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Original article

Theoretical perspectives of environmental education from educommunication in digital environments

Perspectivas teóricas de la educación ambiental desde la educomunicación en entornos digitales

Perspectivas teóricas sobre educação ambiental sob a ótica da educomunicação em ambientes digitais

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ABSTRACT

Information and Communication Technologies have a high potential to promote behaviors that counteract the environmental deterioration of the planet. In this context, educommunication, understood as the confluence between education and communication, has gained relevance in digital environments. This review addresses the main theoretical perspectives and the relationship between environmental education and educommunication, with the aim of socializing the theories that support these processes to transform teaching and learning in a world mediated by technology. The research has a mixed approach and a non-experimental, descriptive, field design, focused on a dialectical materialist perspective. Theoretical methods such as historical-logical analysis were used, which allowed studying the background and theoretical perspectives of environmental education from educommunication in digital environments and the systemic-structural method, which approached research as an interrelated unit. In addition, documentary analysis, analysis and synthesis, induction and deduction techniques were applied. Among the main results, a significant evolution in environmental education was noted, from conservationist approaches to comprehensive strategies that include sociocultural and technological aspects. Several trends in this evolution were identified, such as the move from an isolated reaction to a defined political strategy, and from practice disconnected from theory to a focus on praxis. These elements facilitate the effective implementation of environmental education in a hyperconnected world and promote greater community participation and the integration of public policies and institutional programs.

Keywords: environmental education; educommunication; digital literacy.

RESUMEN

Las Tecnologías de la Información y las Comunicaciones poseen un alto potencial para promover conductas que contrarresten el deterioro ambiental del planeta. En este contexto, la educomunicación, entendida como la confluencia entre educación y comunicación, ha cobrado relevancia en los entornos digitales. La presente revisión aborda las principales perspectivas teóricas y la relación entre la educación ambiental y la educomunicación, con el objetivo de socializar las teorías que sustentan estos procesos para transformar la enseñanza y el aprendizaje en un mundo mediado por la tecnología. La investigación tiene un enfoque mixto y un diseño no experimental, descriptivo, de campo, centrado en una perspectiva materialista dialéctica. Se utilizaron métodos teóricos como el análisis histórico-lógico, que permitió estudiar los antecedentes y perspectivas teóricas de la educación ambiental desde la educomunicación en entornos digitales y el método sistémico-estructural, que abordó la investigación como una unidad interrelacionada. Además, se aplicaron técnicas de análisis documental, análisis y síntesis, inducción y deducción. Entre los principales resultados se constató una evolución significativa en la educación ambiental, desde enfoques conservacionistas hacia estrategias integrales que incluyen aspectos socioculturales y tecnológicos. Se identificaron varias tendencias en esta evolución, como el paso de una reacción aislada a una estrategia política definida, y de la práctica desconectada de la teoría a un enfoque en la praxis. Estos elementos facilitan la implementación efectiva de la educación ambiental en un mundo hiperconectado y promueven una mayor participación comunitaria y la integración de políticas públicas y programas institucionales.

Palabras clave: educación ambiental; educomunicación; alfabetización digital.

RESUMO

As tecnologias da informação e da comunicação têm um grande potencial para promover comportamentos que combatam a deterioração ambiental do planeta. Nesse contexto, a educomunicação, entendida como a confluência entre educação e comunicação, ganhou relevância nos ambientes digitais. Esta revisão aborda as principais perspectivas teóricas e a relação entre a educação ambiental e a educomunicação, com o objetivo de socializar as teorias que fundamentam esses processos para transformar o ensino e a aprendizagem em um mundo mediado pela tecnologia. A pesquisa tem uma abordagem mista e um desenho não experimental, descritivo e baseado em campo, centrado em uma perspectiva materialista dialética. Foram utilizados métodos teóricos, como a análise histórico-lógica, que possibilitou o estudo dos antecedentes e das perspectivas teóricas da educação ambiental a partir da educomunicação em ambientes digitais, e o método sistêmico-estrutural, que abordou a pesquisa como uma unidade inter-relacionada. Além disso, foram aplicadas as técnicas de análise documental, análise e síntese, indução e dedução. Entre os principais resultados, destaca-se uma evolução significativa na educação ambiental, desde abordagens conservacionistas até estratégias integradas que incluem aspectos socioculturais e tecnológicos. Foram identificadas várias tendências nessa evolução, como a mudança de uma reação isolada para uma estratégia política definida e da prática desconectada da teoria para um foco na práxis. Esses elementos facilitam a implementação eficaz da educação ambiental em um mundo hiperconectado e promovem uma maior participação da comunidade e a integração de políticas públicas e programas institucionais.

Palavras-chave: educação ambiental; educomunicação; alfabetização digital.

INTRODUCTION

The contemporary environmental crisis requires an effective educational response that combines critical awareness, sensitization and action. In this sense, the interaction among educommunication, environmental education and Information and Communication Technologies (ICT) emerges as an essential strategy to address these challenges in a comprehensive manner.

A practice between education and communication is educommunication and constitutes a resource to strengthen teaching-learning in its various processes, such as the planning, implementation and evaluation of the various educational programs through ICT and communication systems, which contributes to promoting assertive communication in order to improve the application of institutional plans (Bello, 2019).

Environmental education, for its part, makes use of multiple resources, including virtual ones, with the aim of making transformations in values that affect behavior and lifestyles, as well as expanding citizens' knowledge and promoting prevention and treatment processes for current and future environmental problems.

For this reason, this symbiosis is vital: Environment, ICT, educommunication and environmental education, since through them we contribute to mobilization and awareness; but, above all, they are considered as providers, in certain elements, of social participation, since they allow inclusive environments when reducing the limitations imposed by space, time and mediation (Muñoz *et al.*, 2020).

In turn, this relationship can be seen from several aspects: ICTs facilitate access to a vast amount of information; educommunication relies on ICTs to create interactive and dynamic learning environments with technological literacy and message analysis; and environmental education provides a formative learning process to develop essential behaviors and skills in the relationship among people, social groups and the environment.

This correspondence is synergistic, as environmental education, educommunication and ICT seek to improve the educational process, facilitate access to information and develop critical skills to navigate in a constantly evolving media and digital world.

The study is part of the research, development and innovation project "Environmental management strategy for mitigation and adaptation to climate change in communities and production units of the Hermanos Barcón production hub", which belongs to the Tobacco Collection and Processing Company of Pinar del Río, in the municipality of Pinar del Río.

The research is based on the frameworks of the 2030 Agenda for Sustainable Development, which includes 17 Sustainable Development Goals (SDGs) and 169 targets. These include improving education, awareness-raising and human and institutional capacity regarding climate change mitigation, adaptation to it, reduction of its effects and early warning.

Furthermore, it supports both the Economic and Social Policy Guidelines and the National Economic and Social Development Plan until 2030, approved during the VII Congress of the Communist Party of Cuba. These have as their primary objective the protection of the Environment and the implementation of strategies that promote sustainable development and the National Environmental Strategy (ENA) as the main instrument of environmental policy, which promotes the conduction of actions in order to achieve the goals of sustainable development; it also has a flexible approach to adjust to the institutional and economic changes that are taking place at this stage.

Likewise, it is based on the Territorial Environmental Strategy of Pinar del Río of 2021 and defines its fundamental objective as: "to achieve a healthy and balanced environment

through the conservation, protection and rational use of natural resources, better environmental quality and the confrontation of climate change, promoting sustainable development of the territory" (Ministry of Science, Technology and Environment (CITMA), 2022).

The existence of the term environmental education was first recognized in 1972 at the United Nations Conference on the Human Environment. At that meeting, the International Environmental Education Programme (IEEP) was created, which, according to Bedoy (2002), aimed to unite efforts and optimize information, resources, materials and research in environmental education in order to thus extend knowledge of the theoretical and practical contributions that were being made in this field of science.

Coinciding with the definitions consulted (United Nations Educational, Scientific and Cultural Organization, 1978; Cuba. National Assembly of People's Power; 1997, 2016; González- Escobar, 2017; Jaula *et al.*, 2018;), environmental education is assumed as a process of permanent educommunicative action, for the strengthening of capacities from the conceptual, attitudinal and procedural, for the acquisition of sociocultural values and habits that allow the development of a favorable position towards the protection, conservation and restoration of the environment and environmental problems and contribute to its resilience.

However, communication is not only the message, but also the how, why and what are the effects that it produces through the interaction between people, which makes their behavior evident in relation to what surrounds them (Novoa, 1980). It is action, but mainly it is the basis of any relationship (Anzorena, 2013).

Kaplún (1997) develops the notion of educommunication, from its interweaving around human and political rights to generate a critical reading of culture and mass media. Educommunication is defined as an educational model where the platform of the teaching-learning process is the participation of the students, and it is conceived as an active process of knowledge construction.

However, despite all the above provisions, the institutional strength necessary to devote the relevance that the topic requires to environmental education and environmental care at the national and territorial level has not been achieved.

The article aims to socialize the theoretical perspectives that support the development of the environmental education process from educommunication in digital environments.

MATERIALS AND METHODS

This work represents a partial advance of a master's research developed by the Center for Environmental and Natural Resources Studies of the "Hermanos Saíz Montes de Oca" University of Pinar del Río. Theoretical methods such as historical-logical analysis were used, which allowed to analyze the background and the main theoretical perspectives that support the development of environmental education from educommunication in digital environments. In addition, the systemic-structural method addressed the research in a comprehensive manner, examining the interrelation between the components of the environmental education process. The justification of this approach is based on its ability to evaluate the problem considering the level of interaction between the parties involved.

In the international context, key documents were reviewed such as:

- Stockholm Declaration on the Human Environment (1972), which emphasizes the importance of environmental education in the conservation and improvement of the human environment.

- Tbilisi Conference (1977) also provided fundamental guidelines for environmental education, promoting a holistic approach that considers the interdependence between human beings and their environment.
- The Belgrade Charter (1975) and UNESCO's International Programme on Environmental Education also provided essential frameworks for the development of educational programs focused on environmental sustainability.

In the Cuban context, educational policy has integrated environmental education into its curricula at all levels of education. Cuba has committed to initiatives such as:

- The National Plan for Environmental Education and the National Environmental Strategy, which promote environmental education as a cross-cutting axis in the educational system. Law No. 150 on the Environment, enacted in 2024, establishes the principles of Cuban environmental policy, highlighting the importance of environmental education for the sustainable development of the country.

Additionally, documentary analysis techniques were applied and analysis and synthesis, induction and deduction procedures were used for a deeper and more comprehensive understanding of the phenomenon studied. These methods allowed the identification of synergies between international and national theoretical frameworks, and their application in the specific context of environmental educommunication in Cuba.

This interdisciplinary and multi-scalar approach allowed us to assess not only the challenges and opportunities in the implementation of environmental education in digital environments, but also its potential to foster environmentally conscious and committed citizenship in the Cuban context.

RESULTS

The results obtained through historical-logical analysis reveal a significant evolution in the conceptualization and application of environmental education from educommunication, in digital environments. This method allowed us to identify the crucial stages and paradigmatic changes in the way environmental education is addressed, highlighting the transition from conservationist approaches to comprehensive strategies that include sociocultural, economic and technological aspects. Likewise, it was observed how the integration of educommunication has enhanced the effectiveness of educational programs, facilitating greater participation and commitment of the community.

The application of the systemic-structural method allowed us to analyze the interrelationship among the various components of the environmental education process, highlighting the importance of considering the educational system as an integrated whole. This systemic approach allowed us to assess how the interaction among the parties, such as educators, the media and public policies, contributes to the formation of environmentally conscious citizens. In addition, the need to develop educational strategies that promote intersectoral collaboration and the use of digital technologies for the dissemination and management of environmental knowledge was highlighted.

Documentary analysis and the procedures of analysis and synthesis, induction and deduction allowed for an in-depth study of educational policies and practices, both at international and national levels. In the international context, key documents such as the Stockholm Declaration on the Human Environment (1972), the Tbilisi Conference (1977), the Belgrade Charter (1975) and the UNESCO International Programme on Environmental Education were reviewed, which provided essential theoretical frameworks for environmental education. These reviews highlighted the evolution of approaches towards

a more integrated and holistic environmental education.

In the Cuban context, national policies and programs such as the National Plan for Environmental Education and the National Environmental Strategy, as well as Law No. 81 on the Environment, were examined. These documents emphasize the incorporation of environmental education at all levels of the educational system and the promotion of a culture of sustainability. The results of the documentary analysis revealed how these policies have been effective in the institutionalization of environmental education in Cuba, contributing to the development of a more conscious and committed citizenry with respect to environmental protection.

The evolution of environmental education has moved from an ecological conservation perspective to a more holistic and complex understanding of the environment. This is reflected in several important changes:

- From ecological conservation to a comprehensive understanding: previously, the focus was mainly on ecological conservation, but now there is a broader vision that includes social, economic and cultural aspects of the Environment.
- From problem diffusion to pedagogy: Initially, the focus was on the diffusion of ecological problems. Today, environmental pedagogies have been implemented

The evolution of environmental education can be observed in several key stages and directions:

- From ecological conservation to a complex understanding of the Environment: Initially, efforts focused on the simple conservation of ecosystems and species, but over time, environmental education has evolved towards a more holistic and integrated understanding of the various environmental components and their interactions.
- From disseminating ecological issues to implementing environmental pedagogies: Environmental education has moved from simply informing about ecological issues to developing and implementing specific pedagogies that foster pro-environmental understanding and action.
- From isolated reaction to the formation of social actors with political strategies: there has been a transition from isolated and reactive responses to environmental problems towards the formation of individuals and groups with well-defined and proactive political strategies to address these problems in a systematic manner.
- From dispersed diversity to collaborative plurality: environmental education efforts have moved from being dispersed and uncoordinated initiatives to forming collaborative networks that unite diverse actors and sectors to work together on common objectives.
- From practice disconnected from theory to a focus on praxis: there has been progress from educational practices, without a solid theoretical basis, to a focus on praxis, where theory and practice are integrated for greater educational effectiveness.
- From voluntary actions to institutionalization and integration into public policies: initially, environmental education depended on voluntary and isolated actions, but over time it has been incorporated and institutionalized into public policies and formal programs.

A constant and essential aspect throughout this evolution is the generation of pro-environmental knowledge and behaviors. Environmental education seeks to generate deep cultural changes, instilling a perception of belonging and responsibility towards nature. By doing so, individuals can make informed decisions that mitigate environmental deterioration and promote sustainable management of natural resources.

In the non-formal sphere, environmental education facilitates the participation of heterogeneous and voluntary groups outside the institutional educational system, with the aim of developing skills and capacities that promote environmental criteria in daily life, which allows a positive influence on the environment.

To promote environmentally responsible lifestyles, education and communication are essential; educommunication integrates both processes, generating awareness and actions in favor of the environment, spreading messages in a creative and attractive way.

Educommunication in Latin America, influenced by Paulo Freire's critical pedagogy, allows for the integration of creativity, autonomy, culture, media and technology in participatory and collaborative learning. This approach is crucial, since the lack of adequate information is one of the main causes of environmental problems.

Educommunication promotes collaborative learning through critical reflection and facilitates interaction and active participation in solving environmental problems in digital environments. Digital literacy is vital for managing, understanding and communicating environmental information, fostering the development of critical and responsible individuals who can positively influence sustainability and environmental protection.

Social media serves as a medium to communicate information and to promote environmental awareness, while digital literacy helps individuals to critically interact with this information. Educommunication connects these elements, fostering reflective and participatory learning that can transform habits and cultures towards harmonious coexistence with the environment.

The evolution of environmental education has been a complex process that has gone through several significant stages. Initially, environmental education focused on ecological conservation, with a specific focus on preserving species and ecosystems. However, over time, it has evolved towards a broader and deeper understanding of the Environment, encompassing not only ecological aspects, but also social, economic and cultural ones.

One of the most notable changes has been the transition from merely disseminating ecological problems to implementing environmental pedagogies. Previously, environmental education was limited to informing about ecological problems, but now specific pedagogies have been developed that not only seek to inform, but also to train individuals capable of taking concrete actions to solve these problems. This change has been crucial in transforming environmental education into an effective tool for social change.

Furthermore, environmental education has moved from being an isolated reaction to ecological problems to the training of social actors with a defined political strategy. In the past, responses to environmental problems were fragmented and reactive. Today, efforts are being made to train individuals and groups who not only react to problems, but also have well-defined political strategies to address them in a proactive and coordinated manner.

The evolution of environmental education has also been marked by the shift from a dispersed diversity to a collaborative plurality. Previously, environmental education efforts were varied and not always coordinated. However, today, greater collaboration has been achieved among different actors and sectors, creating networks that work together towards common goals. This collaborative plurality has been essential to increasing the effectiveness of environmental education efforts.

Another key aspect of this evolution has been the movement from a practice disconnected from theory to a focus on praxis. In the past, theory and practice in environmental education were often disconnected. Today, a conscious effort is made to integrate theory and practice, ensuring that theoretical knowledge is effectively applied

in practical contexts. This focus on praxis has allowed environmental education to become more relevant and effective.

There has also been a significant transition from voluntary actions to institutionalization and integration into public policies. Initially, environmental education relied heavily on voluntary actions and individual efforts; however, over time, it has been incorporated into public policies and formal programs, ensuring its sustainability and expanding its reach and impact.

Throughout this evolution, a constant aspect has been the process of generating pro-environmental knowledge and behavior. Environmental education not only seeks to inform, but also to generate profound cultural changes, instilling a perception of belonging and responsibility towards nature. Through environmental education, individuals can make more conscious and effective decisions to mitigate environmental deterioration and to promote sustainable management of natural resources.

Environmental education has also been fundamental in community participation and action. In the non-formal sphere, it has facilitated the participation of heterogeneous groups and volunteers outside the institutional educational system, with the aim of developing skills and capacities that promote environmental criteria in daily life, allowing people to positively influence their environment.

Educommunication has emerged as a crucial tool in a hyperconnected world. To promote environmentally responsible lifestyles, education and communication are essential. Educommunication, which integrates both processes, generates awareness and actions in favor of the Environment, spreading messages in a creative and attractive way. In Latin America, educommunication has proven to be a powerful resource to generate awareness, sensitize, train and encourage actions that transform habits and

cultures towards greater participation and influence on environmental problems.

In the digital age, digital literacy has become essential for environmental education. It is not just about using ICTs, but about understanding and using them critically and responsibly. Digital literacy empowers individuals to critically interact with information, promoting environmental awareness and informed decisions. Social media plays a vital role in this process, by providing a platform to communicate environmental information and to promote environmental education.

Integration of education and communication: Environmental educommunication should effectively combine education and communication to create deep environmental awareness. This includes not only informing, but also training and motivating action.

Active and collaborative participation: It is essential to encourage the active participation of various actors, including communities, organizations and authorities. Collaboration is key to generating a significant impact on environmental education.

Creativity and innovation: Using media and technologies creatively to make environmental messages engaging and accessible. This includes using digital platforms, social media and other interactive resources.

Critical perspective: promote a critical and reflective vision in students, allowing them to question and analyze environmental information, and develop critical thinking that drives informed decisions.

educommunication messages and methods to the cultural and social context of the audience. Cultural relevance increases the effectiveness of communication and education.

educommunication initiatives are sustainable over time. This includes integrating these

processes into public policies and institutional programs to ensure their continuity.

Community empowerment: The ultimate goal of educommunication is to empower communities to take an active role in protecting the environment. This is achieved by developing capacities and skills that enable individuals and groups to positively influence their environment.

DISCUSSION

Environmental education seeks cultural changes, starting by establishing feelings that conceive it as part of nature; through it, the individual will make decisions that help mitigate the current deterioration of the Environment and, in turn, achieve a more successful management of the Earth's resources. Precisely, Márquez *et al.* (2021) establish that environmental education takes on vital importance in overcoming the current crisis that humanity is suffering, since it can play an important role in overcoming consumption patterns and achieving the desired sustainability.

Mateus *et al.* (2020) consider that there are few Latin American countries in which progress is evident in the development of public policies related to media, interpersonal and business education. Precisely, the lack of information to promote environmental education is one of the main causes of environmental problems and poor education in this regard.

The recognition of the integration of these two disciplines reveals that neither education nor communication, from their individuality, have solved problems that they have in common. This means considering, firstly, "the collaborative and participatory nature of educommunication; secondly, its creative and transformative possibilities and, thirdly, the means and codes through which the educommunication process is established " (Barbas, 2012, p. 165).

For various theorists, such as: Kaplún (1997), Ferrés & Masanet (2017), Chévez (2021), educommunication allows the incorporation of traditional and digital media in educational spaces, with the aim of understanding the processes of environmental education from the perspective of communication to generate awareness and thus form citizens through social transformations, enhancing the information and knowledge of communities (Sena *et al.*, 2019).

However, there are several challenges for environmental education to make media literacy effective in environmental matters on social networks. Digital literacy is not only about using ICTs, but also about knowing them; in addition, understanding them, studying them critically, appropriating them and using them responsibly, in order to, in the case of this research, obtain greater skills for the dissemination of issues related to the Environment and that contribute to corporate environmental education.

According to Barbas (2012), educommunication in the 21st century must integrate cyberspace as part of social learning and see it as an extension of society. It is crucial to promote new forms of social learning through social networks and expand active learning through digital media. Educommunication must be attentive to new forms of learning on the web, critically evaluating them to positively influence reality (Hernández *et al.,* 2021).

The theoretical-conceptual review allowed us to establish key definitions for the course of this research, such as: environmental education, educommunication and its link with ICT.

Educommunication and environmental education can help promote a change in attitude and encourage the adoption of sustainable measures to protect the environment, through the use of digital platforms.

The study highlights the need for educommunication in environmental education in digital environments, as an effective resource

to promote knowledge, values, and the transformation of attitudes in citizens.

The integration of educommunication in environmental education in digital environments opens a vast field of possibilities, understanding communication not only as a tool but as a strategic process to develop methods that promote more effective learning and commitment to environmental sustainability.

Finally, educommunication connects all these elements, fostering reflective and participatory learning that can transform habits and cultures towards harmonious coexistence with the environment. The evolution of environmental education shows a progress from simple and isolated approaches to complex, collaborative and integrated strategies, with a significant focus on praxis, community participation and the use of technologies for environmental literacy and communication.

Research suggests that the future of environmental education is intrinsically linked to the ability of ICTs to transform not only the way information is shared, but also how relationships between individuals and the environment are built and consolidated.

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