

The Contribution of Education for Enhancing Natural Resources Better Utilization in Terms of Sustainability. Author: Nelly Osorio. Universidad Nacional Experimental Rafael Maria Baralt, Venezuela

State of the Problem

The need for transformation being experienced by society today is a global phenomenon. Worldwide, there are evidences of a need for defining a "New Type of Person" a "New Type of Individual" in order to be able to foster effective and productive social awareness and social participation to give birth to a new type of Society (Zamanillo, 2001). In that situation, the awareness for a better utilization of the environment has taken an important place in the whole discussion of a sustainable use, especially in developing nations when facing globalization of the economies growing faster. That discussion is a very complex matter to be approached from a holistic point of view that permits the integration of economical, scientific, human-social, strategic vision of the problem.

Education plays an important role and can place a valuable contribution in the "re engineering" of the new mind of that men/women . Nevertheless, when analyzing the social aspects, education emerges as a very sensitive area of the whole picture. Still Latin American nations are facing serious problems in the quality of education, poverty and inequality shape a totally unequal pattern of opportunities in education (Kliksberg, 2002). Primary or Basic education plays an strategic role in any initiative of giving environmental education starting with the children, only 40% of the population reach 5th grade and 10% 9th grade (IDB, 1998). This is the education that at least in theory has to be provided by the state to all citizens.

Nevertheless, it is important to stress that the mission of education to contribute to prepare people to make environmentally sound decisions and to participate responsibly in environmental sustainability. Accordingly, environmental education has to be seen as an axis across the curriculum in all the educational levels, fields and professions. Then, we should ask the question: Is education achieving that mission? Are educators prepared to teach sustainable environmental education? The answer does not seem to be positive or satisfactory to society .Let find answers to the questions: Are elementary education teachers well prepared to teach environmental education and sustainability? What is the preparation they are having in the Venezuelan Colleges of Education?

In the case of Venezuela, it is mandatory to provide environmental education in the Higher Education curriculum no matter the field (Engineering, Medicine, Law, Education, Sociology or any other field or profession). For the purpose of this paper, there will be analysed the case of the Colleges of Education pointing out the Basic Education Teachers Curriculum. There is reported the curriculum content analysis made to that important program. The results will indicate the state of the art on environmental education in the elementary education level. Afterward, suggestions and recommendations will be made to improve the learning process.

Some Theoretical Background

Environmental Pedagogy: does it exist?

There has been placed the idea of Environmental Pedagogy. Limon Dominguez (2002) asserted that: "In the colleges of education, it is possible to prepare one pedagogue able in design, techniques and tools for an environmental education that fosters a cultural change regarding people and their environment" (p1). Environmental pedagogy can be explained as: (Hernandez, 1989, p40)

- Understanding knowledge acquisition as a process of participative reflexion and construction of new concepts and attitudes.
- The classroom is a place of "democratic experiences", analysis and reflexion permit that students be able to create their own learning.
- It is based on respect to personal conceptions and experiences of the learners. It is related to their cultural and social diversity.
- Includes value and ethics education.
- Environmental education can be an opportunity collective knowledge building.
- It is critical and oriented to build new paradigms.
- Environmental problems are complex and systemic.

Constructivism

Constructivism seems to be the most appropriate learning theory for environmental education. Ballantyne & Packer (1996) explored the application of that theory: "In terms of this approach, individuals construct their environmental conceptions according to the way in which they focus on, structure and integrate particular aspects of knowledge, attitudes and behavioural orientations relating to an environmental phenomenon. In designing constructivist learning experiences in environmental education, it is therefore necessary to gain some indication of the basic environmental conceptions and experiences the learners have which underpin the construction of new knowledge.

Learning involves conceptual change and growing, that is replacing of existing understanding with a more appropriate alternative. "The methods by which such change is brought about seek to encourage students to evaluate their current conceptions in a context that makes their construction of an alternative likely and its adoption attractive" (Posner et al, 1982). Teaching strategies found to be effective in enhancing conceptions and induce a state of cognitive conflict within the learner. Learning experiences are designed to encourage students to explore, clarify, elaborate and develop the internal consistency of their exiting environmental conceptions in the light of conflicting alternatives. Matthias Wesseller (1987) affirmed that: it is not possible to enhance human development if we do not consider people's own culture and traditions, roots, their hopes and aspirations. He also thought that we have to let students to develop their own potential and conscious understanding, sharing of emotions, own needs and to build their own learning (p 89).

The Venezuelan University National Council (CNU) Guidelines:

The CNU Guidelines for the National Undergraduate Curriculum Development in Colleges of Education (2000) stated four components: General Education, Pedagogy, Specialized Education and Practicum.

The General Education component includes one course for one semester on Environmental Education, which is oriented to: provide learning opportunities to facilitate the living with other human beings in a positive relationship and comprehension of his/her physical world, the nature that surrounds and the planet, being aware of Venezuelan reality, its relations with other nations and provide solutions and ideas for improvement by participating actively.

This is the only environmental education course that is included in the curriculum of the Elementary Education teachers in Venezuelan Universities. That educator is the responsible for the integral education (teaching of all areas) of all the children between 6 and 12 years old. What a big responsibility...!

Objectives Pursued with this paper:

1. Analyse the environmental education approach and content included in the Venezuelan Colleges and Universities' Teachers Education Programmes, focusing the case of the Integral Education curriculum oriented to prepare Elementary Education Teachers.
2. To share a proposal for a sustainable environmental education in Higher Education Teachers Programme.
3. Open up a Latin American-German discussion around the issue of environmental education in the Teacher Education Programmes in Universities and Colleges by answering together some provoking questions I am presenting at the end of this paper. In that way when we return to our countries we will bring some contributions to implement or at least some ideas to think of.

Methodology:

1. Analysis of 15 Venezuelan Colleges and Universities curriculum to identify the environmental education courses included.
2. Content analysis of the environmental education learning unit existing in the Teachers Education Programmes of 15 Venezuelan Universities, the case of the Integral Education Teachers Programme. The analysis was made following the criterion: number of learning units, objectives, suggested learning and teaching strategies.
 - Venezuelan Universities National Council Guidelines for the Undergraduate Curriculum.
 - Analysis of the Constructivist approach for environmental education learning and teaching: learning by transferring to the learner own reality
 - Analysis of the Environmental Pedagogy approach.

Results

There was found that:

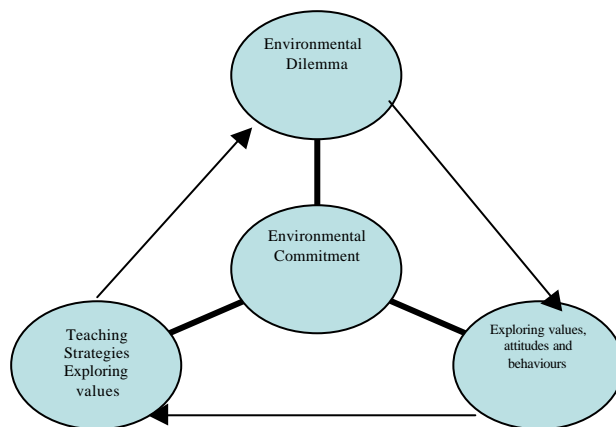
- Only one course on environmental education exists in the curriculum of the 15 Venezuelan Universities Teachers Education Programmes (Educación Ambiental). It belongs to the

General Education Programme and is mandatory nationwide according the Venezuelan Universities National Council Guidelines. That course is standard in all the Universities curriculum nationwide.

- The course objective is related to make the future teacher knowledgeable of his\her environment. Environment (Ambient), is approached as an integral construct which includes the interaction of Human Beings and all natural elements, biological, chemicals, physical and socio –cultural to impact the life of all alive beings in an interdependent and multidirectional influence. Includes 3 learning units: my environment, my country and my planet.
- The content does not include the “sustainability issue” explicitly.
- The learning and teaching strategies suggested are not according to the objective of the course. It does not seem to be enough for preparing future Teachers to be “knowledgeable” in environmental issues. Teaching Constructivist strategies are not clearly suggested.
- Only one course does not seem to be enough to prepare deeply and well enough future Teachers.

Some Questions to Provoke a Thinking that will Promote a Contribution to Environmental Sustainability Understanding and Learning Improving

1. Is there is a need to redesign the course Ambient Education that is the only one included in the teachers education programme?.
2. Does it seem to be well oriented to assure empowerment and capacity building on sustainability among Venezuelans through ambient education?.
3. Is important to take into consideration the Johannesburg World Summit on Sustainable Development (2002) regarding: 1) capacity building and information exchange at the regional level. 2) The empowerment of women, indigenous people and other vulnerable groups. 3) Building knowledge networks for scientific research and innovation?
4. Can a proposal for a better environment sustainability education in teaching undergraduate programmes be integrated by the elements? What do you think?
 - Make “ambient education” an axis across the curriculum.
 - Empower future teachers female, who are the 85% of students in that area.
 - Build information sharing net as knowledge communities in colleges of education and elementary schools.
 - Promote awareness by making possible to apply Constructivist theory in the classroom by training future teachers on learning and teaching strategies.
 - Implement learning strategies that promote cognitive conflict and structures controversy learning units as follows:



Can Knowledge Sharing and Knowledge Management be Implemented as Learning Strategy in Teachers Education to Achieve Sustainability? What benefits could be enhanced?

A knowledge community is a virtual space for knowledge building. That is the "spirit and heart of knowledge sharing". This oriented to share the "know how". That means to tell each other. The elements of a knowledge community are:

- Lesson learned
- Best practices
- New knowledge and innovation
- Directed to empowered the social assets: citizens
- Knowledge is different from information. Knowledge is oriented to action.

What conclusions and recommendations would we make in this symposium?

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