

*ErasmO VELÁZQUEZ CIGARROA**,
*Natalia Helena SÁNCHEZ JARQUIN, María Luisa MONTOYA RENDON*¹

AGROECOLOGY AND HIGHER SECONDARY EDUCATION: EDUCATIONAL PRACTICES FOCUSED TO CURRICULUM GREENING

SUMMARY

The problem of the environmental pollution and the indiscriminate abuse of natural resources as a result of the human practices, have affected many parts of the world through the global warming. In the last few decades it has been observed that climate variation affects to diverse ecosystems; the increase or decrease of the temperature in geographical zones that use to have a constant temperature, the water shortage, droughts and floods in places where these phenomena did not occur, are some examples caused by the irresponsible human actions. Although it is acknowledged that the large majority of the countries has a capitalist economic system has been an important cause of the environmental deterioration, is possible to make a change starting with social groups to replace these habits of consumerism and to raise awareness about care and environmental conservation. Against this background, as educational institution as an agent for change it is proposed the development of a curricular proposal that links the agroecology disciplinary knowledge in educational practices. A curriculum greening is achieved through the curricular contents of the subjects offered at high school, where the entire school community participates on sustainable practices that encourage their development and a students comprehensive education. In this paper, we present the case of the development of this project in the No. 100 Official High School, located in Texcoco, Mexico, likewise, demonstrates the progress, issues and challenges that have arisen

Keywords: Agroecology, environmental education, curricular environmentalization, curriculum greening, sustainability.

INTRODUCTION

A society is a group of people who share a common habitat and depend on each other for their survival and well-being. The culture of a society tends to be similar in many aspects from one generation to another (Harris, 2001, Miranda, 2013). Neighboring societies may have both very similar cultures and very

¹ErasmO Velázquez Cigarroa* (corresponding author: erasmO.vcigarroa@gmail.com), Natalia Helena Sánchez Jarquin, Department of Rural Sociology, Chapingo Autonomous University, MEXICO; María Luisa Montoya Rendon, Faculty of Public Health, University of Antioquia, Medellín COLOMBIA

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different cultures. The enculturation, according to Harris (2001), focuses on generational control transmissible from parents to children or the elderly at younger ages. Given this, the environmental culture, for the purposes of generational transmission, conceives a set of attitudes, behaviors and environmental knowledge that a person has (Kilbert, 2000). People can formulate appropriate values, norms, and codes of conduct for the development of their daily activities (Harris, 2001).

Therefore, culture is an inherited characteristic of human beings. For Harris (2001), González (2018) and Miranda (2013), every culture is an environmental culture because it can be defined as the way in which social groups relate to their environment within a symbolic and practical way. In fact, the environmental culture is manifested in each society lifestyles (González, 2018). Since its appearance, humans have transformed its environment and have transformed himself. But what repercussions exist in the environment when there is no sustainable relationship between the practices of a culture and the transformation of nature by human beings? Undoubtedly, humanity has walked contrary to the laws of nature and its ecological processes, because the management given to organic and inorganic matter as a polluting waste deteriorates the environment and causes diseases. In this sense, the human being, in his eagerness to achieve the mastery of nature and the subjugation of those of his own species, appeals to instrumental reason to justify the means that have served to fulfill his purposes. Science achieves its task of dominating nature but causes the oppression of man, who, in his intention to be the master of nature, ends up getting rid of it (Adorno and Horkheimer, 1988).

This is reflected in the high rates of waste generation associated with deficiencies in collection and treatment services that are a source of negative impacts; the inadequate disposition of the material linked to an incorrect separation is causing proliferation of plague species, bad odors, formation of toxic gases, fumes and dust that contribute to the contamination of ecosystems (Velázquez et al, 2017). Therefore, it is considered, as an alternative, to resort to the state of knowledge of agro-ecology, interdisciplinary linking agronomy, and ecology is responsible for the development of agricultural techniques oriented to an environmental approach (Granados and Lopez, 1996). From this interdisciplinary, the concepts of the ecosystem (environment), agro-system (modified ecosystem) and eco-technology (sustainable use technique) are immersed. Agro-ecology is a field of knowledge generated in the last decades of the twentieth century, we cannot currently refer to Environmental Education (EE) if this interdisciplinary approach is not contemplated, which leads to the analysis and understanding of ecological and biological bases (Victorino et al. , 1992). The knowledge and application of these terms are of great importance for the development of educational practices oriented towards “Curricular Environmentalization” (CE) in the educational plans and programs, reflected in the teaching practices.

At the international level, the first advances in CA were made in countries such as the United States, Canada, Australia and the United Kingdom (Sterling and Scott, 2008). In Colombia, efforts in environmental education in higher education began in the seventies with the introduction of studies of ecology and the environment, as well as the conservation of natural resources (Pabón, 2006, Gómez and Botero, 2012). According to Gómez and Botero (2012), in the eighties, professional training programs were established in the environmental field, incorporating this subject in other professions and disciplines. In a qualitative study carried out in three institutions in Colombia (National University of Colombia-Headquarters Medellín, Universidad San Buenaventura-Sede Medellín and the National Service of Learning) in 2012 on the degree of incorporation of the environmental issue in the educational curriculum, reflected advances achieved in the search for the environmentalization of their mission processes and that these processes should seek the adoption of pro-environmental principles that guide the institutional practice, promoting greater awareness and participation of the entire community (Gómez and Botero, 2012). According to Gómez and Botero (2012), in the eighties, professional training programs were established in the environmental field, incorporating this subject in other professions and disciplines. In a qualitative study carried out in three institutions in Colombia (National University of Colombia-Headquarters Medellín, Universidad San Buenaventura-Sede Medellín and the National Service of Learning) in 2012 on the degree of incorporation of the environmental issue in the educational curriculum, reflected advances achieved in the search for the “environmentalization” of their mission processes and that these processes should seek the adoption of pro-environmental principles that guide the institutional practice, promoting greater awareness and participation of the entire community (Gómez and Botero, 2012).

This paper presents the evolution of the planning and execution of an intervention project whose main objective is to promote Environmental Education (EE) in educational institutions through the curriculum. Thanks to the follow-up of this project, we can appreciate the real impact that the development of these actions has generated in a group of high school students, who participated in the academic activities of this project (Velázquez and Blanc, 2018).

MATERIAL AND METHODS

From a qualitative approach, two methods of this nature were considered. The first is the documentary research that leads to the theoretical review which allows to identify the conceptualization of culture and how it can move towards an environmental culture and in turn, sustainable. In addition, it was important to consider linkages between this concept with the CE matter and its agroecological relationship. The second is the use of participatory action research, since the researcher is involved as coordinator of the intervention project, conceiving it as a set of systematically planned actions, based on needs fully identified and

oriented to goals that respond to what happens, which must contain theoretical elements that support it (Rodríguez *et al.*, 1990). This involvement allows you to guide the search, refer to the research and give a close follow-up that gives you more information about the development of the project.

To make the analysis as part of this study, the systematization method was used. The fundamental principles of this methodology are the following: the analysis is based on a set of indicators, is directly related to the evaluation of the experience, consider goals and objectives to determine levels of progress or success; the evaluation of the experience is carried out through the representation of opinions, judgments, and questions of what has been done and what was lived (Chávez, 2006). In this work, a critical opinion is extracted about the experiences of the development of environmental culture in the institutions of upper secondary education and when evaluating it, we obtain evidence of the advances of a CE, under an agroecological approach, in the educational practices.

The research instrument to obtain information and with this guide, the analysis based on the application of a questionnaire, designed based on the instruments made in the diagnosis for the implementation of the EPO 100 project towards sustainability in September 2016. This questionnaire is made available to previous and current students who have participated in the project, through a database with information to contact them (name, email, Facebook account), In addition, from the beginning of the project, an account was created Facebook called "EPO 100 towards sustainability", in which information related to the project was published and followers interacted with their comments and dissemination of this page. With this, it allows having a fairly broad view of the impact of learning activities, under the EE approach, on the environmental culture of the students. The project began in September 2016 and is still ongoing. So this questionnaire highlights the vision of the CE that students have at this point in the project, comparing them with the perspective they had before participating in this project of educational intervention. With this instrument, one can consider a perception of the average environmental culture of high school students after participating in sustainable practices in the school setting (Velázquez and Blanc, 2018).

The procedure used in the development of this questionnaire was through a digital application called *surveymonkey.com*, the participants accessed the survey through this link <https://www.surveymonkey.com/r/Q8BZYBH>. In this program, the questions are designed and the link is sent to the participants who have a social network or email to answer it. The information obtained is graphed and ordered by the same application.

This questionnaire was applied on May 3, 2018, and the results of the first 84 students surveyed were trained, of the 840 students (number of students and alumni who participated in this project) to whom this instrument was sent for their participation via email and through the use of the social network Facebook page <https://www.facebook.com/epo100.com.mx/> where they are followers. With this, an analysis of their opinions and their relationship with the sustainable

practices that they have carried out in the academic activities under the CE approach was made.

RESULTS AND DISCUSSION

Working directly with the students of EPO 100 makes it possible to develop these questionnaires in an explicit way regarding the evolution of an environmental education. Indeed, students have participated in various activities related to the preservation of the environment during the development of this project, among the most outstanding is the collection of PET containers for recycling and the development of biodigester bales: the latter consists of reusing food waste to create organic fertilizer for crops, is much simpler than a compost, can be done quickly and with basic tools, plus laboratory studies for organic fertilizer have proven their effectiveness in their physicochemical properties and the content of macro and micronutrients (Velázquez et al, 2017).



Figure 1. Activities developed in the EPO 100 project towards sustainability linked to the subjects of Innovation and technological development, Chemistry and Creativity.

38.5% of respondents believe that the care and conservation of the environment should be part of a habit of life, a percentage that exceeds those who responded that should be a need, a duty and obligation. Although in question (P) 6, 50% expressed an intermediate participation in the development of sustainable actions, giving a score of three on a scale, where one is the lowest score and five the highest. This reflects that considering these sustainable practices as a habit is not synonymous with being carried out in a constant and active way by the participants. Another data to consider, is the level of impact of this project in the EPO100, in this study 78% of respondents report that the conceptualization of sustainability has been heard constantly in school, compared to the results applied in the diagnosis prior to the implementation of this project in 2016 that was 55%.

In addition, 83 of the 84 respondents are in favor of this type of projects being institutionalized and part of school activities, where 40% of participants considered that their level of participation in this project is 4, on a scale where the one is the lowest score and five the highest. For this, in P10 more than half of the students expressed that for EPO100 to be consolidated towards sustainability,

there must be greater participation of students, teachers, and managers. Although 30% say that it is important that this project is part of the institutional regulation for compliance.

In P3, more than 70% of the students expressed as the main problem that affects their local environment is the excessive generation of garbage and the lack of efficient methods for their management, a percentage that increases compared to the study applied in 2016, where to this same question 56% expressed this same answer. The most surprising fact is that thrown by the P8 where 61% say that the school has been the medium that has driven their habits for a practice of sustainable actions, followed by a 31% that expresses the family as the means to the development of these actions. Data that is related to P3 where it is observed that 3 out of 4 participants have implemented the activities of this intervention project at home or in another space outside the school context. Before this, more than half of the respondents expressed that in the family, the school and the media, a sustainable culture should be promoted for the benefit of the conservation of the natural and social environment.

Given this, education is a factor of change for the development of culture for the benefit of society. Environmental education is the way that facilitates the transmission of cultural keys so that the individual and social groups adapt responsibly. The curriculum around the environment should be reformulated from an integral perspective (Mata, 2004). This will make it possible to redefine the culture environmentally because every culture in itself is environmental and if the environment is related to sustainable growth, it propitiates the maintenance of the capitalist system that currently influences society. A change that extends to all sectors of society, promoting a culture of sustainability, not only in the political sphere but also in social agents and citizens as a whole (Aznar, 2003, Meira and Caride, 2006).

In the case of EPO 100, for two years now the project "EPO 100 towards sustainability" has been implemented, which aims to guide this institution to sustainable practices through curricular environmentalization in teaching plans by teachers and that these are reflected in the learning activities and in the promotion of an environmental culture, a different institutional dynamic has been manifested since its application, where the participants conceive this environmental conceptualization as part of their daily work, although this does not yet mean that all their daily practices are sustainable for the care and conservation of natural resources (Velázquez and Blanc, 2018).

CONCLUSIONS

The environmental issue influenced by culture is appreciated with greater objectivity, which, in turn, is in constant epistemological dynamism due to external factors, such as globalization, among one of the main causes. It is through the process of enculturation where mechanisms can be given that favor the incorporation of elements of an environmental culture for the development of sustainable practices. It is important that the family promotes the construction of

a sustainable culture among its members. It is expected that this intervention project in educational institutions will allow participants to carry out this enculturation in a medium or short term.

On the other hand, environmental problems must be addressed from different areas of knowledge, such as agroecology, in a transversal manner, making use of innovation to search for alternatives and orientation towards sustainable practices.

When addressing curricular environmentalization, the comprehensive education of upper secondary education students is considered under an approach that links learning with the development of an environmental culture that affects the context in which students interact. Given this, education is a factor of change for the development of culture for the benefit of society, it is the EE that facilitates the transmission of cultural keys for the individual and social groups to adopt responsibly.

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