ACTA DIDACTICA NAPOCENSIA
Volume 1, Number 1, 2008

SOLUTIONS TO ENVIRONMENTAL-EDUCATIONAL PROBLEMS THROUGH THE INTEGRATION OF COMPETENCES

Lenke Soós, Margit Kovács

Abstract: The importance and significance of the environmental education, as one of today's accentuated assignments is unquestionable. The reasons for these are approached from different perspectives, both by specialists and by educators/pedagogues, but also by the entire society. In this article – selecting from various possibilities- we shall demonstrate what this all means in practice, by presenting the so-called valley-settlements' formation and structure, their long-ago functioning ethnic peculiarities, and today's environmental problems.

Zusammenfassung: Die Wichtigkeit und der Bedeutung der Umwelt-Bildung, als eine der heutigen hervorzuhebenden Aufgaben ist unbestritten. Die Gründe für diese werden von verschiedenen Perspektiven her gesehen, sowohl von Fachleuten als auch von Erziehern/Pädagogen und nicht nur diesen, sondern von der gesamten Gesellschaft. In diesem Artikel werden wir – mit Auswahl aus verschiedenen Möglichkeiten - zeigen, was das alles für die Praxis bedeutet, durch Vorstellung der so genannten Tal-Siedlungen, deren "Bildung und Struktur, ihre ethnischen Besonderheiten, die seit langem funktionieren und die heutigen Umweltprobleme.

Keywords: environmental education.

1. Introduction

The importance and significance of the environmental education, as one of today's accentuated assignments is unquestionable. The reasons for these are approached from different perspectives, both by specialists and by educators/pedagogues, but also by the entire society.

Historical-ecology, for example, analyzes the long-term process of symbiosis and interaction between nature and society. It systemizes and interprets the results of different sciences, with the goal of reconstructing the interactions of the long-lasting relationship between man and nature.

Exciting, sometimes even mysterious questions arise when we examine also the nature-handling routine of different societal regimes in different eras, the way they piled up their experience, and how they ensured the regenerating ability of their environment.

For today's man, vital information could consist of how did they transmit these experiences from generation to generation, coded into culture (or by other means)? How did the makings of nature influence history, and how did man shape his environment throughout the centuries?

The aim of environmental education could be exactly to:

1. **motivate** one to familiarize with these experiences,
2. **develop**, among others, **the approach towards historical-ecology and the system**, namely to convey coherent and up-to-date knowledge-system to the scholars,
3. **assert that nature is valuable**,
4. **form emotive bonds** whilst getting acquainted with and fond of nature, because if we are emotionally drawn to something, then we are able to secure and protect it,
5. **make environmental-conscious thinking part of our value judgment.**

Within the process of environmental education, the pedagogue must fulfill an emphasized role, starting from kindergarten, through different stages of elementary- and high school, until university. But it's not the same, however, how he does all of this!

First of all, he has to possess:

1. valid competences in his profession
2. perspicuous interdisciplinary knowledge

3. widespread methodological culture, so that he is able to pass on his experience to his disciples in such a way, that they in turn can creatively apply these in everyday life.

In this article – selecting from various possibilities- we shall demonstrate what this all means in practice, by presenting the so-called valley-settlements' formation and structure, their long-ago functioning ethnic peculiarities, and today's environmental problems.

2. Valley-settlements' formation

In the Carpathian-basin, villages built alongside streams that flow in the bottom of the hills are very common. This is the case in Transylvania, Hungary, the "Dunántúlon", or in other areas far from these.

A very large part of the frequent precipitation that falls in the highlands seeps into the soil, where it passes the pervious layers, and then it builds up in the non-pervious layers and cracks open onto the surface as a spring. The source that comes into being this way is always of first water quality.

The explanation to this is that:

1. the precipitation that comes in touch with the soil looses its atmospheric clarity, because there is active life in the ground, whose soluble materials pollute the leaking water (from corpses of snails to the excrements of worms and decaying leaves we can find everything in the streaming rainwater in the soil)
2. even so, the water arrives with first water quality to the spring, because of the micro-organic activity that goes on in the ground, when the organic substances become soluble, inorganic vegetable nutrients. The forest, we can say, "eats out" the solute organic substances from the water.
3. If the ecological functioning of the highlands' vegetable kingdom changes (for example we chemically restrain the bacterial function or we inhibit the processing of the strain of nutrients by eradicating the woods) this will lead to water pollution. So can the inefficient artificial forest, or agricultural plantation that isn't in harmony with the natural soil-functioning of the landscape, destroy the healthy functioning of the water-supply spot.

How can we assert the cleanliness of the spring water?

- **By chemical inquiry:**
  We take with ourselves to the scene a "mini-laboratory", which can be easily accessed by children, using even the school's chemical equipment – we establish the water's qualitative and quantitative composition. The solute has to have the same quality as that which is established by the provisions of the environmental protection.
- **By the "association-doctrine" inquiry:**
  We make a list of the animal and vegetation species that live in the basin of the spring. (For example: Chrysosplenium, Veronica, Gammarus etc.) The species that live in this area are typically of the spring water kind.
- **By ecological inquiry:**
  We consult the specialist literature regarding the indicator value of the species that appear in the "association-doctrine" record, and to find out how they indicate the needs for their own water quality to be fulfilled.
- **By microbiological inquiry:**
  For this we need more complicated equipment, and a more complete microbiological knowledge, but, however, we can execute it in a vocational or specialized environment. (The soil of the spring water and spring basin is almost completely bacteria-free, since it has no degradable organic substances.)

From the spring departs the wimpling stream. Close to the stream's shore, the so-called valley-side village's houses are built. The luckiest among the inhabitants are those who could settle down close to

the spring. They build their house in the back of the garden, dig a well next to their home, from which they can use the clean water coming from the stream. (see: physics – communicating vessels)

The water from the well is polluted not only by them, but by their animals, with sewage and addles. This enters the stream. Thus, the people who live down the stream can draw from their wells water that is somewhat polluted, because of those living closer to the spring.

The villagers are well acquainted with this phenomenon, and thus the hierarchy of the village is created. Where the water is cleaner, the richer, more elegant and distinguished people live. This part of the village is called the **upper-quarter** or **upper-part**. Those who are constrained to live in a place where only second hand water flows, live in the **lower-quarter** or **lower-part** of the village. This is how the non-conscious – but coming from strong practical knowledge -- settlement-structure is related to the ethnical science.

If, when moving along the stream, towards the center of the village, we make more observations, then all of this can be proven, namely:

- The chemical examination already shows some nitrate-, nitrite- and phosphate-loads. The quantity of the solute organic substances rises also, and we can identify some pollution caused by proteins and urea.
- The specie-list of the vegetation in the stream-basin also changes. Gradually, the species that indicated clean water disappear. (See: Enclosure: The original species living alongside the spring.)

Here are some common and representative original species:

Mentha aquatica

Myricaria occurs in Transylvania

Parnassia palustris

Gammarus sp.

Spring with original vegetation

Catabrosa aquatica

- The bacteria -that degrades the organic substances- and the blue algae -that requires a higher level of nitrate-phosphate- appears. The original species place is gradually taken over by the so-called **ruderal eco-species**.

Some of the ruderal species that indicate the measure of pollution:

Caltha palustris

Carex elata

Iris psoudacorus

Equistetum palustre

If we head further on towards the watercourse, the original species disappear gradually, and the ruderal species become more and more frequent. This is the already mentioned lower-part or lower-quarter of the village. Where we find only ruderal plants – there the chemical and ecological inquiry will also show that the water is inadequate to be consumed. Typically, it is also the end of the village: a little further from the last house we find only improper living grounds.

Naturally, the stream flows past the last lower-part house. Mostly this is where the communal reed, swamp, willow-bed is to be found. The stream spreads on a wider ground; its water becomes a stinking, belching swamp. If we perform the already known experiments, we come upon a quintessential, undiluted nutrient-overload. The broken down substances, however, become assimilated by the flora, and so the water slowly regains its original cleanliness and clarity, resembling that of the spring water. The original species reappear on scene and the next village's upper-quarter begins.

We can draw numerous conclusions from this phenomenon. We can unravel such historical, ethnical, geographical (settlement-, economy-geography) correspondences, that, paradoxically, become clearer due to the fact that other scientists in different domains have never thought about it.

The nomad people lived in homogeneous – and mostly temporary—settlements (aggregation settlements). The valley-settlements presented here were highly inappropriate for the nomad folk. On the other hand, they fit perfectly as the cultivator's, isolated stock-breeder's permanent home.

In the Karpat-basin, the Huns and Avars lead the same kind of lifestyle.

- How did they know that this was the optimal settlement-structure for them?
- Did they dispose of experience? If yes, how many experience?
- To what extent was the settling down and the established relationship with the environment a conscious action?
- If our ancestors knew this information thousands of years ago – how much were they able to acquire?

3. The environmental education

Since the understanding of this sole example requires proficiency in different sciences. In turn, the life of a society doesn't rely only on the suitability of the environmental settlement-structure, but presupposes familiarity within history, geography, chemistry, biology, physics and other scientific domains.

These interdisciplinary knowledge-bases occupy a prominent place among the competencies that successfully bring into effect the aims of the pedagogue stipulated above, concerning environmental education.

The challenges of the 21st century require new perspectives in the area of environmental education, too. Based on the principle of sustainable evolution, the nature-respecting culture of the peasant becomes as important as the apprehensive, sentimental, moral and active unit of education. The key to the efficaciousness of environmental education rests in the exemplary behavior of the pedagogue, in his environmental culture, his professional and methodological preparedness, and exigency.

From the glimpsed beauty to the perceived usefulness…

In every child there lies the inclination to create, which arises from the propensity to be curious, to wonder, to marvel and to question.

As **Rudyard Kipling** wrote:

"I have six faithful servants
(I've learned everything from them)
They are called: "What", and "Why", and "When",
And "How", and "Where?" and "Who?".

I wonder, how can we raise the curiosity of the children towards our current matter – valley-settlement's environmental issues?

From what kind of methods, instruments and action-forms can we choose from to help us in the environmental education?

Table 1. The environmental education

Its primary scenes	Its methods, forms of activity
forest school field-work environmentalist camps specialized meetings quizzes, competitions study promenades and excursions	project self-supporting research- and collector-work team-work drama-pedagogy situation- and role-play experiments, inquiries on field and in the laboratory measurements, sample-drawings

In the following, we will present to you the adaptation of a project, -- which can be realized individually (for example project-days, project-week) or within a forest school program – through interdisciplinary relations and by integrating the competences, referring to the valley-settlements' environmental issues.

Methodological steps of the project

1. **Assignments (themes)** – search for problem-like issues that concern the interest of the participants: "From the upper-quarter to the lower-quarter…"
2. **Scheming**: problem-solving, configuration of the common activity-based process with the detailed planning of the entwining steps.
3. **Implementation, active interaction**
   - **Integration** of different **instruments, working techniques** and of **subject-oriented knowledge** that corresponds with the problem type
   - **Cultivation** of the correspondence-recognizing way of thought, so as **"every sensory organ"** is engaged into the activity
   - The solving of different problems that can arise during the process, on the level each requires (whole-section or part-section), in a reflective manner; flexible alteration of original plan, when needed
4. **Supervising**
   - Evaluation of the completed work and of the process of preparation on a group level
   - Making public the final results (through recitals, discussions, presentations and/or expositions)
5. **Improvement**
   - If needed, development of new projects and/or re-utilization of the results to improve different subjects and culture-contents.

Picture 1. The "From the upper-quarter to the lower-quarter" project's contingency to interdisciplinary linkage

Table 2. Forms of activity that can be applied during the materialization of the project

Based on pupil initiative	Compelling to co-operation	Creative revelations, researches
conversation start of a debate narration of an experience brainstorming for ideas individual data-collection creative workshops	situation- and role-play playing puppeteer dramatic situation-exercises collection-work quizzes, contests research-, collection-work	unraveling of specialized literature making of models and scale-models staging of expositions examinations on the field and in the laboratory map-drawing and –use taking photos of nature

Scholar competences that can be developed during the project:

- communication skills
- problem-solving capacity
- collaboration capability
- solving of problems individually
- organizing skills
- taking on responsibility
- creative- and critical-thinking capabilities
- systematization skills
- essence-observing capacity
- analyzing-, synthesizing-, abstractizing- and differentiating skills

4. Conclusions

During the 57th general assembly of the ENSZ on December 20th 2002, the 2005-2015 period was proclaimed as the decade of "Learning for sustainability". The environmental education, the aims and extensive conception-system of the pedagogues don't try to materialize imagined ideas, but simply to contribute to the survival of mankind through the instruments of pedagogy. Because until the survival of man isn't ensured, there is no point in speaking about any kind of ideology.

The conclusion from all of this is that when we speak about environmental competencies, then we don't just simply attach another element to the list of capabilities and capacities. Through the expression of "environmental competencies" we already emphasize the fact that we can achieve results within the pedagogy of sustainability and in the field of environmental education, if the citizens who emerge from the educational system become capable of using all of their acquired skills, capabilities in the best interest of the environmental issues.

Literature

[1] Dobóné Tarai Éva – Tarján András: Környezetvédelmi praktikum tanároknak, (Environmental practicum for teachers), Mezőgazdaségi Kiadó, Bp.1999.
[2] Gánti Tibor: Eltűnő szigetek (Disappearing islands), Natura, Bp. 1983.
[3] LehoczkzyJános: Iskola a természetben avagy a környezeti nevelés gyakorlata (Schools in the heart of nature, or the practice of environmental education), Raake Klett Kiadó, Bp. 1999.
[4] Lükő István: Környezetpedagógia (Bevezetés a környezeti nevelés pedagógiai és társadalmi kérdéseibe) [Environmental pedagogy (Introduction to the environmental education's pedagogy and social questions)] NTK, Bp. 2003.

[5] Schróth Ágnes: Környezeti nevelés a középikolákban (Environmental education in elementary schools) Trefort Kiadó, Bp. 2004.

Authors

Dr**. Soós Lenke**, Babeş-Bolyai University, Psychology and Educational Sciences Department, Cluj-Napoca, Romania
e-mail: soos_lenke@freemail.hu
Dr. **Kovács Margit**, Eötvös Lóránd University, Budapest, Hungary