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**EVALUATION OF THE PROGRAM "CHANGE MY MODEL OF**  
**CONSUMPTION"**

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*Abstract*

This study evaluates the content, didactic resources and methodological dynamization of the “Change my model of consumption (*CamBio mi modelo de consumo*)” Environmental Education program. The objective of this program is that participants discover the importance of reducing the generation of waste in their daily behavior to preserve natural resources and not jeopardize the satisfaction of the needs of future generations. We start from a theoretical frame of reference which includes fundamental aspects related to the contribution of environmental education to sustainable development as one of the main challenges of today’s society. A mixed methods design (quasi-experimental quantitative and qualitative) has been used, which has taken into account the participation of students and teachers of Compulsory Primary and Secondary Education. The results obtained show the transversality and relationship of the contents of the evaluated program with those that are taught in these educational levels. For this reason, it is considered that the research carried out can be useful to promote the participation in non-formal environmental education activities that are offered by public or private entities to the educational system in the school environment.

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## 1. Introduction

The creation of a new model of relations between the environment and human beings has become one of the great challenges of our society. From this perspective, the need to undertake pro-environmental actions aimed at achieving the sustainability of human development and all forms of life that interact and live on our planet arises. Responsible consumption is a strategy to adjust individual and collective consumption patterns to the rational and efficient use of resources, incorporating sustainability principles and criteria that make consumers aware of their co-responsibility towards conservation and environmental protection. Thus, current European environmental policies advocate replacing a mainly legislative approach with a strategic one that encourages shared responsibility and citizen participation, promoting the modification of certain behaviours and consumption habits (Rodríguez, Gómez, Zarauza, Benitez, & Equipo de IMAGINA, 2013). Acting responsibly and as conscious and critical consumers involves a series of commitments (Quirós, 2008):

- To be critical of our own consumption patterns and lifestyle, taking into account ethical values.
- To require information on the social and environmental conditions in which a product or a service has been brought to the consumer and what the consequences are.
- To reduce consumption –as an ethical and ecological option – and to choose a model not based on the possession of material goods, which has an environmental and social impact.
- To practice consumption that respects the environment, reducing, reusing and, finally, recycling and consuming more sustainable or fair-trade products.
- To practice an equitable consumption based on solidarity, respecting people and cultures and avoiding discrimination and exploitation.

The new 2030 Agenda for Sustainable Development (United Nations, 2015) recognizes the importance of an adequate educational response. Specifically, one of its objectives (SDG 12) focuses on “guaranteeing sustainable consumption and production patterns”. These objectives aim at students acquiring knowledge about responsible production and consumption patterns, as well as the interrelation between production and consumption (supply and demand, toxic components, CO<sub>2</sub> emissions, waste generation, health, working conditions, poverty, etc.).

Within this panorama, environmental education plays a fundamental role in favouring the clarification and creation of values, the discussion of alternatives, the acquisition of skills and competences to act on problems on environmental issues, as well as in the mediation and resolution of socio-environmental conflicts. Education is also here understood as a process of continuous learning that can occur in various educational scenarios, covering any period and aspect of life. The strategies, therefore, must be multiple and transversal: impact on the formal educational system as a whole, communication campaigns directed to the general public, programs destined to the business and union sector, development of a participative environmental management on the part of administrations, integration of education in development plans, implementation of projects by associations, use of environmental interpretation techniques in leisure and recreation contexts, etc. (Centro Nacional de Educación Ambiental, 1999). From the formal educational system, the transversality of environmental education is determined by the educational themes that respond to different social problems (health, coeducation, consumption,

environment, etc.), and that are present in all the curricular areas of primary and secondary education (Moreno-Latorre, Molins-Palanca, Padilla-Bautista, & Boisset-Castell, 2017). In this line, environmental education programs – as a complement to formal education – seek to empower students and equip them with strategies, tools and resources that allow them to acquire habits of sustainable and responsible production for the environment and society. The present work lays out the results of a program of activities based on environmental pedagogical itineraries as a learning sequence to develop capacities and attitudes around a specific socio-environmental problem, covering different approaches and even proposing a solution to the conflict presented that could be effective and sustainable in time.

## **2. Problem Statement**

The social functions of educational systems are the preservation and critical transmission of knowledge, culture and social values to new generations, the revelation of individual capacities, and the increase of the knowledge base of our society (Bricall, 2000). The progressive concern for environmental problems and the growing need for contact with the natural environment do not automatically translate into changes in society-environment relations. Therefore, it is necessary to promote values and consumption habits compatible with environmental conservation and sustainable development. Thus, it is essential to promote the involvement of teachers in the implementation of Environmental Education Programs (Santana-Esponda & Ortega-Vera, 2010).

Environmental education plays an essential role in the formal educational system. Thus, environmental education has to be based on the fundamental role that people and social systems must play in relation to environmental issues, and the possible solutions to this situation. Likewise, it is essential to discover a critical and constructive vision of participation in the search for a life in harmony with the environment in which we live and committed to the solution of local environmental problems with global impact. Environmental education must be an instrument that works in favor of a sustainable way of life, in the construction of a new model of society based on the principles of sustainability.

## **3. Research Questions**

The evaluation of the Environmental Education Programs that are offered by public institutions to educational centres is important in order to estimate their effectiveness in improving their impact on the attitude of the participating students and their ability to put into practice values that favor the conservation of the natural environment. Therefore, the following research questions have been raised in the present study:

- Do the participants in the activity increase their knowledge and understanding of the environmental problem of waste generation?
- Can participation in an environmental education program lead to changes in consumption habits as a preventive or corrective action of climate change?

#### 4. Purpose of the Study

The present investigation has evaluated the effectiveness of the environmental education program called *CamBio mi modelo de consume*, a pedagogical itinerary designed to reflect on the environmental impacts and the influence on climate change of our consumption habits. It is an activity framed in the “Green Passport” citizen awareness campaign of the City of Malaga.

This environmental education activity takes place on a sign posted path located in the natural environment of the “*Los Ruíces* Environmental Centre, where solid urban waste is processed for recovery and disposal. This place has high plant diversity, and there are also protected species such as the Common Chameleon present in the area. Thanks to its panoramic position, the viewing areas on the path allow an analysis and interpretation of the landscape and human activities in the urban environment. This environment also has a sea container which has been recycled and enabled as an eco-classroom equipped with didactic material and wind and solar energy to cover all its energy needs. Environmental educators, following a predetermined path, interpret the most important milestones along the route and encourage conversation about the centers of interest. A series of explanatory panels is arranged at different strategic points of the marked itinerary. During the tour, observation and data recording activities are carried out on the landscape, fauna, vegetation, anthropic use of natural resources and environmental problems.

#### 5. Research Methods

The research uses a mixed methods design in which quantitative and qualitative methods are combined to perform various studies. Likewise, the recommended guidelines for obtaining and contrasting data for education research have been adopted, as indicated by Leon & Montero (1993).

This paper presents the results of the elaboration, validation and application of a questionnaire. The questionnaire was designed with 10 items in a Likert scale format, a series of identification questions and two open questions (qualitative). The questionnaire was constructed based on the objectives of the applied environmental education program, including five items related to perceptions on various environmental issues before the program was carried out (pre), and another five items to respond to after the application of the program (post).

The sample unit corresponds to a class or classroom of a certain educational level; therefore, it consists of homogeneous groups in terms of age and cultural level. The questionnaire was applied in a pilot study to a sample of 200 students (83 male and 117 female) of Primary and Secondary Education in five educative centers that participated in the program *CamBio mi Modelo de Consumo* in the 2017/2018 academic year. Students’ mean age was 13.67 years old (SD = 2.13). The students were in the second cycle of Primary Education (34.3%) and Secondary Education (65.7%).

A Cronbach’s alpha of 0.64 was obtained (acceptable internal consistency) for the questionnaire measurement. A factor analysis of the main components was also carried out. The conditions of application of the factor analysis were fulfilled (KMO = 0.68, Bartlett’s Test of Sphericity with a  $\chi^2 = 248.34$ , with 45 df. and  $p \leq 0.0005$ ). The factor analysis showed a structure of three components that explained 51.44% of the variance. The three components were consistent with the structure with which the questionnaire was designed (previous knowledge, energy saving behaviours and aspects that influence climate change).

Descriptive analyzes were carried out (frequencies, percentages, means and standard deviations) and t-tests of differences of means, using gender and educational level as a comparison variable. All analyses were carried out with SPSS Statistics V22.0.

## 6. Findings

The following is a summary of the results obtained. The descriptive results are first set out. The results of the comparison of means analysis (*t* tests) are then presented.

### 6.1. Descriptive results

Table 1 shows the items of the questionnaire (Likert scale from 1 to 5) with the mean and standard deviation values obtained.

**Table 01.** Means and standard deviations for the questionnaire items

Element	Mean	Standard Deviation
1. Did you learn things about climate change in your classes?	3.39	0.96
2. Did you learn things about climate change in other activities outside of class (excursions ...)?	3.01	1.07
3. Did you learn things about climate change in your home?	2.86	1.18
4. Did you think that climate change was a serious problem?	4.14	1.15
5. Have you thought about the fact that what you consume at home could affect climate change?	3.67	1.19
6. Do you think that there is a solution to the problems of climate change?	3.99	0.97
7. Do you think it is important to turn off lights and unplug electronic devices when you are not using them?	4.52	0.80
8. Do you think it is important to use the bicycle, or public transport, to reduce climate change?	4.29	0.86
9. Do you think about not using disposable plastic bags, or reducing your consumption of products with excessive packaging?	3.77	1.10
10. Do you think it is important to use solar and wind energy to produce electricity?	4.23	0.93

As shown in Table 1, before carrying out the environmental education program, students say they had learned more about climate change in their classes (item 1), than in other activities (item 2), or in their homes (item 3). It is also striking that one of the most strongly valued items is the one that refers to the severity of climate change (4.14 out of 5). After doing the program, students are in agreement with the taking of certain measures: turn off lights and unplug electronic devices when they are not in use (4.52), the use solar and wind energy to produce electricity (4.23), and the use of the bicycle, or public transport to reduce climate change (4.29). The reduction of the consumption of products with excessive packaging and not using disposable plastic bags is supported slightly less strongly (3.77). One of the most significant results is undoubtedly the belief that the problems of climate change can be solved (3.99).

## 6.2. Comparison of means: gender and educational level

T tests were carried out linking all the items of the questionnaire with gender and with educational level (Primary and Secondary Education). Regarding gender, no significant results were obtained. Thus, it is not safe to claim that there are differences in opinions between boys and girls.

Regarding educational level, some significant differences have been observed. For example, Secondary Education students learned more about climate change in their homes (Mean = 3.03) than in Primary Education (Mean = 2.52). This difference is significant with  $t = 2.86$ , with 192 df. and  $p = 0.005$ . A similar situation occurs with the perception of the severity of climate change. The students in Secondary Education thought that it was more serious (Mean = 4.33), than the ones in Primary Education (Mean = 3.77). This difference is significant with  $t = 3.30$ , with 192 df. and  $p = 0.001$ .

Another statistically significant difference occurs with the possible solution to climate change. On this occasion, the students in Primary Education are more optimistic (Mean = 4.30). Secondary school students also think that the problems of climate change can be solved, although to a lesser degree (Mean = 3.83). This difference is significant with  $t = 3.28$ , with 194 df. and  $p = 0.001$ .

## 7. Conclusion

According to the results of the survey carried out, and in relation to the questions of the present investigation, the following conclusions stand out:

Participation in the Environmental Education Program *CamBio mi modelo de consumo* generated practical learning and understanding of contents, highlighting the usefulness of the activity for the interpretation of environmental problems in formal education. Likewise, we consider that the use of this resource can easily support teachers' daily work and the student training process.

The results clearly indicate that participation in the Environmental Education activity has a positive impact on the attitude of students in terms of encouraging them to develop a form of personal consumption that makes responsible use for natural and energy resources, thus reducing their waste production and collaborating with the protection of nature and the mitigation of climate change. The participants who most value the need to take energy saving measures coincide with those who have more information about the energy problem. The comparison of the responses of the students in primary and secondary educational levels –who come from different schools – has revealed similar answers in relation to the high-level importance that they give to taking actions to reduce climate change.

Thus, it can be concluded that this Environmental Education Program presents an effective methodological design for acquiring and constructing concepts and enhancing environmental values in formal education.

We hope that the research carried out may be useful in promoting the use of the non-formal teaching resources offered by public or private entities, which seek to promote a curricular connection in collaboration with the teaching staff as the main agent of interpretation for students, Sauvé (2004).

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