



Original article

Environmental training in distance postgraduate education in times of COVID-19

Formación ambiental en la educación de postgrado a distancia en tiempos de COVID-19

Formação ambiental na pós-graduação a distância em tempos de COVID-19

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ABSTRACT

The current environmental problems, exacerbated globally and locally by climate change and pollution, require Cuban science to project actions from different modalities of improvement to contribute to the environmental culture of society. However, despite the efforts made, there are gaps that must be overcome in environmental training. From this perspective, the Cuban university is in charge of contributing to the fulfillment of the 2030 Agenda and the State Plan to confront climate change. Consistent with this aspiration, the Diploma Course "Territory, Environment, and resilient communities for Sustainable Development" was developed, coordinated by the Center for Community Studies of the University of Las Villas. The objective of the article is to present the results of environmental training achieved in this diploma, through distance education. The methods used were: document analysis, participant observation, interviews and questionnaires. As a result of the training process, the development of environmental training in the trainees was achieved, expressed in: knowledge, skills and values demonstrated in the workshops, through virtual platforms. It provided a diagnosis, a proposal for actions and a monograph, which constitutes reference material for future training processes. In the course, the responsibility of students and teachers in COVID-19 conditions was evidenced, in pursuit of environmental training. In the process, it was possible to appreciate the community self-development of the individual and collective subject before each activity proposed by the faculty, which assumed the accompaniment of the group with pedagogical mastery.

Keywords: community self-development; education; environmental training.

RESUMEN

La problemática ambiental actual, agudizada a nivel global y local por el cambio climático y la contaminación, exige que la ciencia cubana proyecte acciones desde diferentes modalidades de superación, para contribuir a la cultura ambiental de la sociedad. Sin embargo, a pesar de los esfuerzos realizados, se aprecian vacíos que deben ser superados en la formación ambiental. Desde esa perspectiva, la universidad cubana tiene el encargo de contribuir al cumplimiento de la Agenda 2030 y del Plan del Estado para el enfrentamiento al cambio climático. Coherente con esa aspiración se desarrolló el diplomado "Territorio, Medio Ambiente y comunidades resilientes para el Desarrollo Sostenible", coordinado por el Centro de Estudios Comunitarios, de la Universidad de Las Villas. El objetivo del artículo es presentar los resultados de formación ambiental alcanzados en ese diplomado, mediante la Educación a Distancia. Los métodos empleados fueron: análisis de documentos, observación participante, entrevistas y cuestionarios. Como resultados del proceso formativo se alcanzó el desarrollo de formación ambiental en los cursistas, expresada en: conocimientos, habilidades y valores demostrados en los talleres, a través de plataformas virtuales. Aportó un diagnóstico, una propuesta de acciones y una monografía, que constituye material de consulta para futuros procesos de formación. En el diplomado se evidenció la responsabilidad de cursistas y docentes en condiciones de COVID-19, en pos de la formación ambiental. En el proceso se pudo apreciar el autodesarrollo comunitario del sujeto individual y colectivo ante cada actividad propuesta por el claustro, el cual asumió con maestría pedagógica el acompañamiento al grupo.

Palabras clave: autodesarrollo comunitario; educación; formación ambiental.

RESUMO

O atual problema ambiental, agravado a nível global e local pelas mudanças climáticas e pela poluição, exige que a ciência cubana projete ações de diferentes modalidades de melhoria, para contribuir para a cultura ambiental da sociedade. Contudo, apesar dos esforços realizados, existem lacunas que devem ser superadas na formação ambiental. Nesta perspectiva, a universidade cubana é responsável por contribuir para o cumprimento da Agenda 2030 e do Plano de Estado para enfrentar as mudanças climáticas. Coerente com esta aspiração, foi desenvolvido o curso de diploma "Território, Meio Ambiente e comunidades resilientes para o Desenvolvimento Sustentável", coordenado pelo Centro de Estudos Comunitários, da Universidade de Las Villas. O objetivo do artigo é apresentar os resultados da formação ambiental alcançados neste diploma, através da Educação a Distância. Os métodos utilizados foram: análise documental, observação participante, entrevistas e questionários. Como resultado do processo formativo, conseguiu-se o desenvolvimento da formação ambiental nos alunos, expressa em: conhecimentos, competências e valores demonstrados nas oficinas, através de plataformas virtuais. Forneceu um diagnóstico, uma proposta de ações e uma monografia, que constitui material de referência para futuros processos de formação. No curso de diploma, ficou evidente a responsabilidade dos alunos e professores nas condições da COVID-19, na busca pela formação ambiental. Nesse processo, o autodesenvolvimento comunitário do sujeito individual e coletivo pôde ser apreciado diante de cada atividade proposta pelo corpo docente, que pressupunha o acompanhamento do grupo com domínio pedagógico.

Palavras-chave: autodesenvolvimento comunitário; Educação; treinamento ambiental.

INTRODUCTION

In the current context of Cuba, affected by the dangers, vulnerabilities and risks that exacerbate the effects of climate change, the negative consequences of pollution are also observed. Therefore, the development of environmental culture in the population is urgently needed to perceive, prevent and minimize the effects that these problems generate.

Such aspiration is contained in the National Environmental Strategy, a document that details the theoretical framework and guidelines for the training and development of human resources.

The development of environmental training and the need to continue providing actions and results that contribute to promoting sustainable development is a latent, unresolved problem that demands research, projects, the support and responsibility of everyone. It is an approach in which criteria and works by authors such as: Borges, Zurbano and Castro (2022) coincide; Tovar-Gálvez (2020); Márquez, Linares and Jaula (2021); Borges *et al.* (2022); Castro *et al.* (2022); Pérez-Vásquez and Arroyo-Tirado (2022) and Castro *et al.* (2023).

The content of this article exposes the theoretical foundations that support the development of environmental training in the participants of the diploma course "Territory, Environment and resilient communities for Sustainable Development." It was assumed as a transversal axis that this environmental training was promoted from the formation of environmental culture, which is oriented not only to the formation of knowledge, skills, values that later materialize in responsible attitudes of the subjects (individual and collective) with the Environment, but will also do so in correspondence with the inclusive and participatory goal of the Cuban social project: moving from the "object" approach to the "subject" approach; from assistance to protagonism as an expression

of the self-transformative action of the subjects (Borges, Zurbano and Castro, 2022; Borges *et al.*, 2019).

Thus, based on the knowledge acquired in the distance environmental training process, the subjects involved will become multipliers of good practices, in favor of guaranteeing sustainability and contributing to minimizing environmental problems and the impacts of climate change in the territories.

To develop this training process, the sociological approach to self-development is assumed, which incorporates among its features spiritual growth, a humanistic and developmental foundation, based on fair, equitable and inclusive social relations, which contribute to a harmonious relationship with the Environment. From this premise, it is clarified that it is essential to promote actions that enhance the participation and cooperation of society and, at the same time, allow subjects their self-development to identify contradictions, overcome individualism and transition to harmonious and sustainable community practices in the world. time and space.

In this logic, the sustainability criterion illustrates the possibility of developing an individual-community-Environment relationship, which contributes to mutual development. It implies transforming the way of thinking and doing of social subjects, in their relationships with the Environment, the formation of critical consciousness and social responsibility as part of a collective project that leads to the overcoming of personal interests. This sustainability criterion is defended by Márquez, Linares and Jaula (2021) as an essential instrument to promote environmental change based on social transformation. It involves a profound social transformation that privileges horizontal and symmetrical links, processes of participation, cooperation and social emancipation as part of the self-development of communities. The demand for sustainable development extends to all human activities, therefore, the training

process must guarantee inclusive education that contributes to the participation of society, in pursuit of the 2030 Goals.

In correspondence with this principle, the article proposes: to present the environmental training results achieved in the diploma "Territory, Environment and resilient communities for Sustainable Development", through Distance Education.

The importance of this research lies in the sociological approach assumed, consistent with the demands of the Diploma in Distance Education, which allowed the development of actions with the protagonism of the subjects involved, both the faculty of teachers and graduates. In addition, it paid, as added value, the solidarity and responsibility between the subjects to meet the objective, under conditions of isolation due to COVID-19; This demonstrates the scope achieved and supports its novelty.

MATERIALS AND METHODS

On the basis of the dialectical method, the theoretical methods were used: analytical-synthetic and deductive-inductive, which made it possible to identify regularities in relation to environmental formation. The following key documents were analyzed: the National Environmental Education Strategy, the 2030 Agenda, the State Plan to confront climate change (Task Life), the Postgraduate Management Manual for the Distance modality and the Distance Education Model of Cuban Higher Education. Through participant observation, it was guaranteed to be part of the process and obtain information that allowed the internal functioning and future projections of the diploma to be characterized, in order to guarantee the objective. The interviews were the basis for developing the diagnosis.

Research-Action-Participation-Transformation and the Community Self-Development Methodology (Alonso, 2009) were used, qualitative par excellence, consistent with the theoretical references assumed by the authors and with the principle of community action-transformation, adjusted to the modality virtual. From that perspective, group techniques and methods adjusted to Distance Education were promoted.

The following design was followed for the process:

It was defined as a scientific problem: how to contribute to environmental training in the group of students of the diploma course "Territory, Environment and resilient communities for sustainable development"?

Consequently, the general objective was formulated: to propose actions that contribute to environmental training from Distance Education, in the group of students of the diploma course "Territory, Environment and resilient communities for Sustainable Development".

The specific objectives set were: to diagnose the current state of the environmental training of the students, to propose actions that contribute to environmental training, from Distance Education, in the group of students and to propose a monograph containing the articles prepared by the graduates, as final work.

Participation was carried out virtually through the Moodle and WhatsApp platforms. The students were grouped according to interests, to discuss the different topics assigned in each course. An intentional sample was selected, made up of 24 subjects who make up the group that took the first version of the diploma, in the period March 2021-September 2021.

RESULTS

Environmental training is considered in the National Environmental Education Strategy as a process that must be organized and is responsible for:

- Develop methodological guidelines based on environmental problems.
- Organize workshops.
- Organize courses that allow teachers, managers, and decision-makers to improve.
- Promote the systematization of community training courses.
- Introduce the environmental dimension in training plans.

From these guidelines, defined in Cuban environmental policy, the authors of this article return to the essence of Cuban education, which states that:

- The purpose of education must be aimed at the formation of man in his broadest and highest concept. The integral man who thinks, feels, values, does, acts and, above all, loves.
- Possess great precision in the definition of the categories: education, teaching, instruction and training, as well as the most general principles that guide education.
- Aspire to a natural, scientific, practical education, not pragmatic or utilitarian, developmental and, above all, humanistic.
- Project the harmonious unity of the formation of man and the aspiration to educate him for life.
- Insist on the close and necessary relationship between the activity of the teacher and that of the student, which is expressed in the work between the facilitators and the professional.
- Rely on dialogic communication.
- Use methods that activate and problematize.
- Highly value the necessary relationship between school, family and community.

As results of the distance environmental training process, the following results were obtained:

- Diagnosis of the current state of environmental training in graduates .
- Proposal of actions to contribute to environmental training in Distance Education.
- Monograph "Environmental Training in distance improvement in times of COVID-19, containing the articles prepared by the diplomats as their final work.

Below is a summary of each result:

- Diagnostic result: current state of environmental training in graduates .

The diagnostic results were obtained from the individual interview for admission to the diploma course. Based on the items of the applied instrument (totalizing nature of the Environment, participatory methods to carry out actions in it, topics that you would like to know about), a scale of high, medium and low was applied; The following main regularities were obtained:

- Of 24 students , eight were in the high category, coinciding with the registered master's degrees and doctors, 16 showed a medium level of knowledge.
- The main gaps were found in the understanding of the totalizing nature of the Environment and in the use of group methods that can strengthen critical consciousness.
- The topics that most interested the students were: climate change, environmental resilience, education and environmental management; as well as: knowledge management and participatory forms to develop group actions in the Environment.

Based on the results of the diagnosis, a system of actions was proposed. Below is stated, in summary:

- Proposal of actions to contribute to environmental training in Distance Education.

Analysis and discussion of Cuban environmental policy documents.

Proposed objective: argue the totalizing nature of the Environment, using the instruments of Cuban environmental policy.

The aim was to analyze the instruments of Cuban environmental policy and express, in the forum designed on the Moodle platform (virtual platform accessible to diploma holders), the totalizing nature of the Environment.

The means were the bibliography provided by the teachers and the information and communications technologies made available to the students.

To close the activity, it was requested to express, through the WhatsApp platform , the knowledge and skills acquired when carrying out that activity.

- Development of workshops, on the WhatsApp platform, on the following topics: totalizing approach to the Environment, Cuban environmental policy, community environmental resilience, space and territory, heritage conservation, contribution of knowledge management to environmental management, importance of group devices in actions for environmental training, environmental training and education, heritage conservation.

The objective was to explain the behavior of the problems under study in the world, in Cuba and highlight the particularities in its territory.

The aim was to analyze the bibliography posted on the Moodle platform and carry out a synthesis of the problems under study, with emphasis on their behavior in the territory.

For the closing, it was requested to express, through the platform created through WhatsApp , a summary of the main environmental problems of the territory and organize a discussion in groups, which would highlight the knowledge and skills that contribute to personal environmental training.

- Carrying out virtual workshops, with the collaboration of FLACSO and other specialists, on topics such as: climate change and Plan to confront climate change in Cuba (Tarea Vida).

The objective was to argue the effects of climate change in the territory of origin, based on the information offered by the video on this topic.

It was oriented: identify the central theme of the video, make a synthesis of the theme discussed in the video and identify its behavior in the locality, refer to the causes and consequences for the residents, propose actions for its solution and contribute to responsible behaviors of the population, present the results in a plenary session for debate and propose actions that contribute to the projection of the State Plan to confront climate change in the territory of origin. The results were presented in a virtual workshop, through the group created on WhatsApp .

For the closing, it was requested to express conclusions about the activity and prepare a text about the knowledge, skills and values developed through the activity.

- Compilation, in a monograph, of the articles presented as the final work of the diploma, which provided material to be used in future training processes.

The objective of this action was to bring together, in a monograph, updated scientific information on environmental problems and their impact on the country's territories.

The guide was to select a topic from those assigned to the group, prepare a scientific article and present the results in a final workshop.

To guarantee the independent work of the diplomats, under conditions of isolation, the following guidelines were issued for video analysis and environmental interpretation:

a) For the environmental interpretation, define the following aspects: objective of the environmental interpretation (why?); target audience (to whom?); interpretation sites (where?); interpretive themes (what to interpret?); procedures for interpretation (how to interpret? what modalities and techniques to use?); preparation of the guide, according to the content to be interpreted.

b) For video analysis, the following guidance guide:

1. Identify the central theme of the video.
2. Prepare a summary of the topic discussed in the video and identify its behavior in the locality.
3. Say the causes and consequences for the residents. Propose actions for its solution.
4. Present the results in a plenary session for debate.
5. Propose actions to contribute to responsible behavior of the population aimed at the topic discussed.

Throughout the training process, its evaluation was developed, through participant observation, by the researchers, who at the same time were part of the teaching staff of the diploma. The analysis of the information obtained allowed us to characterize, evaluate and redesign, when necessary, its internal functioning.

DISCUSSION

From the theoretical methods used during the process, it was possible to verify that the main results achieved with the proposal of actions contributed to strengthening the environmental training of the diplomats, based on a conception of community environmental education, developing: knowledge, skills, values and behaviors at the individual and group level, defended by Mederos and Castro (2018, 2021), Márquez, Linares and Jaula (2021), Castro *et al.* (2023).

The environmental training process showed the value of community environmental education, which has as a distinctive element its developmental character, which will guarantee, in the subject, the active and creative appropriation of culture based on their own experience; At the same time, it will promote the constant self-perfection of the subject, its autonomy and self-determination in intimate connection with the socialization processes (Castro *et al.*, 2022; Castro *et al.*, 2023).

From this perspective, the assumed community environmental education takes shape in group work that contributes to environmental training (Borges *et al.*, 2022; Castro *et al.*, 2022). Its development function is also specified in the construction of the proposal of actions, facilitating the fulfillment of the intention and purpose of the process; It transcends traditional proposals to emerge as a transmission of culture, as a transformation of oneself and as a transformation of reality adjusted to the context (Castro *et al.*, 2023).

By enhancing the development function in non-school community environmental education, it also contributes to the community taking care of its problems and organizing itself to solve them, developing its own resources and potential and using those of others; idea defended by Pérez-Vásquez and Arroyo-Tirado (2022).

It is essential that this process contributes to the subject's self-developing as such, active and protagonists, assuming the condition of subjects of said practice (Castro *et al.*, 2023); That is to say, it is necessary to promote training processes with disalienating, conscientizing and socializing participation, as a way to counteract the alienating ideological effects of dependent structures.

All of the above allows the achievement of the emancipatory and self-developing intentionality of the environmental training process that takes place in the diploma, which is achieved by expressing, in the capacity achieved to promote self-management, the self-development of the subjects, enhancing action. of transformation and its role as a transforming subject of reality, based on its own needs and resources (Castro *et al.*, 2023), consistent with Distance Education. As stated by Borges *et al.* (2022), the environmental dimension transversalizes the training and self-development processes, both in institutional, business and community contexts.

At the same time, the center of power is assumed by the group with the prominence of the subjects in the actions. The subjects are actors, managers, facilitators who belong to the field of action and who develop the actions from a virtual platform that unites them as a group. In this practice, under conditions of isolation, a sociocultural exchange occurs that provides typical characteristics to the environmental formation process.

The practical activity of man gives culture a core character that occurs in its social relationships. Borges, Zurbano and Castro (2019) highlight that this premise is essential for the environmental education and training process; It has a socializing, developmental and emancipatory character, which occurs in the different socializing agents. The authors specify that, as a cultural process under construction, it generates behavioral changes based on the knowledge, skills and values acquired in it, which are expressed

in the development of the environmental culture of society.

In that sense, these authors specify that environmental culture will be in correspondence with the inclusive and participatory goal of the Cuban social project: moving from the object approach to the subject approach, from assistance to protagonism as an expression of the self-transformative action of the subjects.

From these arguments it was appreciated that the environmental training process was strengthened from foundations that consolidate and develop it; achieves values, criteria, commitments and clarifications of demands in relation to environmental problems and assumes as a theoretical-methodological and practical conception that the Environment is a complex and dynamic system of ecological, socioeconomic and cultural interrelationships that evolve through the historical process. of the society.

In the process of analysis and discussion of the results of this article, the authors highlight as an interesting element, which made possible the fulfillment of the proposed objectives in the distance environmental training process developed by the diplomats, the theoretical-methodological approach used, focused in the sociological paradigm of self-development, where the formation and development of values that allow leading and responsible behavior with the Environment and sustainable development is assumed by conviction. Assuming further that:

- It focuses on the formation of an integral, free man; a man who thinks, feels, values, creates, acts. A humanist, participatory, cooperative and critical subject of himself and his reality, capable of transforming environmental problems through responsible attitudes.

- Focuses on the epistemological and axiological assumptions of human activity with a critical sense.
- Strengthens people's ability to be active subjects and protagonists of the process; that is, to consciously shape educational actions.
- It defends education as a social practice and demonstrates that it is not static or rigid but fluid and changing.
- Promotes a dialectical interpretation of the subject in the educational process.
- It guides actions based on collective participation, within an emancipatory paradigm.
- It provides a conception of life and the ideal of man that one wants to achieve, and guides the educational purpose.
- It contributes to consolidating the socializing nature of education, outside the framework of the school.
- It invigorates the idea of symmetrical bonds between group members; as well as with other groups and subjects abroad.
- It permanently affects the educational process through the epistemes that identify it.
- It is oriented towards the future through collective projects, it goes beyond the school to involve other socializing agents and agencies.
- Furthermore, it invigorates the role of education in the formation of the social being in a new way and facilitates the apprehension of reality as a premise for change.
- In educational work, the process of appropriation of culture occurs through activity as a process that mediates the relationship between man and his objective reality. Through it, man modifies reality, forms and transforms himself.
- Subjectivity is a condition for sociality and a result of participation in practical social activity.
- Subjectivity reproduces and produces social relations, therefore, its development requires participation in social activity, as this models its form, content and levels of development.
- The conception of mediations, as an expression of the notion of dialectical synthesis and processuality, underlies all of Vygotsky's work .
- The emancipatory positioning, from the emphasis on the subject's possibilities of analyzing the harmonious relationship with nature and society.
- It contributes to the establishment of adequate communication based on respect and recognition of the other.
- It offers the possibility for people to become subjects of social action, to the extent that collective activity is an expression of their own will.
- It makes it easier for man to be the subject of a relationship of reciprocal determination and transformation, with a reality that transcends him and which he in turn modifies.

From the pedagogical point of view, it assumes the approaches of Social Pedagogy, as a discipline that addresses the theoretical and the practical as two dimensions of the same reality, its field of intervention is the socio-community space of transmission of citizen values, with the purpose of overcome existing contradictions in different social groups, community settings. It is organized by placing the facilitator as the center of all educational action and making him an active subject of his knowledge.

From the didactic point of view, it is based on Critical Didactics, as a theoretical-practical science that guides the reconstructive action of knowledge, in a teaching-learning context, through tendentially symmetrical processes of

Vygotsky 's cultural-historical approach were also considered valuable, particularly regarding the fact that:

social communication, taking the group as the fundamental scenario of this process and from the horizon of an emancipatory rationality.

Critical Didactics, from its emancipatory approach, tries to change subjects as individual and social people, their attitudes, values, judgments, feelings, capacities and attitudes. To the extent that the subject is changed individually, through the group, its projection as a transforming subject before society is changed and will influence in an emancipatory way; Therefore, under this didactic conception, teaching is transforming.

The methodology of Critical Didactics is a participatory, critical practice that favors debate, reflection, and discussion in small groups. It uses innovative methods, experiential dynamics, round tables, discussion panels, case studies, role simulation and dramatic games, among others; Therefore, it contributed to the actions developed remotely.

From this conception, the vision of the world that each participant brings, from their cultural, educational, social, political experience, and from the multiple generational, gender, ethnic and social mediations, enriches the debate on the different social problems and the role of subjects as citizens who are protagonists of their self-development.

Socioculturally, it includes the knowledge of values, attitudes and expectations that it is desired to preserve and transmit, through non-school community environmental education (Borges, Zurbano and Castro, 2019). This allows us to value the contribution that everyday culture can offer to enrich the development of environmental culture in the population; It is not limited to the school, a group or a class, since it includes a broader context that is society, the values and attitudes that are present in its development, as part of society and a specific context.

The requirements established in the Postgraduate Management Manual for the distance modality are also considered important foundations for the process, which highlights that it requires effort, motivation and perseverance on the part of its actors and a conception of the pedagogical process that takes into account the Distance Education Model of Cuban Higher Education, in the specific conditions of the center where it is developed. Therefore, compliance with the following requirements is guaranteed:

- a) Personnel trained to work in this modality;
- b) a process focused on the student and his learning, in response to the social demands of the context in which it is developed;
- c) a didactic design that encourages interactions between all actors in the process, to guarantee knowledge management;
- d) the articulation of collaborative work, in multidisciplinary teams, which integrate specialists from various disciplines for the development of educational resources;
- e) the existence of educational resources, in correspondence with the didactic designs in this modality;
- f) an evaluation system based on the didactic design and modality that ensures a correct assessment of compliance with the objectives of the program, as well as student authentication (recognition of the student's identity and their enrollment documents, systematic evaluation and finally);
- g) number of hours dedicated by the faculty to the different activities of the distance postgraduate program, the design, management of courses and educational resources, teaching, tutoring, monitoring, evaluation of learning and other activities that are considered relevant;

h) access to updated and reliable information.

The postgraduate programs in the distance modality pursue the following objectives:

a) Respond to the need for knowledge management on advances in science, technology and art, with a sense of relevance, research and innovation and flexibility, with reach to all professional sectors of the territories, in accordance with the demands of the permanent training of qualified human resources that the growth and development of the country demands, in general, and local development in particular;

b) promote autonomous, collaborative learning through flexible and personalized teaching, as well as active participation and critical reflection on one's own practice, by incorporating the components of the Distance Education Model of Cuban Higher Education, with intensive use of Information and Communications Technology (ICT), which integrates innovative teaching strategies and the ethical dimension in all academic, scientific, technological or artistic endeavors and in professional practice;

c) develop research, innovation, artistic creation, specialized professionalization, administration, teaching and other processes linked to work activity, which the postgraduate program must address in accordance with its nature and the lines of research of the HEIs, ECTI and centers authorized to provide postgraduate professional development, as well as the dissemination of knowledge, reflection and formulation of proposals for solutions to real problems of society.

Graduate programs in the distance modality are designed for a scenario of total connectivity, in correspondence with the Distance Education Model of Cuban Higher Education, guaranteeing that the faculty and students have access to the guidelines, contents, educational resources digital resources and learning activities,

when they are found for certain periods of time in scenarios without connectivity or with partial or limited connectivity.

Strengths are considered to be that the contents and activities of the diploma program were accessible from different portable devices to guarantee their reuse in different educational, information and connectivity training scenarios. The positive results achieved from the use of these means demonstrated the effectiveness of considering the inclusion of the tools provided by ICT in the formation of environmental culture (Antúnez and Díaz, 2017) and, specifically, in postgraduate education to distance (Guerra e Infante, 2018; Soler, Figueroa and Artímez 2021).

In addition, educational resources and learning activities are permanently available to program actors, as well as the general guidelines of the program in this modality: information about the program, the academic calendar, forms of tutoring, evaluation system and orientation. necessary for the student in their learning management; as established by the Distance Education Model of Cuban Higher Education.

Consistent with this model, other results were obtained that support the fulfillment of the objectives defined in the Distance Environmental Training process:

- the students assumed responsibility for their training and learning autonomously and collaboratively;
- complied with program and institution regulations; They dedicated time to the creative realization of the assigned activities, works and teaching tasks, in accordance with the profile of the graduate of the graduate program in conditions of isolation due to COVID-19;
- They were organized in learning communities and networks that encouraged participation, cooperation and collaboration, in

order to assume their duties, exercise their rights and integrate responsibly into the management of the graduate program of which they were part.

- The systematic, continuous and comprehensive evaluation was carried out with quality at the moments defined by the program and together with the responsibility of the faculty who kept the students informed of their achievements and the aspects to be overcome, through the technological platform in The program was developed allowed the development of the evaluation activities in the allotted time and with quality.

After a thorough analysis of the results, the authors highlight as a finding the success of supporting the starting theoretical foundations from the referenced authors. Since, in practice, the validity of the sociological approach to self-development was verified, adjusted to a participatory process in virtual networks, based on the requirements of Distance Education in Cuba. This guaranteed the active and creative appropriation of environmental culture from the training process, thus promoting the development of their constant self-improvement, their autonomy and self-determination, in intimate connection with the necessary processes of socialization, commitment and social responsibility.

Likewise, the effectiveness of action research was validated, a methodology that involves participants in environmental commitment, to identify their needs and contribute to decision-making through processes of reflection and action. This is an aspect pointed out by Pérez-Vásquez and Arroyo-Tirado (2022) as fundamental in environmental education, for inducing a sense of responsibility, solidarity, understanding and appropriation of reality.

Due to the above, it is considered that the initial theoretical-methodological approach facilitated the protagonism of the

diplomats, despite their condition of isolation due to COVID-19.

The diagnosis on environmental training, applied to the students of the diploma course "Environment, territory and resilient communities for Sustainable Development", showed their gaps and interests, indicated the need to strengthen environmental culture from training processes so that it can later be derive actions in the territories.

The actions designed for environmental training, from the sociological approach and the requirements of Distance Education in Cuba, allowed their application in an atypical context caused by COVID-19; which did not prevent the protagonism and development of the subjects, from the virtual platforms, together with the development of values such as: responsibility, solidarity, industriousness of the participants in very adverse conditions caused by the pandemic peak caused by COVID-19 in Cuba in the moment of application of the diploma.

These results validated the criteria that defend that the context generated by COVID-19 imposed a challenge, but also constituted an opportunity to continue the improvement of professionals (Ruiz et al., 2021) ; potentiality that is also demonstrated in the research of Tovar-Gálvez (2020); Bernaza et al. (2020) and Ruiz et al. (2020).

The monograph containing the articles prepared by the graduates becomes a source of scientific reference for future environmental training processes.

The development of the diploma course "Environment, territory and resilient communities for Sustainable Development", offered remotely, showed the responsibility of students and teachers in conditions of COVID-19, in pursuit of a common objective that united them: the environmental training. In the development of the process, it was possible to appreciate the community self-

development of the individual and collective subject, who from their protagonism assumed responsible behavior in each activity proposed by the faculty, which assumed the accompaniment of the group with pedagogical mastery.

The sociological approach to self-development assumed together with the use of active techniques and methods contributed to the development of knowledge, skills, values and behaviors that contributed to a developmental and emancipatory process in its content. In addition, it became sustainable by providing a monograph that can become reference material for other students .

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The authors participated in the design, analysis of the documents and writing of the work.

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