

La estrategia curricular de educación ambiental desde Cartografía en la formación didáctica del geógrafo The curricular strategy of environmental education from the Cartography in the geographer's didactic formation

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Resumen: Teniendo en cuenta las insuficiencias detectadas durante el proceso de formación didáctica del profesional de las carreras universitarias en cuanto a la instrumentación de la estrategia curricular de educación ambiental desde la asignatura Cartografía que se imparte en la Universidad de Sancti Spíritus, se proponen procedimientos metodológicos como herramientas de trabajo para la correcta implementación de esta estrategia curricular en la formación didáctica del especialista de Geografía con el objetivo de formar un egresado preparado integralmente para dar respuesta a las demandas sociales.

Palabras clave: Estrategia curricular; Educación ambiental; Enseñanza cartográfica; Formación didáctica; Desarrollo sostenible

Abstract: Considering the insufficiencies detected during the process of the professionals of the university careers didactic formation and from the methodological work as for the instrumentation of the curricular strategy of environmental education from the subject Cartography that is imparted in the University of Sancti Spiritus. They intend methodological procedures as work tool to educational and students for the correct implementation of this curricular strategy in the specialists of Geography didactic formation with the objective of forming a prepared egressed integrally to give answer to the social demands.

Keywords: Curricular strategy; Environmental education; Cartographic teaching; Didactic formation; Develop sustainable

Introduction

Environmental education, for several decades, has been a requirement in curricular designs for the training of future education professionals in Cuba. Today it becomes a fundamental requirement in the model of the professional of the universities and in particular in the faculties of pedagogical sciences to respond, from the educational level, to the global, national and territorial environmental crisis.

In this sense, the Ministry of Education assumes a great implication based on the political will of the Cuban government in defense of environmental care, hence the Curricular Strategy for Environmental Education, which is part of the Educational Strategy of the Year as an indispensable element in the process of institutional self-evaluation, with a necessary presence in the lines of methodological work of the Department of Natural Sciences and the interdisciplinary collective of Geography.

In relation to the above, the topics covered in the Cartography subject contribute to the development of the dialectical-materialist conception of the world in students, finds a wide application in different subjects of General Media Education, in daily life, and in the knowledge and conservation of the environment.

It is undeniable that the then University of Pedagogical Sciences, now a faculty of the same name, has played an important role as an institution in charge of teacher training through undergraduate and postgraduate courses in order to achieve the development of environmental education, and that they are the achievements made in relation to an environmental culture that largely involves students and workers are indisputable.

However, the observation of 13 classes, and 10 teaching and research activities, the interview with the 18 professors who teach Geography in the University and in the territory, and the review of 10 subject preparations, allowed to verify that there are still Weaknesses in the implementation of the environmental education curriculum strategy expressed in:

- The insufficient demonstration in the class of ways of acting to promote environmental education from the possibilities offered by the content.
- The systematization of education sets the different forms of teaching organization and class types is not enough.
- The limited projection of activities of academic, labor and research and extension component from the class aimed at the implementation of the environmental education strategy.

- Evidence of information on the implementation of the Environmental Education Strategy in the subject's preparations is not always sufficient.
- Limited interdisciplinary exercises between different subjects.

For the exposed elements it is that within the lines of methodological work of the Geography collective the improvement of the instrumentation of the curricular strategies is conceived in correspondence with the mode of action that propitiates a solid political, ideological, socio-humanist, environmental culture, economic, and high professional skills.

In that sense, it is important to point out that in the process of self-evaluation, the quality pattern of university careers requires in chapter # 3, article 31, point 7, that work is carried out with the documents that support the methodological work of the career, among that the curricular strategies are found (Ministry of Higher Education, 2014, p. 22)

Therefore, the objective of this work is to propose methodological procedures that allow the work to be implemented with the curricular strategy of environmental education from the teaching-learning process of the subject Cartography in the didactic training of the geographer.

Development

The development of science in the contemporary world imposes on universities the responsibility of graduating integral professionals capable of solving the problems facing society, and achieving the training of professionals directly linked to the social reality that characterizes their future context of professional performance, particularly in the field of education Therefore, an essential aspect in this process of preparation to direct the school teaching-learning process, presupposes achieving mastery by students of both the knowledge and skills of their pedagogical work, and of those that constitute the content of science corresponding to the subjects to be taught as a teacher.

In the preparation of the future graduate, the didactic treatment of the teaching-learning content of the specific profile of their profession in the school plays an important role, which generally provides the quality of the direction of learning that this achieves in their students within the different school programs

The implementation of curricular strategies based on the contents of geographic disciplines contributes to the formation of the scientific conception of the world by deepening the study of physical and socioeconomic-geographical components. In addition, its contents favor the work with topics such as environmental education for environmental conservation and sustainability, the relationship between the different components that are distributed in the geographical space, and the analysis of aspects of total validity such as climate change and the global problems that affect humanity and the home country in particular.

From the content of the disciplines of this career, it contributes to the improvement of methodological aspects that favor the scientific-pedagogical activity of students such as the linking of theory, practice and research; the development of observation, independent work and self-preparation. It also contributes to the controversy and reflection during the teaching-learning process.

Legal education can be worked extensively by referring to legal postulates on different national and international edges. In the first case, for example, those related to the environment, environmental management instruments, the National Environmental Strategy, the National Environment and Development Program and the other programs, plans and projects of economic and social development in force. In the same way, the case of Law No. 85 Forestry Law passed during the Fifth Legislature of the National Assembly of the People's Power of the Republic of Cuba, in force since September 7, 1998, which has within its objectives establish the general principles and regulations for the protection, increase and sustainable development of the forest heritage of Cuba, and precise indications for the control of the resources of this heritage and the increase of the actions of reforestation at the country level. Also Decree Law No. 212 on Coastal Zone Management that establishes the provisions for the delimitation, protection and sustainable use of the national coastal zone and its conservation.

The antecedents of the curricular strategies are resumed from the structuring of the C curricula by forming as part of them the so-called Master Programs that found an outstanding development, fundamentally, in areas of professional training of a high priority, even in the current moments.

For some years the educational improvement has been incorporating the concept of curricular strategies with an integrative vision of the process of professional training, so it is defined as:

...those general aspects of each profession that cannot be formed from a particular discipline, requiring the competition of the remaining ones, so that they are coherently integrated into the curriculum of each career, as part of its design and with a balance real of the whole and each of its parts. (Ministry of Higher Education, 2003, p. 8)

The Curricular Strategy for Environmental Education is conceived in the direction III of the Faculty of Pedagogical Sciences expressed in the initial and permanent training of the teaching staff through curricular actions with the objective of promoting an adequate incorporation of the environmental dimension in the processes of initial and permanent training of teaching staff. Among the actions that are included in the curriculum strategies are:

- Identify the potential of the content of each discipline and subject to incorporate the environmental dimension with an interdisciplinary character in the academic, labor, research and extension components.
- Promote methodological work in the Faculty of Pedagogical Sciences for the incorporation of the environmental dimension in all subject and discipline programs.

The conceptualization of environmental education is assumed according to Law 81. Of the Environment in Official Gazette of the Republic of Cuba (1997, p.7)

Continuous and permanent process, which constitutes a dimension of the integral education of all citizens, aimed at, in the acquisition of knowledge, development of habits, abilities, capacities and attitudes and in the formation of values, the relations between the human beings and theirs with the rest of society and nature, to promote the orientation of economic, social and cultural processes towards sustainable development.

Since environmental education is assumed as a permanent educational process that seeks to develop a responsible attitude towards the environment, it is important to deepen the plans and programs of study of teacher training at the beginning of their training and in the exercise of the

same, and that all measures are taken to guarantee training in environmental education to all teachers who need it.

- Therefore, to incorporate environmental education for sustainable development in the training of professionals, we must start from guiding ideas. According to Santos and Villalón (2017, p.7)
- Promote, stimulate and consolidate transcendental social and economic processes for society.
- Consolidate processes of cultural identity for each people and nation, recognizing the value of the local.
- Be based on the ecological, economic and socio-political dimensions of the concept of sustainable development.
- Express yourself through the development of feelings, attitudes and values, as part of the integral formation of the personality.
- Man ensures the maintenance of the planet's conditions with a responsible action towards the environment.

In this sense, educational requirements must be kept in mind to incorporate environmental education into the subject programs, expressed in:

- The didactic conception that is assumed must respond to the socio-environmental situation of the province or locality, and to the educational requirements established in the education model for which the professional is trained.
- They are based on the specific environmental problems of the locality, from the local to the global, which implies thinking globally and acting locally.
- To assume environmental education as a dimension within the teaching-educational process and the environmental culture as its result.

- Learning strategies must contribute to the fulfillment of the training and development functions of the objectives of environmental education, the professional model and the education for which the professional is trained.

Referring to this, it is important to emphasize that the quality of the direction of the teaching-learning process in Higher Education in Cuba is based on the development of a comprehensive general culture in which the mastery of the content of curricular strategies plays an essential role.

Therefore, for the implementation of Education for Sustainable Development (EDS) in the curricula, the following elements should be focused as key elements:

- Basic concepts of sustainable development and ESD from a local, national and international perspective,
- Disciplinary, interdisciplinary and transdisciplinary approaches to some key examples of sustainability challenges,
- Projects focused on specific problems of local, national and global importance in cooperation with educational institutions and other local collaborators.
- Practical experiences with ESD approaches and their critical reflection.
- Analysis based on the investigation of ESD processes in different learning environments (school, university, non-formal educational institutions)

Correspondingly, pedagogical approaches are required to address the use of participatory teaching and learning methods that foster these skills, primarily through active learning. The selection of specific methods will be made according to the context, to the needs of the student group, the resources available, among other aspects to consider.

Key pedagogical approaches in ESD:

- Student-centered learning. Student-centered interactive teaching and learning contexts.
- Action oriented learning. Participation and collaboration. Creation of links between formal and informal learning.

- Transformative learning. Oriented towards problems, inter and transdisciplinarity (transformative and action-oriented pedagogy)

Goal number four for sustainable development focuses on: Ensuring quality inclusive and equitable education and promoting lifelong learning opportunities for all. This objective has 10 goals that encompass many different aspects of education.

There are seven goals that are expected results and three goals that are means to achieve those goals. Among these is citizenship education for sustainable development, which refers to the fact that by 2030 all students must be guaranteed the necessary theoretical and practical knowledge to promote sustainable development, among other things through education for sustainable development and the adoption of sustainable lifestyles, human rights, gender equality, the promotion of a culture of peace and nonviolence, world citizenship and the valuation of cultural diversity and the contribution of culture to sustainable development , among other means. (UNESCO, 2015)

In this sense, the curricular strategy must be contentive of actions that respond to the Life Task, which constitutes a State plan for confronting climate change. This plan is a continuity of the thinking of the historical leader of the Cuban Revolution, Fidel Castro Ruz. The Life Task includes a set of five strategic actions and 11 tasks aimed at counteracting the impacts in vulnerable areas that were approved on April 25, 2017 by the Council of Ministers, and constitute a priority for the country's environmental policy.

Considering the fundamentals raised about the implementation of the curricular strategies and specifically that related to environmental education, then, reference will be made to how these are conceived in the teaching-learning process of the Cartography from the application of General methodological procedures emanating from the methodological preparation of the Geography collective.

The definition proposed by Echemendía (2012) is assumed, who considers that “a procedure takes place through a succession of closely related and clearly defined steps that allow a job to be done correctly” (p.58).

Within the methodology used, the dialectical-materialist approach stands out as a general method. Pedagogical research methods were applied among which the historical-logical, analytical-synthetic, the inductive-deductive and empirical methods such as the interview and the observation that facilitated synthesizing the most important references of the subject, their ordering and integration to reach to generalizations and to the proposal of methodological procedures that allow to implement the work with the curricular strategy of environmental education from the teaching - learning process of the subject Cartography in the didactic training of the geographer.

In addition, during the period from September 2017 to January 2018, interviews were conducted with 18 teachers from the Department of Natural Sciences of the University of Sancti Spíritus “José Martí Pérez” and the territory, a total of 12 methodological activities were observed among which highlights: open classes, demonstration methodological classes, and analysis of the product of the activity (career, discipline and methodological preparations of the Geography in the territory), which allowed us to verify that in the didactic training of the student graduated in Geography education The implementation of this curricular strategy for its future professional performance from the subject Cartography is the essential element, which is the basis of the rest of the geographic disciplines.

Ten sessions of methodological work were carried out in the Geography discipline group and with professors who teach the subject in the territory simultaneously with the implementation of the environmental education curricular strategy in pedagogical practice based on cartographic contents. In each session the report was prepared to analyze the resulting information as a starting point for the determination of the accepted elements to be included in the result.

We apply the methodological procedures that are part of the didactic work for the implementation of the environmental education curriculum strategy based on the teaching of Cartography.

Methodological procedures to guide teacher preparation:

1. - Location of the subject in the program of the subject and in the content scheme

2.- Analysis of the objective system (professional model, year of the career, discipline, subject and class)

3. - Determination of the contents of the subject that enhance the treatment of environmental education. For this, it was essential to analyze deeply: the content of the subject (which includes the specialized bibliographic review and those described in the textbooks), the methodological orientations of each program, and the different activities of the textbooks that take into account the Environmental education treatment.

4. - Determination of the environmental contents that can be treated based on the potential of the subject

5. - Establishment of interdisciplinary nodes from the previous work that each teacher must perform depending on the content to be imparted and the selected environmental contents. In this sense, the definition of interdisciplinary nodes given by Bravo (2011, p. 19) is assumed: “it is the grouping of content in which elements of this converge, corresponding to different disciplines”

6. - Planning of teaching tasks that allow the effective development of environmental education and that allow the application of the different types of evaluation.

Application of methodological procedures from the work with the curricular strategy of environmental education from the cartographic contents.

Activity 1

Theme. - Looking for the method of cartographic representation

Objective. - Identify the cartographic representation methods so that they develop their own Geography skills.

Orientations:

- 1- Consult the text of Notes for working with maps, by Pedro Pablo Recio Molina, and prepare a synoptic chart with the cartographic representation methods and their characteristics. (They are precedent contents)
- a) In the Special Supplement of the National Assembly of People's Power in the Ninth Regular Session of the Eighth Legislature, published in Juventud Rebelde (digital support), read the headline Support State deputies State Plan for confronting climate change , by Gómez Bugallo, S and Tamayo León, R. (2017, July 15), and refer to:
- b) The measures conceived in the Life Task.
- c) Look at the map Zones, areas and places prioritized by the Life Task, and say what cartographic representation method was used.

This activity demonstrates the methodological procedure The establishment of interdisciplinary nodes based on the method of representation used (symbols) referring to: the main threat of climate change is that future projections indicate that the elevation of the level The middle of the sea can reach up to 27 centimeters in 2050, and 85 in 2100, causing the gradual loss of the surface emerged from the country in very low coastal areas, as well as the salinization of underground aquifers open to the sea by the advance of the «wedge saline.

The State Plan for confronting climate change has five strategic actions focused on the management of coastal settlements and threatened agricultural land. This issue is everyone's task and from the geographical and biological disciplines its output is enhanced.

Activity 2

Theme. - Using technologies to find the ideal cartographic representation method.

Objective. - Identify the cartographic representation methods so that they develop their own Geography skills.

Orientations:

Refer the students to their smartphones consultation of the folder in digital support of the subject
Cartography: maps of protected areas in the world, Cuba and Sancti Spiritus.

Some questions are asked:

What method of cartographic representation was used to represent these maps?

Refer to the importance of protected areas in the world and Cuba.

What protected areas exist in our province?

Based on the responses, reference is made to the protection and conservation of the environment through aspects such as: both at the planetary, regional, national and local levels, the system of protected areas approved by UNESCO (Natural and Cultural Heritage of Humanity) are established. ; All countries have sites of local or national interest that constitute a well-justified reason for pride; there are values of a nation whose importance is such that they transcend their borders, in which case they become part of the heritage of all mankind, which are approved on the basis of their qualities as the best possible examples of cultural and natural heritage where the richness and diversity of our planet stand out.

Activity 3

Theme. - Reading the map

Objective. - Identify cartographic representation methods so that they develop skills and an environmental culture.

Orientations:

Look at the map on digital radioactivity support after Chernobyl and answer:

What is the cartographic representation method that was used for the elaboration of this map?

What is currently happening in that geographical area?

It should be pointed out that the incident that occurred in 1986 affected the lives of many people not only in Ukraine but also in other countries where the radioactivity emissions came causing

different diseases among which thyroid cancer is found, for example, and since then Area became uninhabitable. Cuba provided solidarity assistance in the face of this catastrophe, creating the conditions to give medical treatment to the victims.

Teachers are recommended to use the documentary “The Chernobyl Nuclear Disaster (1986) and from subjects such as Economic Geography, Regional Geography, Biogeography, Physical Geography, achieve the realization of activities or integrative exercises where our students can be evaluated with respect to the contents of these subjects, to the development of an environmental culture and a scientific conception of the world.

Based on the proposal made, it is demonstrated that students are responsible for solving certain problems that arise during the learning process even though they receive knowledge for the first time, in any of the forms of organization of education in Education Superior during the study of geographical disciplines, which occurs in the same way in other careers such as Marxism Leninism and History, which in many spaces is helped by the map as a means of teaching for the transmission of certain content, which makes it possible to stimulate to work and research and in the end give you a creative and suggestive response demonstrating modes of action and satisfaction to be the protagonist of your own training.

The results derived from the application of the methodological procedures for the implementation of the curricular strategy of environmental education from the teaching of Cartography are presented below.

Through the group interviews who expressed high levels of satisfaction with the methodological procedures for the implementation of the environmental education curriculum strategy based on the teaching of Cartography. They argued that they are useful because sometimes the cartographic contents make it difficult to implement a certain curricular strategy and in the bibliography it is not explained how to give way to environmental education and solve problems specific to the teaching of Cartography that contribute to the didactic formation of students.

A total of 12 methodological activities were observed according to the different types of methodological work among which are: open classes, demonstration methodological classes and the analysis of the products of the activity (career, discipline groups and methodological preparations of the Geography in the territory), which allowed us to verify a transformation in favor of achieving a comprehensive approach in the initial didactic training of students based on the use of methodological procedures for the implementation of the environmental education curriculum strategy based on the Cartography teaching.

Conclusions

The proposed methodological procedures for the implementation of the environmental education curricular strategy since the teaching of Cartography in the didactic training of the student Graduate in Geography Education improve the learning for the formation of competences in their professional performance; allows to develop skills, aptitudes, ways of acting from the work with the map as a way to raise the significance of the content of Geography in the formation of a general culture of the citizen.

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