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Evaluation of the Green Campus Program at the University of A Coruña

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Abstract. Green Campus (GC) is an international program launched by the Foundation for Environmental Education (FEE) which includes the philosophy, methodology and experience of Eco-schools, adapted to the specific university needs and problems. Through its seven-steps methodology, the GC program can be considered a kind of environmental management system, which includes external evaluation and pursues continuously improved environmental performance. The GC program began at the UDC in 2014, with autonomous implementation at the center level, promoting bottom-up initiatives in combination with other top-down initiatives. In 2022 it had reached all 20 UDC teaching centers, more than half of them having already achieved program certification (green flag award). This paper analyses the evolution and performance of the GC program at UDC, through two on-line surveys addressed to 1) students in general, and 2) coordinators and members of the environmental committees. Some difficulties identified are low involvement and participation of students and overload of tasks of all kinds, which hinders the volunteer participation of committee members. Nevertheless, a good overall rating was given to the program from participating staff and students. A SWOT analysis is also presented, summarizing the information obtained through surveys, together with the Office for the Environment's experience in the coordination of the different centers involved in the program. Finally, a strategy is proposed to improve the visibility of the GC among students and enhance their participation.

Keyword:

Green Campus Program, Scope, Participation, Difficulty, Recognition of Volunteering, Program Assessment

1. Introduction

In consideration of their leading role in society, higher education institutions cannot ignore the climate crises magnitude, its multidisciplinary and global range of effects, as well as the threat it constitutes to human well-being and planetary health [1,2]. However, their action cannot be restricted to plans and policies on technology-based mitigation, as this approach fails to address humanity's intersecting crises and neglects human societies' wellbeing interdependence with climate, ecosystems and biodiversity [3,4]. Therefore, it is crucial that a climate justice paradigm rules their actions. Moreover, the changes needed to ensure a contribution in climate justice demand huge behavioral and cultural changes, while at the same time considering inclusive choices that prioritize risk reduction, equity and justice. Broad and meaningful participation of all relevant actors in society is desirable in order to ensure deep and wide support for transformative changes [4].

The University of A Coruña (UDC) is moving towards adhering to this paradigm. The way sustainability and climate justice are addressed relies on different offices and programs, all of them working together to progress everyday towards a more sustainable, fair, and implicated with the community university. The Green Campus (GC) program is one of the main strategies for this purpose. UDC's GC is part of the international FEE EcoCampus program, an initiative of the Foundation for Environmental Education (FEE) in collaboration with several universities and other higher education institutions (HEIs) around the world to enhance the values of Environmental Education in the university context [5].

In 2014, the University of A Coruña (UDC) signed a collaboration agreement with the Association of Environmental and Consumer Education (ADEAC), as member of the FEE for Spain, to implement ecological management procedures under the GC program [6,7]. GC program adapted the philosophy, methodology and experience of Eco-schools (the largest global sustainability program for schools) to the specific needs and problems of university sustainability [5].

UDC's GC goals revolve around 10 areas of action, including optimization of water and energy consumption, reduction of waste generation, pollution prevention (air, noise, light), mobility, healthy habits and lifestyles, biodiversity, responsible consumption, awareness-raising (including participation and environmental volunteering), and climate change. These thematic areas are directly related to most of the sustainable development goals conceived and promoted by the United Nations [5,7].

GC methodology at UDC is defined by the following seven steps: 1) Establishment of a Center or Campus Environmental Committee, 2) Conducting an Eco-Audit, 3) Development and Implementation of an Action Plan, 4) Ongoing Monitoring and Evaluation, 5) Curriculum linking, 6) Information and Communication, 7) Declaration of Environmental Commitment [6].

The FEE EcoCampus program is considered the largest environmental education program for schools of different levels in the world [8]. It can be considered a kind of environmental management system (EMS), as several authors have pointed out [9,10]. This is so, since its 7 stages of implementation include the well-known Deming cycle or PDCA (Plan, Do, Check, Action). In this way, it could be analyzed in relation to other EMS implemented in HEIs, such as ISO 14001 or EMAS. However, the scientific articles that analyze the implementation and results of EcoCampus FEE programs are scarce [8,15],

compared to the published information available assessing general sustainability programs in universities, as well as the other mentioned EMS [11,12,13,14]. Considering the bottom-up and participatory approach of the Eco-Campus FEE program, an aspect of great importance is the student's point of view and how their participation can be encouraged [16,17].

This paper analyses the evolution of the GC program at UDC, its scope and the evaluation carried out through surveys by the students in general, as well as the coordinators and members of the environmental committees. Attention is paid to the difficulties and shortcomings identified and to the reported solutions. The results of the surveys and the analysis of the operation of the program are useful for the design of a strategy that consolidates participation and improves the visibility of the GC program, in particular among students. The work also constitutes a contribution to overcome the lack of scientific reports on the FEE EcoCampus program in HEIs.

2. Materials and Methods

In this evaluation of the UDC's GC program, two main surveys were used, one addressed to active members in the environmental committees of the centers, and another aimed at all UDC students. The first survey consisted of 37 questions of different formats: mostly quantitative, but also with some qualitative ones. Some of these questions pursued investigating the level of participation in the tasks of the GC program, the degree of complexity and difficulty of the tasks, the solutions proposed for the program's difficulties and shortcomings, the center's capacities and competencies to address different themes, and the results achieved in the thematic areas of action of the GC program. Also, the general assessment of the GC program was considered.

The second survey, addressed to students, included a total of 28 quantitative questions that aimed to, among other things: a) investigate the degree of knowledge that students have about the GC program and the sustainability promotion activities developed by the GC programs themselves and by the Office for the Environment of the UDC; b) know the participation of students in the program, the factors that condition it and the perception of participation by the rest of the students; c) ask about the interest of students in the various topics and activities carried out in the program, and the scope and means used for their dissemination; d) general assessment of the program, including its usefulness for the center and the students themselves.

All surveys were anonymous and were performed using Microsoft FORMS. The survey aimed at active members of the committees was distributed through the coordinators of the respective committees and was available for one month, during which participation was re-encouraged once. On the other hand, the survey aimed at UDC students was distributed through the official UDC email list that includes all students at different levels (grad's, master's, and doctoral). This second survey was available for seventeen days, during which one reminder was sent via email.

To describe the GC program at UDC, successive reports prepared by the Office for the Environment (OMA-UDC) were reviewed, including program reports submitted to external evaluation as well as the resolution of different evaluations by the external evaluating entity. The Scopus database was searched for scientific literature on FEE EcoCampus in IES using the following keywords inserted in "Article Title, Abstract, Keywords": "FEE EcoCampus" OR

"Foundation for Environmental Education" OR eco-schools) AND ("High* Education" OR "green universit*" OR "green*universit*" OR "Green*Campus". This search returned only 5 articles. In a second, broader search, the following terms were used in the same database: "environmental management system*" OR "ISO 1400*" OR "EMAS" OR "Eco*Campus" OR "Green*Campus") AND ("High* Education" OR "green universit*" OR "Green*Campus". This second search returned 67 papers, which abstracts were reviewed, identifying 9 articles of interest for the discussion of the results of this study. This discussion was finally based on the content of the 5 articles from the first search and the 9 from the second search's selection. The last one included 2 papers on EMS in Spanish universities. However, although the FEE EcoCampus program is at least in use in another Spanish university (University of Vigo), these searches did not yield any results referring to FEE EcoCampus in Spanish universities. The information about the EcoCampus program of the University of Vigo was obtained from its website.

3. Results/Discussions/Implementation

3.1. The Green Campus Program at UDC

The UDC's GC program is based on participatory and common methodologies, which can perform as an EMS, including external audits. In addition, it requires specific steps, such as the foundation of an environmental committee, the performance of an eco-audit and the elaboration of an action plan. If the program achieves a positive assessment by ADEAC, then a green flag is awarded to the center, certifying its conformity. The program is regularly supervised and is renewed every two years (unless extraordinary conditions) in order to correctly adapt and address sustainability problems. Meanwhile, University community's participation is promoted, identifying, preventing and providing solutions.

In 2014 the GC program began to be applied at the UDC (Figure 1), starting with 5 centers and progressively incorporating more until in 2022 it reached all the teaching centers of the UDC, although with different levels of intensity and consolidation. In order to guarantee grassroots participation, UDC's GC was implemented at the center level (or grouping of centers by campus area), providing it with a strong bottom-up character. This contrasts with other centralized or top-down approaches where a single program is applied to the whole university. Nevertheless, there is still an important connection between different GC programs, as well as with external agents, which is mediated by the Office for the Environment.

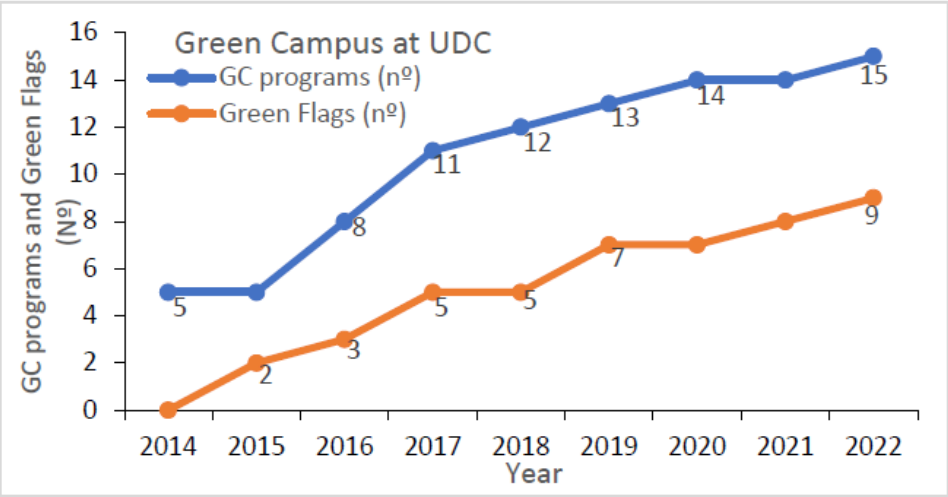


Figure 1. Evolution of the GC program at UDC

The UDC has 20 teaching centers, 15 of them located in the Coruña campus and 5 in Ferrol, where they form a single GC program. At the beginning of the 2022-2023 academic year, all teaching centers in Coruña were fully integrated into the GC program. In total, there are 15 GC programs in operation at the UDC. So far, 9 GC programs have been positively evaluated. Some centers have once achieved a positive evaluation, while others have reached their fourth renewal of the Green Flag in 2022. In their trajectory, 19 reports have been positively evaluated, while 2 were initially rejected but later positively reevaluated. Of the 15 GC programs, 6 have not yet been presented for external evaluation.

According to data obtained from a follow-up form answered by coordinators of 10 GC programs (June 2022), the environmental committees of these programs have a total of 183 members, including 46 students. The estimate for the additional 5 programs raises the number of people actively involved in the UDC's GC programs to 224.

The GC program at UDC is based mainly on the voluntary participation and dedication of the members of the environmental committees. In addition to this basic aspect, the implementation and coordination of the program include the following means:

- External advice and evaluation services by ADEAC.
- Network of student scholarship holders of the program, including one scholarship per program (2 in the case of programs that include several centers). There are 17 scholarships offered in the overall program, generally covering yearly between 12 and 14 of them. Each student scholarship holder is meant to dedicate a total of 8 hours per week to service-learning activities related to the program.
- Compensation for teaching load to the faculty members who participate in the coordination of the programs (10 or 20 hours of annual reduction in teaching load per program, depending on whether it corresponds to a single center or multiple centers).
- Assistance from the Office for the Environment, particularly in the development of sectoral projects (waste, composting, water, biodiversity, mobility, environmental outreach, etc.), and overall coordination of the program.
- Assistance from the management of the respective teaching centers, and from other UDC services, such as UDC Healthy lifestyle service, Architecture, Urbanism and

Equipment's Service, Office for Cooperation and Volunteering (OCV), and others.

3.2. The evaluation received from active personnel in the GC programs

This evaluation was carried out through a survey in which a total of 49 participants responded, of whom 41 corresponded to teaching and research staff (TRS), 5 to administration and service staff (ASS), 2 were associate personnel, and 1 was a student. The group of participants included 11 program coordinators and 29 other members who declared regular participation, while 9 participants declared occasional participation. Only 3 were external to the environmental committee. Thus, this evaluation mainly reflects the opinion of the TRS active in GC programs, directly reaching 30% of the TRS members of the environmental committees. On a scale of 1 (very poor) to 5 (very good), 3 out of 4 participants in the survey rated the GC program as good or very good overall. The average rating was 4.12, with no significant variation between respondents with higher participation (4.07 for those who participated in the development of action plans) and those who registered lower participation (4.21 average rating).

Participation and degree of complexity in GC program tasks

The majority indicated that they had participated in the elaboration of the eco-audit (63% of respondents) and the action plan (61%). In contrast, the number of people who reported participating in the elaboration of the environmental statement was low (29%). The creation of the environmental committee is the most well-known action among all respondents (92%), while the elaboration of the environmental statement appears at the opposite end, with only 29% of respondents able to assess its degree of difficulty.

The degree of difficulty (on a scale of 1 to 5) of creating the environmental committee, conducting the eco-audit and the action plan, and other tasks related to the program methodology were inquired. The responses indicate a medium level of difficulty, while the percentage of responses that chose a level 4 or 5 (high or very high complexity) ranged from 14% to 32%. However, implementing the programs is not the easiest chore, especially considering that most responses come from programs with a longer history and a higher level of activity. The elaboration of the action plan is shown to be the most challenging task, with 37% of responses indicating high or very high levels of difficulty.

Solutions declared to the difficulties and shortcomings identified

For the launch of the environmental committee and its running, there was a lack of greater incentive or recognition for participating in the committee (62.5% of the responses), while the need for greater commitment from the participants was detected (17.5% of the responses). It was found that the overload of tasks of all kinds (in addition to those specific to the GC program) that they must attend to, hinders the participation of committee members, who act as volunteers. The low involvement and participation of students is another of the difficulties to overcome. This last one is perhaps the most significant flaw in the overall programs, but it is also related to the lack of availability and recognition of the involved TRS and ASS members.

Thus, possible solutions include better understanding of the functioning of other environmental committees and sharing experiences, as well as a greater dedication of the coordinator and the most active members to promote it, which again needs greater formal recognition with a deduction of the teaching and workload.

Considering that the action plan presented the greatest complexity, the solutions offered

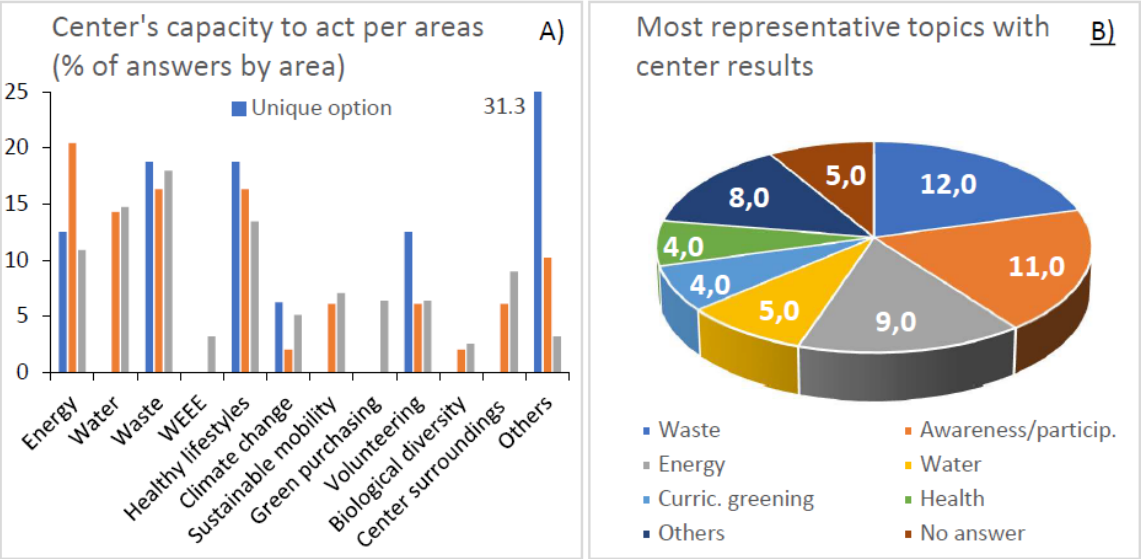
were mostly equally chosen as a) having a guide model and adapting it according to the needs, and b) actively working in a network during the elaboration process. On the other hand, the proposal of the monitoring and evaluation process being public rather than restricted to the center's environmental committee received more support. In addition, a majority (50%) considered that a model or methodology to facilitate and create the habit of documenting actions is missing.

Regarding information and communication, the greatest supported option is that it should be individual to each faculty but with a common methodology, and that it would be very interesting to know examples from other faculties, schools, or universities.

To enrich the curriculum linking to sustainability (i.e. curriculum greening), the responses prioritized the following options: a) carrying out actions that allow increasing the experience of participants and improving their training (54%), b) knowing other examples of curriculum linking (29%), and c) promoting the participation of students, according to their knowledge in the evaluation and resolution of conflicts in other centers (14% of responses). In short, embedding sustainability in the curriculum needs promotion and training that our university has not specifically addressed yet. It should be clarified that this is not an obligation or exclusive task of the program, but rather a more general planning and academic training. At the center level, and within the GC program, the following proposals were pointed out: a) online registering of curriculum greening activities or initiatives carried out in different subjects, b) calling for curriculum greening prizes.

Areas of action

The main areas identified with capacity for action at center level were energy, water, waste, and healthy living, each of which accounts for between 10 and 20% of responses (Figure 2A). This is consistent with the attention paid by the UDC to these themes [7,18,19,20]. The rest of the themes appear in second place, with percentages close to 5% (climate change, sustainable mobility, volunteering, environment), or even with lower adherence (green purchasing, biodiversity). In particular, it is worth noting the low adherence to green purchasing, over which the centers have some competencies, and to two areas as important as climate change and sustainable mobility, due to their cross-cutting nature and the capacity for collective and individual action in all centers. However, this perception may be conditioned due to the intense relationship between climate change and energy, with the energy area receiving priority adherence.



Regarding the themes in which the center achieved results (Figure 2B), those of awareness and participation, waste, and energy were pointed out as the most representative, each with 16-21%, followed by water, curricular greening and health promotion (7-9%).

3.3. Assessment by students

The student assessment survey was conducted in May 2020 and received 256 responses (Table 1). 44% of them came from 4 centers, and the rest from 16 other teaching centers of the UDC.

Table 1. Subgroups differentiated according to the students declared knowledge of the UDC's GC program and participation, and indicators of program assessment

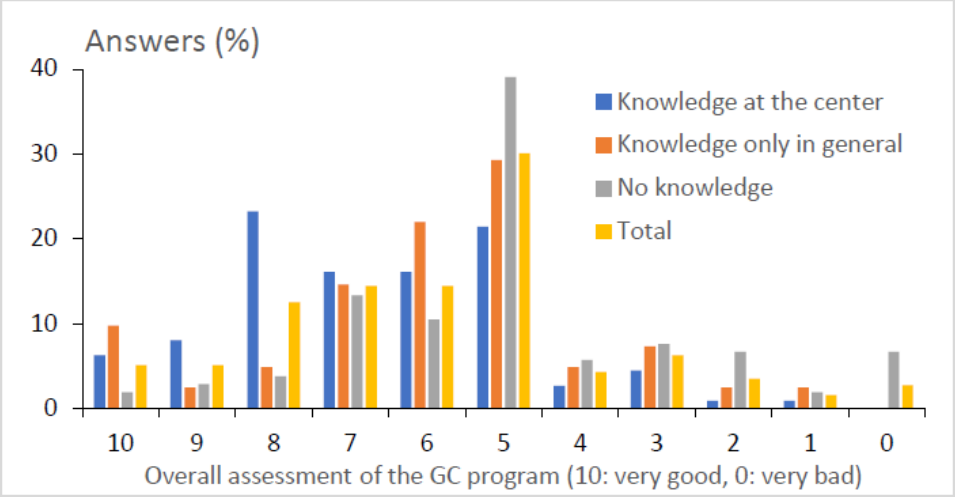
	Total (n=256)	Participated in UDC's GC[a]	Know the implementation in their center[a]	Know UDC's GC in general[b]	Do not know UDC's GC
Answers (%)	100	11,3	43,8	16,0	40,2
Indicators (Mean rating and standard deviation; scale 0-10)					
Degree of knowledge of GC[c]	2,8±2,6	-	4,8±2,2	2,9±1,8	0,6±1,3
Level of participation[d]	3,2±2,0	-	3,6±2,0	3,1±1,8	2,9±1,9
Activity diffusion level[d]	3,5±2,2	-	4,3±2,2	3,7±1,9	2,6±2,0
Overall assessment of UDC'sGC	5,8±2,2	-	6,6±1,9	5,9±2,1	4,9±2,2

[a]The subgroup of those who "know that it is implemented in their center" contains the subgroup of those who "participate in GC". [b] Those who declared knowing the UDC's GC program but do not know if it is implemented in their center. [c] Degree of knowledge of the UDC's GC program by the respondents. [d] Level of participation or dissemination that the survey respondents perceived.

Out of the total respondents, 40.2% stated that they did not know the program (Table 1). The remaining 59.8% who claimed to have some knowledge and/or direct involvement in the program were classified into three subgroups: a) those who declared general knowledge but did not know if the GC program was being applied in their center and did not participate in the program (16.0% of the total), b) those who knew that it was being applied in their center, regardless of whether they participated in the program or not (43.8% of the total), and finally c) those who directly participated in the center's program (11.3% of the total).

Among the factors investigated in this survey, we analyzed the degree of knowledge of the UDC's GC program, the perception of student participation, the perception of the dissemination of program actions, and the overall assessment of the program. Logically, the degree of knowledge shows the most disparate values and defines each of the groups. The information obtained from the survey indicates that only 23.8% of those who claimed not to know the GC program are unable to identify sustainability activities in their center. Therefore, 76.2% of this group (which represents 31.2% of the total respondents) know that sustainability activities are being carried out in their center but do not identify them with the GC program.

The perception of participation by the university community and the dissemination of activities also increases with the degree of knowledge, but shows very low values in all cases, with an average of 3.2 on the 0-10 scale. Differences were found in the identification of the most representative activities of the center, mainly between the responses of those who claimed not to know the program and the responses of those who do know it and know that it is being applied in their center. The latter identify energy, water, or waste-related activities to a greater extent. On the other hand, those activities related to healthy lifestyles (which achieve the highest adherence in all groups) stand out especially among the group who knows the program in general.



Additionally, students considered that the GC program could enrich and improve their curriculum, as it would encourage greater involvement and commitment to sustainability (61%), open new job opportunities (23%), allow for greater specialization and differentiation from other similar training (23%), and add more value to their education (40%). Students are

aware of various inconsistencies in both the university and the centers and suggest that programs should reinforce the autonomy and initiative-taking capabilities of students.

3.4. Strategy to improve GC visibility among students and students participation

Regarding the implementation of FEE EcoCampus at UDC, as well as the difficulties found and the possible solutions, it would be important to compare the UDC experience with other Spanish and European universities participating in the same initiative. However, as indicated in Section 2, published papers about FEE EcoCampus are very scarce, having found only information related to the program at the University College Cork, but with little relation to the content of this study [9, 15]. A country that has an EcoCampus program implemented in many HEIs is Portugal [8,17]. These authors emphasize the importance of participatory aspects involving students, teachers, staff, and outside school community members. They also show that students are more participative in sustainability activities in the case of institutions that have these programs, but also that, from the students' perspective, there is still much to be done on the road to sustainability.

Regarding Spanish universities, Lo-Iacono-Ferreira et al. [14] proposed a methodology to define environmental key performance indicators to be easily applied and integrated in an existent EMS. This proposal may be an element of interest in the future for the consolidation of the GC program at the UDC. On the other hand, León-Fernández et al. [16] made proposals such as i) the creation of a debate forum on the main issues, strengths and weaknesses of the institution in terms of environmental management, and ii) enhancing expectations and generating proposals and action measures that are translated into process documents. These proposals would take advantage of participatory processes while strengthening them, which constitutes both a characteristic and a difficulty of the GC program at the UDC.

In fact, lack of participation not only stands out as one of the main challenges encountered in UDC-GC programs but is also usually mentioned in the GC program of the University of Vigo. Their published plans of action historically include participation, awareness, and environmental volunteering as one main objective, and their revision documents, although not fully updated, highlight generally trouble to engage students' participation [21,22]. Therefore, special attention must be paid to this issue due to its difficulties in overcoming it.

Based on the results presented in the sections above, together with the OMA-UDC's experience of coordinating the different programs, the authors of this article prepared a SWOT analysis of the GC program at the UDC (Table 2). SWOT analysis facilitates the development of overall strategies to correct weaknesses, address threats, maintain strengths, and capitalize on opportunities. In this case, the authors propose a strategy to improve the visibility of the GC among students and student participation that is supported by the WO components of the SWOT analysis (Table 2: weaknesses and opportunities), focusing on how to overcome internal weaknesses and take advantage of external opportunities.

Table 2. SWOT analysis for the UDC's GC program

STRENGHTS	- OMA-UDC and GC scholarship holders - Environmental committee at each center - ADEAC-FEE and media recognition (greenflags awards are usually covered in press) - Economic support by the OMA-UDC (ADEAC-FEE accession rate and requested campaigns, e.g., waste) - Centralized coordination of the OMA-UDC and advice
WEAKNESSES	- Unknown to the university community - Lack of interest in environmental issues - Time Incompatibility/Time Lack - Format of actions and activities not very attractive for student participation - Dispersed organization and disparate campaigns - OMA-UDC's lack of ability to monitor andcoordinate all programs - Inefficiency in implementing the action plan - Complexity, lack of awareness of the program and lack of specific training
OPPORTUNITIES	- To take advantage of scholarship holders for student outreach, especially for freshman students (message between equals) - Recognize the work of the environmental committee - Incorporate Service-learning methodology to UDC subjects - Sustainability included in the UDC strategic line - Sustainability regulations (decarbonization, energy savings, green purchase, waste...) - Promotion of beach cleaning and other fashionable actions among students
THREATS	- Institutional 'abandonment', without financial or personal resources - UDC TRS and ASS with little time available to get involved - Few people involved, disappearing environmental committees - Low participant involvement - Diversity of similar environmental and sustainability offices in the UDC (which recruit people for similar actions, e.g., OCV for SDG, Sustainability Campus with training courses, and talks, OMA-UDC with environmental volunteering and other environmental training)

The lack of knowledge of the program and the low participation on the part of students can be improved directly by recognizing their specific participation and, potentially, the role of scholarship holders as leading means of communication with students, as well as adapting the format and themes of activities to the interests of this group. Meanwhile, more general strengths will help to consolidate the program and will also influence greater students' responsiveness.

On the other hand, the OMA-UDC must prioritize the improvement of the program and ensure support for the most active programs and committees (or those potentially activable), which will enable the main weaknesses to be overcome. This strategy will be proposed to the GC committees at the ordinary coordination meeting at the start of the 2023-2024 year.

4. Conclusion

UDC's GC program is an example of how sustainability in higher education institutions can be approached from a bottom-up perspective and incorporating a diversity of sustainability topics. The participation corresponded in the first place to the TRS members, followed by the students and finally the ASS members. External agents have also been involved in some cases. The students' knowledge of the program is not sufficiently high, although the vast majority of them are able to identify sustainability actions in their school. The involvement of students in the GC was identified as one of the main challenges, highlighting the need for better dissemination of activities as well as recognition of participation. As in the case of the students, the participation of TRS and ASS members was fundamentally voluntary, so the need for their recognition was also pointed out. Nevertheless, the program received a good overall rating from participating staff and students, but continuous improvement must lead GC actions.

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