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An evaluation of the 'Red Andalusia Ecocampus University of Malaga' environmental education programme

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Abstract

Training university students so that they become professionals who will promote an improvement in the relationship between socio-economic activity and the environment is one of the main challenges in higher education. Thus, it is important to evaluate the Environmental Education Programmes offered by public institutions to the university community. The objective of this research is to assess the impact of the 'Red Andalusia Ecocampus University of Malaga' Programme in relation to the involvement of the university community in the environmental sustainability of its setting. A mixed methods design was used. Research participants included teachers, students and administrative and service staff at different research and training centres of the University of Malaga ($n = 387$). The results in this research work reveal that this Programme has an effective methodological design when it comes to acquiring concepts and strengthening environmental values in the university community.

Keywords: Environmental education, programme evaluation, sustainability, higher education.

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1. Introduction

The present study is based on a theoretical frame of the reference related to the values and attitudes provided by Environmental Education in the university environment and its contribution to the conservation of the natural environment. Training and qualifying managers, planners and decision-makers so that they orient their values and behaviour towards a harmonious relationship with nature is a crucial challenge in Education (Novo, 2009).

According to Lara (1990), in any Environmental Education activity, the best way for participants to understand environmental problems is to approach them directly through a local situation, and its conclusions and analysis should connect with global perspectives, bearing in mind that there are multiple interactions in all the environmental issues. According to Gonzalo, Sobrino, Marin, Benitez and Coronado (2017, p. 85), 'the differentiating factor of sustainability competencies is the inclusion of action for transformation in order to achieve change in education for sustainable development'.

Environmental Education is education for action. It can be carried out through volunteer activities related to solving problems that occur on our planet. According to Rivarosa and Perales (2006), the design of a programme of activities as a learning sequence to promote skills and attitudes around a specific environmental problem facilitates the analysis of different approaches, and even the development of a possible solution to the conflict presented with a certain level effectiveness and durability.

Andalusia is a region of Spain home to a great diversity of landscapes and an extraordinary fauna and flora biodiversity. A significant part of its territory is included in a network of protected natural spaces in Europe, 'Red Natura 2000'. In view of this, it is important to properly value Andalusia's natural heritage to promote the social, economic and cultural benefits of habitat conservation and improve public knowledge and appreciation through awareness-raising and volunteer actions that contribute to solving environmental problems.

UNESCO, the lead agency for the United Nations Decade of Education for Sustainable Development (DESD, 2005–2014), promotes the creation of educational resources to improve our relationship with the natural environment. The involvement of the university community in the promotion of environmental sustainability (social, environmental and economic) is the fundamental as it is a key sector of society with great potential to have an impact on the improvement of our human relationship with the natural environment based on the professional responsibilities of its members (Gutierrez, Benayas & Calvo, 2006). More and more universities are incorporating environmental sustainability in their management. However, its inclusion in the university syllabus and in the different lines of research it carries out continues to be a challenge in the context of effectively involving universities in the achievement of the sustainable development goals (SDG) defined by the United Nations and which include the 2030 agenda (United Nations, 2015).

In November 2016, the European Commission set out its strategic approach for the implementation of Agenda 2030, including the SDG (United Nations, 2015). In line with this commitment, the SDG are included in each of the European Commission's 10 priorities. The University is a key agent of society transformation, one of its main functions being to shape new attitudes and behaviours compatible with the conservation of the natural heritage. Within the scope of their corporate social responsibility, universities must commit themselves to achieving these Objectives for Sustainable Development, prioritising the establishment of strategies that connect the university community with environmental problems (Escolano, 2006; Losada, 2018). According to Leal Filho (2009) and Rieckmann (2017), education for environmental sustainability is a process of continuous training aiming at promoting an informed and involved society that develops creative skills for solving environmental problems. The European Higher Education Area is increasingly involved in the growing environmental problems in its territories through the development of initiatives such as the establishment of different university networks to promote sustainable development in higher education. An example of this is the Network for the Training of Environmental Education Professionals (CAPEA, Spanish acronym), which aims to

link Ibero-American and Spanish university centres to deal with regional and local problems related to climate change, pollution and the responsible use of water within the main areas of influence of the participating universities (Martin & Tojar, 2013).



Figure 1. Participants in the 'Red Andalucia Ecocampus Universidad de Malaga' programme

2. Purpose of the article

There is an assessment deficit in terms of the effectiveness of carrying out programmes and actions for environmental awareness and volunteering in the university environment. Extracurricular university activities play an important role in connecting students to the reality of their immediate natural environment and reflecting on the impact of their daily habits on environmental sustainability. It is important to analyse the different proposals and criteria frameworks that guide the development of basic sustainability skills in university training processes (Gonzalo et al., 2017; Murga-Menoyo, 2015; Ull, 2014).

Higher education plays a fundamental role in the transformation of society, with this educational experience of the Smart Campus Vice-Rector's Office of the University of Malaga is focused on environmental awareness and the conservation of the natural heritage of its provincial environment.

The Environmental Education Programme 'Red Andalucia Ecocampus University of Malaga', carried out during the academic year 2017/2018, promotes the participation and ecological awareness of the university community of Malaga (teachers, students and administrative and services staff).

Specific objectives:

- Encourage the development of programmes and actions for training and environmental awareness and environmental volunteering, in the university environment.
- Construct an environmentally coherent university model through participatory processes and intervene on campus and in other nearby environments to evaluate and improve its environmental quality.
- Reinforce the role of sustainability classrooms and green university offices in the design and development of environmental programmes in this area.

Action Research methodology have been used. Initially, the participants made a diagnosis of the environmental situation of the University Campus and Areas of Special Conservation of the province of

Malaga, highlighting their natural values and making proposals for a sustainable use of their resources. For this, they have worked in small groups recording data and collecting photographic evidence in the environment. Finally, a pooling has been carried out to exchange experiences and establish proposals for priority actions.

This research presents an assessment of the results of the 'Red Ecocampus Andalucia Universidad de Malaga' Programme, promoted by the regional government of Andalusia within the framework of the European regional development funds for the period 2014–2020. The main purpose of this Programme is to increase the university community degree of knowledge and awareness regarding the main threats derived from human activity which affect the habitats included in the protected natural spaces of the Natura 2000 Network, located in the area of influence of the University of Malaga. The importance of the conservation of these protected areas for the preservation of biodiversity is also highlighted. To this end, voluntary work, awareness-raising and environmental information actions have been carried out on the university campus and in the natural environment. The university community of Malaga includes a great diversity of academic areas, a faculty that carries out different lines of research that can be applied transversally to environmental sustainability, a large student body and a large administration and services staff. Therefore, it is important to assess the effectiveness of environmental activities that could create synergies across the university community.

With the purpose of understanding the impact of the 'Red Ecocampus Andalucia Universidad de Malaga' programme and to assess the involvement of the university community in the environmental sustainability of its environment, both on the university campus and in the protected natural spaces included in the NATURA 2000 European Network, the following research questions were proposed: Do the participants improve their knowledge and attitudes in relation to environmental sustainability? Is a collaborative involvement of the university community in the conservation of the environment encouraged?

Teachers, students and administrative and service staff from different teaching and research centres of the University of Malaga ($n = 387$) participated in the 'Red Andalucia Ecocampus Universidad de Malaga' Programme and carried out the following information, education and environmental volunteering activities during the 2017/2018 academic year.

Table 1. Typology of activities and number of participants in the 'Red Andalucia Ecocampus University of Malaga' programme

Typology of activities	Number of women	Number of men	Total
Workshops on environmental volunteering in Red Natura 2000 protected areas.	43	73	116
Conference on environmental awareness-raising in Red Natura 2000 protected areas.	57	95	152
Thematic meeting on environmental information and awareness-raising at the university campus.	40	33	73
Participatory biodiversity conservation project on campus.	25	21	46
Total	165	222	387

3. Methods

A mixed methods research strategy was applied, and the guidelines recommended by Leon and Montero (1993) for obtaining and contrasting data through surveys for research in education were adopted. The survey was designed using incidental non-probability sampling techniques. The results of the application of a questionnaire—in Likert scale format (minimum: 1 and maximum: 5)—are presented through a descriptive statistical analysis. This questionnaire also included identification issues and an open-ended question to obtain qualitative data.

The questionnaire was designed in relation to the objectives of the 'Red Andalucia Ecocampus Universidad de Malaga' Programme. The questionnaire measurement reliability was assessed with Cronbach's alpha (0.67, acceptable internal consistency). The sample size was 387 (60.1% men and 39.9% women). The participants were heterogeneous in terms of age (31.88 years on average with a high standard deviation of 13.97), diverse in terms of academic discipline training, as would be expected given the plural nature of the university community of Malaga, and consisted of teaching staff, students, administrative and services staff of different educational centres as well as researchers. Nearly, 51% were between 18- and 30-year old (mostly students). Nearly, 26% were over 50 years of age (mostly teachers and administrative staff). The remaining age groups are minority: 14% are between 31- and 40-year old and 9% between 41 and 50-year old.

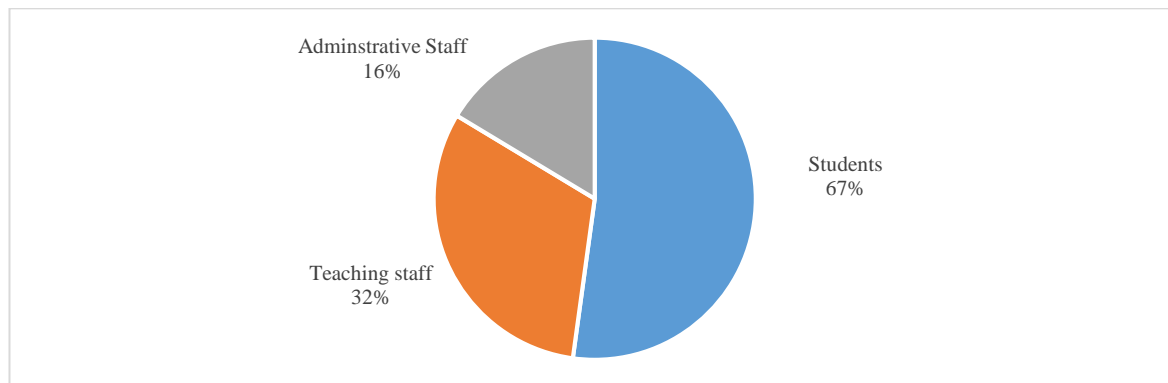


Figure 2. Percentage of university community participation

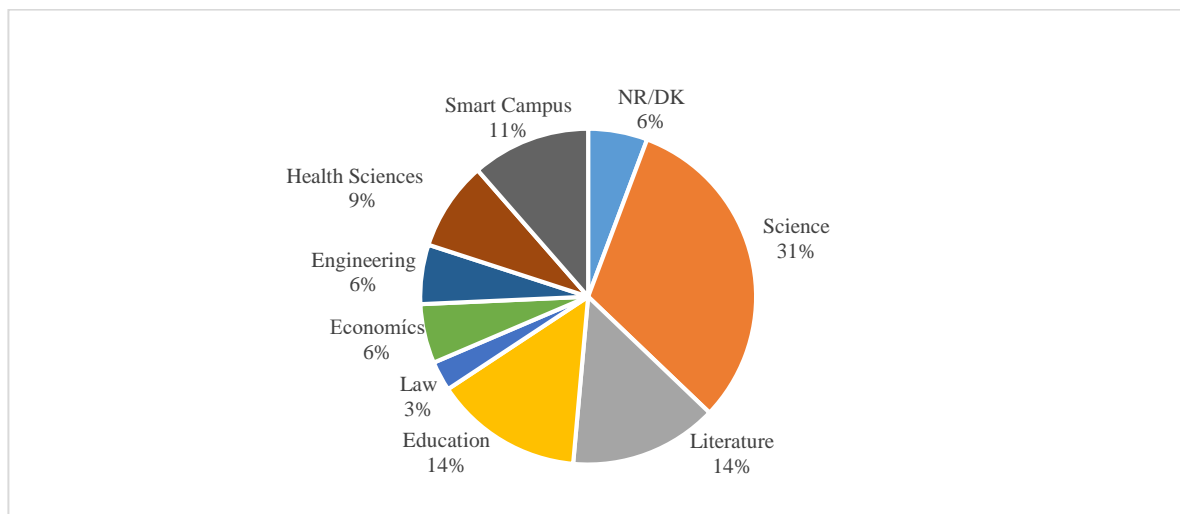


Figure 3. Origin of University community participants

The results reveal that the origin of the participants was highly diverse. The majority were students from the University of Malaga, followed by teaching and administrative staff. Most of the participants come from Science and Education; these two groups add up to 45% of the total participation.

4. Results

A summary of the results obtained is given below. First, the descriptive results are detailed. Table 2 shows the items of the questionnaire (1–5 scale) with the mean and standard deviation values obtained.

Table 2. Results of the questionnaire items

Questions	Mean	Standard deviation
1. Was the information provided sufficient and correct?	4.70	0.52
2. Have my personal environmental knowledge and skills improved?	4.68	0.57
3. Have adequate materials and resources been available?	4.68	0.59
4. Have the activities been well designed?	4.67	0.50
5 Was there a good relationship between the participants?	3.42	1.37
6. Would it be interesting for activities like this to be continued in the future?	4.93	0.29
7. To what extent are you concerned about the environment, and are you aiming at preserving it with your behaviour?	4.41	0.70

The results in Table 2 demonstrate the efficiency of the programme. Almost all the values of the elements of the questionnaire scored above four (maximum five). The most highly rated element is the one that refers to the need for this type of activity to continue (4.93), also with a very high agreement of all participants, i.e., with a very low standard deviation (0.29). At the other extreme is the least valued element, the relationship between participants, which, while having an acceptable score, does not reach a 3.5 mean. This modest rating is the result of the answers given by the teaching and administration staff, who value the relationships between participants with a mean of 3.0 and 3.2, while the score in the case of students is a 3.7 mean. Therefore, the standard deviation of this element is the highest (1.37).

Other items that obtained a high value are those that refer to the adequacy of the information provided (4.7), and to adequate materials and resources (4.68). Special mention should be made of the score of the element related to the improvement of the participants' environmental knowledge and personal skills. This last item has a 4.68 value with relatively low heterogeneity (0.57).

Qualitative assessments can be classified into different categories, the 'sensitisation and awareness-raising' (SC) standing out. Within this category, opinions regarding the 'importance of protected natural spaces for society' (SC1), 'importance of taking care of the environment' (SC2) and the 'role of citizenship in the care and conservation of the environment' (SC3) are gathered. Another important analysis category is 'interdisciplinary and intergenerational collaboration' (CII). It includes assessments of the 'enriching and productive nature of interdisciplinary collaborative work' CII1 and the 'opportunity for the entire university community to work together' (CII2). The third category worth noting in the analysis of qualitative assessments is the 'appeal to action' (AA). This category includes ratings, such as 'intention to volunteer' (AA1) or 'interest in joining environmental associations' (AA2). As seen in Figure 3, awareness (SC) has a reciprocal relationship of influence with AA. Intergenerational cooperation promotes awareness (SC) and maintains a reciprocal relationship with AA. The latter category (AA) is key to fostering intergenerational and interdisciplinary collaboration (CII) and sensitisation and awareness-raising (SC)

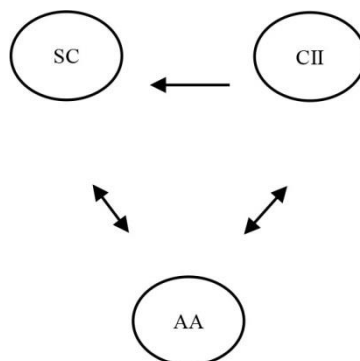


Figure 4. Relations across qualitative categories

5. Discussion, conclusions and recommendations

In terms of the results obtained, the high valuation of the information received is worth highlighting, as well as the acquisition of knowledge and personal skills in relation to environmental sustainability. Although the academic and professional realities of the university community are highly diverse, similar responses were obtained in relation to concern for the environment and willingness to participate in its preservation with personal behaviour. Likewise, the design of environmental training, awareness-raising and volunteer activities was highly valued by the participants.

Particularly noteworthy among the results was the good relationships developed between the university community of students, faculty, administrative and services staff. In the open response to the questionnaire, many participants described this opportunity to work together as a university community in Malaga in favour of the conservation of protected areas and biodiversity on the university campus as 'very positive'. These results are supported by studies such as Huelmo (2016), who highlights the importance of intergenerational cooperation for environmental knowledge. The willingness to create stable groups of university volunteers and to register in environmental associations is very positively valued. The relationships between the categories built based on the qualitative assessments of the participants are evident. Environmental awareness and sensitisation (SC) is fostered through CII. Both categories favour AA to make collective behaviour decisions that promote sensitisation and environmental awareness raising (SC).

The comments gathered in the evaluation assemblies and in the different surveys analysed, in relation to the Conduct of awareness and environmental volunteering in protected natural spaces, show that the participants have become aware of the importance of conserving biodiversity and geodiversity in these natural spaces.

The information transmitted to the participants has been tried to adapt to all type of university public, although, and since many of them belong to faculties and schools not directly linked with the knowledge of the environment, part of this information has been totally new for some of them. So, the explanations may have been a bit more difficult to follow. Even so, a high percentage of participants evaluate it with the highest score. At the time of the general assessment by the participants, no major differences have been detected the activities carried out so far.

Regarding their participation in the Environmental Awareness Days, the contributions and initiative in the group activities has highlighted, as well as the assessment they have made of the environmental services that these protected spaces offer to the local population and visitors.

The survival of natural heritage is not possible without achieving a high degree of citizen involvement, especially in the area of the local population of natural areas and the habitats of protected species. It is crucial to ensure knowledge, positive evaluation and above all the citizens' pro-environmental action.

The results obtained show that the 'Red Andalucia Ecocampus University of Malaga' Programme has an effective methodological design for acquiring concepts and promoting environmental values in the university community. Furthermore, the importance of encouraging the carrying out of participatory (Varela-Losada, Perez-Rodriguez, Alvarez-Lires & Alvarez-Lires, 2014), cooperative (Garcia-Moreno, 2017) and interdisciplinary (Huelmo, 2016) environmental activities within the university is worth noting, as well as the usefulness of this programme for the interpretation of problems related to the sustainable development of the territorial environment of the University of Malaga. The relationships that have been established among the university communities while carrying out environmental activities can create synergies and stable commitments to environmental sustainability, and can also have a positive impact on the promotion of new everyday behaviours and more sustainable lifestyles on the university campus itself.

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