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ENVIRONMENTAL TOPICS IN TECHNICAL EDUCATION

Abstract

The phenomena of globalization and of the global education associated appeared in the 19th and the 20th century also in pedagogical theory. This emerging approach reveals the interconnections between men and the environment and environmental protection. It stresses the risk of an environmental crisis, and of our responsibility for future life on the planet Earth. For that reason, the ecology and environmental education with its focus on the global responsibility and sustainability of life on the planet Earth, is the main part of the global education. It is highly important to raise awareness of these problems among children from their very early age. Parents, schools and teachers play a key role in the education on environmental protection. It is crucial for children in preschool and primary education to understand and recognize which negative impacts and positive impacts the technology have on the environment.

Keywords: ecology, global education, environmental education, security and protection, environment, technical education, preschool and primary education.

TEMATYKA EKOLOGICZNA W PRAKTYCE NAUCZANIA

Streszczenie

Zjawisko globalizacji oraz powiązane z nim zagadnienie edukacji globalnej wkroczyły również do teorii pedagogiki w XIX i XX wieku. To nowotworzące się podejście pokazuje wzajemne powiązania między

człowiekiem a jego środowiskiem naturalnym oraz ochroną tego środowiska. Podkreśla ono ryzyko kryzysów w zakresie środowiska naturalnego oraz odpowiedzialność człowieka za przyszłe życie na Ziemi. Z tego powodu, ekologia oraz edukacja w zakresie ochronie środowiska ze szczególnym uwzględnieniem globalnej odpowiedzialności oraz utrzymania życia na Ziemi jest głównym komponentem edukacji globalnej. Jest niezwykle ważne, aby podnosić świadomość tych problemów wśród dzieci od najmłodszych lat. Rodzice, szkoły oraz nauczyciele odgrywają kluczową rolę w edukacji w zakresie ochrony środowiska. W edukacji przedszkolnej i podstawowej niezwykle istotne jest, aby dzieci rozumiały i potrafiły zidentyfikować negatywny i pozytywny wpływ technologii na środowisko.

Słowa kluczowe: ekologia, edukacja globalna, edukacja w ochronie środowiska, bezpieczeństwo i ochrona, środowisko naturalne, edukacja techniczna, edukacja przedszkolna i szkolna podstawowa.

Introduction

Education focused on environment, its protection and sustainability at school and extra-curricular education and training are incorporated into the subjects ecology, ecological education and environmental education at all educational levels. At the universities it is in the study programs Ecology and Environmental Sciences. Ecological and environmental education as a part of global education have become important factors of environmental protection as well as rational and efficient use of natural resources.

Environmental awareness and education in Slovakia

First Society of nature protection and animal protection was established on October 19, 1927 in the Great hall of the Municipal Advisory House in Banská Bystrica. In historical records, the first association of natural protection in Slovakia states that: *„abroad a considerable attention is paid to the protection of nature and its monuments. Where the human hand*

forcibly interfered in the natural development, it did not improve it, but ruined. America, Germany, Switzerland, Norway, Denmark and other countries understand the importance of protected areas. In our country old commemorative trees are being destroyed, horses suffer during wood transportation and brutality occurs while handling poultry. Imbalance of natural forces comes from the death of predators which as „health police” removed the weak and diseased animals. It is necessary to find a compromise between economic imperatives and the protection of natural beauty. It is therefore necessary to establish a society in Slovakia which will protect nature.” The follower of the Society was the Association of Nature Protectors. Later, the Association turned into Slovak Union of Nature and Landscape. The records state that volunteers were the reporters and protectors of the state protection of nature, who were appointed by the Deputy of Education and Culture no. 212 of 1958. The Association of nature and animal protection in Banská Bystrica also participated in the development of standards of legal protection of nature.

According to Hassa, Ondrová, Švajda the environmental protection awareness increased intensively through the mass media after 1969. According to Jančová an important document was already in the 80's Government Resolution of SSR No. 268/77, which provided education in environmental protection. This resolution required the comprehensive educational system for environmental protection in Slovakia.

The public has been concerned with the *issues of environment*, environmental awareness since 1994. The year 1994 became the first preparatory year for the next national conference on environmental education at schools in the Slovak Republic. The National Council of the Slovak Republic issued the Law 287/1994 on nature and landscape protection. The first National Conference on an environmental education in schools was held in 1995 where the general recommendations were stated. When drawing up strategies of environmental education in schools in Slovakia the term ecology was distinguished as a scientific discipline of Environmental Science. Already in 1998,

at the Second Conference the recommendations were accepted and contributed to a greater care for environmental education.

The teaching started at all school levels and involved NGOs. The Ministry of Environment played a significant role as the central body of state administration for the environmental protection. In 1997 the Slovak Government approved the Concept of Environmental Education, which was part of the National Action Program II. and the National Strategy of Sustainable Development.

Environmental awareness of children and youth began to develop through non-formal education and the implementation of various activities. Since 2000, the Slovak Environmental Agency (SAŽP) has been concerned with improvement of environmental awareness in the field of nature and landscape. It includes the improvement and strengthening communication and cooperation between stakeholders and the exchange of information and experience in this area. Members of the Slovak Environmental Agency developed material and information base aimed at training and education of nature and landscape protection, including NATURA2000. The priority of Slovak Environmental Agency is to contribute in environmental awareness, educational and professional community by creating basic methodological and information resources, the realization of the cycle of certified training and methodical days, conferences, educational activities, competitions and programs, information events.

It helps to achieve the objectives and measures of the following documents: National Biodiversity Strategy in Slovakia (1997), the Conception of environmental education at all school levels in the Slovak Republic and the system of lifelong learning (2006), its Action Plan – The Action Plan of education and training for Sustainable development in Slovakia (2006), as well as the Action Plan for Sustainable development in Slovakia for the years 2005 to 2010 (2005), Strategy EHK United Nations (2005) for education for Sustainable development (2005), and other national and international commitments of the Slovak Republic.

Environmental education in preschool and primary education level

Environmental education can be considered as a process of lifelong education and training focused on the protection and care for the environment. It is necessary to form the fundamentals of environmental education and training from early childhood to adulthood, continuously from preschool, primary, lower and upper secondary to tertiary and lifelong learning. Kminiak states that such education and training is carried out in two directions:

- direct implementation of ecology and protection of environment in the content of subjects: history, geography, biology,
- educational obligatory extra - curricular activities such as Biology competition.

Competition „Learn and protect”, prevention activities in the fight against drug addiction, smoking, hatred and racial intolerance, and terrorism.

According to the author the influence of environmental component can be observed in the following:

- *preschool children*, they get to know the environment of their schools, learn the basics of hygiene, relationship with nature, through emotional perception of its beauty, aesthetics and harmfulness;
- *primary level of education*, pupils acquire knowledge, habits and skills. They form the basic relations between them and the environment,
- *lower secondary level of education*, students continuously continue in acquiring new knowledge, prepare for skills to be able to analyze ecological relationship between man and environment, form their own opinions and judgments,
- *upper secondary level education*, with specialization on chosen fields of study, based on building industry, business, transport, health care, environment, update their knowledge and develop their environmental awareness,

- *tertiary education*, students deepen their theoretical knowledge, apply creative thinking in the study specialization, build individual concepts, master the methods and forms of behavior and procedures,
- *further postgraduate education*, adults increase their qualifications in their profession and obtain new resources for development in their environmental consciousness.

The nature protection and environment protection is therefore included in the the educational content. Gašparová 2013 states that if we can „*find the interdependencies and relationships between the content and procedures of education*”, we can expect understanding of the relationship between the school and real life.

Vaculčíková 1999 says that „*the content of environmental education allows to understand, analyze and evaluate the relationship between man and the environment. It is based on discovering the ecological processes which influence life on Earth, geomorphological and climatic conditions affecting the activities of humans and other living creatures. Equally important is understanding social and cultural influences which determine human values and behavior, awareness of individual responsibility for man's relationship with the environment.*”

Jozafová stated in 2001 that „the content of environmental education is to educate the individual to take responsibility, dignity, tolerance, honesty, a sense of life and respect everything around us. The basic moral values, improving personal qualities as well as the forming environmental awareness should be the basis of educational content.”

Environmental education in preschool education

Jan Amos Komenský compares human life to a tree which, when healthy, is evolving from healthy roots. He compares the early childhood to the roots of the tree. He says that if the teacher is convinced about the content, if his work with children

is sensitive, he sows only the best in them. It is because it allows children to feel with all the senses: to see, hear, smell, feel and taste. From these children only healthy trees will grow. Krátka states these pedagogical approaches which a teacher should apply in effective environmental education:

1. Explore the world and nature through emotions and children's curiosity.
2. Do not present only basic information to children, but to stimulate their thought and provoke them for new solutions.
3. Allow children to enjoy the beauty of nature, not only teach them about the problems of civilization.

The objective of environmental education in preschool education is personality development of a child so they will:

- understand and evaluate the relationship between them and the environment,
- understand the need for environmental protection,
- have a positive attitude towards the environmental protection.

It is important that preschool children create and develop environmental feelings and behavior with cultural and ethical behavior with the aim to lasting development and preserve the life on Earth. All this is done with simple activities which contribute to the protection of plants and animals and care for the surrounding.

According to Foldesová 2000/2001 the mission of environmental education is to offer the children in preschool age in the following development areas:

Cognitive:

- acquire basic knowledge about nature and the surrounding world,
- get age-appropriate knowledge about nature protection,
- build basic habits of ecological,
- discover the nature and its importance in human life.

Socio-emotional:

- develop an emotional relationship with nature by learning its importance for a man,
- know and learn to see the beauty of nature,

- ability to express own feelings in relation with surroundings,
- learn to take responsibility for own actions.

Perceptual – motional:

- develop sensory perception, coordination, sensory and physical organs,
- develop physical and self-service skills,
- develop work habits necessary for the protection of nature and environment.

The National educational program „Children and the World” for preschool education defines the following content areas: Myself, Culture, Nature and People, content and performance standards to which it is possible to integrate the environmental education as cross-cutting topic. As in all areas of education also in professional and technical activities it is possible to integrate the topic of environmental education (Table 1).

Table 1. Environmental topics in technical education in preschool

Topics of environmental education	Content areas and performance standards:
1. Protection of nature and country	Work with different materials – <i>products from recyclable material</i>
	Importance of natural environment – <i>know your surrounding</i> – <i>growing plants/crops</i>
2. Parts of environment	World diversity – <i>rivers, mountains, oceans</i> – <i>world of animals, birds, fish</i>
3. Natural resources, its use and protection	Organic and non-organic nature, Weather – <i>electrical energy - sun, water, air</i> (water mill, wind mill...)
4. Human activities and problems of environment	Work and technical creativity – <i>using natural materials</i>
5. Relationship between man and environment	Work and technical creativity – <i>traffic, houses, bridges, roads...</i>

Resource: own elaboration.

According to the National educational program ISCED0 Environmental education as a cross-cutting topic is obligatory in preschool education. In present, there are many kindergartens which focus on environmental issues. They can create their own school educational programs where they implement numerous environmental elements. Many of them seek to obtain certified the „Green School”. Program to support environmental education in schools was approved by the Ministry of Education, Science, Research and Sport of the Slovak Republic.

Environmental education in primary education

In environmental education teacher of primary school pupils improves their emotional relationship to the environment, admiration of life and natural beauties, but mainly tolerance in human relationship to organic and non organic nature.

In terms of National educational program ISCED1 the environmental education is as a cross-cutting topic defined for all educational areas. Most important areas are natural and technical science and social science. In the educational area „Man and Work” the subject of technical education is included in the 4th year. The content contains wide range of activities and technical skills which pupils acquire, basic skills that contribute to their future professional orientation. Pupils come into direct contact with human activities and technologies, whereby they acquire practical working skills.

The objective of environmental education as a cross-cutting topic in accordance with the National educational program is *„to contribute to the improvement of pupils so they are able to understand, analyze and evaluate the relationship between man and his environment, at the same time understand the need for protection of environment worldwide. It is important for pupils to acquire knowledge and skills so with the simple activities they can help the environment in an adequate and appropriate way.”*

Topics of environmental education can be incorporated into the subject technical education in the 4th year by projects and practical activities defined in the following table (Table 2).

Table 2. Topics of environmental education in content areas of the subject Technical education in the 4th year.

Topics of environmental education	Content areas in Practical teaching in the 4th year:
1. Protection of nature and country	Care about environment – <i>waste separation</i> – <i>decorative and useful plants</i>
	Folk traditions and crafts – <i>exploring the country, culture and traditions</i>
2. Segments of environment	Creative use of technical material – <i>waste separation</i>
3. Natural resources, their use and protection	Basis of constructing – <i>electrical energy</i> – <i>alternative sources and their use</i> – <i>ecological aspects of energy</i> – <i>use of small natural material</i>
4. Human activities and problems of environment	Creative use of technical material – <i>negative human impact on nature</i>
	Preparation of food and eating – <i>healthy food – healthy city</i>
5. Relationship of a man and environment	Constructional work – <i>objects in nature: buildings, houses, bridges, roads etc.</i>

Resource: own elaboration.

The content of several subjects is implemented in the cross-cutting topics incorporated in educational areas. Interconnection, expansion, consolidation and systematization of knowledge, special habits and skills help the students understand the knowledge. According to Tomkuliaková, 2012, it is necessary to engage students in learning process by experiences, creative learning situations, stimulating learning environment where students can understand global issues.

Understanding the issues is the prerequisite for an active approach of students for the effective and sustainable protection of the environment.

The words of Hilbert 1996 say: „*At the end of the process of environmental education should be continuously improving man: wise man, on a technical level, the ethical and aesthetic profile, human caring, kind, sensitive, tolerant, responsible, respecting life, present and future. Such person can be raised by educational system, which will teach to live, not the technology of life.*”

Conclusion

Protection of nature and a sustainable healthy environment within environmental education have gone through massive conceptual, theoretical, methodological and applied succession. However, it mainly depends on the way we live and lifestyle people have. Naturally it reflects the hierarchy of moral and preferred values of entire society.

Over the past period Slovakia has done many activities in favor of protection of nature and environment and school and extra-curricular activities, activities organized by various institutions interested in environmental issues. Despite this fact, we can see large open space for today's needs. There is an absence of systematic acquisition of skills, attitudes, core competencies needed for pro-environmental awareness, behavior and actions, which still lag behind the neighboring European standards.

Resources

1. Burkovský J. 1998. *History of the first Society of nature protection in Slovakia*. Taken from depozitu http://www.enviromagazin.sk/enviro1_3/depo-zit16.html, [25.09.2014].
2. Földeřová J. 2000/2001. Environmental education in kindergarten. In *Předřkolská výchova*. 2000 – 2001. roč. 15, č. 4., s. 19. ISSN 0032-7220, s. 14-16. *řtátny vzdělávací program: Environmentálna výchova (Prierezová téma)*. 2009.

3. Gašparová M. 2013. Cross-cutting topics and their place in content integration in primary education. In *Current problems of natural – technical subjects and cross – cutting topics in primary education*. Prešov: Pf PU v Prešove. 2013. ISBN 978-80-555-0994-5, s. 45.
4. Hajdúková V. a kol. 2008. *Practical guide for the school educational programs for kindergarten*. Bratislava: MPC, s. 40+216. ISBN 978-80-8052-324-4, s. 53-54.
5. Hass M., Ondrová M., Švajda J. 2008. *Environmental education*. Ružomberok: TESFO, 2008. ISBN 978-80-88923-09-1, s. 6.
6. Hilbert, H. 1996. Problems of environmental education in pre-school and primary schools. In *Životné prostredie*. ISSN 0044-4863, 1996, roč. 30, č. 3, s. 123-127.
7. http://www.statpedu.sk/files/documents/svp/prierezove_temy/environmentalna_vychova.pdf, [25.09.2014].
8. Jančová G. 1996. Protection of nature and country – important part of education at elementary and secondary schools. In *Environmental education and school. Conference proceedings 27. september 1996 in Banská Bystrica*. Banská Bystrica: PF UMB, Katedra vlastivedy a prírodovedy. ISBN 80-8055-003-4, s. 101-105.
9. Jozafová V. 2001. Environmental education in Slovak skauting. In *Acta Universitatis Mathiae Belii:séria environmentálna ekológia. Ekológia a environmentálna výchova*. roč. III., č. 1. Banská Bystrica: Matej Bel University, Faculty of Natural Sciences 2001. ISBN 80-8055-663-6, s. 105-108.
10. Kminiak M. 1997. *Environmental education*. 1. vyd. Bratislava: AP, 1997. ISBN 80-967720-3-1, s. 94.
11. Krátka K. 2001/2002. Environmental education. In *Predškolská výchova*. roč. LVI 2001/2002, november – december 2. ISSN 0032-7220, s. 31.
12. Natura 2000 is network of European protected areas, which member states of European Union declare for the protection of the most precious and threatened species and habitats in Europe.
13. Šimonovičová J. *Improvement of environmental awareness in the area of natura and country protection (also NATURA 2000)*, <http://www.sazp.sk/public/index/go.php?id=1760>, [25.09.2014].
14. Tomkuliaková R. 2012. *Strategies in teaching natural science in primary education*. Banská Bystrica: Pedagogická fakulta UMB v Banskej Bystrici. s. 156. ISBN 980-80-557-0386-2. s. 13.
15. Vaculčíková D. 1999. *Environmental education in work of a teacher*. 1. vyd. Banská Bystrica: Metodické centrum BB, 1999. ISBN 80-8041-259-6, s. 44.