

EDUCATION TOWARDS SOIL PROTECTION IN THE CONTEXT OF BASIC SECONDARY SCHOOL: A NEW PERSPECTIVE

LA EDUCACIÓN AMBIENTAL HACIA LA PROTECCIÓN DE LOS SUELOS EN EL CONTEXTO DE LA SECUNDARIA BÁSICA DESDE UNA NUEVA MIRADA

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ABSTRACT

A didactic strategy was designed to promote soil protection through environmental education within the Cuban Geography subject on students at Mixed Center «Cira María García Reyes» municipality of Holguín. To this end, methods and techniques such as the historical-logical, analysis-synthesis, induction–deduction, scientific observation, surveys, interviews, and case study were applied. The proposed strategy enhances the teaching-learning process of the contents of Cuban Geography subject and enables teachers with didactic tools that foster student learning. Furthermore, it constitutes an instrument of vital importance for its implementation into educational practice.

KEYWORDS: strategy; didactics; environmental education; Cuban Geography subject

RESUMEN

Se diseñó una estrategia didáctica para favorecer la protección de los suelos desde la educación ambiental a través de la asignatura Geografía de Cuba, en los estudiantes del Centro Mixto, «Cira María García Reyes», del municipio Holguín. Para ello se utilizaron métodos y técnicas como: el histórico-lógico, análisis síntesis, inducción-deducción, observación científica, encuestas, entrevistas y el estudio de caso. La propuesta presentada favorece el proceso de enseñanza-aprendizaje de los contenidos de la asignatura Geografía de Cuba que se imparte y permite la preparación de los profesores en el uso de herramientas didácticas que favorecen el aprendizaje, además constituye un instrumento de vital importancia para introducir en la práctica educativa.

PALABRAS CLAVES: estrategia; didáctica; educación ambiental; Geografía de Cuba

INTRODUCTION

Environmental education should be a process that generates learning through the construction and reconstruction of knowledge, as a result of studying the complex society-environment interactions. This should raise citizens' awareness of their role as an integral part of nature, so that they develop new relationships, attitudes and behaviors towards it.

Furthermore, it is widely considered a recently created activity whose framework began with the Human Development Summit, Stockholm '72. However, despite this generalized criterion, it is valid to highlight the concern of many pedagogues to transmit to their disciples the ethical values related to love and respect for nature.

High School has as one of its objectives to create environmental awareness and achieve solutions to the main problems manifested in this regard, both: in school, community and home, with the intention of achieving sustainable development.

To achieve this objective, specialized teachers are needed who assume their role among the different roles within the school and the community, with emphasis on proper environmental education in the formation of their students to address problems manifested in the school, their home, and the community, as well as the transformations currently taking place.

In High School, there are valuable experiences; however, not all constitute references for students attending schools from diverse social backgrounds. Therefore, this work may represent an advance in achieving a more coherent Teaching-Learning Process (hereinafter TLP) to the possibilities and needs of students in rural and suburban environments, based on effective organization and planning of teaching activities.

This context is currently marked by reflection and debate, occupying a clear and progressive benefit in Latin America, not only due to the studies that have been developed on it but also due to the advancement of science and technology, the pretensions of the educational level, and the psychological characteristics of the students.

In Cuba, the Third Improvement of the Educational System has introduced transformations at this educational level that respond to the conditions and demands of the development of Cuban society, expressed in the National Economic and Social Development Plan 2030, and to the particularities of personality development in adolescents at this stage of their lives. In this sense, adjustments are being made that involve curricular modifications in the study plan, subject programs and methodological guidelines for High School. The conception and design of teaching-methodological work are being perfected to achieve greater teacher preparation to assume new challenges.

These transformations impose new challenges on society, and to face them, teachers and administrators will need not only a considerable base of knowledge from already achieved scientific and technological research but also the capacities to apply them suitably and intelligently in managing the formative process, evaluating the impacts they cause in society, both negative and positive (Álvarez, 2021).

In the current century, the approach to Environmental Education has centered the debates of many authors who have contributed diverse interpretations regarding its definition. Among them, we can mention: Fernández (2008); Novo (1996); Driggs (2015); Labrador (2016); Doce (2018); Alonso, Leyva y Mendoza (2021); Rugel, Tenesaca & Velastegui (2023).

Environmental education is considered an intentional, permanent, active process with a systemic and futuristic approach, whose last goal is not only changing the behavior of different social actors but also changing current development models based on economist approaches. This is achieved through the internalization of essential values and knowledge to develop attitudes and aptitudes that transform into individual and collective action in favor of the environment and in the search for solutions to current problems and their future prevention, based on the re-dimensioning of their own priority schemes; that is, it is oriented towards being, knowing and doing (Novo, 1998).

As expressed in Environmental Law 81, environmental education is: «The continuous and permanent process, which is a dimension of the comprehensive education of all citizens, oriented in the acquisition of knowledge, development of habits, skills, capacities and attitudes, and in the formation of values, the relationships between human beings and of them with the rest of society and nature are harmonized, to guide economic, social and cultural processes towards sustainable development». This definition fits the country's reality due to the elements it addresses in correspondence with the environment–environmental education–sustainable progress.

On the other hand, Rugel, Tenesaca & Velastegui (2023) argue that environmental education oriented towards sustainable development «is part of the values that must be formed in our students, as they respond to the interests and needs of society and are present in the type of person it requires».

As can be seen, to achieve environmental education in High School students, a process and result towards sustainable development must be considered, benefiting the student through their studies through different activities carried out in the student sphere, with emphasis on environmental knowledge, perception, sensitivity and behavior, with the purpose of caring for and conserving the environment.

The object of study of education for sustainability is characterized precisely by extreme complexity, encompassing the biotic and abiotic, the cognitive and evaluative, the attitudinal and behavioral; that is, how to ensure that students, during their professional performances, become aware, perceive and develop sensitivity to solve environmental problems caused by human work activity in the environment, contributing to its sustainable development (Rugel, Tenesaca & Velastegui, 2023).

Researchers such as Alonso, Leyva y Mendoza (2021) consider environmental education as a process and result of appropriation and application of contents directed towards the protection, care, conservation and sustainable development of the environment, aimed at solving environmental problems generated by human work activity during production and services, both in the work and community contexts. This occurs through the utilization of educational influences of the disciplinary diversity of the career and the integration of academic, labor, investigative and community components.

The above is assumed for considering it adjusted to the analysis context of the presented research. It is, in turn, considered a process and result of appropriation and application of contents directed towards the protection, care,

conservation and sustainable development of the environment, aimed at solving environmental problems.

Environmental education can and must be a strategic factor influencing the established development model to reorient it towards sustainability and equity. «To effectively contribute to improving the environment, the action of education must be linked to legislation, policies, control measures and decisions that governments adopt regarding the human environment» (Castillo, 2010).

In addition to the above, the interrelation of the school with the family and the community is perfected and strengthened, based on the role these factors reclaim in teaching students. Furthermore, the formation and programming of teaching activities and their link with the school and family community are coherently adapted, assuming the school as the most significant cultural seat of society.

In turn, adjustments are made from the educational aptitude in the National Education System in close connection with the National Economic and Social Development Plan 2030 (PNDES), which must manifest from its strategic and management conception the Sustainable Development Goals (SDGs), which combine the economic, social and environmental dimensions (Díaz-Canel & Delgado, 2021).

In this regard, Ruiz (2001) specifies High School as the educational level whose spatio-temporal location corresponds to a type of receiver in the phase of developing their cognitive, affective and evaluative potential. Therefore, these receivers need more formative, polyfunctional and integrated curricular conceptions, providing them with a general culture and value formation that facilitates continuing higher studies or entering life to participate actively and creatively in social progress.

In correspondence with the previous definition, in the context of High School, a process is established that must go through stages and requires the establishment of relationships between the school, the family and the community, as an open system, through a set of actions aimed at fulfilling the educational purpose of students. This educational level is distinguished by its integral, renovating and contextualized character, which must start from individual and social particularities so that dynamic interaction between instruction, development and student formation is fostered under the teacher's direction.

The foregoing is in full correspondence with what is mentioned in the current Cuban High School Model and what is planned in the Third Educational Improvement, where it is programmed that its purpose is the basic and integral formation of the Cuban adolescent, based on a general culture that allows them to be fully identified with their nationality and patriotism.

The teaching-learning process of students in environmental education must forge, from an environmental point of view, awareness of the environmental problems of the community where the school is located to intervene effectively on them. The diagnosis carried out highlights difficulties affecting the teaching-learning process of the Cuban Geography subject in 9th grade due to inadequate understanding of the importance of Environmental Education with an emphasis on soil protection.

The information offered by the different validations carried out on normative documents, as well as class visits, review of normative documents, among other applied research methods and techniques, identified the following shortcomings:

1. Shortcomings in the theoretical and methodological preparation of teachers when selecting didactic components of the class that favor the teaching-learning process of Cuban Geography subject in 9th grade.

2. Limited application of the potential offered by Environmental Education contents aimed at soil protection that favor the teaching-learning process in Cuban Geography subject in 9th grade.

The epistemological analysis carried out in the consulted literature allowed distinguishing the following theoretical deficiency: insufficient theorization about the application of a Didactic Strategy on Environmental Education with emphasis on soil protection that favors the teaching-learning process of Cuban Geography subject in 9th grade.

The described analysis allows declaring the following scientific problem: How to favor soil protection from Environmental Education through Cuban Geography subject in 9th-grade students at the «Cira María García Reyes» Mixed Center in Holguín municipality. Therefore, the elaboration of a didactic strategy is proposed to effectively favor environmental education towards soil protection in 9th-grade students at the «Cira María García Reyes» Mixed Center in Holguín municipality. The population is all 9th-grade students and a sample of 28 students from group 9no1 is taken, who make up the total classroom enrollment.

DEVELOPMENT

The theoretical level methods used in fulfilling the research tasks were: the historical-logical, which allowed to deep into the particularities of the treatment given to environmental education towards soil protection during the TLP of Geography of Cuba in the subject programs in Secondary Education during a given period and stating the peculiarities of the links between logical development of thought and the history of the researched process. The analysis-synthesis, which was used to mentally decompose the research object into its parts and reveal its essential characteristics through synthesis operations, resulting from processing, from a quantitative and qualitative point of view, the obtained information.

The induction-deduction method, present throughout the investigative process, allowed the analysis of the information provided by the diagnosis and the systematization of theoretical and methodological references of the research. The historical-logical method was used to determine the evolution of antecedents in studies about didactic strategies in environmental education with emphasis on soil protection during the TLP of Cuban Geography subject in 9th grade.

Among the methods and techniques of the empirical level used were scientific observation, which allowed obtaining direct information about the treatment given to didactic strategies in environmental education towards soil protection during the TLP of Cuban Geography subject in 9th grade. Surveys and interviews allowed verifying the information obtained from the diagnosis about teaching results of Cuban Geography subject in 9th grade. The review of sources enabled a thorough study of scientific literature about referential theoretical framework, and the rigorous review of normative documents provided abundant and valuable information for the progress of the research.

The expert criterion, the case study of the situation, as well as critical reflection workshops, allowed enriching and improving the didactic strategy based on the criteria and focused testimony of teachers working in 9th grade, to delve into how the didactic strategy is conceived in Cuban Geography subject in student formation; critical reflection and collective construction workshops and expert criterion for the assessment of the elaborated Didactic Strategy.

From the mathematical-statistical level, percentage analysis was used to interpret the obtained data. As a methodological resource, method triangulation was used to verify the proposal's viability.

Theoretical-methodological foundations about Didactic Strategies to favor Environmental Education towards soil protection in the context of High School

Human activity is defined by changing and evolving nature, changing beyond a strict passive adaptation, simple responses of the organism to stimulus.

It is revealing to recognize that the progress of student's personality and their human properties, the environment in which they are declared, not as a condition of development but as a beginning of development, are necessary aspects when creating a revelation of the role concerning environmental education in formation of appropriate behaviors for their coexistence in the environment and preparation for future, in a world where they have the necessary duty to save.

The school is the primary way for the development of environmental education in students, youth, and even adults, given the close relationships established between educational institutions with parents and society as a whole. Hence, the need to achieve environmental education as a social phenomenon, whose function, content, and social essence are shown in the daily practice of the school in various social relationships that occur during the performance of its school functions.

As can be seen, the teacher must know how the psychic development of students is carried out to successfully manage the complex process of forming their personality. On the other hand, due importance is given to the role of the relationships that should be established between school, family and students, in which daily life supports the formation and development of skills that favor the understanding of the surrounding situation, intelligently implanting arguments related to environmental education.

In this endeavor, environmental education is directed towards the objective orientation of preparing man for life and for full fulfillment of their social function. Retaking the distinguished role of the school in the process of modeling the personality as a subject as a whole and its understanding is

indisputable, essentially when reflecting that environmental education in its social essence is carried out in a personalized manner but constructed in the process of socialization of its different arguments for action in a connection of the individual with the social.

Therefore, regarding the alignment of appropriate behavior concerning the environment, it is undoubtedly not only the teacher's task, who has the duty to extend a system of actions focused on orientation, transmission of norms, traditions, behaviors and knowledge, forming guidelines that certify adequate conduct that it responds to the internalization and retention of the behavior norms required by society.

From a pedagogical point of view, it has as a purpose to favor in teachers a system of theoretical and methodological knowledge regarding environmental education and achieve its elaboration through implementation in the development of teaching-learning process of the strategy.

The teacher, as a guide for students and an effective facilitator of appropriate behavioral norms, moral qualities, motives and interests, extends an entire endeavor in pursuit of the development and alignment of correct environmental knowledge for present and future generations, also standing out for their constant performance in the teaching-learning process.

On the other hand, environmental attitudes are significant as a response to a need to raise awareness in current society and favor a series of environmental declarations and values, as a basis for considered care and management of natural resources. This is reconciling a fundamental component of this process developed in the population. Environmental Education should promote the awareness and precise values to optimize the quality of life. This admits that due attention must be sought for environmental attitudes when developing environmental education program actions (Zabala & García, 2008).

The modeling of environmental education is based on sociology, from the education-society relationship and the educability of human being as a social being. Likewise, in High School, the relationship between teacher and student is established, their interrelations with other subjects (other teachers, students, family and community), based on cooperation between teacher-student-family.

Didactic Strategy to favor Environmental Education towards soil protection in the context of High School

A diversity of authors have contributed, from different positions, definitions and concepts about didactic strategies, among them we can highlight Abreu et al. (2018); Lima (2012); Fardales et al., 2012 and De Armas et al., 2005. The last defines it as a system, a set of actions and a way to achieve objectives.

This research assumes the definition of didactic strategy proposed by (De Armas et al., 2005), whose essence lies in the way of planning and directing actions to achieve certain objectives and has as its essential purpose the projection of the process of transforming the research object from a real state to a desired one and overcoming difficulties with optimization of time and resources.

Didactic strategy objective

To implement a system of actions in the TLP of Cuban Geography subject that allows favoring environmental education with emphasis on soil protection in 9th-grade students at the "Cira María García Reyes" Mixed Center in Holguín municipality.

Strategic planning

Strategic Action 1: Improvement of preparation process of teaching collective's professors for designing a Didactic Strategy to favor Environmental Education towards soil protection in the context of High School.

Action Objective: To prepare professors of the teaching collective for designing a Didactic Strategy to favor Environmental Education towards soil protection in 9th-grade students at the "Cira María García Reyes" Mixed Center in Holguín municipality.

Executes: Lead Teacher

Date: January 2025.

To develop this specific strategic action, the following operations are proposed:

- ✓ Design integrative methodological workshop programs of an interdisciplinary nature at the grade level.
- ✓ Implement the integrative methodological workshop programs of an interdisciplinary nature at the grade level.
- ✓ Validate the integrative methodological workshop programs of an interdisciplinary nature at the grade level.

Strategic Action 2: To improve the professional development process of professors responsible for the TLP of Cuban Geography subject in implementing a Didactic Strategy to favor Environmental Education towards soil protection in the context of High School.

Objective of this strategic action: To provide professional development to professors of Geography of Cuba discipline during the researched TLP, for its planning, organization, execution, control and evaluation.

Executes: Lead Teacher of the Cuban Geography subject

Date: From March 2025 to December 2025.

Operations:

- ✓ Design a professional development program for Cuban Geography subject collective in implementing a Didactic Strategy to favor Environmental Education towards soil protection in the context of High School.
- ✓ Validate the professional development program for Cuban Geography subject collective in implementing a Didactic Strategy to favor Environmental Education towards soil protection in the context of basic High School.

Strategic action 3: Improvement of the professional development process of Geography of Cuba collective.

Objective of this strategic action: To provide professional development to professors who teach the Cuban Geography subject at the «Cira María García Reyes» Mixed Center in Holguín municipality to contribute, from its content, the tools that allow the implementation of a Didactic Strategy to favor Environmental Education towards soil protection in the context of High School.

Executes: Lead Teacher of Cuban Geography subject

Date: From January 2025 to December 2026

Operations:

- ✓ Design a professional development program for the collective of Geography of Cuba professors.
- ✓ Implement the professional development program in the collective of Cuban Geography subject professors.
- ✓ Validate the professional development program in the collective of Cuban Geography subject professors.

Strategic Action 4: Socialization of the Didactic Strategy to favor Environmental Education towards soil protection among the professors of 9th-grade at the «Cira María García Reyes» Mixed Center in Holguín municipality.

Execute: Teacher

Date: Month of September 2025

Objective of the strategic action: To analyze with professors of 9th-grade at the «Cira María García Reyes» Mixed Center in Holguín municipality, the Didactic Strategy to favor Environmental Education towards soil protection.

Operations:

- ✓ To form teams taking into account student preferences.
- ✓ To select which Didactic Strategy is the most appropriate to favor Environmental Education towards soil protection.
- ✓ To debate, in the teaching-educational context, which Didactic Strategy is the most appropriate to favor Environmental Education towards soil protection within Cuban Geography subject, with the presence of professors and specialists related to the researched topic.

The didactic strategy allows for better preparation of teachers in addressing environmental education during the teaching-learning process of Cuban Geography subject and its application in educational action. Furthermore, it incorporates new actions that enrich with emphasis on soil protection, favoring the TLP in Cuban Geography subject in 9th grade at the «Cira María García Reyes» Basic Secondary Mixed Center in Holguín municipality.

CONCLUSIONS

The proposed Didactic strategy reflects the particularities of the didactic integration process, in which the contents of Environmental Education in Cuban Geography subject taught in 9th grade are articulated through a system of actions and activities with emphasis on soil protection. This allows the enrichment of knowledge, development of skills, formation of values and deployment of modes of action in students. The proposed Didactic strategy on Environmental Education with emphasis on soil protection allows the preparation of teachers in the use of didactic tools that foster learning; furthermore, it constitutes an instrument of vital importance for introduction into educational practice.

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