

“Medio Ambiente en la Historia”, hipermedia para fortalecer la conciencia ambiental en las Ciencias Médicas

“Environment in History”, hypermedia to strengthen environmental awareness in Medical Sciences

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RESUMEN: La asignatura Historia de Cuba puede contribuir a lograr mayor concientización ambiental en los estudiantes. Se realizó una investigación en la Facultad de Ciencias Médicas de Sagua la Grande entre 2019-2022, utilizando los métodos revisión documental y cuestionario con el objetivo de confeccionar un recurso educativo digital para fortalecer la conciencia ambiental desde la asignatura Historia de Cuba en los estudiantes de Ciencias Médicas. Se confeccionó una hipermedia con la bibliografía nacional y cuatro monografías confeccionadas por las autoras, sobre los problemas ambientales de la región y la incidencia de estos sobre la salud humana, para interés del perfil profesional.

Palabras clave: Hipermedia; Conciencia ambiental; Ciencias médicas; Historia de Cuba

ABSTRACT: The History of Cuba subject can contribute to achieving greater environmental awareness in students. An investigation was carried out at the Faculty of Medical Sciences of Sagua la Grande, using the documentary review and questionnaire methods with the objective of making a digital educational resource to strengthen environmental awareness from the History of Cuba subject in Medical Sciences students. A hypermedia was made with the national bibliography and four monographs prepared by the authors, on the environmental problems of the region and their incidence on human health, for the interest of the professional profile.

Keywords: Hypermedia; Environmental awareness; Medical sciences; History of Cuba

Introduction

For years, climate variability has had a direct impact on the behavior of communicable and non-communicable diseases. Different types of pollution and climate change are detrimental to human, plant and animal health. Although many of these aspects are known, there is still not enough environmental awareness, let alone a culture of environmental awareness. This lack of

awareness among the population and many professionals is influenced by insufficient knowledge of environmental issues and the failure to internalize those (Rodríguez et al., 2020).

It is essential to introduce the environmental dimension in higher education, particularly in the Medical Sciences and especially in Medicine, in a systematic and interdisciplinary way, which would contribute to achieve a better work of health promotion and prevention, as well as help to develop an environmental awareness in the population, since one of the functions of the physician is to educate (Rodriguez et al., 2020). Creating an environmental culture in the general practitioner should be a purpose of the first order (Mendoza & Martínez, 2016).

The medical university today has a huge challenge: the social responsibility of training future professionals in the sector, informing, motivating and channeling the environmental culture in education and professional performance. The preparation of future health professionals acquires significant importance, which is one of the keys to implement the necessary processes to face the challenges of the modern world (Labrada & Videaux, 2018). To achieve environmental awareness and culture in students of medical sciences from the discipline History of Cuba in a way that tributes to the specialty, pedagogical innovation and the use of resources to support the teaching-learning process are needed.

In the design of the "E" Study Plans presented by the Ministry of Higher Education (MES), the impact of the informatization of Cuban society on education and the importance of making use of means that transform pedagogy, the role of the teacher, learning models, among others, are highlighted (Cepero & Pérez, 2021). This study plan was implemented for careers in the Medical Sciences starting in 2019. Montes de Oca et al. (2019) express that today's society has reached a scientific and technological development that has had a direct effect on teaching; being the Information and Communication Technologies (ICT) an indispensable pillar in the new models of medical teaching. The means of teaching are no longer limited to the conventional use of chalk, blackboard and books, but the use of computer media and the Internet has been introduced.

The use of ICT in academic spheres is increasing, since the context demands new tools that facilitate and improve, while making the teaching-educational process in universities more inclusive. That is why Digital Educational Resources are gaining momentum among teachers and students. In Cuba, educational policies encourage the use of ICTs in teaching processes to improve the quality of teaching and achieve a more active and motivating role for students.

González (2018) states that ICTs originate a new vision of knowledge and learning, modify the roles played by institutions and participants in the teaching-learning process, the dynamics of creation, the dissemination of knowledge and the priorities of current curricular concerns. Its use brings multiple advantages to the improvement of the teaching quality, optimizes the spatial and duration difficulties; and the interaction with the information by the different actors of the teaching-learning process with the information.

On the use of digital educational resources to address the environmental dimension from different subjects and careers, there have been numerous investigations such as those of Muñoz et al. (2020), Galindo (2015), Zambrano et al. (2020), Ortiz (2021), Hernandez et al. (2020), among many others.

Despite all the studies that have been carried out and all the innovative proposals to strengthen environmental awareness, the work in this dimension is never enough, since environmental conditions are getting worse and worse and it is urgent to face this problem. That is why it is so necessary to continue the search for strategies that motivate students for environmental issues to enrich their knowledge and internalize the danger it represents for the survival of human beings. Based on this problem, the objective of the research was to develop a digital educational resource to strengthen environmental awareness in students of Medical Sciences from the discipline of Cuban History.

Development

A prospective quasi-experimental research was carried out in the Faculty of Medical Sciences of Sagua la Grande in the period 2019-2022, using as population all 2nd year students of the Medicine career and 1st year of Bachelor's Degree in Nursing, for a universe of 98 students. The sample was selected through non-probabilistic sampling by criteria, excluding those students who for some reason could not participate or did not give their consent to do so. From this selection, a sample of 81 students from both careers was obtained.

In order to carry out the research, it was necessary to apply different methods, both theoretical and practical. A bibliographic review was carried out to determine the state of the subject to be addressed, as well as the social contributions that the current study could present. For this purpose, it was essential to consult the Study Plan “E”, the programs of the discipline and of the

subject History of Cuba, the methodological guidelines for the teaching of the same; as well as research articles on the approached subject, published in scientific journals. Also, a questionnaire was applied anonymously to the selected sample in order to verify the students' knowledge on environmental issues and to determine the main deficiencies they present in this regard, in order to cover these deficiencies in the digital educational resource to be created, so that it really strengthens environmental awareness.

In addition, the historical-logical methods were used to order in a coherent way the environmental history through the different historical stages Cuba has gone through, so that the digital educational resource allows the student to easily navigate through the information offered; the analytical-synthetic and the inductive-deductive to interpret the data obtained and deduce the knowledge needs that should be covered with the educational resource; as well as the systemic-logical method, to interpret the data obtained and deduce the knowledge needs that should be covered with the educational resource; as well as the systemic-structural one for the preparation of the digital educational resource, which was in charge of the teachers of the History-Philosophy Department of the Faculty of Sagua la Grande, who present an adequate knowledge in the work with tools, which facilitate the elaboration of teaching means, in this case digital. In this sense, there are previous experiences with results already published in the elaboration of this type of resources for other subjects of the disciplines taught in the Department and even of the subject of Cuban History itself.

As a result of the questionnaire applied to the sample of students, the following difficulties were detected to work on the environmental dimension from the discipline of Cuban History: insufficient knowledge of the students about the environmental problems of their municipalities, about the natural wealth of the region where they live and about the laws established by the Cuban government with the purpose of protecting the environment. The questionnaire also revealed that 92.59% of the students considered their environmental preparation to be sufficient, even though the insufficiencies in knowledge were evident to them, since 90.10% chose the option "I do not know" to the knowledge questions in the questionnaire.

Although 100% agree that it is important for them as future health professionals to master the environmental effects for the better development of their profession in the communities, only 86.41% consider that it should be addressed from the subject History of Cuba with educational resources that combine text and images. The 3.70% confessed not to have any interest in the

subject being addressed with any educational resource. These data show a significant lack of motivation for the subject in the sample studied.

Based on these results, the teachers who teach the discipline History of Cuba at the Faculty of Medical Sciences decided as a subject group to create a pleasant digital educational resource that would be attractive to students of Medicine and Bachelor's Degree in Nursing, and that at the same time would bring together the existing bibliography on the subject at the national level, the main laws of the Cuban government for the preservation of the environment and four monographs - previously compiled - on environmental problems and their influence on health in the historical development of the municipalities where the students who study at the Faculty reside.

Torres et al. (2022) consider that treating the environmental education strategy from the locality, through the use of these monographs; will contribute to achieve a greater awareness of the need to protect the environment in the students of the School. Understanding the environmental problems presented by their municipalities will favor their work performance once they graduate, because they will be able to relate the predominant diseases in their medical offices with the environmental conditions of the territory.

With the inclusion of these contents, which will be studied in history classes accompanied by an adequate pedagogical proposal, the students' lack of knowledge will be solved. In addition, images will be included together with the text as requested by most of the sample. Among the digital educational resources that can be used in teaching -that allow grouping contents in the same place, that combine text and images and that are pleasant for students, born in a technological world- is hypermedia.

Hypermedia arises as a result of the fusion of two technologies, hypertext and multimedia. Hypertext is the organization of a given piece of information into different nodes, connected to each other through links. A hypertext would be formed by a set of connected and related nodes, thematically and structurally. Multimedia technology is the one that allows the integration of different media -sound, images, sequences, text- in the same presentation. Hypermedia, on the other hand, is a set of procedures for writing, designing, or composing in such a way that the combination of the two technologies is essential in computer environments allowing a change in academic performance (Salcedo et al., 2021).

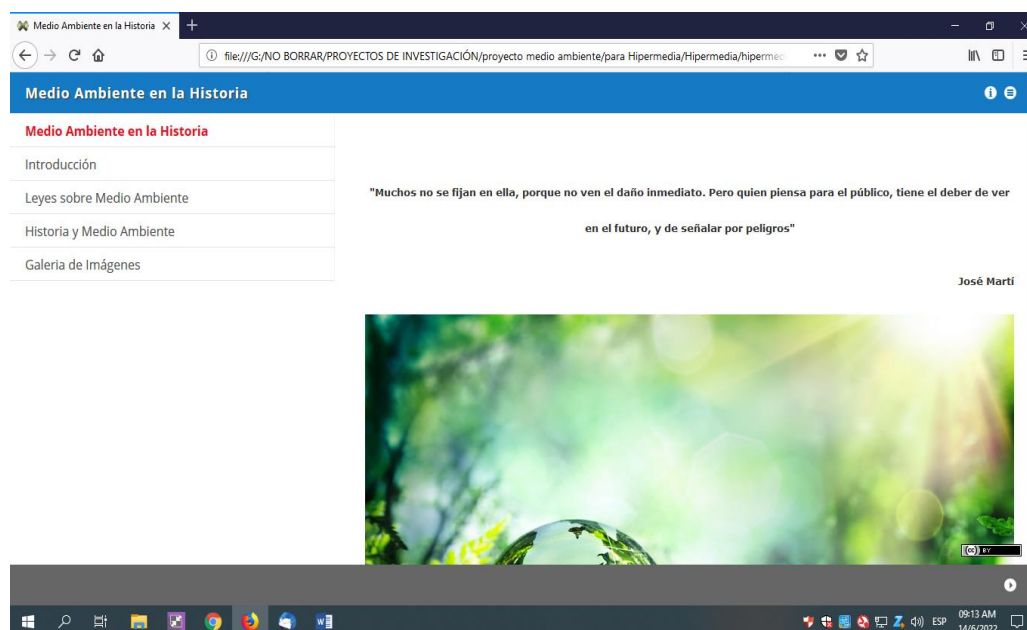
Hypermedia is defined as a dynamic and non-linear presentation of information. It uses the concept of multimedia to enrich the form of presentation, combining other types of data in addition to text. Hypertext, on the other hand, has as its main characteristic to give the user the freedom to navigate through the information, that is, to choose the order in which he/she wants to access it. The hypermedia-centered learning environment offers alternatives to many of the issues that characterize the current educational model. Education in the information age demands a new paradigm: thinking, analyzing, concluding, inferring and interpreting. Hypermedia opens this new perspective of leading students to think and construct knowledge, allying knowledge bases with individualized study, actions demanded today by the new educational model (Gómez & Rojo, 2021).

The hypermedia “Environment in History” was created using the portable tool ExeLearning of the web 2.5 generation. ExeLearning is a free open source tool that facilitates the creation of educational content without the need to be an expert. It is especially oriented to education professionals interested in developing and publishing teaching materials on the web and on online learning LMS platforms such as Moodle. The contents created in this tool are easily updatable, which facilitates the teacher's task. In addition, it is quick, simple and attractive for students to use.

The educational resource created has an illustrated cover (Figure 1) that shows the relation of the contents that are addressed in it, which can be accessed through links that lead to the following statements: Introduction, Environmental Laws, History and Environment, Image Gallery. In this way, students can obtain the knowledge in the order they wish, deepening in those contents that awaken their interest, independently of the fact that the use of hypermedia in the subject is accompanied by a proposal of teaching tasks that the student must carry out as part of his self-preparation to avoid dissociating himself by navigating within the amount of information.

Figure 1.

Hypermedia cover

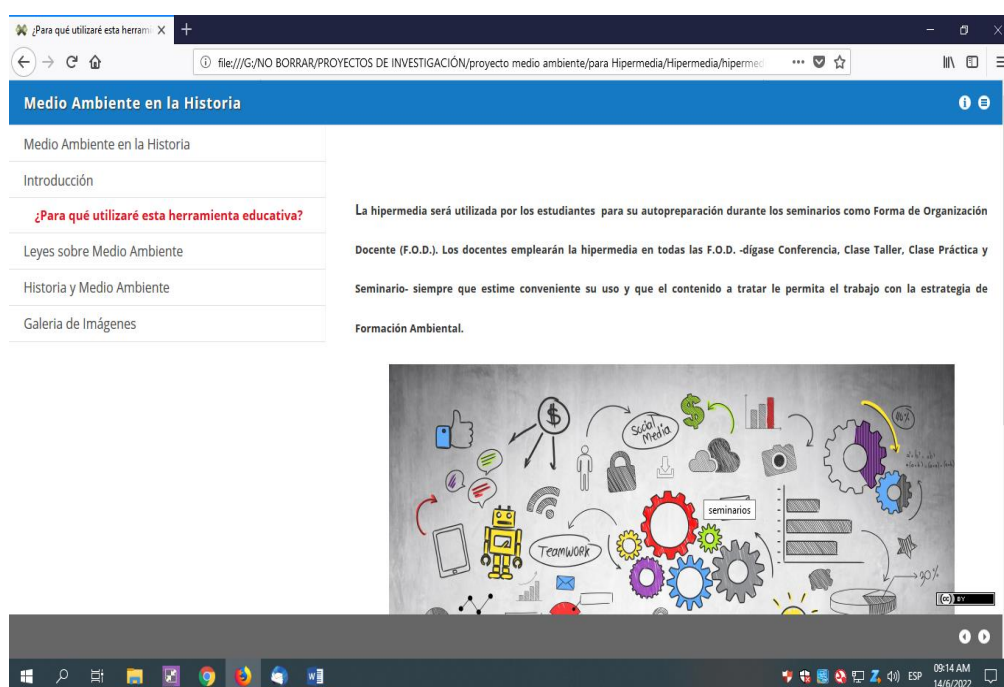


Source: Own elaboration

In the statement “Introduction”, reference is made to the importance of strengthening environmental awareness today, emphasizing the link between Medicine and the Environment, which leads to the need to deepen the environmental dimension for a more comprehensive training of students of Medical Sciences. Likewise, the question “What will I use this educational tool for? (Figure 2) orients teachers and students on the objective of its use in the subject and specifically on the teaching organizational forms where it will be used.

Figure 2.

Introduction



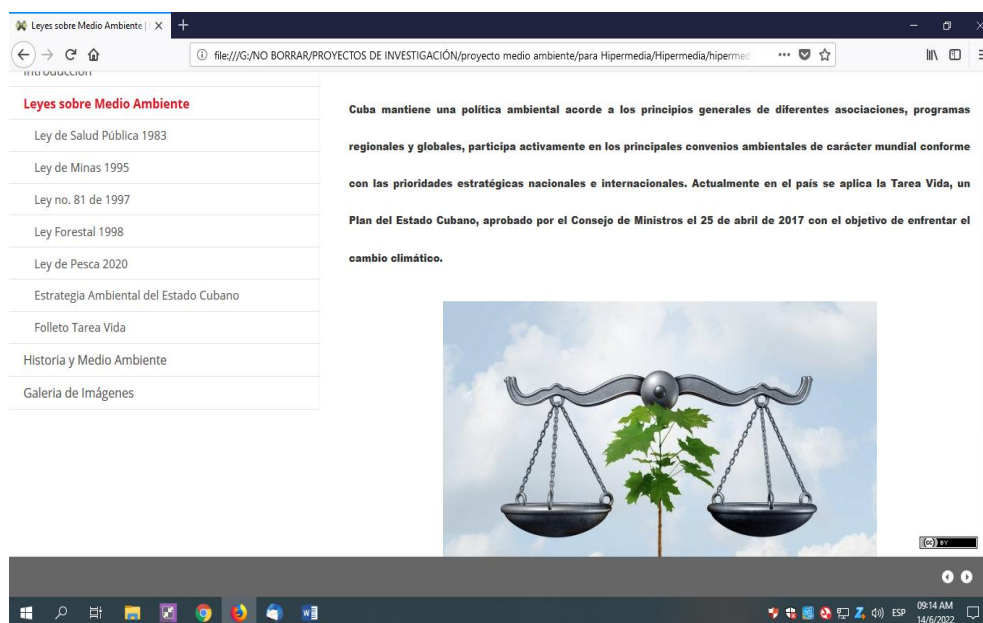
Source: Own elaboration

The following section “Environmental Laws” (Figure 3) lists the main laws enacted by the revolutionary government to regulate the exploitation of the country's natural resources, as well as to ensure their protection, which in turn translates into the protection of human health. Thus, laws such as the Public Health Law, the Mining Law, the Forestry Law, the recently approved Fishing Law, the Environmental Strategy of the Cuban State and the Tarea Vida booklet appear in this space. These documents will be studied in Topic V of the subject entitled The Revolution in Power as one of the main achievements of the revolutionary government.

Knowledge of environmental laws is of utmost importance, not only for young people to regulate their actions in harmony with nature and strengthen their environmental culture, but also because they need to foster a legal culture that allows them to develop in society without affecting the rights of others, for the general good, for health and to prevent additional costs to future generations. The Environmental Strategy of a country also allows recognizing the true interests of the government, and Cuba's, in accordance with socialist principles, is focused on the preservation of the human being in a healthy environment. In this sense, health professionals should have a deep legislative knowledge on the subject in order to perfect their important prophylactic work in the communities.

Figure 3.

Environmental Laws

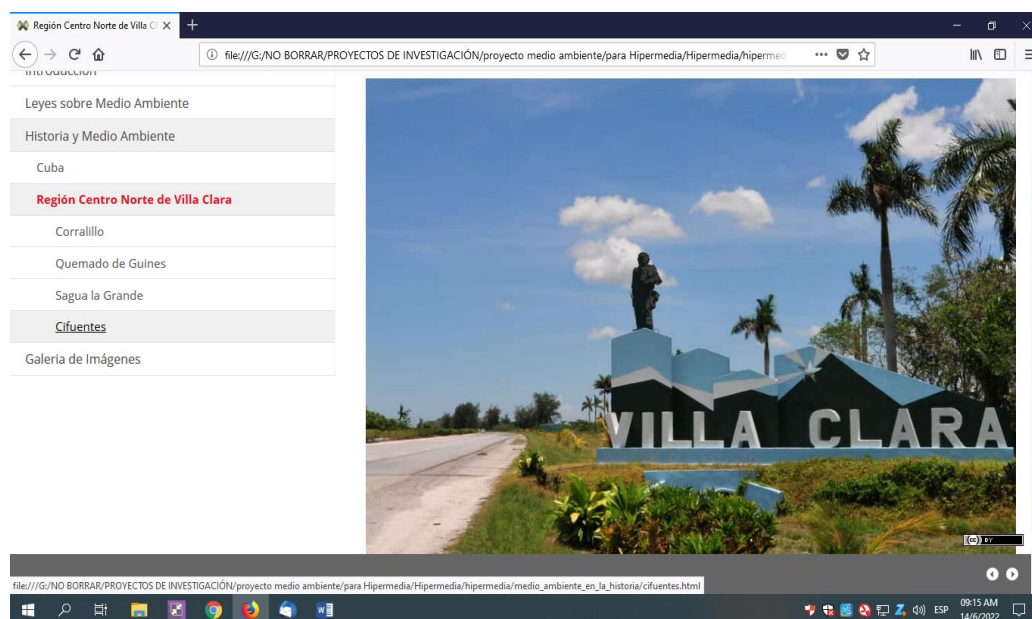


Source: Own elaboration

Next appears the statement “History and Environment” (Figure 4), which presents two sections, one dedicated to Cuba and the other to the Central North region of Villa Clara, the territory where the students enrolled in the Faculty of Medical Sciences of Sagua la Grande come from. The first section compiles digital materials that deal with Cuba's environmental history, as well as texts by José Martí and speeches by Fidel Castro on the main problems faced by humanity in this regard and that have repercussions in Cuba, in spite of the measures taken. The second section contains four monographs on the environmental history of the municipalities of Corralillo, Quemado de Güines, Sagua la Grande and Cifuentes.

Figure 4.

History and Environmental



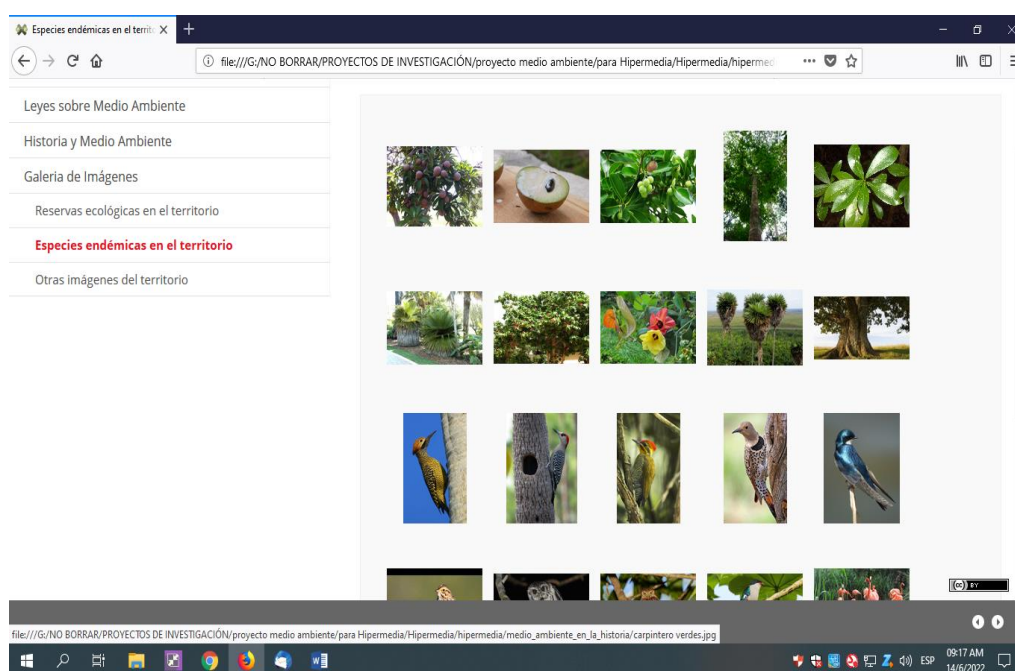
Source: Own elaboration

The compiled national materials, although insufficient in the case of those of a historical nature, allow working with the curricular strategy of environmental education in all the historical stages through which Cuba has passed, which favors the strengthening of the environmental conscience of the students who can observe how nature has been degraded by the intensive use of natural resources during centuries of indiscriminate exploitation by the dominant classes that responded to foreign interests. In the case of local history monographs -elaborated by the professors who are part of the faculty of the History-Philosophy Department of the Faculty of Medical Sciences of Sagua la Grande-, their contributions are collected in Investigative Monographs for the treatment of the strategy of environmental education in Cuban History (Torres et al., 2022).

Finally, there is the statement “Gallery of Images” (Figure 5) divided into three sections. These are: Ecological reserves in the territory, Endemic species in the territory and Other images of the territory, where one can appreciate photographs of the region that illustrate what was addressed in the research monographs, allowing the information offered by the hypermedia to be more enjoyable, enriching and interesting for the students, whose knowledge about the locality where they live is scarce, as could be seen in the questionnaire applied.

Figure 5.

Image Gallery



Source: Own elaboration

The hypermedia was evaluated by a group of three experts, with Bachelor's degrees in Social Sciences, Medicine and Pedagogy, and more than five years of teaching experience. It was evaluated based on the parameters of pertinent and feasible. In each of them, the experts gave a value between one and five points, in ascending order to evaluate the resource.

The result was positive, obtaining the maximum score unanimously for the parameter of pertinent, to strengthen environmental awareness in students of medical sciences from the discipline History of Cuba, and a score of four and two out of five for feasible, since this resource is available for use in the classroom. The only difficulty in this sense is the impossibility of its use in the classroom by those students who do not have mobile devices, for which it will be necessary to devise other strategies such as working in teams, so that they can work with a single device, or that the teacher provides his own phone to students in this situation.

This hypermedia, although it is designed to work with the careers of the University of Medical Sciences, can also be used in careers of other sciences and even in other teachings with specific teaching tasks according to their level of learning. It has a Creative Commons license that allows other teachers to freely remove, add or modify the information it presents according to their needs. For example, they could elaborate and include the environmental histories of other municipalities for greater benefit in other regions.

Conclusions

A hypermedia was created using the ExeLearning portable tool of the web 2.5 generation. It contains national bibliography and four monographs made by the authors that cover the environmental problems generated in the municipalities of Corralillo, Quemado de Güines, Sagua la Grande and Cifuentes in their historical development and the incidence they have had on human health, for the interest of the professional profile. It combines text with images and can be used in other careers.

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