Moldavian Journal for Education and Social Psychology

2017, Volume 1, Issue 1, December, pp. 14-22

Interdisciplinary and Transdisciplinary Approaches to Environmental Education in the Curriculum

Adriana MUNTEAN, Stela GÎNJU

Doi: <https://doi.org/10.18662/mjesp/2017.0101.02>

Interdisciplinary and Transdisciplinary Approaches to Environmental Education in the Curriculum

Adriana MUNTEAN¹, Stela GÎNJU²

Abstract: This study aims to discover opportunities of inter and trans-disciplinary ecological education in the context of the curriculum. The starting premises:

1. Is the eco-educational dimension taken into consideration when framing the curriculum?

2. Do the manual authors aim towards the introduction of ecological education elements amid the proposed topics?

This way, the school curriculum and the alternative manuals for primary and pre-primary education are going to be analyzed. We will be describing models of ecological education promoted by the curriculum authors, then we will formulate suggestions of educational policies regarding eco-education. The analysis we are about to develop is based on both the quantifying aspects and the those regarding quality, following the extent of: comprehension of forms of ecological education within the curriculum field, models and the values of the promoted type of ecological education. We will be observing the ways of approach in developing study programs for the ecological education: social, procedural and personalized orienting on one hand, whereas on the other one, we will be seeing the methodological manners: conservative, praxiological and exploring-investigational, underlining the methodological models of ecological education within primary education. We will analyze principles that are global, of holistic nature and that occur systematically on which the achievement of the ecological education we are seeking is based, all within a formal setting, emphasizing afterwards the extra curriculum informal setting, tracking the typical ecological education directions: prospects, society, continuity, commencement, all these being materialized through general education directions.

Keywords: *ecological education, Interdisciplinary, Transdisciplinary, Curriculum.*

1. Introduction

The world was taken by surprise reaching the number of 7 billion people. This new reality of humanity is putting pressure on Terra's unsustainable resources and imprints a consumer trend that outstrips its limits:

¹ Universitatea Pedagogică de Stat "Ion Creangă" Chișinău, adriana15muntean@yahoo.com.

² Universitatea Pedagogică de Stat "Ion Creangă" Chișinău.

- How far will this model of production & consumption take us?
• How far can the world's population expand?
• How many planets do we require to ensure our current consumer necessity?

Alarmed by the drifting of the planet's ecosystems, environmental specialists have been seeking models to calculate the effect man exerts on Earth.

In 1992, American scientist William Rees redefines the "ecological footprint" as being the calculus formula of the entire stretch of Earth divided by its population, formula that ensues the land an individual or an organization is in need of, in order to be ensured the bare necessities of resources, so that refuse gathered along their existence will bio-degrade completely.

This instrument has been assumed on by the business field, the educational field and the non-governmental one, the index created measuring essentially the pressure we exert on ecosystems, the level of productivity and regeneration of natural resources so as to satisfy human nature's needs and the degree of absorption of the waste produced.

The ecological footprint is measured in global hectares (hag) and in order to calculate it, the entire surface of Earth has to be taken into account, including frozen and water zones.

Starting from this instrument, in the year 2007, it was estimated that if the consumption rate was to remain the same, we would need a planet and a half to sustain the accelerated pace of development and current expenditure. The regeneration capacity of the planet is totally exceeded by the present lifestyle of humans, an absolutely unsustainable model of the thrive of the global society.

An ecological footprint that is equilibrate and adapted to Earth's resources has the value of 1,8 hag per capita. This calculus represents an average between poorer parts of the world and those that are more fortunate. This way, countries from the third world that records values below 1.8 hag / person offers developed countries the possibility to exceed their production and consumption limits. In Europe, the value reaches 4.9 hag / person while in the United States the value doubles.

2. Theoretical Background

We live in a world of change, a world of essential alterations of our surrounding environment. The latter's issues have reached a level where man

feels helpless facing nature. Floods, earthquakes, pollution that hastily spreads threatens our existence and makes us reconsider our steps.

Is it really necessary to consume so much for our own well-being? Does each wafer has to be packed separately? Every sweet in its wrapping? All the shirts with their 2 or 3 labels? Every pair of shoes with their own box? One person, one car? Isn't there any other way around? How as it actually been, so far?

Through the changes humankind made to the biosphere in order to satisfy vital needs, that do earn an ever increasing complexity, we drastically shaped the surroundings nature left us with, according to our necessities, altering, without consent realizing, nature's health. ***This way, the planet got sick and now it has to be treated.***

The problem is if upcoming generations will know how to avert what we didn't have the ability to halt. On this line, we, the adults, and especially professors, have to intervene, accomplishing the so-called "ecological education".

The ecological education has the purpose of maintaining positive attitude towards nature and addresses both the mind and notably the soul of the one being educated. Warning the young generations about the problems of the medium is the most vigorous task the professor has to fulfill, because not only the child has to be educated, but also their family via them. to no end does the child indeed learn at school about the manner of cleaning after themselves after a picnic if the parents pop up a question such as: "there are caretakers who deal with that" or "what are you doing? are you mad?" or "they only teach you nonsense in school. the teacher should clean after herself if she thinks that's the way you save nature !"

We do come forth with the proposal of introducing practical ecological education activities that are to be promoted within the pale of practical abilities class, thus abandoning a part of the folding, cutting or pasting activities (manual work) and putting the child in the situation of planting a tree, watering it, digging its hole etc ... harvesting some onions, looking after a birdie etc

I consider that practical activities during the hours spent in school represent one of the best methods of learning on the go. To have access to these kind of activities, it is necessary for modifications to be settled within the syllabus. The child must be put in the situation of using their own hands. On this line, the Natural Sciences syllabus must be reconsidered regarding

primary school and not only. A 50% percentage of the classes held within the Natural Sciences filiation should be held in nature.

3. Argument of the paper

The goal of ecological education is to: educate students about an integrated environmental vision in relation to the new trends of civilization development, human-environment-human interaction and its consequences, being aware of the environmental problems and their ways of resolving, manifesting a responsible behavior in maintaining our ancestral soil's quality.

The purpose of the discipline is to provide specific skills for each education cycle: Primary, Gymnasium and High School.

The conceptualization of ecological education is based on the methodological principles of the evolution of the "Nature-Society" system, ie it is based on a Coordination of development, on the reciprocity and interdependence of this system. Essentially, ecological education is a process oriented towards training students about ecological consciousness, attitudes, responsible behaviors and values in the "Human-Medium" and "Medium-Human" relationships, which will orient them towards an activity that is conscious of existence on Terra of the actual and the future generations. At a high degree, ecological awareness of a high degree of education refers to knowledge by students of laws, the uniqueness of the natural environment and the laws that will allow human activity the sustainable development of life on earth.

4. Arguments to support the thesis

Ecological education was and is currently being regarded as a serious problem of the contemporary world, a world that has been under treatment ever since the Antiquity by Heraclit (530-479 BC), Democrit (460-370 BC) sau Aristotel (348-322 BC).

The first tries to study nature are found within the Medicin faculties of Bologne, Paris and Praga Universities (XII-XIV c). Jan Amos Comenschi (1641) considered man as part of nature and the way nature waits for a suitable time to achieve her belonging art, the same as the way we have to educate man, precisely during the "springtime of life".

Jean Jacques Rousseau (1762) in his work "Emil" or "About education", substantiates the idea that the spring of education is in nature, in people, in things.

D. Cantemir has transposed Rousseau's ideas, proclaiming as goal of education the shaping of wise man, that are to aspire to soul tranquility, on the way of knowing nature.

I.H. Pestalzzi (1797), I.E. Herbart, Fr. Froebel, K.D. Uşinski, L.N. Tolstoi chose for an education in conformity with nature, by means of observing it.

Gh. Asachi was also an education promoter, establishing the first museum of natural sciences in our country.

In the second half of XIX century, Russian professors, the classics: V.G. Belinski, A.G. Hertzen, N.A. Dobroliubov, D.I. Pisarev, N.G. Cernîşevskii were emphasizing the role of nature-oriented knowledge, with the aim of building moral qualities of persona and of man's behavior within nature. Uşinski gave forth the principle of education through nature's resources.

Montessori M. (1870-1952) elaborated a children education system, focused on sensuous education based on the natural habitat.

In 1901, didactic pieces of work belonging to the Russian professor Polovţev emerge; the latter can be considered the first educator that introduced the biological method in studying nature sciences.

Therefore, humankind became aware of the environment's problems a long time ago, the concept of contemporary issues profiling along. Thus, new forms of education appear, among which crystallized ecological education within the pale of forums, starting with the IUCN Conference (Paris, 1948) when the term "ecological education" was introduced.

In the sequel, inside of the IUCN Nevada reunion, a definition for the pre-established term was compiled:

"The process through which values are recognized and concepts clarified, so as to develop abilities and attitudes necessary for the apprehension and the esteem of relations between man, the culture he belongs to and the biophysical medium. EE also includes taking a decision practice and forming of a self-based set of scruples **with regard to the present state** of nature."

In 1980, IUCN.UNEP/WWF adopted the world strategy to preserve the environment.

By analyzing the syllabus, we can observe that regarding preparatory class, first and second grade, the rudiments about nature are incorporated together with the ones that refer to mathematics, and are structured on three categories: life sciences, natural sciences and Earth sciences. The main

objectives that determined the integrated approach of mathematics and some natural sciences elements, in the context of the same syllabus would be:

- a holistic learning, interesting for students, closer to their universe of knowledge
- contextualizing learning by referring to the surrounding reality increasing the degree of understanding of concepts
- harmonization of the two domains, increasing interactions' flexibility

As specific competences, we do enumerate:

Preparatory Class:

- exploring the surrounding environment in order to identify and count beings and things
- grouping chips that represent animals, transport means etc judging by the number of specific elements:

Acknowledgement of the Sun, the Moon and the Earth using illustrations as auxiliary materials or games such as: "What season is it?" – for the recognition of natural phenomena in real situations or images (rain, snow, wind etc.) –segregation of seasons, two by two, according to specific observed characteristics - filling in a weather forecast prognosis for the next week/month, by pasting / drawing some symbols – clouds, sun, wind etc.; - observing some modifications that spawn daily in the life of: man, animals, plants, according to the season; - observing component parts; - numbering flowers / leafs of a plant that appear during a week's course, with the aim of highlighting their growth;

- keeping track of a growing plant, held under observation one of the factors that sustain life; -identifying senses and utilizing the latter to explore the medium; - direct observation of some plants, bugs etc. within the environment; - correctly identifying and naming parts of the human body, in order to underline the significance these hold;

What cannot be found in the examples given beforehand is the practical activities, where the pupil has to take part for them to enhance abilities that they must hold across school years.

There is, nevertheless, a huge gap between theory and practice. Unfortunately, if you attract a citizen's attention during these days over the fact that it is not ethical to wash one's car in the river's stream, polluting it, thus destroying it during you risk getting offended, beaten or getting to be seen as someone who should not be part of society.

5. Arguments to argue the thesis

Is enough teaching done? Are people intervening when needed?

Unfortunately, way too little for Earth to be saved from death. More is written than done. Why are there still woodworking factories that illegally deforest the woods? Why owner associations do not replace green space that has dried, snatched, damaged or been stepped onto? Why the environmental protection does not take action? Where do the latter ones' salaries come from? Should they be paid accordingly to their achievements regarding pollution prevention / medium destruction? Why do vehicles that pollute still exist if it is very well-known how baneful they are? Why practice of plant pesticides is allowed if these substances are human-threatening?

It seems not all of us have figured that without the good condition of the surroundings we live in, we are also sick. But what measures have been taken? A problem that has been just found, but not treated becomes a chronic disease. Is Earth actually chronically ill? As it turns out, yes. But who cares? Who takes the attitude?

6. Dismantling the arguments against

Ecological education is based on the following principles:

- the consistency and continuity of the didactic approach, consisting in the overall design of the educational stages and of the specific competency classes

Sub-competencies and content in an inter / trans-disciplinary vision:

- accessibility in relation to age periods achieved through the formulation of specific aptitudes, content units and didactic activities;

- systemic switching between fundamental knowledge and functional knowledge, problem-solving and application of specific competences to investigate and solve environmental problems;

- integrating / inter-disciplinarity involving all components of the curriculum (competences, subcompetence, content, learning activities, recommended) and utilizing the uniqueness of common scientific knowledge in the formation of the pupil personality at all levels of common education for the disciplines science, physics, biology, geography, chemistry and so on

The content of the curriculum's scientific information is centered on three areas:

I. Living environments.

II. "Human-Medium-Human Interactions".

III. Environment protection.

Such a selection of scientific content provides the teacher with a flexible basis for their application within the hours.

The scientific information is distributed on educational levels according to the principle "from local to universal", taking into account the four fundamental principles on which the concept of this school discipline is based.

Ecological education promotes the following values and attitudes:

- the formation of a demanding style in the student's relations with the living environments;
- the acquisition by students of responsible behavior regarding the state of the environment in which they live;
- Manipulating the spirit of initiative on the protection of the living environment.
- Formation of a motivated responsibility for environmental protection;
- manifesting / demonstrating a conscious behavior regarding the ecological imbalance that is created.

At the European level, curriculum reforms have highlighted the following trends: interdisciplinary approach, pupil-centered teaching and learning, relevance of student curriculum and society, development of a desirable attitude and value, critical thinking development, authentic learning and assessment.

7. Conclusions

The key message on environmental education is the need to CHANGE the school curriculum on environmental issues. Nature's transformation today has gotten to such an extent that, due to its integration into social life, it is increasingly losing its form and power to regenerate itself. Teachers, students, parents, together with efforts, ideas and optimism, we will succeed in stopping the transformation of nature and helping it to regenerate so that future generations can also enjoy an oasis of greenery, a breath of fresh air and an glass of crystalline water.

References

- Geamănă, N. (2008). *Educația ecologică la vârsta preșcolară*. București: C.N.I."Coresi" S.A.
- Geamănă, N. (2005). *Ecogrădinița-suport de curs*, prezentat la modulul de formare a cadrelor didactice la nivel preprimar și primar. Satu-Mare.

- Gordea L., Ursu L. (2013). Formarea competenței profesionale de educație ecologică la viitoarele cadre didactice din învățământ primar, Chișinău.
- Gînju S. (2012). Valorile educației ecologice și pentru protecția mediului. În: *Univers Pedagogic*, ISSN 1811-5470.
- Gînju, S. (2014). Educația ecologică. Suport de curs pentru studenți, specialitatea pedagogie preșcolară. Chișinău: UPS "I. Creangă".
- Gînju, S. (2013). Educația ecologică a viitoarelor cadre didactice din învățământul preșcolar prin prisma valorilor naționale. În: *Educația din perspectiva valorilor. Idei, Concepte, Modele*, Materialele Conferinței științifice internaționale, Cluj-Napoca: Ed. Eicon, V. III, 103-106, ISBN 978-973-757-918-8.
- Gînju, S. (2011). *Corelația dintre cunoștințele și comportamentul ecologic al elevilor. Modalități de echilibrare*. În: Culegere de materiale a Conferinței de totalizare a muncii științifice și științifico-didactice a corpului profesoral-didactic pentru anul 2010 of UPS "I. Creangă"; Probleme ale științelor socioumane și modernizării învățământului, Volumul I, 119-123, ISBN 978-9975-46-094.
- Gînju, S. (2011). Conexiuni între educația ecologică și educația pentru sănătate. Sugestii metodologice de realizare. În: *Culegere de materiale informative și ilustrative pentru educația ecologică "Sănătoși într-un mediu sănătos" AO "Mediul și Sănătatea"*. Chișinău: Continental Grup SRL, 25-33, ISBN 978-9975-4248-3-7.
- Pascari, V. (2006). *Continuitatea în formarea competențelor de învățare la copiii de 6-8 ani*. Autoreferat al tezei de doctor în pedagogie. Chișinău, 24.
- Mîslișchii, V. (2012). *Continuitatea în formarea competențelor lingvistice la copiii de vîrstă preșcolară mare și școlară mică*. Autoreferat la teza de doctor. Chișinău.
- Teleman, A. (2012). *Formarea competenței de explorare/investigare a proceselor ecologice la elevii claselor primar. Monografie*. Chișinău: Tipografia centrală.
- Teleman, A. (2014). Educație ecologică. Suport de curs pentru studenții specialității pedagogia învățământului primar. Chișinău: UPS "I. Creangă".
- Ursu, L. (2008). Educația pentru mediu – obiectiv al Strategiei de Dezvoltare durabilă al Uniunii Europene. În Materialele conferinței științifice internațional. Pregătirea și perfecționarea cadrelor didactice în domeniul învățământului primar și preșcolar. Chișinău, UPS „Ion Creangă”, 12-20.
- Ursu, L., Saranciuc-Gordea, L., Gînju, S., Rusuleac, T., & Teleman, A., (2010). *Sinteze Eco Educaționale. Retrospectivă, actualitate și perspectivă a Educației Ecologice. Aplicații metodologice inter/transdisciplinare*. Chișinău: Garomond-Studio SRL, 210, ISBN 978-9975-4104-1-0.