Environment Ethics and Sustainability Learning Spaces: Curriculum, Guidelines, Pedagogical Practices, Readings and Suggested Ideas

This Curriculum is organized into "Environment Ethics and Sustainable Learning Spaces" and it is intended to aid Peru's public primary education teachers to teach the theory and practice of Environment Sustainability and Ethics to first cycle students and perhaps, the community as well.

Each segment is divided into three sections:

"**Pedagogical Practices,**"

"**Reading Materials**," and

"**Suggested Ideas."**

The program can be used in a traditional classroom, through televised lessons, or Websites, which may facilitate the diffusion of the Curriculum to neighboring countries who share the Inca Heritage, Lake Titicaca, and the Amazonian Rain Forest.

Even though article 33 in the Peruvian Education Law specifically establishes the Ministry of Education's responsibility in creating the National curricular structure for the whole nation, this dissertation will contribute these Pedagogical Practices for Environment Ethics and Sustainability Learning Spaces education with the hope that they will be taken into consideration by the ministry. The ministry's directive is also explained in the Diseño Curricular Nacional de Educación Básica Regular of November 2005:

> El Ministerio de Educación es responsable de diseñar los currículos básicos nacionales . . . el Diseño Curricular Nacional

> constituye un documento normativo y de orientación válido para todo el país, que sintetiza las intenciones educativas y resume los aprendizajes previstos. (10) [1]

The Pedagogical Practices are central in this dissertation and cover the important area of "Environmental Ethics and Sustainability of the Resources" because of its transcendental role and the relationship between ethical sustainability of resources and poverty. This area correlates with other areas because of the linkage with the entire natural and cultural resources of Peru.

"Four Pedagogical Practices" for Peru's Public Education are designed for primary teachers of second level, first cycle students, relating environmental aspects in their daily relationship with the ecosystem

The equivalent in the United States would be the first four years of elementary school. These pedagogical practices target Peru's major environmental problems: **waste, water, land, and air.**

Development of Environmental Literacy, Ethics, and Sustainability Curriculum Guidelines:

Objective: To assure progressive pedagogical and curricular coherence in the integral formation of students based on the use and understanding of the words' and concepts' real meaning, their ethical weight, and their orientation to sustain the environment. Since these are related to students' immediate survival they

[1] [The Ministry of Education is responsible for designing basic national curricula . . . [and] the National Curricular Design constitutes a normative and guiding document applicable to the entire country; it synthesizes the educational goals and summarizes all the knowledge expected (my translation)].

are connected to the preservation of natural resources. It is intended that the individual apply them at every moment, in any space where he or she carries out his or her daily endeavors, always thinking about the future consequences of those actions.

1-Area: Environmental Ethics and Sustainability and Environmental Literacy.

2-Timetable: corresponds to one school year in Peru during the first four of primary; ages 6 to 9 years. (Equivalent in the United States to the first four years of elementary schooling.)

3-Learning Outcome: Understand in every-day life, location, and situation what is affecting the ethical environmental sustainability and not be mislead by actions, words, or concepts that are not sensible to the environment. For example: understand the meaning of ecosystem, elements, trash-waste, pollution, rain forest destruction, highland, coast, deserts, gas, development-production, work offer. In more practical terms, to define and explain accurately these terms so they are readily applicable to everyday life and be sure to avoid unwanted consequences in the environment.

4-Subject contacts: The area “Environmental Ethical Sustainability of the Resources” needs to establish connections with other areas such as communication, science, social studies, and religion.

5-Competencies:

A-Students achieve knowledge and understanding of the ecosystem’s components, which means that every element is related and connected to each other. Any human action exerted on the ecosystem will necessarily influence the

environment in some way. That is why students need to relate to the environment constantly.

B-This understanding allows students to speak of and participate actively in the care, cleanness, and conservation of their surroundings in the classroom, school, home, community, shantytown (poor human settlements), city, and nation.

6-Capacities and attitudes:

A-Students observe, discover, and identify different main elements of their surroundings, knowing their names and identifying different elements of their landscape and habitat. On the coast: oceans, deserts, valleys, peninsulas, beaches, Humboldt current, el Niño current; in the highlands, peaks, mountains, streets' main squares, avenues; in the jungle: rain forest, rivers, lakes, ponds. Students will learn about seasons and atmospheric conditions: dry, rainy, humid, cool, and hot climate.

B-Students observe, understand, and identify the life cycles of human beings: childhood, adolescence, young adulthood, maturity, and old age. They will examine social or ethnic groups: native, Indian, mestizo, Spanish, and European. They will explore stages of health: healthy, sick, and closeness to dead. They will understand gender: man and woman (male and female) as well as masculine / feminine roles.

C-Students observe, understand, and identify forms of animal life. From the coast: fish, mollusks, shrimp, birds, mammals, domestic and farm animals, such as cattle, sheep, pigs, horses, donkeys. From the highlands: llamas, vicuñas,

alpacas, and native species. From the rain forest: insects, butterflies, leopards, pumas, toucans, snakes, spiders, etc.

D-Students observe, value, and care for sites related to mineral resources: gold, silver, coal, gas, and other minerals.

E-Students observe, understand and identify cycles and life of plants: flowers, produce, fruit-trees, timber, vegetation, fodder, native plants, and medicinal plants.

F-Students should be able to know, speak, understand, cherish, and cultivate their environment and cultural heritage, identity, art, and traditions, such as: myths, legends, popular sayings, dances, songs, archaeological sites, popular art, typical food dishes, special religious processions, and rituals for social ceremonies, and ritual ceremonies for Mama Pacha, (mother earth) the forest, land, crops, lakes and oceans, and mountain peaks or “apus.”

G-Students can address actions or activities to help restore quality, integrity, health, and beauty of human beings, animals, and plants. They should know about natural disasters and how to get protection, as well as to learn to protect others and the habitat of animals and plants as well.

Suggested year-round activities with the students:

- Maintain in the school a corner for ceramics or other remains that may be found in the area.
- Keep a record of places known as Inca or Pre-Inca cemeteries in Spanish “Gentilares.”

- Record and comment on practices that were known to their Peruvian ancestors especially if they were related to the protection of the environment or preservation of the resources. For example, in Lima it was possible to have fresh tasty “Lisa” fish year-round, because of the knowledge and fishing practices at the Pacific entrance of the Rimac River.
- At home raise guinea pigs or “cuys” and once a year have a celebration having for lunch “Cuy Chactao” or guinea pigs cooked over hot stones.
- Revive the pit cooking “pachamanca” where the entire school can enjoy a delicious and natural lunch. The Inca kitchens or ovens **do not** produce green house gases, and human creativity can develop simple methods to control cooking smoke.
- Practice the typical Peruvian dances, the Huayño (Inca dance) and the marinera (Mestizo Dance).
- Sing and listen to Peru’s music. Play Peruvian musical instruments, pututos, sampoñas, quenas.
- Choose a day when students can bring some of the vegetables they grow at their small home gardens, and make a salad with them, get the parents involved.
- Keep a record and the seeds of the region’s native plants that could feed hungry people in the future. Plants such as maca, quinua, quihuicha, ocas, racachas, llicchas should be protected from biological engineering and manipulation.

- Inform and discuss the nutritional value of potato chips and coca cola in contrast to potatoes cooked or grilled over a pit.
- Bring to foreground or emphasize how the Incas practiced mutual cooperation and solidarity in times of emergency.

7-Class activities with the students:

A- Suggested hands-on pedagogical modules such as the waste module for the first four years of primary school.

B- Reading stories that support not only environmental awareness but also fundamental environmentally ethical sustainability from a personal perspective.

Pedagogical Practices Modules about Waste

1-Objetives: Teach, educate, and familiarize students with the types and sources of residues, waste, and trash.

2-Methodology:

Through experience, participation, exposition, and demonstration.

3-Concepts and Knowledge:

What are solid residuals?

Where are they manufactured?

What are organic wastes?

What are non-degradable wastes?

Make distinctions and separate: paper, carbon, plastic, aluminum, stainless steel, glass, organic matters, and others.

WASTE Module (In the classroom) First Grade

1-Discuss environmental misuses, overuse, and waste of paper, plastic, and what is inorganic and organic waste. (connect with communication, science, and mathematics)

2-Explain how paper and plastic are produced. (connect with science)

3-What is the resource used to make paper? (connect with science)

4-Why should paper not be wasted? (establish ecological consequences and connect with science)

5-How do the paper and cardboard industries work? (connect with sustainable development: Pollution and extermination of trees, science and social studies)

6-How can we save trees? How do trees affect human health and participate in ecological equilibrium (connect with care, responsibility, preservation, connect with social studies)

7- How have plastics and the production of plastics contaminated our land, water and air? (effects of contamination over the ecosystem, connect with science, and social studies)

8-Why is it important to separate plastic and inorganic waste such as cans, bottles, and containers from organic waste? (connect with social studies)

9-Students, with the teacher's help, formulate solutions to waste problems. (connect with religion and ethical consequences)

WASTE Module (at Home) Second Grade

1-Direct students to closely observe their surroundings and make an inventory of the misuse, overuse, and waste of resources that they can identify. Pay

particular attention to the handling of organic and inorganic waste at home. (connect with science, and mathematics)

2-Guide students in finding better ways to use, reduce, reuse, and recycle. Use and come up with creative ways for improving the disposal of organic waste. For example, they could start a project where they take care of a little plant or garden using organic fertilizers and reused water. As far as inorganic waste goes, students should learn to take this waste to recycling centers. (connect to science, mathematics, and with ethics, design, and creativity)

WASTE Module (in the Community) Third Grade

A-Students should become familiar with the waste disposal sites in their community.

B-Design a project where the students along with their teachers, parents, and family do something that helps their community. Such as: “Adopt a Tree” (“Adopta un árbol”) or “Create a Green Corner” (“Crea una zona verde”).

C-Students make a project to plant trees around the community; preferably native species that can adjust to the local environment.

D-Students consider and locate the Pre-Hispanic or Inca warehouses that preserved goods and materials for future needs. (connect with history)

WASTE Module (Connecting the classroom, home, community, authorities, and school for the benefit of the present generation and learn responsibility to care for the future well-being of the country) Fourth Grade

A-Organize a campaign to collect, in a little warehouse, things students no longer want or need such as paper, pencils, erasers, notebooks and deliver them to help other students in need.

Pedagogical Practices Module about WATER

1-Objective: Familiarize students with the types and sources of water. Understand that water is one of the most vital elements in the conservation of human health and that it influences other elements of the ecosystem. Familiarize students with the undesirable situation of polluting water and with the care and protection of each drop of water.

2-Methodology: Through experience, observation, participation, and demonstration.

3- Concepts and Knowledge:

What is water?

What are water's characteristics?

What types of water can we find?

What is scarcity of water?

What is contaminated water?

What is the influence of water on life?

Make clear the uses of water by industries, corporations, and private homes.

Make clear the need to protect water.

WATER Module (In the classroom) First Grade

1-Discuss absence of water related to sickness and health. (connect with science)

2-Discuss water misuse, waste, and contamination. (connect with science)

3-Explain where water comes from to the school. (connect with social studies)

4-Discuss and give real examples why and how water is wasted. (connect with social studies and science)

5-Who uses water in industry and for what purposes? (connect with social science)

6-How does water get contaminated, what are domestic contaminants? (connect with science)

7-Establish the difference between fresh, potable, ocean, and contaminated water. (connect with science)

8-Encourage students to offer solutions to the scarcity of water in their own community counting on the water that the region, city, or villages have. (connect with science)

WATER Module (At Home and in the Community) Second and Third Grades

1-Direct students to observe closely their surroundings and make an inventory and conditions of water faucets, bathrooms, washing activities, and spaces where water is used. (connect with science)

2-Guide students to check on bad or malfunctioning connections on faucets and in bathrooms that have waste water leaks. (connect with science and social studies)

3-Guide students to be aware of the potential absence of water and what containers are best to keep water the longest and in the best possible condition. (connect with science)

4-Guide students in how to sanitize water by boiling, adding chlorine and/or filtering methods. (connect with science)

WATER Module (Connecting the classroom, home, community, authorities and school for the benefit of the present generation and accept responsibility to care for the future well being of the country) Fourth Grade: Organize a small campaign to protect water from waste by checking around what is wrong with pipes, faucets, hoses, and bathrooms. Form a small pool of parents who know how to repair those imperfections and return them to an acceptable condition. The campaign can be called:

"I ♥ Water"

"Remember Water Day March 22*."*

"A Vital Drop of Water"

"I Love a Drop of Clean Water"

"Protect Water and Share Water"

Pedagogical Practices Modules about Land

1-Objective: Care for the small piece of land we live on. Teach about and note the buildings, houses, facilities, highways, landfills, soil, surface, oceans, atmosphere, forests, deserts, beaches, and river shores. Know where there are agricultural areas, industrial areas, and military areas; public and private spaces and buildings; contaminated or sick lands.

2-Methodology: Through experience, visits, exploration, exposition, participation, and demonstration.

3-Concepts and Knowledge:

What is the Earth?

How do oceans, lakes, ponds, marshes, and rivers connect with the soil?

How is the atmosphere a part of the earth?

How highways unite but pollute?

What are urban, rural, agricultural, and green forest environments?

What are residential, commercial, and industrial zones?

What is volcanic land?

What are coasts, highlands, and jungles?

What is the green forest?

What are natural disasters such as landslides, earthquakes or volcanic activity?

What are flooding and tsunamis?

How do these parts interact in the earth ,water, air, oceans, rivers, ponds, lakes and forests,?

LAND Module (In the classroom) First Grade

1-Discuss the piece of earth where the class is located. See what organic beings and inorganic properties there are in your area. (connect with social studies)

2-Explain why there are or there are no trees, flowers, birds, or other animals in some areas. (connect with science and social studies)

3-Discuss why the land is productive or not productive. (connect with science)

4-Discuss local land disasters. (connect with science)

5-Discuss how people protect themselves from those disasters. (connect with science)

LAND Module (at home and in the Community) Second and Third Grades

1.Make an inventory to recognize urban, agricultural, archaeological sites. (connect with social studies, history and science)

2-Make a recognizing inventory of resources that the land and communities in your area have.

(connect with social studies and science)

3- Recognize how commercial and industrial facilities treat the land. Do they pollute the land? Do they use toxic substances or elements? (connect with science and social studies)

4-Guide students to repair and beautify any spot that needs a clean up or help to promote a special site. (connect with science and social studies.)

LAND Module: (Connecting the classroom, home, community, authorities, and school for the benefit of the present generation and learn the responsibility to care for the well-being of the country) Fourth Grade

1-Organize a campaign to help to be responsible, overcome indifference, or let someone else do it, or “facilismo.” (The Spanish word “facilismo” conveys the same sense as the English expression “Let George do it.) One avoids responsibility by expecting someone else to solve a problem.

“United we can clean, plant, care for, and protect our animals, plants, and land.” (Nosotros unidos podemos limpiar, plantar, cuidar y proteger nuestras plantas, animales y tierra.)

“We can help others to rebuild their houses.”

“We can help after an earthquake.”

“Let’s celebrate Earth Day on the 22nd of April.”

“Let’s eat salads and fruits from our small orchards.”

“Let’s plant a small orchard.”

“Let’s have one cactus in every house.”

“Let’s have an eucalyptus in every yard.”

Pedagogical Practices Module about AIR

1-Objectives: teach, educate, and familiarize students with the atmosphere and good, healthy air.

2-Methodology: Through experience, participation, exposition, and demonstration.

Concepts and Knowledge.

What is the earth’s atmosphere?

What are the parts of the atmosphere?

What is air pollution?

What is air radiation exposure?

What is the altitude effect in the highland and in the coast?

What is indoor and outdoors air quality?

What is industrial, mining, or cement production pollution?

What is smoke in the cities and factories?

How does air pollution relate to health problems?

How did air get polluted by vehicle emissions in cities such as: Lima, Arequipa, Chiclayo, Trujillo?

AIR Module (In the classroom) First Grade

1-Discuss the quality of air that the classroom has. (connect with science)

2-Discuss the natural illumination the classroom and the school have. (connect with science)

3-Discuss whether the air in the classroom and in the school is clean or not, and if not what to do about it. (connect with science)

4-Discuss why the air is so unclean and heavy in streets where there are many cars. (connect with science)

AIR Module (At Home and in the Community) Second and Third Grades

1-Discuss how one can prevent fainting if there is fire, too much smoke (or a tear gas bomb.) (connect with science, social studies)

2- Direct students to feel and breathe unpolluted air and know why polluted air has bad consequences for the respiratory system. Try to go on an excursion to a clean air location. (connect with science and social studies)

AIR Module: (Connecting the classroom, home, community, authorities and school for the benefit of the present generation and the responsibility to care for the well-being for future needs) Fourth Grade

1-Establish and practice a drill in order to evacuate in case of fire, earthquake or volcano eruption. (connect with social studies and science)

2-Help to protect trees, plants, and flowers. (connect with science)

3-Lobby with authorities to have mining, cement, and paper industries adopt effective technologies to clean the air for the sake of the population respiratory system. (connect with science and social studies)

4-Lobby with authorities and newspapers for the cleanness of air by asking to have car engines in good condition. Point out the importance of constant

mandatory inspections and lobby for them to prevent accidents as well as respiratory infections. (connect with social studies and science)

5-Lobby for the installation or reinstallation of trains or trolleys for mass transportation. (connect with social studies, and science)