

ENVIRONMENTAL EDUCATION AND HEALTH (HEALTH EDUCATION)

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Abstract: *Environmental education also deals with rules and phenomena with a significant impact on human health. The theoretical basis for healthy living, the natural phenomena and happenings in the ecosystem, are altered by anthropogenic effects differing by region. The most important of them are introduced to the students in the form of compulsory environmental education. The Pedagogical Faculty of Masaryk University provides environmental education as a compulsory subject for all future teachers at junior and secondary level. The lectures mainly focus on anthropogenic changes of circulation of macro-biogenic elements with subsequent effects on human health.*

Keywords: *ecological-environmental education, health education, sustainable development, quality of environment effect on life*

1. Introduction

The Czech law and order has established the principles of sustainable development (SD) and its statement – Agenda 21 – by the following definition: „**Sustainable development of a society is a development allowing the present and the future generations to satisfy their basic living needs and keeping the versatility of the nature and the natural functions of its ecosystems**“. For that purpose environmental education, upbringing and enlightenment are defined as follows: *Education, upbringing and enlightenment are to lead to thinking complying with the principle of sustainable development, awareness of responsibility for maintenance of quality of the environment and its individual components and respect for life in all its forms.* The inter-ministerial group within the Ministry of the Environment of the Czech Republic has prepared the “State programme for environmental education, upbringing and enlightenment (EEUE) in the Czech Republic“. Subsequently the Government of the Czech Republic passed a resolution (1048/2000) by which it authorised the Ministry of Education, Youth and Physical Training (MoEY&PT) of the Czech Republic to be the guarantor of environmental education, upbringing and enlightenment within the State Programme. EEUE has been included in the primary curricula and provided though family upbringing, school education, lifelong education, personal experience and sense.

Environmental education and upbringing have become an integral part of primary and secondary education of the whole population of the Czech Republic. The liability to establish environmental education as an integrated whole is stipulated in the so called White Book of 2001 Kotásek, 2001 and further deepened in the Framework Educational Programme of Primary Education. The Programme defines Environmental Education as one of the six *interdisciplinary themes*.

Interdisciplinary themes represent in primary education RVP the current issues of the contemporary world. They represent a major formative element of elementary education, create opportunities for individual assertion of the pupils and their mutual cooperation and help develop the pupil's personality mainly in the area of attitudes and values. The interdisciplinary themes represent the *compulsory part of primary education*. The school must include all the interdisciplinary themes to its curricula for elementary as well as junior level education. However, not all themes need to be present within a single form. In the course of primary education the school is liable to offer to its pupils all thematic circuits of the individual interdisciplinary themes, their scope and method being specified by the SEP.

Environmental education is divided into thematic areas allowing for complex understanding of the issue of human relationship to the environment, the basic living conditions and responsibilities of the current generation for future life.

Thematic areas:

- **Ecosystems** – forest (forest in our environment, productive and non-productive functions of the forest); field (purpose, anthropogenic changes of surrounding landscape, methods of cultivation, fields and their surroundings); water sources (anthropogenic activities related to water management, relevance for landscape ecology); sea (type difference, relevance for the biosphere, algae and oxygen, carbon dioxide cycle) and tropic rain forest (comparison, type variety, threatening, global relevance and relevance for us); human settlement – city – village (artificial ecosystem, its function and relationships to the surroundings, adaptation to local conditions); cultural landscape (understanding of the deep influence on the nature in the course of civilisation history until the present days)

- **Basic living conditions** – water (relationships between water properties and life, relevance of water for anthropogenic activities, protection of water purity, drinking water in our country and abroad, solution methods); air (relevance for life on the Earth, threats to the air and climatic changes, links of the world, air purity and pollution in our country); soil (environmental links, source of nutrition, soil threatening, re-cultivation and surrounding situation, changes in the need for agricultural soil, new functions of agriculture in the landscape; protection of biological species (reasons for protection and methods of protection of individual species); ecosystems – biodiversity (functions of ecosystems, role of biodiversity, levels of biodiversity, threats and protection in our country and abroad); energy (energy and life, effects of energy resources on social progress, use of energy, options and methods of solution, local conditions); natural resources (raw material resources and energy resources, their sustainability, effects on the environment, principles of natural resource management, importance and methods of acquisition and use of natural resources in the surroundings)

• **Anthropogenic activities and environmental issues** – agriculture and the environment, ecological agriculture; *transport and the environment (relevance and development, energy resources for transport and effects of transport on the environment, modes of transport and environmental burden, transport and globalisation)*; industry and the environment (industrial revolution and demographic development, effects of industry on the environment, processed materials and their effects, effects of legal and economic instrument on the relationship of industry to environment protection, industry and sustainable development of the society); waste and waste disposal (waste and the nature, principles and methods of waste disposal, recycled waste); nature protection and monument conservation (importance of mature protection and cultural monument conservation; legal solutions in our country, in the EU and in the world, examples from the environment, principle of preliminary carefulness; nature protection in the course of mass sporting events – MOV principles), changes in the landscape (landscape in the past and now, effects of anthropogenic activities, their reflections and perspectives); long-term programmes focused on development of environmental awareness of the public (State programme EEUE, Agenda 21 EU) and events (Day of the Environment of the UNO, Day of the Earth etc.)

• **Relationship of man to the environment** – our municipality (natural resources, their origin, methods of exploitation and waste disposal solutions, nature and culture of the municipality and its protection, environment protection in the municipality – institutions, non-governmental organisations, people); our lifestyle (consumption of things, energy, waste, ways of conduct and effects on the environment); current (local) ecological issue (example of the issue, its cause, consequences, circumstances, ways and methods of solution, evaluation, own opinion, its justification and presentation); health and the environment (diversity of effects of the environment on health, their complex and synergic effects, ways and methods of health protection); inequality of life on the Earth (diverse environment conditions and diverse social development on the Earth, causes and consequences of increased differences in globalisation and principles of sustainable development, examples of their application in our country and abroad)

Every school uses RVP to prepare its School education programme (SEP), including compulsory environmental education. This interdisciplinary theme is to be implemented at primary and secondary schools by the liability of teachers of all subjects to resolve environmental issues in the context of their respective subjects. Practical implementation slowly approaches this objective.

To achieve the ideal state there are various auxiliary educational activities of not only specialised sites (environmental education centres – such as Lipka, Chaloupky, Sluňákov etc. the Pavučina association) but also professional organisations (such as KEV, with some employees of the Pedagogical Faculty of Masaryk University as its members) providing further education of teachers in this area (specialisation studies of school coordinators of environmental education and upbringing, as well as partial educational units in the form of various seminars, educational events in various environments including open air activities).

The State programme of environmental education, upbringing and enlightenment (the EEUE) in the Czech Republic focuses on increased environment awareness and

knowledge of the population. It assumes (among other things) “*assurance of systematic and complex implementation of environmental aspects in educational programmes on all levels of education, including university level*”.

The framework educational programme for junior schools “...helps pupils obtain knowledge, skills and habits that will allow their independent learning and adoption of values and attitudes leading to considerate and cultivated conduct, responsible decision making and respecting rights and liabilities of the citizens of our state ...” by means of continuous learning of the key competences. All educational content of basic education is divided into **educational areas**. They are implemented by the individual educational subjects (sometimes singular).

One of the educational areas for junior level of primary schools is “**Man and health**” with the subjects of health education and Physical training. In addition another educational area “Man and the world” (only conceived for the elementary level of primary education) also defines the educational content of the health for the individual ages and levels.

The educational content of the educational area “Health education” includes themes which widely overlap, follow and cross the themes of the interdisciplinary theme of Environmental education. For the basic comparison of the two themes see Horká, 2006.

2. Overlaps of Man and Health and Interdisciplinary Environmental Education

Environmental education leads the individual to understanding of the complexity of the relationships between man and the environment, i.e. understanding of the necessity of continuous transition to sustainable development of the society and understanding of the importance of responsibility for conduct of the individual and the society as a whole. Environmental education allows for following and realising the dynamically developing relationships between man and the environment in the context of direct cognition of the current environmental, economic, scientific and technological, political and civic aspects, temporary aspects (relationships to the future) and spatial aspects (relationships between local, regional and global issues), and the optional solution variants of environmental issues. Environmental education leads individual to active involvement in environment creation and protection and affects lifestyle and value orientation of the pupils towards sustainable development of human civilisation. The interdisciplinary theme is implemented through most educational areas. Continuous links, extensions, fixations and systemisation of knowledge and skills obtained in these areas allow for development of an integrated environmental view. Each area has its specific relevance for affecting the rational side of human personality as well as the emotional and will part. In particular in the educational area of **Man and health** the theme touches the issue of effects of the environment on individual health and health of other people. In relation to the issues of the contemporary world environmental education leads to understanding of the importance of care of the nature in the context of organisation of mass sporting events. The curriculum definition lists the following themes related to the environmental education issue:

- Effects of living conditions
- Relevance of physical activity for health
- Safe conduct in sport and transport
- Health risks of civilisation diseases
- Health and social risks of computer work
- Movements in risk environments
- Forms of health support – effects on changes of environment quality and individual behaviour
- Stress management skills
- Value attitudes

3. Environmental Education at Pedagogical Faculty of Masaryk University

Environmental education is a compulsory subject at the Pedagogical Faculty of Masaryk university for all students preparing for the career of teacher at junior level of primary education and secondary education level:

Environmental education *SZ7BP(K)_BiEV* – 1st year 1/0/0 Ko, interdisciplinary approach (cat. Bi, Ch, Phy, Ge) for circa 800 (250) students of teaching of general education subjects at junior primary and secondary level.

Similar but briefer *ZS1BP(K)_IVZA* – 2nd year, 1/0/0 Ko, interdisciplinary approach (cat. Bi, Ch, Phy, Ge, Pd) for circa 150(100) students of teaching at elementary level of primary education.

In addition to the abovementioned basic subjects environmental education is part of other compulsory, compulsory optional and optional subjects extending knowledge of the basic subjects and deepening the transferred knowledge, supporting development of skills, formulation of attitudes and acquisition of key skills, of course on different levels (OP3BP/K/_BEEV/P,S/, SC4BK_ZEEV, SC4MK_REEV, SC4MK_KTUR etc.).

Objective of subject:

On the basis of functioning of the ecosystems and the biosphere to get to understand the basic issues of the relationships between the environment and anthropogenic activities in harmony with the principles of existence of the living matter and thus environmental principles (the man and the whole human population is a highly organised living matter with the ability and now also with the options of a strong environmental agent) with the necessity of respect for sustainable development. To understand changes as past changes (processes of the relationships of the human society and the nature including natural resources), as well as coming changes with the threatening dominant of an ecological-environmental crisis. Search for methods of remedy in sustainability of life.

In harmony with the RVP it is possible to define objectives of environmental education and upbringing anew:

Knowledge and skills: on the basis of the acquired knowledge and understanding of the functioning of the relationships within the ecosystem to apply the knowledge to the relationship between the society and the environment, their overlaps, to explain how and why, assumptions of further development and possible ways of minimisation of impacts on the nature, realisation of the negatives and the positives of the measures.

Attitudes: to adoption of the principles of environment protection (including nature protection) and sustainable development

KK: project teaching strategies with regard to the regional principle, modern teaching strategies with the aim to apply the acquired (knowledge, attitudes and skills) in practical life.

Environmental education at the Pedagogical Faculty of Masaryk University first presents to the students the **ecological aspect:**

- *Basic premise:* a suitable environment is a diversified ecosystem (full value) as the functional framework and the necessary prerequisite for existence of all organisms. The differing ecological functions of primary and secondary ecosystems reveal the fundamental contradiction of ecology and environmental studies: **the inputs of the cultural evolution.** Even though the submitted view is “heretic” and impracticable, it is based on the necessity of maximum respect for and seek of approaches to the “functional fully diversified ecosystem of the respective biome with minimum disturbances by environmental conditions as the prerequisite of the ideal relationship between the biotic conditions on the one side and the organisms represented here by the man and his health on the other side“.

Briefly speaking: **For “healthy life” and “healthy” environment.** Of course the premise is unfeasible and represents the ideal objective with the effort for maximum approximation, i.e. the effort to achieve the properties and the quality of the environment with minimum damage to human health. Many remedial procedures follow from that (Tab. 1).

Environmental aspect: Increasing effects of progressing changes and disturbances of the environment on the health state of the human population and individual humans.

- Primary starting point of the subject: Accumulation of data on the environment condition of the selected region, whether the place of permanent residence or workplace, in the context of a tutorial work as the basis for knowledge

Tab 1: Overlaps of environmental themes in subjects taught at Pedagogical Faculty of Masaryk University and health education

Themes of environmental education	Environmental lectures with significant effects on health	Subject allocation
Introduction, tasks and goals of environmental education, legal standards	General issues of the relationships between environment quality and health	12346789
Basic ecological notions (population, communities, ecosystem, factors)	- <i>Basic premise</i> : a suitable environment is a diversified fully functional ecosystem with minimum anthropogenic changes (relevance of semi-natural and natural ecosystems in the landscape)	12345789
Substance and energy flows, anthropogenic changes, global environmental issues, sustainable development (assumptions)	- Anthropogenic changes of circulation of macro-biogenic elements – for further overlaps see below	12345789
	N: - Point and flat increase of input (including P) of soluble salts to surface water (water eutrophication) with increased poisoning of water (unsuitable for water management and recreation purposes) and other anaerobic processes with accumulation of toxins (botulotoxin etc.)	12345789
	- Air oxygen in combustion processes at high temperatures (> 1000 °C) as acid forming source with interactions harming breathing processes	1378
	S: Acid forming source reducing healthiness of the air, water and soil including quality of food	123478
	- Development of smog in relation to the abovementioned negative effects of NO ₂ , ground ozone with significant impact of transport on health especially of urban citizens	12345789
	- Global and local water pollution with	12345789
	● Toxic and mutagenic substances	138
	● Inorganic substances (nutrients) – water eutrophication ● Organic substances – water saprobity (extreme increase of content)	123456789 135789
C: Global warming as a predisposition of climatic changes and thus spread of the area of occurrence of many pathological invasion species with negative health effects (spread of tick to the mountains, <i>Anopheles</i> mosquito to Central Europe, hogweed to Bohemia etc.)	123456789	
O: Double effect of ozone (O ₃) – necessary sufficient level as protection against UV radiation (UV radiation mediated diseases) in connection with Freon – the issue of ozone gap versus toxicity of ground ozone	89	
- Further negativisation of surface waters with regard life and water circulation in the organisms (pollution with biologically active substances – mutagens, antibiotics, contraception etc.)	123456789	
134689		
Pollutants, toxicity, prevention environmental education at school, “ecology” of the household	- Soil pollution and degradation with subsequent production of food harmful to health - Effects of pollutants on human health - Ground ozone toxicity - Toxic substances at school and in the household	12345678
Waste	- Health risks of accumulation and disposal of communal waste and waste of breeding of farm animals	123456789
Energy	- different risks of energy generation Noise negatives: direct x indirect damage (slow damage to mental health leading in extreme cases to disintegration of personality)	123456789
environment in general – introduction	See the basic premise in confrontation with particular effects	12345678

Environment in the Czech Republic	- Light pollution as a negative of ecosystem	178
	- Abovementioned issue of water pollution in fresh water and marine bicycle	12345678
	- Abovementioned changes in quantitative proportions of macro-biogenic circulation	12345678
	- Abovementioned introduction of foreign substances	12345678
	● General contaminants	1358
	● Toxins such as pesticides, herbicides, industrial, agricultural and food processing waste	13578
	● Mutagens such as PCB as well as biologically active contraceptives, antibiotics etc.	
Landscape	- See the basic premise in confrontation with anthropogenic changes	123456789
	- Regional devastation of the environment – exploitation of sources up to the level of health risks	
	- Direct relevance of off-production functions of the forest for health, indirect effect as agent of psychic health and work performance.	123456789

SZ7BP_BiEV – 1

OP3BP_BEEP – 4

SC4BK_ZEEV – 7

SZ7BK_BiEV – 2

OP3BP_BEES – 5

SC4MK_REEV – 8

ZS1BP_IVZ4 – 3

OP3BK_BEEV – 6

SC4MK_KTUR – 9

ZS1BK_IVZ4 – 4

... positive and negative evaluation of the regional environmental situation. This will be used as the basis for potential SWOT analysis. All knowledge quantifies effects of the environment on individual health and health of the population in the region in general.

- Secondary materials: theoretical lectures are presented both as environmental phenomena and as significant agents affecting human health. They clarify, illustrate and put in context various **environmental agents as determinants of human health**.

Considerable attention is paid to functional principles of the relationships between organisms and the environment, anthropogenic changes of macro-biogenic element circulation, their effects and health risks. Subsequently other phenomena and processes are presented as agents harmful for human health (see Tab. 1).

All these and other effects are manifested by worsening of the quality of the environment and deepening of the indirect effect on human health. This is assessed in the theory of environmental education, upbringing and enlightenment as global issues as well as regional issues. The regional relationships and principles are emphasized by seeking environmental information about the region with potential health risk specifications. Many conclusions and principles of friendly approach to the environment, and principles of sustainability are presented as principles supporting **healthy lifestyle** and as such as **accepted and adopted** by many students.

The tabular survey documents considerable presence of many of the themes in lectures in not only the compulsory subjects. Just some are reserved for optional subjects with more detailed extension of the issue. When comparing the lectured themes of Environmental education at the Pedagogical Faculty of Masaryk University and the papers presented at the workshop “School, Health and the Environment” (see the programme of 16 December 2008) all the themes discussed at the workshop are included in

the subject syllabus and lectured on. The subject syllabus is extended with new findings and knowledge. Despite that event the already overcome issues must be paid attention (the continuing idea of the students about toxicity of the additive anti-detonators in petrol as a consequence of lead content etc.).

4. Conclusion

Enumeration of the basic health negatives presented in Environmental education points to deep relations and overlaps between the standards and quality of the environment and health state of the human population. The correct orientation of environmental education provided by the Pedagogical Faculty of Masaryk University is documented by the conference presented confrontations of various environmental phenomena and human health. A large majority of the presented phenomena are included in the syllabus of the subject of Environmental education SZ7BP(K)_BiEV and other similarly generally conceived subjects.

ENVIRONMENTÁLNÍ VZDĚLÁVÁNÍ A ZDRAVÍ (VÝCHOVA KE ZDRAVÍ)

Abstrakt: Environmentální vzdělávání se zabývá rovněž zákonitostmi a jevy s výrazným dopadem na lidské zdraví. Jako základní teoretické východisko zdravého života jsou prezentovány přirozené jevy a děje v ekosystému, které jsou antropogenními vlivy regionálně rozdílně pozměňované. O nejdůležitějších a nejvýznamnějších z nich jsou studenti informováni formou povinného environmentálního vzdělávání. Na Pedagogické fakultě MU je realizováno jako povinný předmět pro všechny studenty učitelství 2. stupně ZŠ i SŠ. Obsah přednášek je tematicky zaměřen především na otázky antropogenních změn koloběhů makrobiogenních prvků s následnými vlivy na zdravotní stav člověka.

Klíčová slova: ekologicko-environmentální vzdělávání, výchova a osvěta, výchova ke zdraví, TUR – (trvale) udržitelný rozvoj