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ECOLOGICAL EDUCATION IN THE ELEMENTARY SCHOOLS CURRICULA

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SYNOPSIS

The first things the pupils learn about ecology are mostly acquired in elementary school. Our research shows that this learning is mostly memorized in pupils' heads until the twelfth year of their life. We will try to determine the quality of this knowledge by analyzing the contents of the curricula for respective teaching subjects. However, before we venture onto the terrain of analytical observation and measuring of the contents and the program of work, we would like to divide the school program for elementary school pupils into the program for the lower classes (the first four) and the program for higher classes (the second four) of elementary school.

The first category would comprise only those classes of elementary school where there is but one dominant person in the role of the educator – teacher. This is the period of schooling from the first to the fourth grade of elementary school. The other category of pupils consists of those from the fifth to the eighth grade where teaching subjects are taught by a number of subject teachers.

Having in mind that there are pupils who attend elementary schools but learn by special curriculum, we will also analyze the curriculum for pupils with mild mental disturbances in development in the frames of the abovementioned two categories.

INTRODUCTION

The pupils in the first four grades of elementary school *express* their inner experience of the environment through arts, music, and mother tongue. The promotion of physical development is being done by means of organized physical and health teaching. If observed from an ecological view, expressing is one way of the existence of biodiversity and belonging to the living world. The negation of expression would mean the negation of the very right to existence. That is why pupils are asked to

express themselves in as many ways as possible – by means of voice, drawing, writing - this could be regarded as his/her admittance of being an ecological being.

ENVIRONMENTAL EDUCATION

Education of regular elementary school pupils

The pupils at this age acquire their initial systematized school knowledge about the environment through the *teaching subject Nature and society*. Unlike in preschool education where the surrounding nature behaves as in cartoons, fairylike, as early as in the lower grades of elementary school pupils are supposed to learn the fundamental laws of the objective nature's expression. The problem arises when passing over from romanticism to realism becomes a passage from a utopian and happy nature into a human egocentric nature. It is not difficult to explain that seeing a strawberry drawing a potato or a mouse and a cat sleeping peacefully together is fantasy. It is much more difficult to understand sustainable development if these living beings have the right to existence only if it is in the function of man. Thus the passing over is realized as a breaking up of all the living beings' right to live and the human needs.

Another problem that arises at this age is the distancing from life with nature and moving to life with theories. There is increasingly less space for a critical spirit, and more and more of the education moves towards dogmas, fundaments and positivistic explanations of natural and social environment. In the curriculum for the teaching subject *Nature and society* in the second and third grade, i.e. respective teaching subjects Nature and Society, *having information* and *application* are considered teaching tasks. It is noticeable that theoretical work is dominant even at this level of personality development and that a young human being is exposed to experiential science torture for which it could be said that it is on the verge of sustainable development. Enunciation in this teaching subject is boiled down to 20 units in three years or 13,7%. This means that the proportionately same amount of knowledge will be applied compared to the total amount of memorized subject material. So, the process of memorizing facts even at this level pushes back the process of education as a complex theory and practice of creating and developing habits and moments of will.

Table 1: ***Relationship of theory and practice in the subjects Nature and Society***

Teaching subject	Grade	Number of teaching units	Teaching task	
			Having information	***Application***
Nature and society	second	35	28 (80,0%)	7 (20,0%)
Nature and society	third	35	26 (74,3%)	9 (25,7%)
Nature	fourth	37	33 (89,2%)	4 (10,8%)
Society	fourth	39	39 (100%)	0 (0%)

From the viewpoint of ecology likewise the deviation of application compared to having information represents a kind of a getaway of human beings from the world of nature into the world of necessity. The tendency to theorizing or, even worse, to theses replacement and false theorizing is even more expressed later. The causality of reason and result that is conveyed in 86,3% of teaching units (but not applied) is conversely proportionate to the sum of reasons and results existing in nature. Therefore the pupil's image of nature is not only poor in links and consequences, but it is also an upside down reality – a world to which he/she does not belong. The following table that the continuity of thematic units is respected. In the third grade it is interrupted and in the fourth induction is replaced with the method of deduction during processing the teaching topics. The image of the educational process is associated with a worker who takes up a job in a manner of a researcher but cannot determine the basic point. Disorientation is present during the whole process of education. The connections between causes and effects are numerous but not easily available.

Table 2: ***Teaching themes in the curricula for Nature and Society in lower grades of elementary school***

Teaching subject	Grade	Sequence of teaching themes
Nature and society	second	1.School, 2.Residency, 3.Life and work in nature, 4.Orientation in space and time, 5.Appearance of place of living and surrounding, 6.People's life and work in their place of living, 7. Traffic in place of living and surrounding, 8.Natural environment and people's work in nature, 9. Plants and animals in my surrounding, 10. Life conditions on the Earth
Nature and society	third	1.Literacy in reading maps, 2.Homeland and Serbia, 3. Homeland and Serbia in the past, 4. Domestic animals, 5. Plants
Nature	fourth	1.Heavenly bodies, 2.Origin and structure of the Earth, 3. Air, 4. Magnetism, 5. Movement and resistance during movement of bodies, 6. Movement and lifting of bodies, 7. Life communities, 8.Man
Society	fourth	4. Distant past, 5. Past, 6. World War II, 7.Life and work in plains, 8.Life and work in mountainous regions, 9.Life and work on the coast

Education of pupils with mild mental disturbances in development in lower grades of elementary school

Pupils with mild mental disturbances in development in lower grades of elementary school acquire their knowledge of the living environment through the teaching subject Nature and society. The teachers of these pupils have a task to *teach them how to apply knowledge and skills.* Needless to say, this should be done in the range of these pupils' mental and physical abilities. That is why the curriculum is tailored in such a way to suit the mental and physical abilities of such children. Unlike the curriculum for the subject Nature and society for pupils with normal mental

capacity, the authors here tried to keep the continuity of the teaching themes and areas. Let us look at the following table.

Table3: ***Teaching themes for Nature and society for pupils with mild mental disturbances in development***

Years of learning			
First grade	***Second grade***	***Third grade***	***Fourth grade***
School space	Life and work in school	Life and work in school	Life and work in school
Pupil in school	-	-	-
Pupil in school	-	-	-
Orientation in school space - classroom	-	-	-
Orientation in time	Orientation in time; Orientation in space	Orientation in space	Orientation in space
Life and work in parental home	Life and work in parental home	Life and work in parental home	Life and work in parental home
Appearance of landscape – my home place	Appearance of landscape – my home place	Appearance and past of *my* neighborhood	Appearance and past of neighborhood
Getting to know the basic rules of walking in the street	-	Orientation in time; Traffic culture	Orientation in time; Traffic culture
Natural environment and people's work in different seasons	Natural environment and people's work in different seasons	Natural environment and people's work in different seasons	Natural environment and people's work in different seasons

BASIC ECOLOGICAL EDUCATION

Ecological education in regular schools

The abstracting of the eco-system and the fundamentalizing of positive knowledge is visibly expressed at this stage of education. By analyzing the contents it can be determined that ecological issues are present in biology, chemistry, physics, geography, technical, physical and health, art and musical culture, mother tongue, reading texts in foreign languages, and to some extent, in history. It is obvious that fundamentalizing of this knowledge in time increasingly removes ecological content or takes it for granted.

The truth is that there is no ecology without biology as a positive science. But, there is no ecology without social sciences either which study human activities. Biology and similar sciences research the subject of ecology – ecosystem, its structure, connections and relations, natural laws and the changes caused by them. The once established laws always cause the same consequences. That is why they are fundamental sciences. However, the ecological problem lies in the fact that it is not always possible to explain anew consequence by the same cause. The entrance of

man and social community caused some laws to be demonstrated with weaker or stronger intensity in the ecosystem, in a faster and slower manner. In public such phenomenon is called the *ecosystem disturbance.* The disturbed ecosystem reflects unexpected or consequences of disastrous proportions. That is why ecology as a social science depends on the way people act when anticipating the possible consequences.

We are especially interested in the biology curriculum for the seventh grade of elementary school. As can be seen below, 74 teaching lessons per year are dedicated to biological-ecological topics in the narrow sense of word. First we will quote the operational tasks assigned by this program. “Pupils should: 1) get familiar with the concept of ecology and its importance; 2) get to know ecological conditions and their importance for the living world; 3) learn and understand the systems of ecological organization in nature and the relationships within; 4) understand mutual relations of living things and the environment, and the dynamics of the matter-energy relation; 5) get to know basic food relations and the connections among living things in the food chain; 6) understand the continuity of sustaining ecosystems and the causes and effects within;7) learn to distinguish different plants and animals in respective ecosystems and understand their importance; 8) understand man’s status and role in the biosphere; 9) get to know the condition of the environment, figure out the dangers threatening man in local and global proportions; 10) get to know basic procedures and methods for sustaining, preserving, protecting and improving the environment; 11) get to know the basic characteristics of artificial ecological systems, and the manner of their origin an sustenance; 12) develop awareness of ecology and ecological culture.”

Out of totally 12 operational tasks six (or 50%) anticipate getting to know ecological subject matter, one (8,3%) learning and understanding ecological contents, one (8,3%) learning something that they did not know earlier, three (25%) understanding ecological issues, and one (8,3%) developing awareness of ecological culture. And, of course, all this from the viewpoint of biology. From the viewpoint of our research these data are interesting because of the following:

1. Teaching programs for biology for the seventh grade mostly (in 6 tasks) start from the fact that *pupils were not familiar with ecological subject matter earlier*. This leads to the conclusion that pupils meet with these issues for the first time in a more serious and scholarly systematic manner as late as the seventh grade. Or that biology teaching is half satisfied or distrustful about the information which pupils got in lower grades of elementary school about basic ecological contents (the concept of ecology, ecological conditions of the living world, condition and improvement of the environment, etc.).

2. Elementary school is trying to develop in pupils the understanding of ecological subject matter (in 25-33% of operational tasks). Understanding is a considerably higher level of the psychological process. In our opinion, to understand means to collect data, classify, process, and learn the conclusions. So, understanding is a complete entirety of the research and cognitive process in which the pupil or another person turns information into knowledge. In a broader sense, we could accept the conclusion that to understand is to know. What is indicative is the fact that

understanding is built as a universal non-temporal or temporal understanding of ecology, without taking into consideration man's objective needs. In this way, *ecology stops being a practical science and it a separate biological science as a positive scientific discipline.* In order to bridge the following gap, ecology should be connected to knowledge from history.

3. Only one operational task, which is 8,3% compared to the global task, anticipates *the development* of ecological culture. This is one more confirmation that in biology ecology is understood in a positivistic way, i.e. as something unchangeable, naturally given. When this is discovered, everything else is a matter of choice – the subject of ecological culture or lack of culture. The truth is that the teaching subject that starts its tasks with introduction (getting familiar with), then analysis (learn and understand), and conclusion (development) can hardly overcome the positivist limitations. However, in this concrete case, we are more interested in this proportion because of the choice of methods of education. *At such a proportion the mostly applicable is the descriptive method (and only partially the heuristic method) of acquiring knowledge*. *Teaching remains the major mission of education, and creating habits is only indicated.*

Table 4: ***Thematic units in biology teaching in elementary school***

5. grade (74 teaching lessons/year)	**1. grade** (74 teaching lessons/year)	**2. grade** (74 teaching lessons/year)	**8. grade** (70 teaching lessons/year)
Introduction- why we study biology…	Introduction: Natural system of animals and their evolution	Definition and basic concepts of ecology (8+6+0)	Man, nature and society
Living beings are made up of cells	Invertebrate	Grouping and classification of ecosystems (12 + 11 + 6)	Structure of human body
Plants – built and life processes	Chordates	Protection and improvement of the environment (9+9+3)	Family and society
Plant diversity	Introduction to organic evolution: Life on Earth – diversity, microorganisms, plants, animals, man, system categories	Nature protection (4+3+3) Exercises:1 -Getting familiar with methods of research of inland waters; -Determining of numerical representation and vegetation diversity of one grass or forest ecosystem; -Learning about plants as indicators of pollution of water, soil and air; -Visit to a national park	Origin and development of human species
Importance of plants for man			

What indicators can we discover if we analyze the content and number of planned lessons intended for pupils' ecological education?

- Out of total 74 lessons, 14 is planned for defining and getting to know the basic ecological concepts. This reduces the arguments and suspicions of biology related to knowledge of nature and society, based on operational tasks, from 50 to 18,9%. Or, 30,1% knowledge of nature and society should be built upon in order to continue to learning, understanding and developing of ecological findings from the aspect of biology.
- Grouping and qualifying of ecosystems takes up 29 teaching lessons (39,2% of total time). If to this we add up a part of the total lessons number planned for nature protection and improvement of the environment, an even greater percentage of time is spent to make pupils understand than our first result shows. If we compare the percentage of time spent on understanding and the percentage of operational tasks in comparison to the global task, we can see that *biology teachers spend most of the time to make ecosystems understandable to pupils.*
- 12 lessons (or 12,6%of the time) is intended for exercises, i.e. to develop habits of an active attitude towards ecosystems. Half of it is made up of nature protection and environment improvement, and the other half is categorization (practical familiarity) of ecosystems. We can agree that this percentage of time is sufficient for a start, as a foundation for further work. But, there is no further practical work. *So, there are no habits. Pupils became familiar with, they understood and developed ecological culture, and they continue living as sinners of the ecosystem.*

SUMMARY

The pupils in the first four grades of elementary school *express* their inner experience of the environment through arts, music, and mother tongue. The promotion of physical development is being done by means of organized physical and health teaching. If observed from an ecological view, expressing is one way of the existence of biodiversity and belonging to the living world. The negation of expression would mean the negation of the very right to existence. That is why pupils are asked to express themselves in as many ways as possible – by means of voice, drawing, writing - this could be regarded as his/her admittance of being an ecological being.

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