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ORIGINAL

Environmental education activities through the visual arts

Sistema de actividades de educación ambiental mediante las artes plásticas

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ABSTRACT

Our environment inhabits natural, source of vital resources that go from the subjective thing to the most objective as the water and the air. It is a mission of the new generations to preserve the environment in that we live, to a more ones in these times in that the industrial exploitation degrades the world in that we live. In contribution to this cause the following investigation has as purpose to apply by means of the plastic arts the environmental education in the students of 5to degree of the Primary School "Jesús Miguel Iglesias", with the purpose of contributing the formation of a correct environmental education, fundamental tool to preserve our environment. Therefore she/he thinks about as objective of this investigation: to elaborate a system of plastic activities that you/they contribute to the development of the environmental education. The methods used for the investigation were the theoretical ones (logical documental, historical analysis, analysis and synthesis) and empiric (it interviews, she/he interviews, statistical method); they allowed to diagnose and to base the problem and basic aspects for the design of the proposal.

Keywords: Environment; Environmental Education; Visual Arts; Sustainability; Environmental Preservation.

RESUMEN

El medio ambiente, nuestro habitad natural es fuente de recursos vitales como el agua y el aire, constituye hoy un pilar decisivo en la preservación de la raza humana. Es una misión de las nuevas generaciones preservar el entorno en que vivimos, sobre todo en estos tiempos en que la explotación industrial degrada el mundo en que vivimos. Como aporte a esta lucha por la sostenibilidad medio ambiental la siguiente investigación tiene como propósito aprovechar las cualidades expresivas de las artes plásticas como vía para lograr el fortalecimiento de la Educación Ambiental en los estudiantes de 5to grado de la escuela primaria "Jesús Miguel Iglesias" del Consejo Popular Mantilla perteneciente al municipio Arroyo Naranjo. Por dicha razón esta investigación se plantea como objetivo: elaborar un Sistema de actividades que mediante las artes plásticas contribuyan al fortalecimiento de la Educación Ambiental en los estudiantes del 5to grado de la escuela primaria "Jesús Miguel Iglesias". Los métodos utilizados para la investigación fueron los teóricos (análisis documental, histórico lógico, análisis y síntesis) y empíricos (encuesta, entrevista); permitieron diagnosticar y fundamentar el problema y aspectos básicos para el diseño de la propuesta. Los resultados que se obtuvieron con la investigación demostraron el aumento de los índices de conocimiento medio ambiental.

Palabras clave: Medio Ambiente; Educación Ambiental; Artes Plásticas; Sostenibilidad; Preservación Ambiental.

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INTRODUCTION

In recent decades, the environmental problems affecting Planet Earth and our island have increased and become more acute. This has led to growing interest among different sectors of society in developing wide-ranging policies, projects, and training programs to help decision-makers, educators, and the general public adopt positions consistent with the balanced use of natural resources.[1,2]

Humans have made many changes to nature for their survival and development, most of which are irreversible. Although these changes occur in particular areas, their effects extend beyond national borders, becoming international problems.

There are several activities that humans carry out that have adverse effects on the environment, among which those directly related to large-scale logging and burning of forests, loss and fragmentation of natural habitats, poaching, indiscriminate fishing in threatened ecosystems, over-cultivation, illegal trade in species, and soil deterioration, among others, stand out. It is estimated that two-thirds of all species could disappear within the next 100 years.[3]

Compared to previous ones, our era has been characterized by an acceleration of change in a context in which economic globalization imposes new patterns of production and consumption, which generate a high volume of pollutants that are released daily into the atmosphere, thus unbalancing this natural resource.

Problematic situation

Currently, environmental education in Cuba, mainly in the capital, has a low rate of favorable results. Although there are centers such as the Institute of Ecology and Systematics, the Havana Bay Business Working Group (GTE-BH), the National Aquarium of Cuba, the Center for Science, Technology and the Environment (CITMA), the National Botanical Garden, and the National Zoo, the educational environmental projects developed by these centers, such as "My Green Program," "Acualina," and "Friends of the Bay," are truly scarce about the situation at hand. Furthermore, they are not spread equally across all municipalities, so their effect is not as strong as it could be, considering that the capital is one of the country's most densely populated provinces, which impacts hygiene and the exploitation of natural resources.[4,5,6]

The municipality of Arroyo Naranjo in the capital represents 11 % of the total territory of the province of Havana. It has a land area of 83 km², covering 8225 ha of land, of which 36 % is used for agriculture and the rest for other non-agricultural activities. Of this, 27 % is unsuitable land and 7 % is occupied by water. It has a population of 209 878 inhabitants, with a population density of 2300 inhabitants per km².[7,8]

This municipality consists of 10 popular councils: Callejas, Calvario-Fraternidad, Eléctrico, Güinera, Los Pinos, Managua, Mantilla, Párraga, Poey, and Víbora Park.[9]

In terms of education, there are 117 general education centers, 54 primary schools, 17 secondary schools, and 21 daycare centers with 15 kindergartens. There are two polytechnic institutes and four special education centers (language, developmental delay, mental retardation, and behavioral disorders). Four adult education centers, a language school, and two trade schools exist. The Vladimir Ilich Lenin Pre-University Vocational Institute of Exact Sciences is in this territory.[10,11,12]

The territory is a natural ecosystem with a significant diversity of flora and fauna. Its representative fauna consists of species used for cattle, sheep, pig, goat, and horse breeding, and there are others such as guinea fowl, Hinojosa, quail, guanaco, bullfrog, banana frog, Julia conga, labiajaca, and trout, which are abundant but threatened by urbanization and human activity.[13]

The municipal flora has timber potential, including eucalyptus, majagua, almacigo, carob, poplar, and flamboyant trees. Fruit trees such as guava, avocado, coconut, cherimoya, tamarind, mango, and citrus are also abundant. There are also corn, sugar cane, Guinea grass, and elephant grass pastures.[14,15,16]

It also has facilities that give it prestige and are a source of pride for this municipality and its inhabitants, such as EXPOCUBA, the largest business center in Cuba, and Lenin Park, whose main feature is the multiplicity of expressions of art and literature, offering through its extensive cultural, recreational, and sports areas, contact between man and nature; the Botanical Garden, an educational, scientific, and recreational institution, a natural exhibition center with a variety of vegetation, which shows the most representative of the tropical flora of Cuba, America, Asia, Africa, Australia, and Oceania.[17,18] These data referring to the municipality of Arroyo Naranjo were extracted from the same encyclopedic source.[4,19]

However, the territory's natural wealth is not highly valued by the inhabitants, who, far from preserving it, overexploit the resources it provides.[20,21,22] There are various ways in which the inhabitants contribute to the degradation of the environment. A clear example is the uncontrolled urbanization that sometimes takes place in areas considered natural reserves, poaching and fishing in protected areas designated for species reproduction, industrial activity, the burning of extensive landfills, and poor sanitation in urban areas, which leads to the proliferation of invasive species and a decrease in biological controls.[23,24] These data are just a sample of the low level of environmental education among both residents and non-residents of this municipality.[25,26,27]

Specifically, at the Jesús Miguel Iglesias Primary School in Las Lajas, Mantilla Popular Council, Arroyo Naranjo municipality, fifth-grade students do not have a proper environmental education due to insufficient coverage of this topic in the school's curriculum.[28,29] In this grade, subjects such as geography, Natural Sciences, and Civics, among others, include Environmental Education among their objectives. However, this is a pending task, as the teachers who teach these subjects do not have the necessary training to carry out an educational and practical process that raises awareness about the care and conservation of the environment. For this reason, students show very little sensitivity toward the environment surrounding them. It is also important to mention that students with poor environmental education may engage in actions that degrade their habitat, such as noise pollution, threaten the preservation of species of flora and fauna representative of the locality, and fail to protect abiotic resources such as the assets that the state makes available for the education of future generations. Therefore, it is essential to achieve sustainable development by promoting proper environmental education in this school.[30,31]

After the aforementioned problematic situation about the current state of environmental education, this research poses the following question:

Scientific problem

How can we contribute to the environmental education of fifth-grade students at the Jesús Miguel Iglesias Primary School in Arroyo Naranjo?

To solve the scientific problem of the research, the following was proposed:

Objective: to develop a system of environmental education activities through the visual arts for fifth-grade students at the Jesús Miguel Iglesias Primary School in Arroyo Naranjo.

The above objective made it necessary to draw up the following scientific questions with their respective research tasks:

Scientific questions

1. What are the theoretical and methodological foundations that support Environmental Education through the visual arts in Primary Education?
2. What is the initial state of environmental education among fifth-grade students at the Jesús Miguel Iglesias primary school in Arroyo Naranjo?
3. What characteristics should a system of environmental education activities through the visual arts have for fifth-grade students at the Jesús Miguel Iglesias primary school in Arroyo Naranjo?
4. What results allow us to evaluate the implementation of the Environmental Education System through the plastic arts for 5th-grade students at the Jesús Miguel Iglesias Primary School in the municipality of Arroyo Naranjo?

METHOD

Research tasks

1. Systematize the theoretical and methodological foundations that support environmental education through the visual arts in primary education.
2. Diagnosis of the initial state of Environmental Education in 5th-grade students at the "Jesús Miguel Iglesias" Primary School in Arroyo Naranjo.
3. Development of a system of environmental education activities through the visual arts for 5th-grade students at the Jesús Miguel Iglesias Primary School in Arroyo Naranjo.
4. Assessment of the results associated with implementing the system of environmental education activities through the visual arts for 5th-grade students at the Jesús Miguel Iglesias Primary School in the municipality of Arroyo Naranjo.

The following methods were used to carry out this research:

General scientific method

Materialist dialectic consists of theoretical, empirical, and mathematical-statistical methods.

Theoretical methods

Historical and logical analysis: used to learn about the background and main stages of environmental education and the visual arts in primary education in Cuba.

Analysis and synthesis: used to study the research object, interpret, process, and systematize the theoretical information obtained to form the theoretical framework, design the proposed activities, and analyze the results obtained in diagnosing the students' level of knowledge about the environment.

System approach: this method enabled the coordinated and subordinate organization of the current theoretical references in the research. It was also used in the development of the concatenated system of activities.

Empirical methods

Group survey: this was used to consult students and specialists to ascertain their levels of knowledge and carry out a preliminary assessment of the proposal.

Interviews: these were conducted with teachers and school administrators to obtain information on the actions taken by the school and each teacher in particular in their subject area to provide environmental education to 5th-grade students at the Jesús Miguel Iglesias elementary school in the municipality of Arroyo Naranjo.

Scientific observation: this was used to monitor the students in the sample to determine the state of their environmental education and to analyze changes after the activity system was implemented.

Documentary analysis: m was used to consult documents from which all the necessary information regarding environmental education and visual arts could be extracted.

Statistical-mathematical methods

Percentage analysis: used to facilitate the interpretation of the main ideas of the diagnosis according to the students' levels of knowledge of flora and fauna species, with the support of descriptive statistics, by analyzing the data obtained from the instruments

applied in the research.

Population and sample

The research sample consisted of 30 fifth-grade students from the Jesús Miguel Iglesias primary school in the municipality of Arroyo Naranjo.

The sample was intentional, as the students belong to the art workshop run by the school's art teacher and, therefore, have notable skills in this discipline. It comprised 15 fifth-grade students, representing 50 % of the population.

Chapter structure

This research is structured in two chapters. Chapter I brings together the theoretical and methodological foundations that support Environmental Education through the visual arts in Primary Education. It addresses the core theories related to this topic and their treatment in the national context and part of the world, from the background to the present day. Chapter II assesses the initial state of environmental education among students, a proposal for ecological education activities through the visual arts system, and the results associated with implementing this proposal.

RESULTS

Results associated with the diagnosis

An interview with teachers and administrators at the school revealed that teachers have a low level of knowledge about the lines of work and structural methodological guidelines of the National Environmental Education Strategy for the National Education System and its current subsystems. This situation is listed as a deficiency in the School Problem Bank. Some subjects include environmental education in their curricula, but this is useless due to the insufficient training of teachers, who also fail to carry out activities to promote environmental education, such as competitions, workshops, and scientific societies, which makes it impossible to address this issue in an interdisciplinary manner, as is essential in the 21st century. This problem results in students adopting negative attitudes that affect the school environment and the surrounding ecosystem.

Political and intellectual behavior is deficient, the school has limited space for artistic development, and cultural activities are undertaken with little enthusiasm, mainly by teachers, to the point that they end up being imposed and of poor quality.

To obtain information about the difficulties faced by environmental education at the school and their possible causes, a survey was conducted among a sample of 5th-grade students at the Jesús Miguel Iglesias primary school.

The following study groups were involved: 15 5th-grade students from the Jesús Miguel Iglesias primary school.

The student survey results showed that they had difficulties with environmental education. Sixty percent did not know the species of flora and fauna representative of their locality, with most only mentioning fruit trees and domestic animals. Evidently, 75 % were unaware of national and local environmental problems. It did not know of any textbooks that dealt with nature, except those in the subjects The World We Live In and Natural Sciences. The analysis of these results demonstrated the need to implement a system of activities aimed at acquiring knowledge to ensure the protection of the environment through the plastic arts.

The measurement tools applied revealed that environmental education levels are low, as can be seen in the results of the sample's general and specific knowledge. Evidently, students were unaware of the elements that make up the environment, the main phenomena that cause its deterioration, and the means and methods for its protection. This can be seen in the negative behavior patterns they adopt daily and, therefore, in school.

These patterns manifest in the following ways: throwing solid waste outside the bins in different areas of the school, leaning against walls with dirty feet or hands, and not taking any action to beautify the school environment. It is, therefore, essential to promote values aimed at eradicating inappropriate behavior toward the environment and to promote vocational training in the plastic arts as a means of protecting and conserving the environment at an age when students are beginning to form their view of the world and their place in society.

In addition to the results and reflections on the subject presented here, other criteria obtained from questions related to the validation of the proposal carried out through a survey of six visual arts specialists and one environmental specialist served to further the research. The interview with the teachers at the center also highlights the importance they attach to environmental education for students and their views on the proposal.

The specialists argue from their respective fields that implementing activities to promote proper environmental education among students is a motivating way to ensure the success of this task, but that these activities must be well designed to guide students' progressive education toward caring for the environment.

The sample of teachers interviewed was selected considering aspects such as level of education, years of experience, and levels of interaction with the students in the sample.

In these interviews, the vast majority of teachers highlighted the importance of students receiving environmental content linked to the arts, especially the visual arts, as this can be used as a motivational tool in the subjects they teach as a new methodology. They suggest this can contribute to teaching, making it more fluid and effective, as the visual arts make acquiring knowledge more enjoyable.

For the research, it was necessary to characterize the age of the children in the sample, as this is the stage to which the students belong.

The exhibition

The sample is intentional because the students selected belong to the visual arts workshop at the Jesús Miguel Iglesias primary

school, which is run by the author of the research. Therefore, they have notable skills in the visual arts. The sample consists of six female and nine male students, for 15 students between the ages of 10 and 11.

It should be noted that these students are greatly affected by the teaching-learning process due to the loss of their guidance teacher at the beginning of the school year. This situation is widespread, as the school has a shortage of teaching staff, which means that other grades also experience similar situations on different occasions. There is no one to support the 5th grade. This is one of the reasons why the author of the research selected this group, as in addition to teaching workshops, he also supports the school's management board with this situation in his free time by carrying out extracurricular activities in the visual arts as a result of which these students have increased their ability to master skills in the visual arts such as appreciating, drawing, painting, and modeling, among others. The development of these students' skills varies according to their differences, which affects the levels of development within the group, which range from high to medium to low. Similarly, it was taken into account that the students generally have low levels of environmental education.

So, what can be done to reverse the above results?

System of Environmental Education activities through the visual arts for 5th-grade students at the Jesús Miguel Iglesia Primary School

Given the development of this system of activities, the author adopts the definition provided by Gustavo DelerFerrera in his doctoral thesis, where he comments on activity systems as follows:

"They are actions carried out in a conscious and goal-oriented process, in which students and teachers interact under pedagogical and didactic principles for developing teaching content."[29]

Based on Gustavo DelerFerrera's concept, the researcher defines activity systems as a didactic and interactive teaching process carried out through interrelated and logically structured components, guided by the fulfillment of certain functions and to achieve the objectives set.

The activity system was selected for its didactic and interactive nature, which allows students to express themselves through their creative and artistic appreciation skills and cultivate their interest in preserving and enjoying the environment.

This activity system is extracurricular and corresponds to art education (EA), although the objectives are based on environmental education.

Like the research presented above, it complies with the Guidelines of Cuba's Economic and Social Policy:

Art V # 133. Sustain and develop comprehensive research to protect, conserve, and rehabilitate the environment and adapt environmental policy to new economic and social projections. Prioritize studies to address climate change and, in general, the sustainability of the country's development. Emphasize the conservation and rational use of natural resources such as soil, water, beaches, the atmosphere, forests, and biodiversity, and promote environmental education.[30]

Regarding the proposed system of activities

The art instructor works in different contexts and educates citizens using artistic and literary expressions. In this sense, they must undertake their work with a broad and flexible perspective, considering the diversity of the people with whom they interact and how cultural processes are organized. Educational and cultural processes demonstrate that the activity system is an ideal and motivating tool for the professional performance of art instructors in curricular and extracurricular environments. The psycho-pedagogical characteristics of the students in the sample were considered when developing the system of activities.

Psycho-pedagogical characterization of 5th grade students at the Jesús Miguel Iglesia school

The selected students are between 10 and 11 years old. They have particular characteristics in the area of social development that are important for the development of this research. Between the ages of 10 and 11, children's fields of action and social possibilities have expanded considerably. Students in the first cycle cease to be the "little ones" of the school and the home and gradually become individuals with greater social participation and responsibility. This is due to a notable increase in their cognitive abilities, mental functions, and processes, which serve as a basis for placing higher demands on their intellect. This is an aspect that teachers should consider in their interaction with students and, above all, when shaping their cognitive activity. They reject excessive supervision by parents and even teachers. They actively participate in extracurricular activities, such as the pioneer explorer movement and other school activities, due to the increased independence and responsibility they experience.

From an emotional standpoint, they begin to adopt pre-adolescent behaviors. They sometimes display emotional instability and affectivity; they sometimes change abruptly from one state to another so that observers cannot find a logical explanation for these changes. They can also make judgments and assessments about people, characters, and situations, both at school, in the family, and in society in general.

Changes in anatomical and physiological development can be seen in terms of increased height, weight, and muscle volume. Disproportions begin to emerge (the trunk in relation to the limbs), and muscle strength increases. Secondary sexual characteristics begin to appear at an earlier age, which makes proper and timely sex education necessary.

For this reason, the Environmental Education System through the visual arts will become interdisciplinary spaces that promote the discussion of ideas, appreciation, and artistic creation through different channels and methods that contribute to the building of general and specific knowledge about environmental protection since in these modern times, pollution and deforestation caused by humans have made life on the planet increasingly tragic and devastating.

Proposal

E/P "Jesús Miguel Iglesias"

Title: System of Environmental Education Activities through the Plastic Arts for 5th Grade Students at the Jesús Miguel Iglesias Elementary School in Arroyo Naranjo.

Frequency: 4 hours/week

Number of hours: 20

Prepared by: Plastic Arts Instructor Lázaro Javier Hernández Bridón

Date: May 2017

Rationale

The effects of years of irrational use of natural resources are having an impact that is becoming increasingly dangerous in our current situation. Humans are responsible for this reality and continue to be unaware of the problem, even though they know the future consequences.

Due to the high environmental damage in the municipality of Arroyo Naranjo, specifically in the educational center, an Environmental Education System has been created through the visual arts for 5th-grade students at the Jesús Miguel Iglesia Elementary School to combat this problem. It also aims to strengthen creativity and artistic appreciation and develop creative skills through the knowledge of different easy-to-execute techniques. Similarly, it seeks to foster environmental awareness.

The system consists of 10 activities that contribute to environmental education, with content related to the visual arts and environmental education. Each activity lasts two hours, for a total of 20 hours. The activities will take place in classrooms, the school's outdoor and indoor areas, and some community locations. Each activity contains an independent, easy-to-complete task repeated in the 10 sessions. It consists of collecting natural or industrial waste materials that can be used in art projects. This task is designed to help students develop their creative imagination about environmental art.

General objective

The visual arts are used to contribute to the environmental education of 5th-grade students at the Jesús Miguel Iglesia Primary School, improve the environment, and raise awareness of it.

This proposal also aims to promote value systems and skills among students.

Value system

The system responds to the formation of values in 5th-grade students so that they can be transmitters or mediators in their contexts of action. The values to be addressed are:

- Gender equality. Like group work, it allows for different points of view or approaches in various situations.
- Love for the study of natural sciences and the arts, which allows students to appreciate the importance of interdisciplinarity and discover the contributions these subjects make to the ecological cause.
- Friendship and tolerance are the main driving forces behind group work.
- A sense of belonging as the main factor in transforming their existing reality for the better and improving their quality of life.
- Aesthetic sensitivity and love of nature.

Skills system

This activity system aims to develop different skills in students, from identifying the main environmental problems in their community to creating artistic works with a message aimed at eradicating the issues identified. The main skills to be worked on with these enthusiasts are:

- Characterize possible environmental problems, their causes, and consequences for their communities; the expressive media of the visual arts.
- Identify environmental issues in the school and community through artistic works.
- Appreciate the environment through visual arts to support the environmental education process.
- Draw the environment based on knowledge of existing environmental issues.
- Paint artwork that reflects the school and community's environmental situation.
- Create artwork using a mixed technique that includes natural and industrial waste.

Assessment system

The content of the activity system will be assessed systematically and at the end of the course.

Table 1. Assessment system

Systemic	Final
The following form of assessment will be taken into account during the implementation of the proposal, evaluating the knowledge acquired by students orally. Creative processes will also be assessed in a practical manner, as well as the development of manual and creative skills.	This final assessment will be carried out in a practical manner, with each participant in the System producing a piece of artwork that conveys the environmental education knowledge they have acquired during the activities. These pieces will form part of an art exhibition to be held at the educational center itself.

Other forms of assessment:

- Active student participation.
- A brief opinion exchange will occur at the end of each activity to gauge student satisfaction.

Activity system

The activity system consists of 10 sessions.

Activity 1

Topic: expressive media in the visual arts I.

Objective: to characterize the expressive means of the visual arts through school landscapes for the development of creative imagination.

Contents: form system. Indicators of space, point, line, color, texture, tones, area, volume, and values. Foremost national exponents of the visual arts.

Time: 2 hours.

Responsible: art instructor. Lázaro Javier Hernández Bridón.

Activity 2

Topic: expressive media in the visual arts II.

Objective: characterize the expressive media of the visual arts through school landscapes to develop creative imagination.

Content: form system. Laws, principles, proportion, rhythm, balance, emphasis, and figure-ground relationship. Foremost national exponents of the plastic arts.

Time: 2 hours.

Responsible: art instructor. Lázaro Javier Hernández Bridón.

Activity 3

Topic: getting to know the environment.

Objective: To develop environmental awareness by identifying pollution problems through a tour of the school environment.

Content: environment. Main global and local problems. Actions for its protection. Main environmental issues in the municipality of Arroyo Naranjo. Viewing images of flora and fauna.

Time: 2 hours.

Responsible: art instructor Lázaro Javier Hernández Bridón and Master of Information Sciences Guadalupe Bridón.

Activity 4

Topic: the environment in which I live I.

Objective: characterize the school environment through an ecological tour to develop environmental awareness.

Content: tour of the school environment. Measures for environmental preservation. Environmental art.

Time: 2 hours.

Responsible: art instructor Lázaro Javier Hernández Bridón and Master of Information Sciences Guadalupe Bridón.

Activity 5

Topic: the environment in which I live II.

Objective: to characterize the community environment through an ecological tour to develop environmental awareness.

Content: excursion through the community. Measures for environmental preservation. Environmental art.

Time: 2 hours.

Responsible: art instructor Lázaro Javier Hernández Bridón and Master in Information Sciences Guadalupe Bridón.

Activity 6

Topic: draw the environment I.

Objective: describe the school's environmental situation through a drawing to develop ecological awareness.

Content: environmental issues in the surrounding area. Creation of artwork based on environmental themes. Drawing techniques.

Time: 2 hours.

Responsible: art instructor. Lázaro Javier Hernández Bridón.

Activity 7

Topic: draw the environment II.

Objective: describe the environmental situation in the community through a drawing to develop awareness of the environment.

Content: environmental issues in the local area. Creation of artwork based on environmental themes. Drawing techniques.

Time: 2 hours.

Responsible: art instructor. Lázaro Javier Hernández Bridón and Master in Information Sciences. Guadalupe Bridón.

Activity 8

Topic: art with nature I.

Objective: explain the use of disposable materials in the work of visual artist Osvaldo Jacinto Llins to develop the imagination.

Content: appreciation of the work of sculptor Osvaldo Jacinto Llins through the elements of the Form System. Collection of disposable materials for future work.

Time: 2 hours.

Responsible: art instructor Lázaro Javier Hernández Bridón and sculptor Osvaldo Jacinto Llins.

Activity 9

Topic: art with Nature II.

Objective: to create a work of art using natural or industrial disposable materials and mixed techniques to develop sensitivity towards the environment.

Content: creation of works based on environmental themes. Use of mixed techniques. Use of natural or industrial disposable materials.

Time: 2 hours.

Responsible: art instructor. Lázaro Javier Hernández Bridón.

Activity 10

Topic: art with nature III.

Objective: to create a piece of art using natural or industrial waste materials and mixed techniques to develop sensitivity towards the environment.

Content: creation of an artistic work based on an environmental theme. Use of mixed techniques. Use of natural or industrial waste materials.

Time: 2 hours.

Responsible: Art instructor. Lázaro Javier Hernández Bridón.

Methodological guidelines

It is essential to take advantage of all the students' experiences and motivating situations that may arise from walks in the surrounding area, excursions that allow them to appreciate shapes, colors, and textures, and the application of different participatory and creative techniques that may awaken their desire to create and experiment.

It is recommended that the various materials needed for the artistic work be used before each activity starts.

It is recommended that various participatory techniques be used with the students to facilitate the construction of knowledge and the development of skills for artistic creation and appreciation so that they can come to value and enjoy the environment and their creative work.

The activities should be carried out in an interactive environment that encourages free expression, with systematic and varied motivation, so that experiences, emotions, personal feelings, and knowledge about their environment can be achieved.

It is vitally important for students to carry out a collective assessment with the instructor's guidance. This is important for the development of appreciation and conscious and constructive criticism of their own work and that of their classmates. An alternative to this analysis is to prepare a series of questions that allow them to take a visual tour of the artistic works produced.

The art instructors will freely choose the media in accordance with the diagnosis prior to applying the System and the conditions of the school environment.

It is extremely important to consult texts related to the research bibliography or others that meet the system's requirements for System preparation.

The system's environmental focus must be maintained at all times to achieve high levels of environmental knowledge.

Evaluation of the results associated with implementing the System of Environmental Education activities through the visual arts for 5th-grade students at the Jesús Miguel Iglesias Primary School in Arroyo Naranjo.

During the 2016-2017 school year, the author of this research set out to develop a system of environmental education activities through the visual arts, thus ensuring the active participation of students who lacked knowledge, interest, and awareness of environmental care and preservation. These unfavorable data were detected thanks to an in-depth diagnostic study that was carried out, which showed that the vast majority of students were unaware of the riches of the environment that surrounds them and the ways to care for and preserve it. This data was obtained through a survey of the students.

In assessing the implementation of the activity system, the level of assimilation by the students of the knowledge provided on the environment and plastic arts was considered. To determine the levels of expertise, it was necessary to consider assessment criteria, establishing three groups according to the students' assimilation:

Assessment ranges for knowledge levels:

High level: mastery of 95 % or more of the knowledge related to the environment, such as its components, problems affecting it, positions, and measures to be taken for its protection. Incorporation of knowledge into everyday life.

Intermediate level: mastery of 70 % to 94 % of knowledge related to the environment, such as its components, problems affecting it, positions, and measures to be taken for its protection. This level is awarded when students incorporate Environmental Education into their behavior. However, there are times when their behavior is not the most appropriate regarding Environmental Education.

Low level: When there is 69 % or less mastery of knowledge about the environment, such as its components, problems affecting it, attitudes, and measures to be taken for its protection. In addition, environmental education knowledge is not incorporated into their daily lives.

The assessment of knowledge took into account the development of skills in the visual arts, knowledge of the formal system and its elements, and the quality of the artwork.

During the implementation of the activity system, empirical instruments such as observation were used to assess the evolution of the students› environmental education. This was possible thanks to the spontaneity and expressive nature of the extracurricular art activity, which enabled students to experience learning and recreational encounters. In general, the students› environmental awareness was developed, which allowed them to achieve high levels of knowledge about the environment and the visual arts. In addition, they reflected on the need for recycling to eradicate pollution in the school and community environment.

The initial assessment results showed that 60 % of the students had a low level of knowledge about environmental issues. After implementing the activity system, it was determined that of the 15 students in the sample, 40 % had a high level, 55 % had an average level, and only 5 % had a low level of knowledge about the environment and visual arts, which is a notable advance in promoting these topics.

Through discussions with the specialist, the art instructor and students made progress in addressing environmental issues. This allowed the instructor to determine the knowledge about the environment and its protection that was necessary for the students in the sample.

In the visual arts, the quality of the student's artwork also improved thanks to the activities' progressive pace and recreational nature. This aspect is visible in the artwork, which shows a significant improvement in their manual skills, resulting in exercises of high aesthetic and artistic quality.

The practical application of the student's artistic skills about the environment enabled them to become more dynamic and dedicated to environmental issues, which had always been approached from a scientific perspective that was not always easy to understand. According to their differences, one hundred percent of the students developed their manual skills. The artwork was donated to the school for decoration and as a methodological background for creating an environmental interest group.

Consultation with a specialist was key in evaluating the proposal's contribution to the students' environmental education. The scientific component benefited from the active participation of specialist Guadalupe Bridón Calzado, who has a master's degree in Information Sciences and is head of the information department at the Institute of Systematic Ecology in Cuba. The artistic component involved local artists such as sculptor Osvaldo Jacinto Llins, Alain Pérez, and Pedro Estaviles, all with teaching experience in the arts.

In consultation with specialists in the visual arts and the environment, 80 % of them considered the proposal appropriate in terms of its organization and chronological order in presenting its evolution, while the remaining 20 % rated it as excellent, always with recommendations for future practices.

Among the recommendations proposed are the following:

- Refine and expand the proposal in terms of using various artistic techniques and procedures to strengthen the skills discovered in the students.
- Broaden the horizons in treating environmental issues to other national problems such as the care of Havana Bay and conservation agriculture.

Some recommendations were also made before the proposal's implementation, which served as a guide for its proper development.

During the proposal's development, new artistic talents were identified. Specialists are currently working with them to represent the school and the community at critical environmental events such as the "Children's Science Days at the National Aquarium," the "My Green Program" contest, and programs for water conservation and rational use (PAURA), among others.

On the social side, we had the ongoing support of community leaders, whose input helped evaluate the proposal.

Teachers and school administrators acknowledged that during the implementation of the proposal, there was a noticeable improvement in the acceptance levels of the subjects Natural Sciences and The World We Live In, as well as other subjects related to environmental issues.

One hundred percent of teachers and specialists rated the proposal's accessibility as positive for anyone interested in implementing it.

Other results

The implementation of the proposal yielded unplanned results, including: increased engagement of students outside the sample in the activity system and the formation of an environmental brigade of students and teachers.

Negative results

- 5 % of students acquired knowledge about the need to care for the environment, but did not implement what they learned, continuing with negative behaviors and contributing to environmental pollution in their own surroundings.
- Although not decisive for the development of the proposal, there were interruptions due to negative trends at the school that affected the learning process, such as poor attendance in the afternoon.

Results of the evolution

The assessment of the various changes that occurred during and after the implementation of the activity system showed a notable improvement in the student's attitude towards good practices in caring for and preserving the environment. The considerable increase in environmental awareness was noticeable in the school and the community. An example of this is the willingness of students to meet on Saturdays to work on cleaning the center, outdoor areas, and community dumps, guided by a nascent environmental interest group. Work on the school garden was also resumed. In addition, according to school staff and community members, favorable changes have been observed since the school implemented the proposal. However, work must continue to ensure that these practices are not abandoned and to achieve higher levels of environmental education.

CONCLUSIONS

This research systematized the theoretical and methodological foundations that support environmental education through the visual arts in primary education. These allowed us to focus on the basis and objectives of the proposal, which is an excellent contribution to environmental education due to its motivating nature, which ensured the active participation of students and promoted their level of knowledge of environmental education.

The results of the diagnosis of the initial state of environmental education among 5th-grade students at the Jesús Miguel Iglesias Primary School revealed that the students had poor preparation for environmental issues, such as a lack of knowledge about sources of pollution, ecological texts, and local flora and fauna species.

Based on the assessment results, a system of environmental education activities using the visual arts was developed for 5th-grade students at the Jesús Miguel Iglesias school. The system focused on ecological issues and developed skills and values related to these issues and the visual arts.

The evaluation of the proposal's implementation results showed positive results, as evidenced by the high levels of knowledge and acceptance of environmental education among students. In addition, it was found that its application in other contexts is possible due to its flexibility. This assessment was made possible by using empirical methods such as scientific observation.

RECOMMENDATIONS

Improve the proposed activities that link the environment with the visual arts and broaden their horizons to include other topics of interest. Preserve the research results as methodological resources in subjects such as Art Education and Natural Sciences. Expand the system of activities with a more in-depth program that includes such problems as the loss of values, the loss of traditions, and the extinction of cultural forms in their broadest sense, and extend it to the rest of the students at the center.

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CONFLICT OF INTEREST

None.

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