only has UAM honed and regarded what takes place within its centers and campuses, but also their general impact, boosting further development of various measures.

Before highlighting some of these, it is relevant to indicate that the quest for Sustainability comes from two main aspects: (1) The University's commitment to the statements, policies, plans, and guidelines offered by supranational, international, and national institutions; and (2) the adaptability of these policies as decided by the committee (including the participation of different stakeholders).

In regard to the prior, one of the reference guides presented by the United Nations General Assembly in 2015 was the 2030 Agenda for Sustainable Development, which exhibits a transformative vision for social, economic, and environmental Sustainability.

This agenda implies a social and political consensus and is being addressed by UAM, which aims to achieve these goals by developing activities and programs with the hope of a positive outcome.

Thus, on 15 December 2017, the A2030-UAM Plan was approved by the governing bodies of the University. The A2030-UAM Plan is a long-term plan involving political and strategic steps related to the University's policy agenda and linkages between the SDGs and the university community. Social, economic, and environmental sustainability issues all play an important role in the 2025 strategy proposals. The 2025 strategy and the A2030-UAM plans are committed to giving Sustainability the importance that it merits in society.

Equipped with an Office of the Vice-Chancellor of "Institutional Relations, Social Responsibility, and Culture" and, in particular, an Office of the Vice-Chancellor of "Campus and Security", UAM seeks to implement the 2025 strategy and the A2030-UAM Plan.

The latter plans to execute and monitor policies of environmentalism, solidarity, health, and sustainable development. In addition, the Vice-Chancellor of Campus and Sustainability explores the University's infrastructure and space policies. While there are recent measures committed to improving Sustainability, UAM has been campaigning for this for at least three decades with the creation of the ECOCAMPUS office in 1997. The Ecocampus Project is the formalization of UAM's commitment to Agenda21, and it has two main goals: (1) To improve the environmental situation of the different UAM campuses and facilities; (2) to raise awareness of the university community in order to promote further participation in the debate and find solutions for both global and local environmental conflicts.

3.2. Analysis of Study Contents at UAM

UAM strives to develop an educational, humanistic, democratic, and participatory model that allows for harmonious relations among the university community and its surroundings. Thus, UAM offers its students an array of professional training opportunities, both formal and informal.

An in-depth analysis of sustainability issues is offered to students who have completed the survey, as well as other professional training opportunities.

Students involved in our study belong to seven faculties: Business and Economics Science, Law, Philosophy and Arts, Teacher Training and Education, School of Engineering, Science, and Psychology. Regarding the Faculty of Business and Economics Science, the Business Management and Administration degree is concentrated in four subjects focused on environmental policies and sustainable development in Spain, social responsibility, and sustainable economy. Additionally, it gives excellent relevance to corporate social responsibility themes. However, at the Faculty of Law, Law degree students have only one optional subject, environmental law, which includes 10 topics of international, European, and local regulations. Similarly, at the Faculty of Philosophy and Arts, the Philosophy Degree's study plan also only includes one subject aligned with Sustainability; this subject introduces ecological ethics.

From the Faculty of Teacher Training and Education, students from three degrees participated in our study. Teaching specializing in infant education imparts basic knowledge to foster respect concerning the environment and offers a class on developing didactic methodologies for sustainable development. The teaching, specializing in primary education, combines two subjects: One subject on the conservation and protection of the environment, and another subject on the relationship between science, technology, and the environment. Finally, students specializing in infant education and in primary education shared common sustainability topics. From the School of Engineering, students from two different degrees (computer science and engineering, and engineering in telecommunication technology and services) participated; their study plans include only one subject related to Sustainability: Sustainable technological development. Likewise, at the Faculty of Psychology, there is also only one sustainability-related subject: Environmental psychology, which focuses on attitudes, environmental behavior, and pro-environmental behaviors.

Finally, four different degrees participated from the Science Faculty. Physics does not have any subjects related to Sustainability. Biology, with 10 subjects, mainly focuses on biodiversity, SDGs, environmental conservation, environmental education and communication, the crisis of the global environment, climate change, natural resources, ecological evaluation, and ecological systems. Moreover, students from environmental science, environmental science and geography, and land management share subjects on environment and society, environment and human behavior, environmental law, economy, policies, management of natural resources, ecological decontamination techniques, environmental impact, energy, environmental education and interpretation, conservation of species, and others.

Not only are the SDGs integrated across the curriculum, UAM has also raised awareness with alternative forms of informal Education, such as conferences, seminars, workshops, meetings, and dialogues, among others. Consequently, UAM is engaged in Sustainability and has been developing a portfolio of actions and experiences to enable a better understanding of these issues in the university community. Table 1 shows the 2019 results of the classification of formal and informal education, including programs and activities related to SDGs carried out at this institution.

Table 1. Classification of formal post-graduate studies and informal education according to the Sustainable Development Goals (SDGs).

SDGs		Formal Education Undergraduates and Post-Graduates	Informal Education (Actions, Experiences, etc.)
Nº	**Description of SDGs**	**Number (%)**	**Number (%)**
1	No Poverty	8 (11.9%)	3 (1.7%)
2	Zero Hunger	1 (1.5%)	1 (0.6%)
3	Good Health and Well-being	10 (14.9%)	24 (13.9%)
4	Quality Education	6 (9%)	21 (12.1%)
5	Gender Equality	2 (3%)	16 (9.2%)
6	Clean Water and Sanitation	2 (3%)	0 (0%)
7	Affordable and Clean Energy	1 (1.5%)	1 (0.6%)
8	Decent Work and Economic Growth	4 (6%)	4 (2.3%)
9	Industry, Innovation, and Infrastructure	11 (16.4%)	19 (11%)
10	Reduced Inequality	2 (3%)	15 (8.7%)
11	Sustainable Cities and Communities	3 (4.5%)	5 (2.9%)
12	Responsible Consumption and Production	2 (3%)	3 (1.7%)
13	Climate Action	2 (3%)	10 (5.8%)
14	Life Below Water	1 (1.5%)	1 (0.6%)
15	Life on Land	2 (3%)	2 (1.15%)
16	Peace and Justice Strong Institutions	5 (7.5%)	20 (11.6%)
17	Partnerships to achieve the Goal	5 (7.5%)	28 (16.2%)
	TOTAL	67 (100%)	173 (100%)

4. Materials and Methods

The research is based on the analysis of the returned answers of online surveys conducted from November 2018 to January 2019, which were distributed to bachelor (undergraduate) and post-graduate students from different faculties of UAM (with a total population around 30,000). The questionnaire was divided into four parts: (i) Knowledge; (ii) attitudes; (iii) behaviors; and (iv) sustainability implementation at UAM.

The questionnaire was based on previously developed instruments on the subject, which were published in the following papers [11–13,26], adapted to students of UAM (Spanish, type of transportation available in the area). The survey has about 54 questions (English version available in Supplementary Materials), is closed-ended in a Likert scale in the case of personal perceptions and opinions, has some multiple response questions (e.g., all types of transportation used), as well as one open question and two splits in an open part to specify "Others".

A pilot study was conducted in a small group for testing questions with problems incomprehension.

In this study, the objective was to analyze the knowledge, attitudes, and behaviors of students concerning ESHE. The case study method was chosen since it allows "an intensive study of a single unit for the purpose of understanding a larger class of (similar) units" ([46], p. 342). The method enabled us to extract conclusions on how students embed sustainability through studies at HEI. It also helped us to single out actions and areas that can be improved, which will add to the debate on sustainability in HEIs.

In this work, we intended to verify whether, after the implementation of a set of sustainability measures and practices by UAM, there had been an increase in the three dimensions analyzed in students of different faculties: Knowledge, Attitudes, and Behaviors.

A set of questions was drawn up for each dimension in order to make the link between the different strands of each dimension. Thus, 12 questions for the knowledge dimension were elaborated. In addition, 7 + 4 questions were elaborated for the attitudes dimension (Personal Responsibility +

University Responsibility). Finally, 10 + 8 questions were elaborated for the behaviors dimension (recycling, energy … + sustainability implications). These questions can be seen in more detail in Table 2.

Table 2. Global answers of students concerning the three dimensions: Knowledge, Attitudes, and Behaviors.

Knowledge	Partially Agree and Agree
I am familiar with the concept of ecosystems, its interdependency cycles, and diversity	44.7%
I am familiar with the concept of sustainable development	73%
Sustainability is a matter of urgency	87.5%
Sustainability is an opportunity according to an ecological and social perspective	78%
Local structures, economic systems, and governance are important to achieve Sustainability	85.9%
Global structures, economic systems, and governance are important to achieve Sustainability	86.5%
Water, energy, and food consumption are relevant as sustainable resources	81.2%
Education and culture are essential to achieve Sustainability *	83.3%
Initiatives concerning Sustainability (like UN MDGs, Global Compact, GIEC, GRI, ISO 26 000, ESD, etc.) are fundamental	71.4%
I can learn from case studies of success or failures, technological innovations, and social strategies	77.2%
I have an individual role and impact within sustainability objectives	63.7%
Efficient action (individual, organization, or regional level) can create both individual and systemic change to achieve Sustainability	84.9%
Attitudes (Personal Responsibility)	**Partially Agree and Agree**
I believe that everything depends on nature	41.1%
I respect and care for the community of life, now, and in the future	83.6%
I treat others as I would like them to treat me (4th Year)	91.9%
I am actively committed to solving sustainability problems (e.g., by reducing my consumption patterns)	66.1%
I believe one can initiate and reinforce personal and systemic changes concerning Sustainability	82.1%
I am motivated to learn about sustainability issues	70.5%
I want to participate in my University's initiatives related to Sustainability	42.7%
Attitudes (University Responsibility)	**Partially Agree and Agree**
I believe that my University should make Sustainability a priority in campus planning, development, and day-to-day operations	74.4%
I believe that everyone in my University's community should participate in the implementation of Sustainability at the University	77.6%
I believe it is necessary for my University's community to include Education about Sustainability across the curriculum	55.9%
I believe that my University should have a strategy or policy for sustainability implementation	77.2%
Behaviors (Recycling, Energy, Water, Mobility, etc.)	**Partially Agree and Agree**
I deliberately purchase food produced locally rather than imported products	24.6%
I eat less red meat due to its environmental impact when compared to other foods	18.6%
I attend protest marches or demonstrations for environmental reasons	10%
I purchase products packaged in reusable or recyclable containers	43%
I avoid buying from a company that shows disregard for the environment	45%
I pick up litter or trash in the street	89.9%
I recycle glass bottles, aluminum cans, or paper	81%
I try to use less energy (electricity, water, etc.)	78.6%
I turn off lights when I am the last to leave a room	92.8%
I make an effort to use less water when brushing my teeth or bathing	75.8%
Behaviors (Sustainability Implications)	**Partially Agree and Agree**
I consider politicians' positions related to environmental and Sustainability issues when voting	55.9%
I choose to read publications or watch media that focus on sustainability issues	29.5%
I encourage people involved in a destructive environmental behavior to stop that activity	62.9%
I encourage others to take action on behalf of sustainable development	58.1%
I defend equality (e.g., gender, human/cultural diversity) and justice	87.5%
I buy from a company that shows social responsibility (e.g., fair trade)	52.8%
I apply labor rules and human rights in my daily tasks	66.7%
I act with ethical values and against corruption	90.8%

Note: * Question originally negatively worded that was reversed to match the response scale for the positively worded questions.

Initially, the analysis was done at a global level, and then, in the responses where percentages of agreement lower than 60% were obtained at the faculty level (scientific areas), in this analysis only, the percentage of positive agreement was used (partially agree and agree). This analysis aimed to see if a good percentage of positive responses was obtained and if these varied according to faculties.

The measures implemented by UAM that the students considered most appropriate and also other measures that the students considered should be implemented were also analyzed.

This analysis allowed us to assess whether the measures implemented were correctly identified by the students and which other measures suggested by the students should be implemented by UAM.

The analysis was then deepened in order to understand the consistency of the responses, and a global index was created for each of the dimensions, while a partial index was created for each of the faculties. This index represents the profile of UAM students (global index) and the profile of the students of each faculty (scientific area); for the calculation of the indices, we used the average values of the responses, and not only the responses of agreement, as was done in the previous analysis.

4.1. Data and Sample

A total of 504 (undergraduate) and post-graduate participating students, belonging to different faculties at UAM, returned a complete survey. The global sample can be considered representative of the target population, although it was unbalanced with respect to the different faculties. A 4.33% margin of error for a 95% confidence interval was obtained.

Out of total of 504 participants, 69.1% were females and 30.9% were males. The students involved in the survey were distributed into the following degrees: Sciences (6.1%), Business and Economics (38%), Law (18.4%), Philosophy and Letters (0.4%), Teacher Training and Education (36.4%), and Engineering (0.6%). The years of study of the participants were: 1st year 34.9%, 2nd year 15.8%, 3rd year 27.7%, 4th year 5.9%, and above the 4th year 15.6%. The age of participants was characterized as follows: 66.9% under 21 years old; 31.7% from 21 to 25 years old; and 1.4% above 25 years old. Most of the students were from undergraduate degrees (99%) and only 1% from master degrees. In addition, 91.7% of participants had Spanish nationality, 5.7% were from non-European countries, and 2.6% were from other European Countries.

4.2. General Characterization of Statistic Methods Used in the Questionnaire

Before conducting the statistical analysis on the responses, the internal consistency was evaluated and Cronbach's Alpha $\alpha = 0.93$ was obtained, which demonstrated reliable results for the subsequent analysis. All the statistical analysis was performed with SPSS (IBM SPSS Statistics for Windows, version 24.0. Armonk, NY, USA, IBM Corp). Data were also subjected to an exploratory factor analysis to inspect whether they reflect the theoretical dimensions. The results were as expected (not shown here, because of very extensive tables); however, some items were not relevant enough to distinguish dimensions. However, all items were considered in the analysis, because this is a study that aims to present a global picture of students, and all responses contribute to the total variance explained by the responses.

The analysis was divided into the exploratory analysis for sample characterization through descriptive measures and the frequency analysis, followed by some statistical tests to support some hypotheses about relationships between variables and investigate differences between groups and categories. A significance level of 5% was considered in all the statistical tests.

The descriptive analysis of all dimensions and items was carried out with a further analysis on those items with a lower proportion of agreement, i.e., less favorable to SD, or less generalized in the respondents. In this sense, we attempted to identify whether these results were influenced by faculty.

The association between categorical variables was explored using Chi-square test, complemented with the contingency coefficients Phi and Cramer's V whenever applicable. The correlation between quantitative variables (ordinal scale) was evaluated and tested trough Pearson (parametric) and Spearman (non-parametric) coefficients. Next, within the main purpose of the study, the analysis was split by faculty, because it allows for comparisons and helps the definition of targeted measures in the future.

Thereafter, the analysis aimed to synthesize the responses of one student with an indicator to obtain a global score for dimensions and establish relationships between them and with faculty.

A composite measure was determined for each one of the dimensions, Knowledge, Attitudes, and Behaviors, in order to have the global position of students concerning SD. To achieve this,

assuming that the importance of each item was balanced within the belonging dimension, the average of all scores (each between 1 and 5) was calculated to summarize the student's profile and give the final Index of dimension.

Comparisons between groups defined by faculties and comparisons of dimensions were performed through ANOVA (One-Way Analysis of Variance) for independent and for repeated measures, respectively.

The data analysis progressed onto questions regarding the type of classes to relate with data from the curriculum, that is, with the courses that had more curricular units with contents related to SDGs, integrating with the study plans and scientific areas.

Finally, the factors that, in the opinion of the students, were predominant in the implementation of Sustainability at UAM were also studied. In this sense, the strengths and others in need of improvement were identified.

5. Results Obtained with the Questionnaire Applied to UAM Students

5.1. Analysis of Results Obtained in the Main Dimensions: Knowledge, Attitudes, and Behaviors

The first analysis was to describe the global sample of students concerning the three main dimensions: Knowledge, Attitudes, and Behaviors, as shown in Table 2.

This analysis was intended to identify the different issues applied for the three dimensions, where a higher percentage of approval was obtained. The positive percentage was chosen in this analysis because it allowed us, with direct observation, to identify the level of agreement of the students.

It was thus found that approval rates of over 65% were achieved on a wide range of issues, which show a high level of interest for students in these topics.

In the knowledge dimension, the majority of the participants expressed high levels of agreement (>60%) with the importance of each item (11 questions in 12). The exception is that only 44.7% of students were familiar with the concept of ecosystems, their interdependency cycles, and diversity. This result can be justified by the fact that this is a more specific question, and maybe because most of the participants were from non-science degrees.

In all of the items that evaluated the personal attitudes, the majority of participants expressed high levels of agreement (>60%) related with attitudes favorable to Sustainability (5 questions in 7), the exceptions were "I believe that everything depends on nature" and "I want to participate in my university's initiatives related to sustainability" both under 43%.

In the set that assesses the attitudes concerning university responsibility, the answers differed from the first block in the sense that they were more homogeneous (between 74% and 78%—3 questions in 4) except "I believe it is necessary for my university's community to include education about sustainability across the curriculum". This result will be analyzed in more detail to identify possible associations with other features/factors that can contribute to it.

In terms of behaviors related to recycling, energy, water, mobility, etc., some variability was observed (5 questions in 10), as far as there were reasonable rates of adherence to recycling and savings resources, which were not reflected in behaviors that require greater commitment and compromise in relation to installed behaviors like, for example: "I deliberately purchase food produced locally rather than imported products", "I eat less red meat due to its environmental impact when compared to other foods", and "I avoid buying from a company, which shows disregard for the environment".

In terms of behaviors related to sustainability implications, some variability was also observed (4 questions in 8), and the lower percentage was associated with the item "I choose to read publications or watch media that focus on sustainability issues" (29.5%).

It should be noted that the behaviors the students stated should have been confirmed with other types of instruments (e.g., direct observations). In addition, it can be seen that in the answers related to the behaviors, a good percentage of agreement was obtained in only 50% of the questions, and that in the behaviors that implied greater changes, smaller percentages were observed.

In questions where lower percentage approvals were obtained, it was necessary to analyze by faculty (scientific area) to see if there were significant differences between students from different faculties. This analysis will allow the different faculties to be categorized and prioritized during the implementation of sustainability practices and measures by the University.

In order to investigate the association between the positive level of agreement concerning Sustainability and the scientific area of the degree of the students, an analysis was conducted based on the X^2 test, as shown in Table 3. This analysis focused on items in which the percentage of responses favorable to Sustainable Development (SD) was relatively low or less extensive (less than 60%).

As shown in the descriptive analyses, some of the faculties had a low response rate. Therefore, to overcome problems with the validation of the statistical methods, it was necessary to group some to achieve a more balanced classification. Therefore, from now on, we focus on four scientific areas (Sciences and Engineering; Business and Economical Sciences; Teacher Training and Education; Philosophy, Letters, and Law).

In general, the faculty of Sciences and Engineering demonstrated the highest scores in the most favorable responses to SD related with Knowledge, Attitudes, and Behaviors.

Starting the interpretation of Table 3 with knowledge, a significant difference was found between Faculties in the item "I am familiar with the concept of ecosystems . . . ", in fact, sciences and engineering had the highest percentage of agreement (75.7%), far above the next value in philosophy, letters, and law (45.3%).

Concerning the scores of the attitude dimension, a significant association was found with Faculty in two items, namely, "I want to participate in my university's initiatives related to sustainability" (personal responsibility), $p < 0.0001$, and "I believe it is necessary for my university's community to include education about sustainability across the curriculum" (University responsibility), $p = 0.015$. The latter was related to high scores in the option agree for the Faculties Science and Engineering and Teacher Training and Education.

For the Behaviors dimension, a significant association was found with the Faculty factor in six items, namely, "I deliberately purchase food produced locally rather than imported products", "I eat less red meat due to its environmental impact when compared to other foods", and "I attend protest marches or demonstrations for environmental reasons" (in behaviors (recycling, energy, water, mobility, etc.)), and the other three, "I consider politicians' positions related to environmental and sustainability issues when voting", "I choose to read publications or watch media that focus on sustainability issues", and "I buy from a company, which shows social responsibility (e.g., fair trade)" (in behaviors (sustainability implications)). In all these items, the Faculty of Sciences and Engineering demonstrated significantly higher scores. This means that in this faculty, the students had more sustainable attitudes and behaviors that were significantly different from other students who participated in the study. This reveals that their learning is better suited to education for sustainability, and that a number of changes related to sustainability should be made in the other faculties, so that this is also the case in other students.

To proceed with the study of the relationship between the scores of knowledge, attitudes, and behaviors, the index of the dimension was used, with the global score being obtained by averaging all the items, as described in section Materials and Methods.

To calculate this index, we used the average values of the responses obtained and this allowed us to present a profile of the UAM student, and also a specific profile for each of the groups of faculties. These profiles made it possible to categorize and prioritize the different faculties and also to identify a set of sustainability measures that are more appropriate for each of them.

Considering the four groups of Faculties, the aggregated score was higher in the Sciences and Engineering Faculties in all the three groups of items, which define the core concepts in this study: Knowledge, attitudes, and behaviors.

In Table 4, we can observe that in the global sample, the knowledge index was higher than the attitude and behavior indices, and that the Engineer and Sciences faculties had higher levels of

knowledge, attitudes, and behaviors. These differences were significant when ANOVA analyses for independent and related samples were applied ($p < 0.001$). The assumptions of ANOVA were verified, and it was found that the samples are approximately normal. Differences between the means of faculties were significant at level 0.01 (two-sided). In the post-hoc analysis, it was found that the Engineer and Sciences faculties had significantly better levels of knowledge, attitudes, and behaviors than the other faculties. The Teacher Training and Education faculties were an exception in the attitudes index because they were not significantly different from the others, they were in an intermediate position.

Table 5 shows the results of the correlation between the dimensions Knowledge, Attitudes, and Behaviors for the global sample and for scientific areas (faculties).

Globally, all the correlations were significant, with the strongest being between attitudes and behaviors (0.757). The correlation between Knowledge and Attitudes was above the mean (global correlation) in Philosophy, Letters, and Law (0.720) and in Sciences and Engineering (0.703).

For the association between Knowledge and Behaviors, the correlation was globally significant (0.591). As before, the correlation was higher in Philosophy, Letters, and Law (0.731) and in Sciences and Engineering (0.687).

The correlation between attitudes and behaviors was high and similar in all scientific areas. However, Sciences and Engineering had the highest value (0.805).

5.2. Analysis of the Results Obtained and Related to Sustainability Implementation at UAM

5.2.1. More Common Methodologies Applied in the Educational Process

The most chosen methodology was Lecturing in all faculties (Figure 1) and it was above 80%, showing that a more traditional approach was transversal to all faculties in UAM. The other typologies that were indicated as more suitable for the promotion of Education in Sustainability will be detailed.

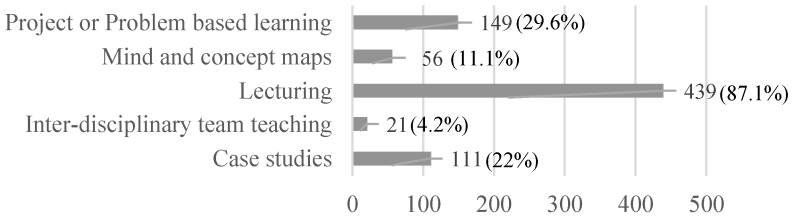

Figure 1. Sustainability implementation at Universidad Autónoma de Madrid (UAM)—the most common methodologies applied in the educational process.

Sciences and Teacher training had the highest percentage of Interdisciplinary and team teaching classes, with 6.5% and 5.4% respectively, although in Philosophy and Letters, 100% was obtained, although only two students answered.

For the Case study typology, all faculties had courses with classes of this type, with the exception of Engineering. The law degree stands out with 41.9%, but we believe that this was related to the nature of the program.

For the Project or Problem-based learning typology, all faculties had classes of this type, and the faculties with the higher percentages were from Sciences (54.8%) and Teacher Training and Education (33.7%), with a good percentage of response from these students. Philosophy and Letters and Engineering also obtained a good percentage in this type of classes, i.e., greater than 50%. However, there were very few students in the sample of these programs.

For the Mind and concept maps typology, all faculties presented this typology with the exception of Engineering; however, this Faculty must be analyzed with caution since we only had three respondents. The Sciences, Business Sciences and Economy, and Teacher Training and Education showed values within the same order of magnitude, i.e., between 11% and 16%.

Table 3. Knowledge, Attitudes, and Behaviors analyzed by scientific area (faculties).

		Partially Agree and Agree					
Scientific Areas	**Total Sample**	**Sciences and Engineering**	**Business and Economical Sciences**	**Teacher Training and Education**	**Philosophy, Letters, and Law**	**X^2**	***p***
Knowledge							
I am familiar with the concept of ecosystems, its interdependency cycles, and diversity	44.7%	75.7%	44.3%	39.1%	45.3%	25.14	<0.0001 *
Attitudes (Personal Responsibility)							
I believe that everything depends on nature	41%	48.4%	37.5%	41.8%	45.3%	19.9	0.07
I want to participate in my university's initiatives related to sustainability	43%	66.7%	40.1%	43.7%	36.8%	64.5	<0.0001 *
Attitudes (University Responsibility)							
I believe it is necessary for my University's community to include education about Sustainability across the curriculum	56%	60.7%	54.5%	61.9%	56.8%	25.02	0.015 *
Behaviors (recycling, energy, water, mobility, etc.)							
I deliberately purchase food produced locally rather than imported products	25%	42.4%	29.7%	18.0%	21.1%	27.7	0.006 *
I eat less red meat due to its environmental impact when compared to other foods	19%	48.5%	17.7%	16.9%	13.7%	47.6	<0.0001 *
I attend protest marches or demonstrations for environmental reasons	10%	39.4%	9.4%	6%	8.5%	60.27	<0.0001 *
I purchase products packaged in reusable or recyclable containers	43%	60.6%	40.7%	45.7%	36.8%	19.6	0.08
I avoid buying from a company that shows disregard for the environment	45%	69.7%	46.4%	37.5%	48.4%	18.03	0.115
Behaviors (sustainability implications)							
I consider politicians' positions related to environmental and sustainability issues when voting	56%	84.8%	53.6%	55.4%	51.6%	30.76	0.002 *
I choose to read publications or watch media that focus on sustainability issues	30%	60.6%	28.1%	27.2%	26.3%	33.01	0.001 *
I encourage others to take action on behalf of sustainable development	58%	79.1%	56.8%	60.4%	49.5%	20.08	0.066
I buy from a company that shows social responsibility (e.g., fair trade)	52.8%	75.8%	59.4%	46.2%	44.2%	30.06	0.003 *

Note: * Significant differences between Scientific Areas at level α=5%.

Table 4. Descriptive statistics for Knowledge, Attitudes, and Behaviors indices.

Scientific Areas Mean ± SD (Median)	Total Sample n = 504	Sciences and Engineering n = 33	Business and Economical Sciences n = 192	Teacher Training and Education n = 184	Philosophy, Letters, and Law n = 95
Knowledge	4.11 ± 0.582 (4.25)	4.44 ± 0.478 (4.58)	4.06 ± 0.637 (4.17)	4.10 ± 0.536 (4.25)	4.08 ± 0.557 (4.17)
Attitudes	3.89 ± 0.635 (3.90)	4.23 ± 0.632 (4.46)	3.79 ± 0.671 (3.82)	3.99 ± 0.549 (4.09)	3.77 ± 0.654 (3.90)
Behaviors	3.63 ± 0.633 (3.32)	4.12 ± 0.564 (4.17)	3.60 ± 0.648 (3.17)	3.65 ± 0.576 (3.78)	3.50 ± 0.662 (3.50)

Table 5. Global correlations and inter-correlations for Knowledge, Attitudes, and Behaviors indices.

	Correlations				
Scientific Areas	**Total Sample n = 504**	**Sciences and Engineering n = 33**	**Business and Economical Sciences n = 192**	**Teacher Training and Education n = 184**	**Philosophy, Letters, and Law n = 95**
Knowledge and Attitudes	0.616 *	0.703 *	0.563 *	0.605 *	0.720 *
Knowledge and Behaviors	0.591 *	0.687 *	0.513 *	0.568 *	0.731 *
Attitudes and Behaviors	0.757 *	0.805 *	0.746 *	0.752 *	0.757 *

Note: * Correlation significant at level 0.01 (two-sided).

Integrating these results with the analyses of study contents—of the case study (i.e., with curricular units that were aligned for Sustainability)—it was observed that the Faculty of Sciences had the largest number of this kind of curricular units. In turn, business sciences and economy, which had four units focused on environmental policies in SD in Spain, social responsibility, and sustainable economics gave some relevance to project- or problem-based learning, case studies, and mind and concept maps. The Teacher and Training degree, which had three units focused on environmental Sustainability, gave some relevance to interdisciplinary approaches, case studies, and projects. The Law degree, which had only one CU aligned with the policy and problems related to environmental Sustainability, also had a significant percentage of case studies and project or problem-based learning (in line with its nature).

5.2.2. Better Ways to Be Educated for Sustainability

The results of this topic (Figure 2) reveal that Critical thinking and analysis (54%) was the most common approach chosen by students, followed by Empathy and change of perspective (53%), Personal involvement (46.8%), and Teamwork and consensus building (42.9%).

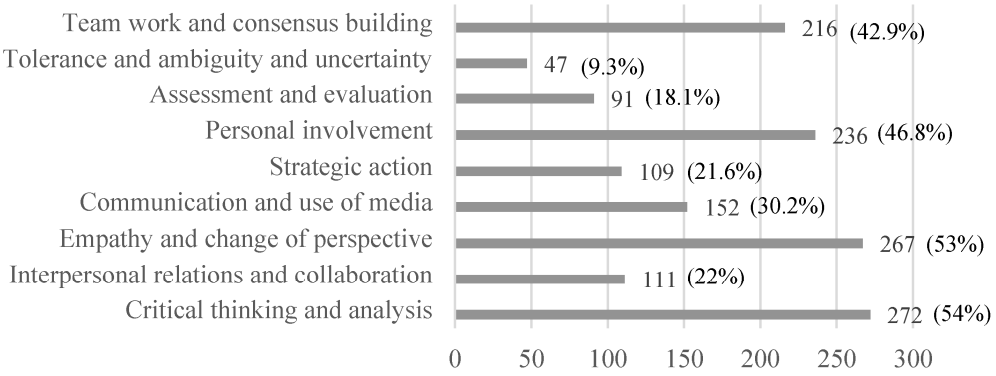

Figure 2. Sustainability implementation at UAM—better ways to be educated for Sustainability.

5.2.3. Main Sustainability Problems at UAM

The main problems indicated by the students were excessive consumption of resources (e.g., energy, water) with 36.9%, followed by Do not know/Do not answer (31.2%). Only 4.4% said that there were no problems (Figure 3).

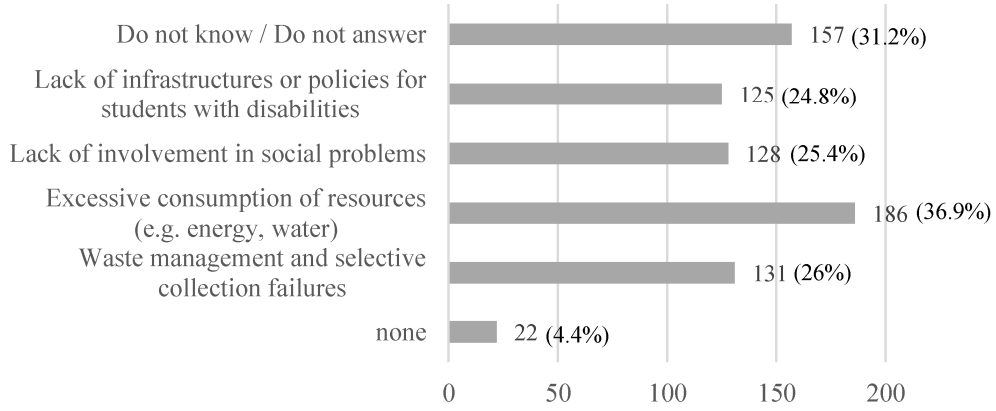

Figure 3. Sustainability implementation at UAM—main sustainability problems.

5.2.4. Sustainability Implementation at UAM

The last block of questions was under the topic Sustainability Implementation at UAM, and was related to the role of the University in the implementation of Sustainable Development (Table 6).

Table 6. The role of UAM in Sustainable Development (SD) implementation.

What Is the Role of UAM in SD Implementation	Partially Agree and Agree
The University contributes to the inclusion of sustainability aspects in study contents	20%
The University promotes sustainability research	29%
The University has a policy/strategy or program for sustainable development implementation	18%
The University has a sustainable campus	36%
The University engages stakeholders (from inside and outside University) concerning Sustainability	22%
Others	6%

The results show that the University has a sustainable campus to some degree (36% agree plus partially agree), followed by University promotes sustainability research (29% agree plus partially agree).

Only 20% of the students said that the University contributes to the inclusion of sustainability aspects in study contents, and 18% said that the University has a policy/strategy or program for sustainable development implementation.

6. Discussion

The framing of the current situation at UAM shows that the University is focused on the SDGs and it has some practices concerning these goals. In fact, there is an effort in the curriculum's contents as well as through informal education. There are programs and activities related to the SDGs developed and offered by the institution. The SDGs have the potential to encourage a paradigm shift for teaching, learning, and understanding sustainability [47]. This may enhance education in ways that benefit students and institutions. Furthermore, academic's engagement in sustainability teaching enforces their role as educators [8]. Embedding the goals within and across the curriculum will contribute not only to extending and enhancing human capital, but will also yield an increase in the numbers taking action and aiming to live sustainably, and this could have a significant impact on achieving the goals and a better future [3,5].

Universities, as significant influencers and agents of change, must play a significant and more prominent role in the change process catalyzed by the SDGs, since this is indeed a good opportunity for HEIs to address SD with practical applications [48]. With the 2030 global agenda set to steer our society towards Sustainability and in order to use the SDGs universally and the Global Action Programme (GAP) on Education for Sustainable Development (ESD), it is clear that further sustainability efforts in all areas of human activities, and at all levels of education, are needed [49].

However, becoming sustainable is a challenging problem in terms of communicating and controlling its characteristic values, behaviors, and attributes in order to guide stakeholders and institutional behavior, and technical solutions alone are not enough [28]. It is necessary to go beyond the technical to issues of behavior and culture, implying that the sustainable organization will remain elusive until, at least, Sustainability becomes embedded within the culture of the organization. The agenda has, therefore, advanced to consider the University more holistically in terms of its transformation and to embed Sustainability more deeply into its structures, processes, practices, and culture [28,48].

Human dimensions and the activities of agents of change in higher Education are important parts of the solution to the complex transition process towards sustainable HEIs, as well as whole societies [49]. As a result of the extensive and integrated agenda of UAM concerning implementing and embedding Sustainability and the SDGs with the development of several informal initiatives, which continued in 2019 with the creation of an SDG Lab that is a multi-stakeholder initiative that contributes to the implementation of the Sustainable Development Goals at UAM, we consider this institution to already be in a more evolved and mature position in terms of implementing Sustainability, which implies a change in attitude and the development of a new set of values and behaviors, i.e., in short, an organizational culture for Sustainability, as stated by [28].

A socially responsible HEI considers stakeholder behavior and perception to better understand their expectations and priorities and use these to define the strategy and goals, to monitor the objectives

in view of promoting activities and accountability, and to enhance community–university engagement. In the end, this contributes to change management and to a more mature sustainable university [6,49]. To better develop the mindset and actions of future generations, we must provide students with a complete set of sustainability expertise [50].

Students are one of the most important stakeholders in the development of a more sustainable society (e.g., [20,51–53]). According to Figueredo and Tsarenko [53], the interests of students in environmental issues influence their participation in sustainability programs. In addition, the promotion of sustainability initiatives by HEIs is a way of facilitating students' participation in this kind of activity [13,20,53]. UAM applied a survey to the students in order to perform an in-depth analysis of sustainability issues and assess if they were embedding Sustainability through their knowledge, attitudes, and behaviors. The implementation of this survey will also make it possible to assess the state of implementation of Sustainability in UAM, monitor it, communicate it, share it within and outside the organization, and improve and stimulate change, often enabling low-cost measures to be implemented [6].

The opportunity that the SDGs present to transform the curriculum, even if such a transformation may challenge existing ways of thinking and organizing, may yield further benefits whereby learning quality and student experience are enhanced. This, in turn, contributes to a virtuous circle, where initial efforts to tackle the challenges are rewarded by better ways of working and learning, where a more attractive educative offering appeals to future students, but also to employers, and where graduate outcomes are more appropriate to a sustainable global context [48].

In the analyses of the results of the global sample (Table 2), it was found that most participants expressed high levels of agreement in the knowledge and attitudes dimensions. However, this result was not replicated in the behaviors dimension, in which there was greater variability in the responses, highlighting that the options involving more drastic changes in behaviors had lower levels of acceptance. Similar results were found in [11–13,21,51–54]. In [54], it was reported that student views were not consistently expressed in self-reported actions for Sustainability, which were dominated by low-commitment actions. It should also be noted that it is easier to measure knowledge than the other two dimensions (attitudes and behaviors), such as those mentioned in [11,13,54]. Further work on pedagogies for SD, particularly linking them to SD expertise, would be of great value [50].

Deepening the investigation, an analysis was carried out on items in which the percentage of responses favorable to SD was relatively low or less extensive (less than 60%) in order to explore the association between the positive level of agreement concerning Sustainability and the scientific area of the degree of the students (Table 3). In general, the faculty Sciences and Engineering demonstrated the highest scores in the most favorable responses to SD related with Knowledge, Attitudes, and Behaviors, and according to other studies [12,13,54], it was shown that university students who had implemented sustainability education measures had better results in this area. Therefore, it is necessary to provide opportunities and incentives to students, faculties, and staff to engage in campus sustainability. Today's college students are tomorrow's leaders. Thus, changes in knowledge, attitudes, and behaviors regarding sustainability and related issues are possible as students progress through their studies [12]. By raising awareness of Sustainability and by providing opportunities to participate in it, universities can be powerful agents of change with a far-reaching impact. The results obtained by Sharma and Kelly [55] suggest that students' knowledge of sustainable development improves when they take relevant courses at Delta Business School. A rethink of current educational approaches moving towards a more coherent and targeted educational strategy to enhance student learning for Sustainability in higher Education is also of great importance [13,31,54].

According to other studies (e.g., [48]), HEIs should align their curricula on the one hand, but also their research on the other, to the SDGs and the many commitments they entail. Here, a unique opportunity is provided to combine the content of courses with the SDGs, thus enriching the learning experience; HEIs may in this context develop, test, and use new contents, learning methods,

and transformative approaches; HEIs should more actively engage with the students' community, to commit to and act in support of the SDGs.

7. Conclusions

This article aimed to help us understand whether the sustainability measures and practices implemented by universities are actually applied by students.

It was also concluded that the training of students is determinant in their change of attitudes and behaviors, with the faculties of science and engineering being where the greatest changes in attitudes and behaviors occurred, as well as where the highest level of knowledge of sustainability was demonstrated, leading to the conclusion that some implemented measures have to be specific to the faculties, and that their implementation is necessary on the curricular level.

This study also allowed us to assess the profile of students at UAM and the correlations between the three dimensions of Education for Sustainability in Higher Education: Knowledge, Attitudes, and Behaviors. It was concluded that the students possess a strong grounding in background knowledge and present good pro-environmental attitudes and behaviors, highlighting the results obtained in science and engineering. The profile will help define a set of measures to be adopted, in which the improvement of communication by UAM stands out and is key to ensuring students and other stakeholders know about and participate in sustainability actions carried out informally. Furthermore, there is a need to adapt the teaching methodologies in formal education processes for typologies that would improve Education for Sustainability. This can be achieved by the new approaches to classes and pedagogies in line with students' preferences.

The study demonstrated that these types of surveys are useful to understand how Sustainability is being embedded by students as well as implemented at the University and to find better paths for improvement. A socially responsible HEI considers stakeholder behavior and perception to better understand their expectations and priorities and use these to define the strategy and goals, to monitor the objectives in view of promoting activities and accountability, and to enhance community–university engagement. In the end, this contributes to change management and to a more mature sustainable university. These statements are also advocated by other authors (e.g., [6,9,10,49,52–54]). A change process enforces an overall vision, an increasing need for change that is experienced by the stakeholders, resources to support the process, and short-term gains that can be communicated (e.g., [6,8,26,28,39]).

In the future, the application of this questionnaire should be extended to other stakeholders, since stakeholder participation can improve decisions. The external impact of implementing sustainable development in HEIs can be measured in the local economy and culture, in challenges in society, in the natural environment, and in policies. However, participation depends on the clarity of policy objectives and their coherence with delivery methods and facilitation.

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