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REVIEW

Environmental education as a philosophy of life: from knowledge to action

La educación ambiental como filosofía de vida: del conocimiento a la acción

Ítalo Andrés Díaz Horna[1], Elías Jesús Mejía Mejía[1]

[1]Universidad Nacional Mayor de San Marcos, Facultad de Educación. Lima, Perú.

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ABSTRACT

Introduction: over the last few decades, it has been recognized that environmental degradation is not only a concern for experts, but for society as a whole. Despite access to information and institutional efforts, a gap between environmental knowledge and everyday behavior persisted, highlighting an urgent need to strengthen environmental education as a tool for ethical and practical transformation.

Development: environmental education was approached as a continuous process that, by incorporating cognitive, affective, and conative dimensions, made it possible to change attitudes toward conservation. It was analyzed how consumption patterns and lifestyles could change if ethical principles were incorporated. Through various approaches, such as conservationist, naturalist, problem-solving, and sustainable, responsible actions such as recycling, reducing consumption, and respect for biodiversity were promoted. Research showed that educational programs, from basic to university levels, positively influenced the formation of conservationist attitudes, especially when experiential and reflective methodologies were applied. Thus, the importance of cross-cutting and transformative environmental education, beyond isolated content, was valued.

Conclusions: it was concluded that environmental education should be a philosophy of life that promotes lasting individual and collective change. Transforming attitudes towards the environment required an ethical, practical, and emotional approach. Global change depended on personal change, and this could only be achieved through education committed to sustainability, capable of forming active, critical, and responsible citizens with regard to the environment and future generations.

Keywords: Environmental Education; Sustainability; Ethics; Attitude; Conservation.

RESUMEN

Introducción: durante las últimas décadas, se reconoció que el deterioro ambiental no solo concernía a expertos, sino a toda la sociedad. A pesar del acceso a información y esfuerzos institucionales, persistió un desfase entre el conocimiento ambiental y el comportamiento cotidiano, lo que evidenció una necesidad urgente de fortalecer la educación ambiental como herramienta de transformación ética y práctica.

Desarrollo: la educación ambiental fue abordada como un proceso continuo que, al incorporar dimensiones cognitivas, afectivas y conativas, permitió modificar actitudes hacia la conservación. Se analizó cómo los patrones de consumo y estilos de vida pudieron cambiar si se incorporaban principios éticos. A través de diversos enfoques como el conservacionista, naturalista, resolutivo y sostenible, se promovieron acciones responsables como el reciclaje, la reducción del consumo y el respeto hacia la biodiversidad. Investigaciones demostraron que los programas educativos, desde los niveles básicos hasta el universitario, influyeron positivamente en la formación de actitudes conservacionistas, especialmente cuando se aplicaron metodologías vivenciales y reflexivas. Así, se valoró la importancia de una educación ambiental transversal y transformadora, más allá de contenidos aislados.

Conclusiones: se concluyó que la educación ambiental debía ser una filosofía de vida que promoviera cambios individuales y colectivos duraderos. Transformar las actitudes hacia el entorno exigió un enfoque ético, práctico y emocional. El cambio global dependía del cambio personal, y este solo se alcanzaba mediante una educación comprometida con la sostenibilidad, capaz de formar ciudadanos activos, críticos y responsables con el medio ambiente y las futuras generaciones.

Palabras clave: Educación Ambiental; Sostenibilidad; Ética; Actitud; Conservación.

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INTRODUCTION

In recent decades, concern about environmental degradation has ceased to be an issue exclusively for scientists and environmentalists and has become a responsibility shared by society as a whole. However, despite the increase in available information and multiple institutional efforts to promote an ecological culture, a significant disconnect persists between environmental knowledge and people's everyday behavior. This gap is evident in seemingly insignificant actions, such as littering, leaving appliances on unnecessarily, or consuming highly polluting products in excess, all of which contribute directly or indirectly to environmental degradation.

Environmental education, conceived as a comprehensive and continuous process, has the capacity to transform these behavior patterns if approached from an ethical and practical perspective. It is not enough to impart theoretical knowledge or carry out sporadic campaigns; education is needed to shape conscious, reflective citizens who are capable of adopting principles of sustainability as an inherent part of their lifestyle. Environmental education should not be limited to formal spaces such as classrooms, but should become a philosophy of life based on ethical values, a sense of belonging, and a commitment to future generations.

This work focuses precisely on analyzing how environmental education can foster attitudes of environmental conservation, considering the cognitive, affective, and conative dimensions of human beings. Through the study of various educational approaches and models, as well as the analysis of pedagogical experiences and intervention programs, it seeks to identify effective strategies for generating lasting changes in individual and collective behavior. In particular, it highlights the importance of recognizing that cultural and consumption patterns are not immutable and that it is possible to change them through a process of personal reflection and social transformation.

Objective

To promote technical knowledge about environmental issues and foster a profound change in the way we think, feel, and act towards nature. It is in this context that experiential environmental education is proposed, focused on the development of conservationist attitudes and committed to improving the quality of human life in harmony with the environment.

DEVELOPMENT

Theoretical Framework

Epistemological Framework

Humans and the conservation of their environment

There is a well-known anecdote about a man walking down the street and leaving the empty soda can he has just finished drinking on the sidewalk. Meanwhile, across the street, behind a window, someone else is eating a hamburger. At the other end of the street, another person leaves his home with his computer plugged in and the water tap dripping. This leads us to wonder whether people are unaware that flooding in cities is largely caused by the accumulation of PET (polyethylene terephthalate), one of the most common plastics used in the manufacture of bottles and packaging, in drainage and sewerage systems. Or that the demand for meat from large fast food transnationals leads to the conversion of vast tracts of land for grazing, and that part of their inputs come from genetically modified crops? Perhaps they do not know that the construction of hydroelectric dams completely alters ecosystems? The answer seems to be obviously no.

So, have environmental education efforts failed, or is the vision of environmental education too simplistic?

According to Holland, the relationship between humans and their habitat varies according to how they respond to the demands imposed by the physical environment. This means that, today, humans need to respond not only to demands, but also to the reality of the environment. However, considering that this relationship gives rise to 'ways of life' and new 'needs', changes seem distant when we take into account current consumption patterns, demand for resources, and cultural norms in society, which lead individuals toward attitudes that are incompatible with environmental conservation.

This implies that environmental education efforts must be considered from a broader human perspective, with constant efforts in everyday life, that is, making environmental education a philosophy of life, not in a metaphysical sense, but as a driving force. A philosophy understood as the daily application of the principles of conservation and sustainable use of natural resources, derived from the inner conscience of each individual and transmitted as a technique.[1]

From the above perspective, if society creates its own ways of life, it can also change them and renounce the status and prestige that they may bring. In other words, the Pérez family could go on vacation to a cooperative that promotes sustainable development through ecotourism, instead of going to a hotel complex that destroys mangroves. The central issue is to try to change these patterns, starting with each individual, not out of obligation or mechanically like any other daily activity,[2] but as an act of thoughtful responsibility based on ethical principles. In this way, well-being would be achieved through care for the environment. Environmental education as an ethical process. It is, first and foremost, an ethical movement that does not focus exclusively on conservation.[3]

Ethics has an eminently rational and normative character that guides and directs the free decisions of human beings in their search for what is right.[4] This ability to reflect on one's own actions is particularly evident when faced with new situations, which means that, given the current environmental outlook, we need to take action and start repeating responsible patterns towards the environment and passing them on to new generations.

Faced with the 'new' environmental situation, it is necessary for the human species to 'learn' to act accordingly. This means that environmental education should be transmitted with a strong ethical component and not just as a set of isolated methodologies. This would regulate our actions towards the environment and allow us to freely and responsibly choose those that are compatible with it.

It is not a question of deciding for others how they should act towards the environment, but rather of each individual deciding, based on an analysis of the state of their environment and its problems, how they can contribute to its solution.[5]

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Anyone can participate in a march that contributes to higher vehicle emissions if that is part of their social role, but even these attitudes can be modified as a result of more responsible behavioral changes, in the interest of a greater good and the importance of improving the environment.

However, the environmental education proposed as a philosophy of life is not intended to be based on romantic environmental principles or visions, or bio-centric ethics, but rather to be the product of reflection and commitment known as the ethics of life.[6]

So far, we have only mentioned ethical actions that can be taken individually and that depend on one's own resolve. Those that do not require immediate intervention have been left out. For example, one can act for or against environmental policies, but immediate decisions considered ethically correct are beyond one's own control. However, it is precisely by adopting the principles of environmental education as a philosophy of life that changes can be brought about which, from the individual and local level, can transcend to the collective and global level.[7]

It is considered that environmental education needs to be approached from a context of greater personal responsibility and commitment, derived from serious reflection and not just as a response to a stimulus. This will influence each individual's actions towards the environment, which in turn will have an impact on their society. Otherwise, if people's relationship with caring for their environment is not linked in a deeper way, there will be no point in raising "ecological awareness."

Environmental education measures need to be adopted at a level of philosophy of life that reminds us of the responsibility that each of us must show and exercise. A global problem such as the environment requires daily collaboration, perhaps small but continuous.

Epistemological approaches to environmental education

Environmental education is understood as a formative process in which the skills, abilities, values, and concepts necessary to appreciate and understand the relationships between humans, culture, and their biophysical environment are acquired.

UNESCO, in the activities of the International Program on Environmental Education (IPEE), explains that environmental education is conceived as a lifelong process in which individuals and communities acquire knowledge about the environmental crisis, become aware of the need to conserve the conditions of life on the planet, adopt conservation values, and demonstrate a willingness to act, individually and collectively, in the joint project of addressing current and future environmental problems.[8]

Environmental education aims to improve the environment with the participation of the different actors involved in the educational process, whether they be teachers, students, researchers, activists, organizations, or other agents who have diverse conceptions and discourses on environmental education, leading to the development of diverse practices and actions according to the vision adopted by each of them.

This diversity of conceptions, characterizations, and ways of intervening in environmental education needs to be grouped into categories in which divergences, commonalities, and complementarities can be found. This means that in environmental education there are different currents and styles of conducting it, establishing the notion of current as a way of understanding and practicing environmental education, which analyzes it.[9]

A plurality and diversity of proposals and intermediate positions can be incorporated into the same current. This systematization of currents provides a valuable analytical tool that allows us to explore the diversity of pedagogical proposals rather than a closed set that forces us to classify them into rigid categories, thereby running the risk of distorting reality.[8]

Salas establishes two groups of currents: one with an ancient tradition that was dominant in the 1970s and 1980s, corresponding to the naturalist, conservationist, decisive, scientific, humanist, and moral and ethical current.[8]

The other group corresponds to those that have emerged recently: the holistic, bioregionalist, practical, critical, feminist, ethnographic, and sustainable eco-education currents. This theoretical basis allows us to describe the most prevalent currents or approaches to environmental education in the world.

Conservationist approach

This emphasizes nature and the environment as exhaustible material resources, giving rise to the need to conserve resources such as water, soil, animals, plants, energy, etc.[10]

The purpose of conservationism has been to raise awareness about caring for the natural world. It began with projects related to preventing health risks caused by pollution in urban and industrial centers, projects to conserve endangered wildlife, and projects to promote ecological awareness.

In the 1980s, there was a huge explosion of environmental groups and movements in the United Kingdom, the United States, and Latin America, with different approaches and positions on environmental protection. Advances in knowledge of the dynamics of nature and ecology led to conservation practices and techniques for saving and using energy, which made it possible to achieve high levels of economic and social development in unfavorable environments, that is, "intelligent use of natural resources".[9]

Conservationism in environmental education is geared toward the development of programs and activities whose main objective is to raise awareness among students about the importance of rational use and conservation of natural resources, especially in activities that promote solid waste management and recycling techniques as the best alternative for reducing pollution levels, energy consumption, and protecting the environment.

A study refers to environmental education programs focused on the "three Rs": reduce, reuse, and recycle, as well as those that promote environmental management (water management, waste management, energy management). The conservationist approach emphasizes the development of environmental management and eco-civic skills, which is already an imperative for action: individual and group behaviors around conservation projects.

Criticism of conservationism is based on the argument that environmental education has focused on idyllic, paternalistic, and unrealistic activities and criteria to promote appropriate styles of behavior towards the environment, understanding participation as attending learning workshops or linking individuals and groups to conservation projects that have been previously designed and financed from diverse realities.[11]

Naturalistic approach

This approach has its origins in the 1970s, when environmental education became a matter of public concern. This approach is characterized by a focus on education closely related to nature, in which the environment is synonymous with nature and living beings, explaining its problems from an ecological perspective, including solid waste management, soil destruction, species extinction, large-scale pollution, protection and care of nature, and improvement of the physical environment.

The rational use of natural resources and respect for nature are considered from a technical anthropocentric perspective, since behavior towards nature is determined by human interests.[12]

The naturalistic approach has conceptual inconsistencies in conceiving environmental education as focused on solving biophysical problems, which is a humanistic approach. This approach considers the human dimension of the environment, which is constituted by the intersection between nature and culture, where ecological heritage is not the only thing that forms part of the environment, but also human beings.

Geographers, architects, and designers work with this approach to environmental education, conceiving history, culture, aesthetics, language, gardens, land use planning, and symbols as an essential part of the environment.

This heritage, which is more cultural than natural, is justified by the fact that human planning and construction have been carried out in close relationship with the materials and possibilities offered by nature. An example of this is architecture as a means of understanding the environment through the landscape, with the design of public squares, gardens, and other collective spaces.

In the educational context, this approach is adopted by teachers interested in teaching environmental education through sensory, affective, and creative means, rather than through cognitive means, through observation, analysis, and synthesis, and the exploration of life through the reading of the landscape.

Resolution-based approach

The origins of this approach date back to the early 1970s, when the extent and severity of environmental problems became apparent. It is characterized by "focusing on positions that consider the environment as a set of problems to be solved."[13]

This approach takes into account UNESCO's view that environmental education should promote awareness of environmental problems among the population and develop strategies to solve them.[14]

This approach focuses on the imperative of taking action on people by modifying collective behaviors. According to this approach, environmental problems are related to various areas of human activity, such as health, consumption, environmental pollution, social inequalities, etc., and therefore require a curricular, rather than a disciplinary, approach.[13,15]

Environmental problems do not have a single solution. They are complex, open-ended, changing problems that require reflection and research, bringing inventiveness and creativity into play. To solve them, we need everyday knowledge, but also scientific knowledge. As can be seen, this approach requires the adoption of decisive environmental management systems in the field of citizen participation, within which the concept of quality of life is more coherently framed.

Sustainable approach

The expression "sustainable development" appears in the discourse of experts, politicians, and journalists since United Nations[16]. The arguments for sustainable development are found in the official doctrine of the United Nations, the European Community, and in the statements of every politician or manager. Now everything is done for sustainable development.[17]

The theory of sustainability is based on "a model of development on a human scale capable of responding to basic needs for subsistence, protection, affection, understanding, participation, leisure, creation, identity, and freedom, under a prototype of an economy that respects natural resources." Sustainable development requires different changes accompanied by everyday lifestyle changes in order to have lasting effects.[18]

Environmental education from a sustainable approach is understood as a new form of transformative education that incorporates the principles of environmental and intercultural education. The latter was established to create new educational concepts and strategies that facilitate conflict resolution and the integration of sociocultural structures and social groups.

From this perspective, environmental education is not limited to raising awareness and changing people's behavior, as is the case with other approaches, but rather promotes education to change society by orienting it towards human development, sustainability, and responsibility towards the planet, requiring the enhancement of human capacities, awareness, and action as responsible citizens with the ability to make decisions in a global and complex world.[19]

Background to the research

A study on the environmental attitudes of trainee teachers in the literature classroom, analyze a pilot educational experience whose objective was to develop the environmental attitudes of future teachers through the reading and discussion of a heterogeneous corpus of literary texts related to ecology and sustainability. They worked with 44 students, highlighting the cross-cutting nature of the issues addressed and their educational performance in different areas. At the beginning and end of the semester, the students completed a questionnaire called the Environmental Attitudes Inventory. Analysis of the responses, on a five-point Likert scale,

shows that this transdisciplinary innovation contributes to changing their environmental attitudes. In addition, there are significant differences between women and men in certain first- and second-order dimensions analyzed, and they conclude that women have greater environmental awareness.

A author, in their study on attitudes toward environmental conservation among students, investigated attitudes toward environmental conservation in a sample of 214 female students. They applied a validated instrument and reported results indicating that attitudes toward environmental conservation are favorable in 39,7 % of cases. In the cognitive component, the result is indifference or neutrality, but in the behavioral component, it is acceptance, and in the affective component, it is high acceptance.[20]

Pérez et al.[21], in their study entitled: Assessment of the change in attitudes towards the environment produced by the 'EICEA' educational program in secondary school students, report on research carried out with students regarding the use of the EICEA educational program, which is based on project-based and scientific research methodologies. Significant attitudinal changes were observed with regard to the topics of 'environmental conservation' and 'intention to behave in an environmentally friendly manner'. There was a shift away from individualistic positions towards attitudes more in line with sustainability, as well as a greater degree of personal commitment to environmental participation.

Espinoza[19], in his thesis entitled: Workshop on ecological culture to improve students' attitudes towards environmental protection, set out to determine the extent to which the workshop on ecological culture improves students' attitudes towards environmental protection. The research was carried out to solve the environmental problem and promote a responsible ecological culture that fosters positive attitudes in students. It was found that there is statistical significance in the dimensions of environmental protection habits and educational innovation, and even between the pre- nd post- s, demonstrating that the ecological culture workshop improves students' knowledge of environmental protection.

Rodríguez[22], in her thesis aimed at implementing an environmental education program to develop environmental conservation attitudes in students, worked with a sample of 80 students. The experimental study concluded that the effects of the environmental education program on the progress of environmental conservation among students were satisfactory, showing high levels in terms of the cognitive, affective, and conative components in the experimental group after the program was implemented.

Ortega[23], in his thesis entitled: The 'My Ecological School' Program and Students' Environmental Attitudes, set out to determine the influence of the 'My Ecological School' program on students' environmental attitudes. He used the scientific method and concluded that the results of the pre-test indicate that 54 % of students have a negative environmental attitude, while 6 % have a positive environmental attitude. In the post-test, 14 % have a negative environmental attitude and 70 % have a positive environmental attitude. Finally, it was concluded that the 'My Ecological School' program has a significant influence on students' environmental attitudes.

A study entitled: Aatitudes towards environmental conservation among students at the Instituto Agropecuario el Milagro, set out to diagnose and describe attitudes towards environmental conservation among students. The research was carried out on a sample of 81 students. The results indicate that 72 % showed a generally favorable attitude toward environmental conservation; the same percentage was obtained with a favorable cognitive attitude toward environmental conservation, and 66 % of the students showed a favorable reactive attitude toward environmental conservation. The researcher concludes that there is no dependence between attitudes at the general level, nor in their cognitive, reactive, and affective dimensions toward environmental conservation, with gender and specialty among students.

Esteban et al.[24], in their article on an approach to university students' attitudes towards the environment, aimed to evaluate the attitudes of students beginning their studies in Environmental Sciences and see how this influences this population, providing us with pro-environmental concepts, attitudes, and behaviors. This is a quantitative pilot study. Before beginning teaching, an initial study was carried out using descriptive methodology to gather information on students' beliefs about environmental issues. To this end, a survey was conducted using the Socio-Educational Environmental Aptitude Questionnaire (CASEM). The results indicated that most students have prior knowledge of the environment and consider that good environmental education is necessary to improve the environmental problems around them.

García et al.[25], report on the research entitled: perception of environmental conservation. Opinions, assessments, and attitudes of university students in Argentina, Bolivia, Brazil, Chile, Spain, Peru, Paraguay, and Uruguay. This study sought to ascertain the opinions, assessments, and attitudes of university students regarding environmental conservation in their respective countries. Comparing the results obtained, the researchers maintain that in the eight countries where the research was conducted, a minority of students say that the environment in their country is well preserved. The percentage who say they are well or very well informed is low. As for the measures that should be taken to protect their environment, students in the eight countries agree in their responses, indicating that environmental education and awareness campaigns aimed at the population should be carried out.

Usnaya et al.[26], set out to determine the influence on the environmental awareness of first-year cadets specializing in Bridge at the Miguel Grau National Merchant Marine School. They worked with a sample of 28 cadets specializing in Bridge. They used a questionnaire validated by expert judgment as their instrument. The research established that in the pre-test, the cadets demonstrated similar theoretical knowledge, practical knowledge, and environmental attitudes. They found differences between the pre-test and post-test scores in practical knowledge and environmental attitudes. Using the Student's t-test, they found that the scores obtained by the experimental group significantly exceeded those of the control group ( ). They conclude that the implementation of the environmental care program influences the development of environmental awareness. The implementation of appropriate academic programs improves environmental awareness and the problem of environmental pollution declines substantially.

In a study entitled Impact of the School Environmental Project (PRAE) on the promotion of environmental conservation attitudes among students, set out to evaluate the impact of the environmental project on the promotion of environmental conservation

attitudes. They worked with a sample of 156 students who responded to a Likert-type survey to identify and assess students' attitudes toward environmental degradation in their surroundings. In addition, a structured interview with 10 teachers sought to describe and determine how they are implementing the PRAE and its influence on students' environmental attitudes. The results reveal that most teachers are developing a cross-curricular and interdisciplinary approach in their teaching, based on their areas of expertise, but that they are producing passive students who, although they demonstrate that they are acquiring knowledge, do not translate this into concrete actions to protect and care for the environment. In conclusion, the PRAE being implemented is having a moderate impact on promoting attitudes among students towards environmental conservation.

Hernández et al.[27], in their research entitled: Evaluation of attitudes towards the environment in its three components and the behavior of Area officials, found that officials have a positive environmental attitude towards conservation and protection. The affective component showed that the most valued aspects are conservation and protection. In addition, they consider that working in this wilderness area is a privilege, a love of nature, a commitment, and a source of pride, which allows us to identify some of the values that the group has toward the object of study. The results of the reactive component indicate that the pro-environmental behaviors of the officials are positive, as they promote the reuse and recycling of waste, the conservation of energy and water resources, and express concern about learning about environmental problems.

The cognitive component indicates that most employees have basic knowledge of environmental issues such as waste pollution, gases and fuels, the implications of human action, and the causes and consequences of climate change. The researchers state that: "It is clear that knowledge alone is not a good predictor of responsible environmental behavior, so it is recommended to promote empowerment in spaces where environmental knowledge, skills, and abilities are provided, with the purpose of raising awareness, stimulating learning, and forming positive attitudes and behaviors toward the environment, at the individual and collective levels, which are translated into actions and projects in favor of conservation...".[27]

Theoretical Foundations

Environmental education

The UNESCO Education Commission maintains that environmental education is the process of recognizing values and clarifying concepts in order to foster the skills and attitudes necessary to understand and appreciate the interrelationships between humans, their culture, and their physical environment, thereby highlighting the consistency that must exist between decision-making and the attitudes assumed by individuals.

A study states that environmental education is a process in which individuals acquire skills and behaviors that enable them to act consciously after serious analysis and reflection. Environmental education is based on the conservation of the environment and has an exocentric approach, because it considers that humans are an active part of the ecosystem. Environmental education is aimed at changing people's lives to ensure the sustainability of the world, starting with raising awareness of the environmental crisis and encouraging people to adopt responsible attitudes.

The development of these attitudes, which may also be opinions and beliefs, should support the sustained adoption of behaviors that guide individuals and their groups to cultivate, manufacture, and purchase goods and develop technology in ways that minimize the degradation of the landscape or the ecological characteristics of a region, air, water, or soil pollution, and threats to biodiversity.

Environmental education is understood as a learning process whose purpose is to facilitate understanding of the environmental reality and the socio-historical process that has led to its current deterioration.

Its purpose is to generate an adequate awareness of the individual's dependence on and belonging to their environment, so that they feel responsible for its use and maintenance and are capable of making conservationist decisions.

These objectives constantly drive the generation of new strategies to develop learning and teaching processes in environmental education by various educational agents. The aim is to educate people in values and attitudes that are responsible towards the environment.

From a methodological point of view, the intervention program is a project-based method, which was described by a study.

This method is a proposal for action to be developed in a social environment and aims to improve people's quality of life. The teaching program has its roots in methodologies based on the research methods mentioned in the background.

There are various theoretical models in environmental education. Below we outline the most important ones.

Interdisciplinary model: from the perspective of environmental epistemology, the environment is not considered a concrete object but rather a relationship established between ecosystems and cultures. Interdisciplinarity should be the result of joint work on a problem, in which different disciplines are first able to analyze the problem in depth from their own field and then propose a discussion of different perspectives, which can be analyzed and questioned from multiple angles. This exercise involves questioning the disciplinary limits of knowledge and helps to build new perspectives and methods for understanding and solving the problem or constructing a new object of knowledge.

Cross-cutting model: cross-cutting not only identifies the educational content that is considered necessary, but also focuses on the meaning and intention that this learning aims to achieve. It is a genuine education in values, an ethical model that must be promoted by the entire institution. No institution alone can address the entirety of an environmental problem, which is why it is necessary to promote cross-curricular environmental education to replace fragmented education.[28]

Systemic model: the systemic approach takes into account the complexity of the objects and phenomena studied in order to understand the relationships between the various elements that make up systems and to identify, for example, the causal relationships between the events that characterize the situation observed.[29]

Environmental model: the environmental model is a strategy for addressing and solving environmental problems in the context,

seeking to transform the environmental reality by building an environmental culture that allows present generations to enjoy natural resources, ensuring their preservation so that future generations also have the opportunity to enjoy them.

Action research model: action research is applied to solve community problems. It involves undertaking a participatory process to solve socio-environmental problems perceived in the immediate living environment. Beyond the usual problem-solving process, it is about encouraging constant reflection on the action project undertaken. It is not about knowing everything before taking action, but about accepting to learn through action. You also learn about yourself and learn to work in a team.[30]

Problem-solving model: the problem-solving approach arises from considering learning as a social construct that includes conjecture and refutation based on a creative process. From this perspective, education aims to emphasize activities that pose problematic situations whose resolution requires analysis, discovery, hypothesis development, confrontation, reflection, argumentation, and communication of ideas.[31]

Goals of environmental education

Rodríguez[22] points out that environmental education is carried out to promote awareness, which involves motivating people to understand our ecosystem and the difficulties it is facing. The knowledge involved in making more people understand the environment in which they live and the role of humanity is called " ."

Attitudes and values must be cultivated in individuals with the aim of protecting and improving the environment. In terms of attitudes, it is about people seeking and developing the necessary skills to solve the environmental difficulties we are experiencing. Tools should be developed to evaluate the measures implemented and promote the participation of each person so that they are responsible and aware of the difficulties they cause to the ecosystem.[32]

Strengthening attitudes towards environmental conservation

A study suggests working to promote positive attitudes toward environmental protection using the following strategy:

- Inspire, encourage, and awaken the desire and interest to repeat the desired behavior. Reinforce it positively.
- Encourage and facilitate the imitation of positive models, based on environmental theory.
- Move on to repeated action through habit formation.
- Monitor and evaluate one's own behavior, overcoming ethical conflicts to achieve metacognition.
- Encourage habits that lead to the acquisition and formation of desired attitudes.
- Provide an affective environment and circumstances that facilitate the formation of attitudes.

Attitude is a form of secondary social motivation, as opposed to biological motivation, which is primary. Attitude drives and directs actions toward certain goals and objectives. It is not current behavior, but rather a prior disposition that prepares behavioral responses to social stimuli. Attitudes are not realities that can be observed directly, but theoretical constructs inferred from the external behavior or verbal statements of the subject.[33]

This makes them difficult to study and understand from a scientific perspective. Attitudes are important elements when it comes to explaining human social behavior, as well as mediating elements in higher learning processes.

Rodríguez[22], points out that in order to formulate and implement environmental education programs, the ecological foundations of how vital support procedures work must be taken into account, the conceptual awareness required to understand how working methods harm our ecosystem, research and evaluation of problems, highlighting the usefulness of education in recognizing and solving environmental difficulties, and the capacity for action to acquire skills that contribute constructively to improving environmental difficulties.

Strategies for developing environmental education programs

Martínez[34] points out that society must develop strategies for the proper management of natural resources and assets. Among the most important strategies are the following:

Multiple strategy: environmental education has an integrative and globalizing character to develop a new worldview. It is more social, more environmentally sensitive, with an entropic, systemic, and holistic sense. Being transdisciplinary, it must be applied from various disciplinary areas, from a scientific perspective and in conjunction with ecology, biology, sociology, economics, politics, culture, ideology, values, behaviors, attitudes, traditions, spirituality, and integrative areas such as learning and recreation.

There are two theoretical perspectives for implementing educational intervention programs related to the environment: the constructivist perspective and the systemic perspective. Both perspectives seek to gradually and progressively develop a set of attitudes after deep reflection.[5]

Investigation of problematic situations: the methodology allows for the study of socio-environmental problems with integrative potential to work on scientific and everyday content in the learning process.[2]

Addressing problematic situations helps human beings to construct new knowledge and learn as they work with these problems and develop cognitive, affective, and behavioral responses.[5]

It involves knowledge of educational issues and the formulation of approaches ranging from the simplest to the most complex, and then moving on to genuine reflections of a socio-environmental nature. Environmental research by students should be integrated into the curriculum, focused as an approach to environmental issues in schools, and modify the dynamics of learning processes.

Meaningful learning: this is characterized by trying to get students to understand concepts, procedures, attitudes, and values, rather than just memorizing them. With meaningful learning, new knowledge is incorporated into the cognitive structure in a way

that is neither rote nor mechanical.

It is assumed that learners necessarily have certain knowledge, concepts, ideas, and frameworks that are accumulated during previous experiences, even if these are simple, and serve as "inclusive ideas," references, or guides for interpreting, associating, and making sense of the new knowledge that is acquired.[35]

Otherwise, it is unlikely that they will achieve understanding. Thus, the initial idea for promoting meaningful learning would be to take into account the factual and conceptual knowledge that students already possess, as well as their attitudes and procedures, and how they will interact with the new information provided by the learning materials.[36]

Attitude in environmental education: in the process of developing environmental conservation, students must move from an analytical conception of the environment and not just understand that reality is the sum of its parts, to a systemic view to understand that reality is a hierarchy of systems integrated with each other.[37]

At the same time, the descriptive approach to reality, which does not consider the cause-effect relationship between things, must be replaced by the analysis of causal explanations, first linear, in terms of one environmental factor determining another, then interactive situations, such as two factors determining each other, and then moving on to spiral models, i.e., seen as a living process, to arrive at a holistic conception, in which everything interacts and integrates in some way.[38]

Experiential Environmental Education Program

The main objective of the Belgrade Charter, with regard to environmental education, is to change attitudes, which implies new ways of thinking, feeling, and acting towards our environment. Therefore, one aspect that must be considered after an environmental education process or after implementing programs to improve environmental attitudes is to evaluate the results and the impact these have had on people.

To achieve the goal of changing environmental attitudes, they must be evaluated to determine whether or not the goal has been achieved. This requires a theory, elements, and instruments to measure and evaluate the impact of an environmental education program on people, which should be reflected in their attitudes and behaviors toward caring for and preserving the environment. Unfortunately, little progress has been made in this field. There are few studies related to the measurement of environmental attitudes, which is why we consider it necessary to develop a theoretical framework and practical tools that allow for the direct evaluation of environmental attitudes in people.[26]

Environmental education is a topic that has only gained relevance in recent years. It is necessary to study this topic because it is the only indicator that allows us to assess the success or failure of an educational process, whether it be a project, program, or educational intervention.

Durmaz et al.[39], one of the leading advocates of environmental sociology, has been working since the 1970s to promote social and cultural movements to raise awareness of environmental issues. He proposes the idea of A New Environmental Paradigm, the title of his work, in which he argues that environmental sociology must open up and consolidate a new line of research. A notable element of the work of Durmaz et al.[39] is the criticism of the lack of theory on the environmental or ecological behavior of people.

"(...) subsequent texts have drawn attention to the relative stagnation of the discipline, especially around the social perception of the environment and the cultural change brought about by the emergence of environmental values (...) the dispersion and poor specificity of studies, the lack of theoretical and methodological imagination, the difficulties in finding satisfactory explanations for certain problems r presented in empirical evidence, and the slowness in integrating advances from different fields and research are some of the symptoms of the stagnation that, in the opinion of the aforementioned authors, affects the sociology of environmental perception."

A study of the current state of environmental sociology and the measurement of environmental awareness, in collaboration with Catton Jr. & Van Lier, propose a tool called the New Ecological Paradigm (NEP).

This assessment tool works with Attitude Theory, whose main theorist is Van Lier, who considers three important aspects when assessing people's attitudes: cognitive, affective, and conative aspects. Related to this, "... the absence of a strong theory that systematically explained the factors that favored environmental awareness was of greater concern to a author and their preference for seeking this theoretical support in attitude theory, a concept that articulates affective, cognitive, and behavioral elements, which fits perfectly with their definition of environmental awareness."

Dunlap's proposal is important for measuring attitudes, as he asserts that they can be measured with appropriate instruments. He insists on the need to develop a theory of attitudes and offers his own scale (NEP) as an assessment tool. This scale is a questionnaire for adults with items that take into account the three elements of attitude theory and allows the responses of users to be assessed using relevant indicators.

Peru has always been committed to caring for the environment and participates in treaties, conferences, and programs promoted by the UN in favor of environmental education. The Peruvian government has adopted a national environmental policy and, through its various ministries, such as Energy and Mines, Environment, Education, Foreign Trade and Tourism, and Women and Social Development, it is clear that each sector promotes different projects from the perspective of sustainable development.[40]

Our country has taken on the challenge of educating its citizens about the environment and is putting this into practice. Environmental policy is implemented in various government departments that have publicly stated their interest in caring for our planet and, above all, our natural resources. However, we know that policies and guidelines are not yet very clear and there are some gaps to be filled.

The main policies of the Peruvian government in the field of environmental education are as follows:

- The first version of the national environmental education policy, which was under consultation for about five years.

- A second proposal is presented in the National Curriculum Design, although we are not sure that it will be sufficient to ensure a change in environmental attitudes.
- A third proposal was put forward by the National Environment Council (CONAM) on how to address environmental education in Peruvian classrooms in order to develop environmental education in Peru "from an integrated and systemic understanding of the environment, generating responsible, critical, and proactive attitudes that allow for the consolidation and strengthening of participatory processes aimed at the sustainable development of the country, within the framework of national environmental policy."

Environmental knowledge must be acquired through environmental education, which develops environmental awareness. The critical state of the environment motivates the development of an intense concern to seek possible solutions, with the achievement of what is known as environmental awareness. It is essential that this issue be reinforced through education and then extrapolated to the entire community, caring for and respecting the environment.

The Ministry of the Environment & Ministry of National Education[41] defines this as "The understanding of the effect that human beings have on the habitat ... understanding how routine actions influence the environment and how this impacts the future of our spaces.".

The program that will be applied in our research is based on three dimensions: the cognitive, referring to knowledge; the affective, referring to feelings; and the conative, referring to actions.

Description of the Experiential Environmental Education Program

Name: Experiential Environmental Education Program.

Justification: given the current situation in our world caused by our irresponsible actions, we must take action from an environmental awareness perspective in order to understand and address the major problems caused by pollution and the destruction of nature. There is a need to take a stand against the mercantilist approach to the irresponsible exploitation of natural resources, but also against all forms of domestic or industrial pollution that compromise the air, land, and water.

The environmental issue is a commitment to environmental conservation, with a scientific and transcendent humanistic approach, with an awareness of "ecological conversion" aimed at true "environmental justice," based on the values of respect and the equitable distribution of natural resources that individuals must uphold in their daily actions.

Theoretical basis: this program is based on encouraging students to change their attitude toward environmental conservation, which should not be taken as a mere slogan to be repeated, but rather as the responsible behavior of each person toward the world in which they live. For this reason, the program is based on education.

According to Martínez[34], "Ecological or environmental culture must first be understood as a dimension of general culture." "Ecological culture was born to conserve the environment, which is why there is a pressing need to create methods of direct communication with society in general, so that through these methods, people can become aware of the need to care for their environment and can determine the role that each individual plays in promoting good actions and habits, with the aim of preventing ecological damage.".

A study describes it as: "Importance is given to trying not to impose guidelines on activities that seriously disrupt the balance that natural processes have developed, making it possible for an environmental quality suitable for human life to exist. It is necessary to incorporate the idea that, over time, by maintaining behaviors that are harmful to the environment, we are losing the opportunity to have a better quality of life, and we are damaging our planet and the beings that inhabit it.".

It is necessary for each person to become aware of environmental degradation in order to participate in the implementation of values and change attitudes to ones that care for the environment. All this as a process of cultural interaction in caring for environmental problems, above all preserving for the future to improve the quality of life of new generations. It is important to adopt responsible attitudes to try to eliminate the mistakes that have been made by humans in the world. It is an awakening to caring for what surrounds us and allows us to have a healthy and comfortable life.

With regard to attitudes, Ortega[23] points out that attitudes are part of our lives and our behavior. As people, we have different attitudes, some in favor and some against. We acquire all of them in the course of our social interaction. Since they are learned, they are susceptible to change, so we can say that our attitudes can change. This is what the proposed program aims to do with regard to changing attitudes in favor of environmental conservation.

General objective

To raise awareness and consciousness about environmental issues, creating environmental attitudes that lead to improving the quality of life for humanity.

Specific objectives

Train students on environmental issues that will be presented to the community.

To contribute to the process of improving the environmental attitudes of students and teachers in relation to the preservation and conservation of the environment.

Method

Work will be based on the needs and weaknesses of the students. All the activities carried out in this workshop are participatory,

beginning with group dynamics, games, and exercises aimed at including students in each of the areas. In this regard, the program will be developed in a face-to-face format to promote academic exchange, and will be organized into six hours distributed over six sessions of two hours per day. The methodology will be based on the following methods: Individual and group activities; plenary sessions; links between content; reflection processes among participants.

Learning sessions: the Experiential Environmental Education Program consists of a series of six sessions, which are as follows: first session: environmental education and the task of everyone. Environmental conservation policies. Second session: protecting biodiversity. Third session: personal conservation behaviors. Fourth session: planning our awareness campaign based on the 3Rs. Fifth session: enjoying nature. Sixth session: implementing our environmental conservation campaign.[42]

Evaluation of the sessions: the sessions were evaluated using rubrics developed for each one.

Attitudes toward environmental conservation

Studying attitudes in human beings is a complex task, and difficulties arise from the very concept of attitude, whose lack of specificity is a serious impediment when attempting to construct theories about attitudinal change. The most widespread conception of attitudes is that they are made up of various dimensions, of which the cognitive dimension and the affective or emotion-related dimension are those that motivate and guide people's responses. The predisposition to action is linked to the cognitive representation of the situation or belief and its association with pleasant or unpleasant events.

A study specifies that the affective is the emotional response linked to an object, which occurs through repeated contact and can generate pleasant or unpleasant sensations in the person, as well as generate a favorable or unfavorable disposition that will lead them to act in a certain direction.

Attitudes

A study defines attitudes as a set of cognitions, beliefs, opinions, and facts that can be considered knowledge, including positive or negative evaluations or feelings about a central topic or object. Attitudes are constructs that not only explain and predict behavior but also help to modify it.[23]

Ortega[23], indicates that an attitude is a relatively constant tendency to act. "An attitude is a firm predisposition to react in a characteristic, favorable, or unfavorable way toward a person or type of person, an object, a situation, or a given idea. An attitude is a feeling for or against something. Attitudes can be intellectual or emotional, but they generally have an emotional basis and tone.".

Saravia[9] states that attitudes are statements or evaluations made by people that have three elements: a. the cognitive, related to judgment or conviction, b. the affective, related to emotions or feelings, and c. the behavioral, that is, the specific behavior of an individual toward others.

Dekhili et al.[43] assert that attitudes are assumed by all people based on their experiences, consciously or unconsciously, without any intention of acquiring new attitudes or changing existing ones. Attitude is, therefore, a preparatory disposition to respond to social stimuli.

Attitudes are learned or acquired from a series of experiences that reinforce or do not reinforce certain behaviors. Hence, they represent a relatively stable predisposition to action, being susceptible to formalization or change and relatively long-lasting, firstly because the affinities and aversions we express towards objects or things are rooted in our emotions.[44,45,46]

Both, especially the latter, are difficult to extinguish, which facilitates their duration, and secondly, because feelings cannot be quickly separated from our perceptions, as they direct our attention and perception towards certain aspects of reality.[45,47,48]

Conservationist attitudes improve, reinforce, and increase interest in the environment among individuals and social groups. These attitudes are realized after social values are acquired, inducing individuals to participate actively in the conservation and improvement of the environment.[36,49]

Attitudes are behaviors or states of mind that are manifested externally, are closely related to our values, and are conditioned by many other factors and by the beliefs that each of us has.[46,50]

Values are moral and ideological principles that guide personal behavior. The system of beliefs, attitudes, and values supports human actions.

Dimensions of conservation attitudes

The first approach to attitudes occurs when we identify their three dimensions, which allows us to take into account the classic three-dimensional approach: the cognitive dimension, the affective dimension, and the conative dimension, also called behavioral or dispositional.

These dimensions increase to four in the model by Fishbein M and Ajzen:

1. Cognitive, which are beliefs and opinions.
2. Affective, which are feelings, evaluation, appreciation, or estimates.
3. Conative, i.e., behavioral intentions.
4. Observed behavior through actions.

Rodríguez[22] indicates that it is possible for an attitude to have more of one component than another. Some attitudes are loaded with affective components and require no action other than the expression of feelings. Some psychologists claim that social attitudes are characterized by compatibility in response to social objects. This compatibility facilitates the formation of values that we use to determine what kind of action to take when faced with any possible situation.

Attitudes are of great interest to psychologists because they play a very important role in directing and channeling social behavior. Attitudes are formed throughout life. They are not directly observable and must be inferred from the subject's verbal or nonverbal behavior.

Rodríguez[22] distinguishes three components of attitudes.

Cognitive dimension: this dimension of attitudes is made up of structured sets of relatively stable beliefs, values, knowledge, or expectations that predispose a person to act in a preferred way toward an object or situation.

This allows us to say that attitudes are determined by information, experience, and generalizations that people make about objects. It should not be forgotten that cognitive representation is not always real; sometimes it is vague, imprecise, or erroneous. Opinions, beliefs, categories, attributes, and concepts belong to this field.[47,51,52]

The cognitive dimension accounts for the degree of information and knowledge about issues related to the environment. While attitudes are considered mediators between a stimulus and a behavior or response, they are a cognitive process that includes the selection, coding, and interpretation of information about the stimulus. Attitudes exist in relation to a particular situation or object.[48,53] For this to be possible, there must be a cognitive representation of that situation or object. The available information, knowledge of objects, and previous experiences stored in memory are some of the cognitive components that constitute an attitude.[49,54,55]

Rodríguez[22] says that it is the set of data and information that detailed knowledge will favor association with its environment. The subject knows about the object towards which they adopt their attitude. Detailed knowledge of the object favors association with the object.

For an attitude to exist, there must be a cognitive representation of the object that is formed by perceptions and beliefs about an object, as well as by the information we have about it. Unknown objects or objects about which no information is available cannot generate attitudes. If the cognitive representation is vague or erroneous, the affect related to the object will tend to be weak; when it is erroneous, it will not affect the intensity of the affect at all.

Whittaker[50], points out that this dimension is a set of categories that human beings use to name all stimuli. Categories define the set of characteristics that an object must possess in order to belong to one of those categories.

A study, points out that the cognitive dimension refers to the degree of information and knowledge about environmental issues, as well as the bodies responsible for environmental matters and their situations. The following are considered indicators:

a) General information about environmental issues, or the extent to which people show interest in environmental information and obtain information from various sources.
b) Specialized knowledge on environmental issues, their causes, and consequences.
c) Knowledge and opinions about the environmental policy of the competent authorities.
d) Environmental policy programs.

Affective dimension: this consists of feelings towards the object of the attitude. The assessment that determines behavior is motivationally activated in the presence of the object or situation and is accompanied by feelings. Most authors agree with Fishbein that this is the most important element in the formation of attitudes because it refers to the emotion that permeates ideas and is related to feelings and emotions.

This dimension is the most deeply rooted and the most resistant to change. It refers to feelings either for or against an object or social situation, for which a cognitive component is necessary. These are perceptions of the environment, beliefs, and feelings about environmental issues. They are the sensations that the environment produces in the subject.

Rodríguez[22] points out that these are the sensations and feelings that the object produces in the subject. It is the feeling for or against a social object. It is the most characteristic component of attitudes. The subject may have different experiences with the object, which may be positive or negative.

It is usually the affective or emotional response associated with a cognitive category of the object of the attitude.[56,57] This component is formed by the contacts that occur between the category and pleasant or unpleasant circumstances.[50,58,59,60] The affective dimension refers to feelings of concern for the state of the environment and the degree of adherence to cultural values favorable to the protection of nature.

This component refers to emotions that reveal beliefs and feelings about environmental issues. From this component, consideration for the environment is not only a set of problems to be solved, but also a way of life to be respected, around which a sense of belonging can be developed and projects conceived, for example, of biocultural valorization or eco-development, from an emotionality centered on moral attitudes.[61,62,63,64]

In accordance with these definitions, within the affective component, we can distinguish the following indicators:[65]

- The severity of different problems or a specific environmental situation that is perceived as a problem, whether present, past, or future, that requires more or less urgent intervention. This can be reflected in assessments of the environmental situation or its evolution over time.
- Personal concern for the state of the environment in general or with regard to specific environmental problems or situations.
- Priority of environmental problems over other social problems, distinguishing between different environmental issues. Unlike the previous indicators, this involves ranking the different problems.
- Adherence to pro-environmental or environmentalist values, or the extent to which people interpret reality in an ecological way when identifying the drawbacks of certain production practices and lifestyles, as well as opting for pro-environmental measures to solve different problems.

Conative dimension: the conative dimension, also called dispositional, behavioral, or conductual, is the predisposition or intention to act. It manifests itself in the orientation of action in a certain way toward an object or subject. Anything that can be converted into an object of thought can become an object of attitude, understanding this as a tendency. Therefore, it is a tendency, an inclination to act, resulting from cognition and affect that can only be deduced through manifest and observable responses.[44,66,67]

The conative dimension refers to intentions to adopt pro-environmental criteria in behavior, demonstrating responsibility in caring for the environment, or a predisposition to participate or contribute to pro-environmental activities. It can be said that social representations of the environment shape environmental attitudes, which are composed of affective, cognitive, and dispositional components that determine the level of environmental awareness and the intention to adopt pro-environmental behaviors.[68,69,70]

These are the intentions, dispositions, or tendencies toward an object that produce a true association between subject and object. It is the tendency to react toward objects in a certain way. It is the active component of attitude.[22]

This dimension includes the act or behavior that an individual will assume in the presence of certain stimuli. This component helps predict what behavior an individual will display when confronted with the object of the attitude. "It is the activation or disposition to act in a specific way toward an object of the attitude. This component is the behavioral predisposition that an individual has toward an object of the attitude that is categorized and evaluated positively or negatively."[50,71,72,73]

Various studies consider that the active or behavioral component encompasses both the individual facet, i.e., private environmental behaviors such as ecological consumption, energy saving, recycling of household waste, etc.; as well as the collective aspect, i.e., generally public or symbolic behaviors expressing support for environmental protection, such as collaboration with collective movements that defend the environment, making donations, participating in demonstrations, etc.[74,75]

Although not explicitly stated, it seems appropriate to distinguish between different types of behavior according to the responsibilities involved in carrying them out, depending on whether they imply more or less profound changes in lifestyle.[51]

Change in attitudes

Attitudes definitely have a direct influence on social behavior. That is why those who try to change people's behavior focus on changing their attitudes. There are many examples of this: parents who try to influence their children's behavior, teachers who try to influence their students, among other cases. Psychologists argue that there are two ways to change attitudes: cognitive and affective.[52,76,77]

Cognitive nature. This is used in people who are motivated and know what they want. This is a very useful way to bring about attitude change. This new attitude will last a long time.[27,78]

Affective nature. This form of change is not as clear as the cognitive one, but rather attempts to bring about change through symbols or cues. If this change does occur, it is temporary and will not last for long.[53,79]

Factors influencing attitude change

In general, attitude change has been associated with the imposition of rules at all levels, from an institution to a state. It is ordered and enforced, a mistake that has been made throughout history because it has generated adverse reactions in people regarding the intent of the rule.[53]

Attitudes, if there is no awareness or internalization of what is to be changed, will not lead to responsible behavior. Each person's reactions will depend on their individuality in the face of a specific reality, as they respond to the values they have learned in their family, friends, and social environment.[54]

The cognitive aspect of a person's development must also be taken into account. Some people prioritize this area, neglecting other factors such as values education, personal awareness, and the environment in which they develop.[54]

These considerations require respect for certain processes in the teaching of environmental issues and a rejection of haste. It must be borne in mind that levels of moral reasoning are constructed and go through different stages. The school practice of identifying environmental education with the accumulation of data and information on environmental phenomena must be definitively abandoned.[55]

The environment

General Education Law No. 28044 establishes that one of the principles of Peruvian education is the development of environmental awareness. In Title I, Foundations and General Provisions, Article 8, Principles of Education, Peruvian education has the individual as the center and fundamental agent of the educational process.

The following principle is upheld: Environmental awareness, which motivates respect, care, and conservation of the natural environment, is a guarantee for the development of life.

Environmental awareness is not limited to people knowing their ecological space, of which they are a part along with other living beings and abiotic elements. It also allows them to take a position and make an active commitment to the preservation of biodiversity, the rational use of natural resources, disaster prevention, the r conservation of protected natural areas, the non-pollution of soil, water, and air, as well as hygiene and health care.[56,80]

Through the development of attitudes and values, students are expected to reflect on and form their own judgments about these issues and be able to adopt value-based, rational, and freely assumed behaviors in response to them. In this way, work on cross-cutting themes will contribute to the formation of autonomous individuals who are capable of critically judging reality and participating in its improvement and transformation.

Environmental conservation

Attitudes toward environmental conservation are predispositions to respond with favorable or unfavorable reactions toward environmental conservation. This involves the preservation of natural and environmental resources and their sustainable use. Environmental attitudes are those that help people decide whether the place where they live is suitable for the development of their lives and help them determine whether or not they are satisfied with the environment in which they live.[57]

This leads to attitudes toward environmental conservation based on beliefs or knowledge about the environment, attachment to the natural environment, and ecological behavior.[58]

People have an attitude that is already defined according to their customs or traditions as part of their development. Thus, the only way to bring about change is through environmental education that produces new positive attitudes toward the natural environment and generates new experiential activities related to environmental conservation.[59]

Environmental attitude or behavior is responsible for the environmental behavior of an individual or group of people, promoting the conservation of natural resources and leading to development and improvement in the quality of the environment.[59,81]

Importance of changing attitudes towards environmental conservation

Changing attitudes involves educating individuals to be aware of global warming and their responsibility to reduce its effects. From this perspective, it is necessary to include certain content in the school curriculum from an early age to enable children to understand the importance of knowledge about global warming and ways of controlling it. The aim is to create habits in childhood that will then naturally multiply in their behavior as adults.[36]

Providing citizens, in this case students, with adequate information about their duties and rights will enable them to demand efficient services from the authorities that guarantee environmental quality and prevent health problems for the population.[36]

On the other hand, a positive attitude among students toward environmental awareness regarding global warming will enable the implementation of policies to reduce greenhouse gas emissions, save water and energy, and reduce polluting processes in their own homes. Likewise, the school education that students in Peru receive today includes a brief explanation of global warming. This is a very serious shortcoming because the State does not ensure that citizens adequately understand this problem, which is common to all and is much more acute in urban areas, where more than two-thirds of the national population now lives.[36]

Assessment of attitudes

Regarding the assessment of attitudes, a study states that, like any psychological phenomenon, this measurement can be done directly or indirectly. It is measured on the basis of inferences that allow us to deduce certain responses of individuals towards certain objects or phenomena and that will help us to measure verbal opinions, feelings, and willingness to act in a given situation. According to the above, regarding the assessment of attitudes, attitude control can be direct or indirect on certain entities or phenomena, to assess expressed opinions, emotions, and the ability to proceed in the face of a fact. More scientifically accepted instruments should be implemented.[60,82]

A study indicates that attitudes can normally be measured and evaluated by inferences made from observable indicators through the following three means:

- Responses to a series of statements or adjectives expressed in scalar attitude techniques.
- Manifest behaviors of individuals, i.e., data observable through naturalistic or qualitative observation methods.
- Physiological responses of individuals, which are inferences based on galvanic skin responses, pupil dilation, breathing, or heart rate.

Of the few quantitative instruments that can be used to assess this aspect, attitude scales are the most important and widely used techniques. Attitude scales consist of providing a questionnaire with a list of statements, which are the classic attitude scales, with bipolar adjectives on which the semantic differential is based, and asking respondents to respond according to a scale based on their feelings or attitudes.

Use and recovery of solid waste

Green Plan[61], in its guide to responsible resource consumption, states: "Separating waste properly will help us reduce soil and water pollution, as well as the emission of harmful gases into the atmosphere". Some considerations in this regard are:

- Separate waste into organic and inorganic.
- Dispose of conventional batteries and cell phone batteries in the boxes provided for this purpose.
- When giving gifts, try to avoid laminated bags. You can reuse products that you can make yourself, such as Tetra Pak cubes, wrap with newspaper, use cardboard boxes and burlap bags, and decorate them with products that can be reused, which also gives them a personal touch. Simplicity does not detract from the gift.
- If you are ordering food, bring containers to avoid the use of plastic.
- Don't buy food or products with excessive packaging.
- Don't buy useless products.
- Avoid plastic bags or unnecessary paper.

The three Rs

There are many things we can do at home. We can summarize them in three Rs:

Reduce: this involves making changes to our daily behavior to generate less waste. We can help reduce waste by using jute or straw bags for shopping at the market. Use cloth bags to buy bread. Avoid buying products with a short shelf life, such as low-life batteries.

Consume as many natural products as possible. Family-size products generate less waste than individual products. For drinks and liquids, choose large, glass containers and, ideally, returnable ones. When it comes to clothing, keep in mind that fabrics such as wool, cotton, and linen are much easier to break down than synthetics.

Reuse: reusing or repurposing means giving things maximum value without destroying or discarding them.

Use both sides of sheets of paper. Give away things that are no longer useful to us, such as used clothing, furniture, equipment, but if they are useful to others, or donate them to charities.[62,83]

Use your imagination and creativity to make objects from inorganic waste, such as key rings, pencil holders, decorations, pictures, etc. Food scraps can be used as organic fertilizer in gardens.

Games for parks, solid waste bins, etc. can be made by reusing tanks, plastic and metal drums. Reuse unusable clothing for other purposes, such as kitchen rags or other things that can be made from scraps.[63]

Recycle: recycling is when a product that has already been used in its entirety or that is not wanted for a secondary use is destroyed through a specific process whereby its "waste" can be used to produce a "new" product. Plastic bottles are transformed into synthetic fabrics that are used in the manufacture of clothing, bags, blankets, among other items.

It is important to understand that recycling is not just the act of collecting and separating materials that are considered waste. It is part of the process that will enable waste to be transformed into something useful. We must reduce, reuse, and recycle at work, in industry, at home, at school, and in the office. We must not forget that all human activities generate waste that can be reused.

CONCLUSIONS

Throughout this paper, it has been shown that environmental education, far from being a merely informative process, must become a transformative strategy capable of changing individual and collective attitudes, beliefs, and behaviors in relation to the environment. The current environmental crisis facing the planet requires immediate responses, but also sustained ones over time. In this sense, it is not enough to implement isolated actions or promote technical knowledge out of context; it is essential to educate people to be critical, aware, and committed to building a truly sustainable development model.

One of the fundamental ideas underlying this approach is that environmental education must be ethical, active, and experiential. This implies that learning is not limited to the cognitive, but also encompasses affective and practical dimensions. Only in this way can real change be achieved in everyday habits and in the relationship that people establish with their environment. Values play a central role in this process: respect, empathy, solidarity, and responsibility are principles that should guide both environmental education and the decisions we make as a society.

The analysis also shows that environmental change begins with oneself. Global transformation starts with personal transformation, based on awareness and ethical commitment to present and future generations. In this sense, environmental education should be understood not as just another school subject, but as a way of life that permeates all areas of socialization: family, school, the media, the community, and institutions.

Finally, it is concluded that promoting a conservationist attitude is not an easy or immediate task, but it is possible and urgent. This requires political will, social commitment, and, above all, environmental education that is aligned with the challenges of the 21st century. Only then can we move toward a more just, equitable, and sustainable society, where human beings recognize that their well-being ultimately depends on the health of the planet they inhabit.

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FINANCING

None.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Ítalo Andrés Díaz Horna, Elías Jesús Mejía Mejía.
Data curation: Ítalo Andrés Díaz Horna, Elías Jesús Mejía Mejía.
Formal analysis: Ítalo Andrés Díaz Horna, Elías Jesús Mejía Mejía.
Research: Ítalo Andrés Díaz Horna, Elías Jesús Mejía Mejía.
Methodology: Ítalo Andrés Díaz Horna, Elías Jesús Mejía Mejía.
Project management: Ítalo Andrés Díaz Horna, Elías Jesús Mejía Mejía.
Resources: Ítalo Andrés Díaz Horna, Elías Jesús Mejía Mejía.
Software: Ítalo Andrés Díaz Horna, Elías Jesús Mejía Mejía.
Supervision: Ítalo Andrés Díaz Horna, Elías Jesús Mejía Mejía.
Validation: Ítalo Andrés Díaz Horna, Elías Jesús Mejía Mejía.
Visualization: Ítalo Andrés Díaz Horna, Elías Jesús Mejía Mejía.
Writing – original draft: Ítalo Andrés Díaz Horna, Elías Jesús Mejía Mejía.
Writing – review and editing: Ítalo Andrés Díaz Horna, Elías Jesús Mejía Mejía.