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Original article

The methodological preparation of the university Physical Education teacher through the treatment of environmental issues

La preparación metodológica del profesor universitario de Educación Física a través del tratamiento de temas medioambientales

O preparo metodológico do professor universitário de Educação Física por meio do tratamento das questões ambientais

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ABSTRACT

The formation of environmental culture in the Physical Education teacher turns out to be an important factor in the integral preparation of this professional. The objective of this study is focused on: proposing a system of methodological workshops oriented to the appropriation of the environmental culture by the Physical Education teacher at the University of Oriente in Santiago de Cuba. The research has a mixed approach of explanatory type. Theoretical and empirical methods, techniques and instruments were applied to gather the necessary information for the study. A diagnosis was made to 15 teachers of the Physical Education discipline at the University of Oriente. Its results showed the insufficiencies in the environmental culture of the Physical Education teacher. In the processing of the data, the contrast statistics were used: Kendall's W test and T-Student test, with a significance level established at 0.05. The concordance of the criteria issued by the specialists consulted and the difference in the results between the pretest and posttest and with the control group, both with a significance of 0.00, allowed assessing the proposal as feasible and functional.

Keywords: Professional overcoming and environmental university steps; University ambientalization and system of workshops methodological.

RESUMEN

La formación de la cultura ambiental en el profesor de Educación Física resulta ser un factor de importancia en la preparación integral de este profesional. El objetivo de este estudio se centra en: proponer un sistema de talleres metodológicos orientados a la apropiación de la cultura ambiental del profesor de la disciplina Educación Física en la Universidad de Oriente de Santiago de Cuba. La investigación posee un enfoque mixto de tipo explicativa. Se aplicaron métodos teóricos y empíricos, técnicas e instrumentos que permitieron acopiar la información necesaria para el estudio. Se efectuó un diagnóstico a 15 profesores de la disciplina Educación Física en la Universidad de Oriente. Sus resultados expresaron las insuficiencias en la cultura ambiental del profesor de la disciplina Educación Física. En el procesamiento de los datos, se utilizó la estadística de contraste: prueba W de Kendall y prueba de T-Student, con un nivel de significación establecido en 0.05. La concordancia de los criterios emitidos por los especialistas consultados y la diferencia de los resultados entre el pretest y posttest y con el grupo control, ambos con una significación de 0.00, permitió valorar de factible y funcional la propuesta.

Palabras clave: Superación profesional y gestión ambiental universitaria; Ambientalización universitaria y sistema de talleres metodológico.

RESUMO

A conformação da cultura ambiental no professor de Educação Física é um importante fator para a preparação integral deste profissional. O objetivo deste estudo é: propor um sistema de oficinas metodológicas orientadas para a apropriação da cultura ambiental do professor de Educação Física na Universidade de Oriente, em Santiago de Cuba. A pesquisa tem uma abordagem explicativa mista. Métodos, técnicas e instrumentos teóricos e empíricos foram utilizados para coletar as informações necessárias para o estudo. Foi realizado uma diagnose em 15 professores de educação física na Universidade de Oriente. Os resultados revelaram as deficiências na cultura ambiental dos professores de Educação Física. No processamento dos dados, foram



usadas estadísticas de contraste: teste W de Kendall e teste T de Student, com um nível de significância fixado em 0,05. A coincidência dos critérios formulados pelos especialistas consultados e a diferença de desempenho entre o pré-teste e o pós-teste e com o grupo de controle, ambos com um significado de 0,00, nos permitiu avaliar a proposta como viável e funcional.

Palavras-chave: Desenvolvimento profissional e gestão ambiental universitária; ambientalização universitária e sistema de oficinas metodológicas.

INTRODUCTION

For several years now, humanity has been experiencing a change of historical epoch due to the systemic crisis through which the systems on which modern Western civilization is based are passing. This premise calls for the establishment of profound questions and the explanation of what has been so far unknown. In this sense, higher education institutions have the challenge of managing uncertainty and effectively influencing their response, and where the university professor must constantly raise and rethink how to improve the pedagogy he or she manages.

According to Delgado, (2013, p. 206), a university professor:

(...) he/she needs to discover the practical meaning of his/her knowledge and its application to his/her professional life, in a way that encourages him/her to search for methods to solve work problems, which translates into an increase in his/her autonomy and creativity and, consequently, an increase in his/her personal involvement in the processes in which he/she is immersed.

Among the necessary conditions for teacher training at the postgraduate level, is to guarantee a system of permanent improvement and recycling during their exercise, which allows them to keep updated in the problems inherent to their specialty and in those that are oriented as part of the social task of the university, of which environmental education is an important part (Mes, 2018).

The problems affecting the environment in the 21st century are becoming increasingly serious and are causing concern in all countries of the world.

The United Nations Educational, Scientific and Cultural Organization (Unesco) recognizes that the Earth's environment has changed more rapidly in the last ten years than in any other comparable period in history, in which the main cause appears to be the leviathan action of the human species, due to man's inability to interact with his needs and not with his needs with the environment, as stated in the dialectical precepts of Leninism.

To this end, Unesco has established: The need to contribute to the preparation for the protection of the environment in students and teachers in order to meet the challenges of Education for the 21st century as an essential part of lifelong learning, which is why it has been declared the Decade of Education for Sustainable Development (Pérez, et al., 2017).

In the area of Physical Culture, there have been several researches related to postgraduate studies and environmental issues, standing out authors such as Castillo (2014) and Castillejo (2017), among others. They all agree in pointing out the need for the improvement of the training of the Physical Culture professional in exercise, in different contexts to raise their professional performance. Although their contributions



constitute powerful references, they are still far away, from the environmental point of view, from contributing to the field of the object of research, which is the training of the performance of the Physical Culture professional.

In addition, the bibliometric study allowed verifying that the categories education, training and environmental culture have been analyzed by the education professional, by authors such as: [Berra, \(2013\)](#); [Herrera, \(2014\)](#); [Licea, \(2015\)](#) [Ibarra, \(2016\)](#); [Fragoso, \(2016\)](#); [Abreu, \(2016\)](#) and [Cejas, \(2018\)](#). However, these authors do not contemplate Physical Culture specialists in their analyses.

For their part, [Fernández, \(2011\)](#) and [González, \(2017\)](#), contextualize the topic in Physical Culture, but, their contributions do not penetrate into the area of Physical Education nor in the training of Physical Education teachers in Higher Education. As can be seen, the experiences in the study and introduction of environmental issues in Physical Education as an object or process still show limitations due to their pragmatic nature, which makes them adhere to the naturalistic, conservationist approach of environmental education, limiting its development. This regularity expresses the need to carry out research that enriches the theoretical-methodological foundations of professional upgrading in Physical Education teachers to determine their impacts on university environmentalization ([Millán, 2020](#)). In this sense, it is necessary to ensure that the teacher appropriates an emerging environmental culture, which breaks with the mimicry and traditionalism of the processes of improvement in this aspect.

In spite of the results and achievements of university Physical Education in Cuba, with emphasis on the University of Oriente, exposed in different events and international congresses by its teachers, the following problems have been verified in the process of the factual-causal diagnosis:

- The environmental culture as a content of the professional upgrading process and as part of the methodological preparation presents an unsystematic character, distanced from reality.
- The skills oriented to know how to be and to do environmental work of the teacher of the discipline show inconsistency with the educational strategies and the environmental curriculum of the University of Oriente.
- The preparation oriented to the environmental theme, which is developed by different organizations and research centers in the territory, presents a high elitist and specialized character, atomizing the transforming role of the discipline and educator of the Physical Education teacher in the context.

Accordingly, these premises are in agreement with [Coya, \(2001, p.125\)](#) when he expressed:

(...) environmental education must question traditional teaching methods, posing new pedagogical challenges for the transmission of environmental knowledge, a knowledge that is not only bookish, but linked to practice, to the close relationship between research, teaching and extension of knowledge.



From what has been expressed above, this author agrees with the questions highlighted by Smyth, (1991), cited by Delgado, (2013, p. 234). The university teacher must constantly ask him/herself:

1. What do I do?
2. How could I do things differently?
3. How did I become this way?
4. What is the meaning of my teaching?

This shows that in contemporary times, environmental culture, more than a necessity, is an unpostponable demand that implies collective sensitivity and responsibility for the problems that affect the physical and cultural environment. For the realization of this research, authorized sources on the subject were consulted, both nationally and internationally, in order to contribute to the systematization of the object of study. Some of these references have been taken into account for the analysis and comparison of the results shown in later sections. Among these referents are the following (Padilla, *et al*, 2017; Iglesias, 2021; López, 2021).

In this sense, the objective of this article is to propose a system of methodological workshops oriented to the appropriation of the environmental culture by the Physical Education teacher, configured on the basis of the social demands of the diversity of university careers and the particularities of Physical Education as a subject based on the foundations of andragogy.

MATERIALS AND METHODS

In the research, the approaches were taken in a combined manner:

Qualitative, through action-participatory research, since it has been carried out by the participants themselves in the educational social practice, with the aim of improving the knowledge of this practice from the situations in which the action is carried out.

In order to develop this proposal, it was necessary to use methods and techniques that made it possible to diagnose the state of improvement oriented towards environmental culture.

Among the theoretical methods, analysis and synthesis were used to characterize from the epistemological point of view the discipline of Physical Education, professional upgrading, and the dialectical hermeneutic method for the understanding, explanation and interpretation of the research.

As empirical methods, interviews were conducted with chiefs (4), surveys with teachers (15) and students of the Faculties of Early Childhood Education and Telecommunications, Informatics and Biomedical Engineering (Fei and Fitib in Spanish) (264), in order to verify their knowledge of the University's environmental strategy and its applicability in their professional life. In addition, the observation technique was applied to different classes and activities, as well as documentary review. The use of environmental concepts, the application of the Physical culture faculty (FCF in Spanish) strategy and



the applicability in the training of this professional were observed. Thus, the current state of professional development in environmental culture of teachers of Physical Education at the University of Oriente was diagnosed.

As a statistical method, specialists' criteria were used to confirm the viability and feasibility of the proposal.

In order to analyze the viability and feasibility of the workshop system to be inserted in the context of the methodological preparation of the Physical Education teacher, Kendall's W test was used, which measures the level of concordance among specialists. The Schapiro Will hypothesis test was also performed to test the normality of the distribution and the parametric T-Student test to verify the significance of the transformations produced in the Physical Education teachers when the workshop system was implemented.

The pre-experiment was used to evaluate the preparation of Physical Education teachers before and after the implementation of the workshop system for the improvement oriented to the appropriation of the environmental culture through the application of entry and exit tests and, in this way, to be able to evaluate its feasibility.

Statistical-mathematical procedures are used to analyze and interpret the results derived from the application of the statistical data necessary for the evaluation of the preparation achieved by the Physical Education teacher, concretized in the decision making through the pre-experiment.

In order to comply with this component, the following indicators were considered in the development of the instruments to conduct the causal analysis:

1. Introduction of the environmental content in the professional upgrading of university teachers of Physical Education.
2. Interest towards professional upgrading in environmental culture.
3. Performance of Physical Education teachers in the dynamics of university environmental management.

RESULTS AND DISCUSSION

The potentialities and deficiencies detected in Physical Education teachers, the selection and access to the field during the research process, as well as the results derived from the instruments applied, are presented below.

The selected methods and techniques were applied to the sample described above, in order to update the diagnosis and corroborate the perceived inadequacies in educational practice. The determination of the research sample was based on a simple non-probabilistic random sampling, selecting 15 teachers for 46.8 % of the total population (32) (Table 1).



Table 1. - Characteristics of the selected Physical Education teachers

Teacher category	Scientific category	Years of experience
Instructor:1	Bachelor´s degree: 6	of 5 years: 4
Assistant:11	Master's Degrees: 9	% 5 and 10 years: 7
Associate:3		+ 10 years old: 4

In the unit of analysis students, 2-year students from the Faculties of Fitib and Fei were surveyed; out of a total population in the year of 290 regular course students, 91 % of the student population (264) was surveyed (Table 2).

Table. 2. - Ratio of two-year enrollment by careers and faculties

Faculties careers	Enrollment	Value in %	Respondents by careers
Fitib			
Tele. Eng.	63	21,7	59
Bio. Eng.	42	14,8	39
Informatic Eng.	37	12,7	35
Child Education	31	10,8	29
Fel			
Preschool Education	21	7,2	19
Primary Education	23	7,9	18
Bachelor's degree in Speech Therapy	25	8,6	24
Special Education	27	9,3	22
Bachelor's Degree in Pedagogy-Psychology	21	7,2	19
TOTAL	9	290	100
			264

Diagnosis of the current state and determination of the needs of the Physical Education teachers at the University of Oriente. Results derived from the surveys applied to students

The 88.6 % (118) of the technical profile students state that their profession has a considered level of impact on the environment since, when working with high energy consuming equipment, due to its high complexity in its electrical and electronic components, they also constitute a polluting load on the environment and they know from subjects and internships received that contractors do not always have a coherent recycling policy in the institution. They state that, at the end of the preprofessional practice in the report, they have to attach the environmental impact of their profession on the environment.



The 80.2 % (299) of the students express that the fundamental environmental problem of their profession lies in the cultural part of the human condition, since they do not want to recognize that they are on earth for a relatively short time and that future generations also need it.

They mention that the main problems are in:

- Irresponsible environmental attitude.
- Poor management of the professional pollutant load.
- Lack of risk perception and prevention.
- High levels of physical demands of the profession.
- Low professional environmental responsibility.

Ninety-five percent (251) of the students surveyed expressed that they are aware of the environmental strategy of the Faculty, since lectures on it are constantly given in informal spaces. However, they are concerned that the teachers, in the broadest sense of the word, do not concretize its content in actions and do not systematize it, except for the subjects of Political Culture and Preparation for Defense.

The 100 % state that Physical Education has the potential to develop a systematized process of environmental education; they mention that there is already experience of extracurricular tasks that link environmental education and Aesthetics from an interdisciplinary approach in the classroom.

Of the students, 78.1 % (206) expressed that teachers of Physical Education are prepared to promote environmental education, but they focus their work on the traditional physical approach and not on the human approach to education in the physical, as a philosophical category.

As results derived from the surveys applied to teachers of the discipline of Physical Education at the University of Oriente, it was found that there is:

- Insufficient mastery of pedagogical skills to enhance university environmental management.
- Limitations in the previous selection and location of the environmental content in the classes, according to the social and environmental demands of the career.

As a summary, it can be emphasized that the current state of the environmental culture of university Physical Education teachers, from the approach of professional upgrading, shows significant contradictions that are nothing more than a cultural inheritance of the previous educational system. It does not embrace the prevailing policy and does not have a theoretical-methodological identity support. The protagonism and commitment of some teachers persists, but not that of the collective. These reflections affirm what was expressed in the problems of the research.

The composition and teaching experience of the teachers involved in the study are as follows: five teachers of Physical Education, two from the University of Oriente (UO in Spanish), two from the University of Holguín (UH in Spanish) and one from the University of Las Villas (UV in Spanish), three researchers from the Center for the Integral Study



of Coastal Areas of the University of Oriente (Cenzoc in Spanish) and two professors from the FCF of Santiago de Cuba, one from the Department of Didactics of Sport, the other from the Department of Didactics of Physical Education. The 45.4 % of the specialists have more than 10 years of experience as Physical Education teachers in Higher Education. Three (3) of the specialists, 27.2 % at the time of application of the survey, belong to the advisory group of the Rector of the UO for the implementation of the Life Task, two (2) constituting 18.1 % are part of the research group of environmental training in Physical Culture of the FCF of Santiago de Cuba.

Methodological requirements to be taken into account in the systematization of the workshops

The proposed system takes into account the dialectical relationship that occurs between the laws and categories of Pedagogy, in close interaction with the components of the teaching-learning process.

A system of methodological workshops was implemented for professional development, oriented to the appropriation of the environmental culture of university teachers of Physical Education. In this type of workshop, the work is organized in such a way that the teachers, in a group work, explore, organize and expose information that constitutes for them an enrichment on the content approached in any of its dimensions. The practice can be a starting point or also a goal in its realization.

This is made up of a general objective and three stages, as detailed below:

General objective: to improve the professional upgrading of university teachers in environmental culture, in the discipline of Physical Education, from the methodological work.

As a result of the above, the following methodological work algorithm is defined (Figure 1).

Conceptual map of the methodological workshops for advanced environmental training systematization.



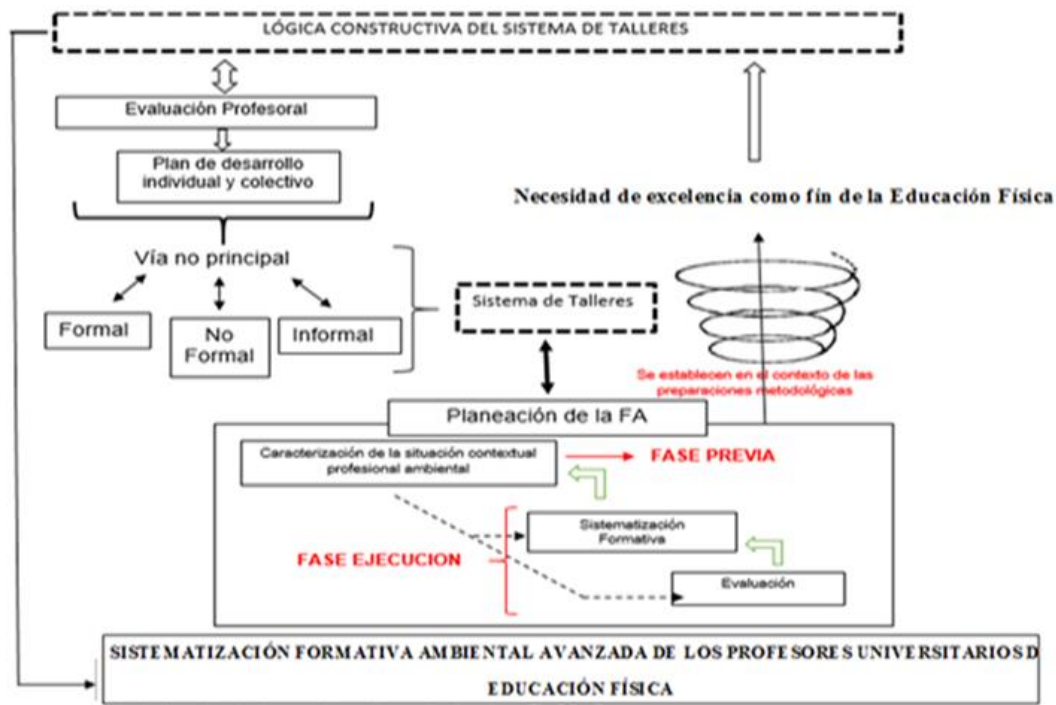


Fig. 1. - Conceptual map of the methodological workshops for advanced environmental training systematization

Phases in the structuring of the workshop system

Pre-active phase: it is aimed at preparing the preconditions for the workshop. Active phase: this stage comprises the process of systematization of the workshops to the discipline collective, which has an operational component that derives in the subsystem.

Subjects covered

1. Characteristics of the components of environmental culture as a process of human and professional development.
2. University environmentalization. Theoretical foundations and contextualization to the discipline of Physical Education.
3. Necessary contents for the improvement of the environmental culture of Physical Education teachers.
4. Climate change. Adaptation, impact on the educational management of Physical Education in the university context.
5. Physical and socio-cultural limits of the environment. Its systematicity in the process of Physical Education from the sustainable curriculum.
6. Environmental diagnosis of the environment. Indicators from the ecosystemic approach.
7. Pro-environmental values, awareness and attitudes.



8. Contextual environmental content fundamentals. Other forms of organization of methodological activities. The scientific-methodological direction in the treatment of contents of professional environmental culture.
9. Presentation of an instructional methodological class on the topic of climate change, impact on Physical Education.
10. Field work through university extensionism.
11. Field work through the 1st year analytical program.

The evaluation of professional and university environmental culture. The hybrid approach.

Post-active phase: the results of the application of the processes of the second stage are verified, resulting in the fulfillment of the system's objective.

In this phase, the parameters are established to determine the scale of advanced environmental culture in Physical Education. This concept is understood by the author of this work as: the ability to cultivate relationships, conditions and meanings of human symbols and feelings that generate, sustain and give meaning to the sustainability of ways of life through environmental affirmations in the professional context.

Assessment by specialist criteria

These specialists were selected based on the following criteria: more than 10 years of experience in Higher Education, scientific-methodological experience based on their work with postgraduate programs, scientific or academic degree they hold. For this purpose, a survey was used with a request for information, grouped in two blocks where it is specified:

- a) Willingness and agreement to participate in the survey.
- b) Personal and employment data for the purpose of delimiting specialists.
- c) Assessment of the workshop system through the evaluation of the environmental culture index based on the Likert scale.

It was applied to 15 identified specialists. After analyzing the criteria, eleven (11) were defined as specialists.

Indicators to evaluate

1. Correspondence of the workshop system.
2. Essentiality of the contents that make up the workshop system.
3. System structure (Objective).
4. Impacts derived from the system.
5. Methodological guidelines.
6. Planned monitoring and evaluation.



7. Possibilities of being generalizable in the pedagogical practice of Physical Education.

Evaluative scale applied

MA- Very adequate (5); BA- Fairly adequate (4); PA, A- Adequate (3); I- Inadequate (2)

The non-parametric statistical test is used. The significance of the specialists' consensus is statistically evaluated through Kendall's concordance coefficient (W), which makes it possible to decide the level of concordance between the judgments issued and allows, with statistical rigor, the selection of the most influential statements whose evaluation was requested to the specialists, with a predominance of quite adequate ones.

In conclusion, after processing the results and applying Kendall's W test, it can be seen that those selected have a Kendall's W coefficient of competence with a significance equal to **0.022**, which reveals the high coefficient of competence of these professionals. It is to face the expected expertise.

Criteria issued by specialists

- The system constitutes a necessary contribution to the professional upgrading of teachers, it contributes to the appropriation of the environmental culture of this professional by overcoming the condition of being, should and want to be in their functions, from the planning of the class.
- The foundations that support the system allow understanding and explaining the essence of the professional upgrading process oriented to the appropriation of the environmental culture by the university teacher of Physical Education.
- The proposal is flexible to changes, it is in correspondence with the current demands when introducing sciences in Physical Education.

Suggestions and recommendations issued by specialists in this regard

To implement an updating preparation stage for teachers, with emphasis on those of lower teaching category.

- To assess the need to implement upgrading courses for teachers with less teaching category and experience in Higher Education that will allow them to link the university environmentalization to the appropriation of the environmental culture of Physical Education teachers.

Interpretation of the hypothesis test results

The consensus criterion of the specialists makes it possible to elucidate the potential impact of the proposal during its implementation, as it is valued as very adequate in most aspects.

The results obtained from the survey of specialists provide favorable evidence for the purpose of this article because, based on the specialized criteria of those surveyed, it was possible to corroborate the relevance, feasibility and applicability of the workshop system.



In conclusion, after processing the results and applying Kendall's W test, it can be seen that those selected have a Kendall's W coefficient of competence with an equal significance, $022 > 0$. This reveals the high coefficient of competence that these professionals have to face the foreseen expertise. According to the criteria issued, **H₀** is rejected and **H₁** is accepted as there is a high degree of concordance between the specialists' criteria.

Presentation and results of the pre-experiment as a practice intervention

In the current article, the pre-experimental, pre-test-post-test design with a single group is used, which, according to Mesa (2014), consists of applying a pre-test to a group prior to the stimulus or appropriation of environmental culture, according to selected indicators and variables. Then the treatment is administered and finally a post-test is applied, with the same characteristics and conditions.

Bearing in mind the aforementioned aspects, it is proceeded to demonstrate the entry and exit tests carried out; to this end, the criteria, evidence of performance and levels of development outlined above are checked.

The pretest and posttest were applied under the same criteria in November 2019 and May 2020, with identical conditions for their implementation.

In order to corroborate and compare the results of the tests for related samples and the existence of significant differences between the proportions of means, the parametric T-Student dummy was used. In addition, the following results are verified:

The SPSS statistical processor (version 19, 0) was used, applying the Schapiro Will test for small samples to determine whether the distribution met the requirements to be classified as normal. It is considered a normal distribution; in all cases, a significance level of $\alpha = 0.05$ was established, less than the probability value determined, so the acceptance of the hypothesis raised is inferred.

To show impact indicators, it is necessary to obtain data related to the fulfillment of some elements such as:

- The need to acquire adequate preparation from professional upgrading to become involved in the transformation process.
- Quality of the forms and ways of upgrading for the appropriation in environmental culture received, with an integrating approach and not only directed to the need of the subject, but also to the need of the aspired change.
- Rationality of the essentiality of the contextualized professional environmental content.
- Correct choice of material for self-upgrading. In order to transform the process of self-upgrading oriented to the appropriation of the environmental culture, a teaching material oriented to the teacher's self-preparation is elaborated.
- Personality qualities that allow overcoming difficulties and carrying out constant self-control and self-evaluation with a high self-critical character, with a dialogic communication style without authoritarianism, which facilitates the measurement, feedback and control of the process through the channels selected for this purpose.



- Presentation and results of the pre-experiment as an intervention in practice.
- The objectives of the application of this method are to seek a convergence of criteria on the appropriateness of the following aspect:
- The analysis is carried out in correspondence with the scientific problem stated in the research: insufficient upgrading that limits the appropriation of the environmental culture of the Physical Education teacher in relation to the selection of variables, their operationalization, classification in the data recording and their application in the frameworks of their functions that limit their professional environmental performance.

Within the results derived from the observations made in classes, methodological preparations and extension activities, it was verified what **Hernández (2003)** affirms, when he says that observation consists of the systematic, valid and reliable recording of manifest behaviors or conducts.

Of the 15 teachers who were direct users of the research, the classes of 66.6 % (10) were indirectly observed, with the objective of identifying how they managed the environmental dimension of the university.

With respect to the control of biological safety in the classroom, the teachers referred to the hygienic state of the area. 26.7% emphasized that the treatment of biological safety, the control of respiratory and skin diseases were inadequate; 73.3% rated it as inadequate. The teachers emphasize the control of clothing and garments. In 100 % of those checked, it was noticeable that the instructional-training objectives did not include aspects related to sustainability criteria in the classroom, for example, those linked to professional values. For 46.6 % of the teachers, the way in which environmental education is treated for the sustainability of the conditions and meanings they generate is inadequate. The remaining 53.4 % consider it not very adequate. 73.3 % use didactic procedures for the control of the physical demands of the profession and the preparation for the management, from the physical point of view, of professional stress syndromes, being catalogued as quite adequate, the remaining 26.7 % are defined as adequate. The professional environmental values from the physical activity show in 33.3 % of the controlled classes an inadequate treatment, 40 % of little adequate and the remaining 26.7 % of adequate. This shows the need to insist on the development of the environmental culture in university students. A comparison can be made with the studies that have been done on the subject in other spaces and it coincides with the opinions of **León, (2013) and González, (2017)**, who, when contextualizing the subject of the environmentalist culture in Physical Culture, emphasize that it is still necessary to continue working on the link between this subject and the training of Physical Education teachers in Higher Education.

In the review of the Environmental Strategies of the Month, of the University of Oriente 2016-2020, other documents analyzed were the teacher evaluation reports of the 2017, 2018 and 2019 school year, as well as the methodological work plan of the FCF and its derivation in the Physical Education department. In these documents, it was possible to verify that:

In the Environmental Strategy of the University of Oriente and its derivation towards the FCF, the Physical Education teacher is not contemplated as a university environmental manager.



- In the evaluation summary reports observed, it is constant to see how the teacher is not taken into account in his/her evaluation of environmental competence in the context of his teaching role.
- In the FCF's methodological work plan and that of the Physical Education department at the stage being monitored, there are no methodological actions or tasks referring to how to deal with and evaluate environmental culture in the classroom.
- The E study plan for university careers shows insufficiencies to contemplate, in the context of the general and specific objectives, the integral application of knowledge, capacities and professional skills of the specialty with the adoption of alternatives with respect to the environment under conditions of sustainable development.
- Methodological activities aimed at preparing teachers are not carried out systematically in each of the methodological structures in which the educational teaching process of the specialty is organized.
- Teachers present difficulties in knowing how to be and knowing how to do related to the contents concerning the institutional environmental policy.
- The environmental strategy of the university does not contemplate a coherent action in the systematic treatment for the environmental culture of the university professor.
- The teacher evaluation does not include criteria on know-how on environmental issues.
- Both managers and teachers recognize the importance of the environmental strategy in the training and preparation of students and teachers.
- All the teachers are graduates of the higher education level, but not all of them have experience in the training of middle-level technicians and workers in the specialty.
- In the methodological preparations of the discipline collectives, only the technical-didactic content of the discipline is weighted.
- In extension activities, the environmental dimension of training is limited.

As results derived from the surveys applied to teachers of the Physical Education discipline at the University of Oriente, it was found that there are:

- Insufficient mastery of pedagogical skills to enhance university environmental management.
- Limitations in the previous selection and location of the environmental content in the classes, according to the social and environmental demands of the career.



The concept of methodological workshops used by other authors (Modesto *et al.*, 2017; Hernández *et al.*, 2020) allowed systematizing, organizing, controlling and raising the professional improvement of university teachers of the discipline Physical Education, oriented to the appropriation of environmental culture.

The current state of the environmental culture of university Physical Education teachers, from the approach of professional upgrading, shows significant contradictions, as a result of a cultural inheritance of the previous educational system. It does not embrace the prevailing policy and does not have an identity theoretical-methodological support. The protagonism and commitment of some teachers persists, but not that of the collective. These reflections affirm what was expressed in the problems of the research.

Therefore, it is shown that the professional upgrading of the university teachers of the discipline of Physical Education strengthens the logical-transforming component of this process and, therefore, reveals a dialectic that must be interpreted as a developing process. Its uniqueness is expressed in the following characteristics:

- It offers the basis for the diagnosis of professional upgrading needs to generalize knowledge and know-how in Physical Education classes.
- It systematically incorporates the different dimensions of the generalization of the knowledge of being in the context of the professional upgrading of the Physical Education teacher.

CONCLUSIONS

The research carried out has demonstrated the importance of the formation of environmental culture in the Physical Education teacher, which proves to be an important factor in the integral preparation of this professional. The system of methodological workshops oriented to the appropriation of the environmental culture of the Physical Education teacher at the University of Oriente in Santiago de Cuba allowed transforming the environmental culture index to a higher qualitative level in the teachers of this discipline.

The feasibility of the workshop system configured for the solution of the detected deficiencies was expressed in the main results of the research, by favoring the university educational process from the teaching of Physical Education with a new alternative for the improvement of the dynamics of this teaching process.

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Conflict of interests:

The authors declare not to have any interest conflicts.

Authors' contribution:

Raul Millán Sánchez: Conception of the idea, literature search and review, instrument making, instrument application, compilation of information resulting from the instruments applied, statistic análisis, preparation of tables, graphs, and images, database preparation, drafting of the original (first version), article correction, translation of terms or information obtained.

Alina Bestard Revilla: Literature search and review, instrument application, compilation of information resulting from the instruments applied, preparation of tables, graphs, and images, database preparation, general advice on the topic addressed, review and final version of the article, article correction, authorship coordinator, translation of terms or information obtained, review of the application of the applied bibliographic standard.

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