

Review article

**TEACHING CONTENTS OF SCIENCE AND SOCIAL STUDIES
FOR THE PURPOSE OF ENVIRONMENTAL EDUCATION**

UDC 37.033:502/504

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Abstract. *Within the system of institutional education and training close attention is being devoted to environmental education in primary schools. In the last few decades we have witnessed a significant vulnerability of the environment, so environmental education of young people from an early age becomes a necessity that should be continuously studied and promoted. In addition to educational element, there is an increasing demand for the improved realization of environmentally educational component. This paper analyses the curriculum of the subject Science and Social Studies in the third and fourth grade of primary education with the aim of establishing the presence of contents related to environmental education and environmental awareness development among children. By analyzing the teaching contents of the subject Science and Social Studies, teaching units have been recognized that, directly or indirectly, indicate to pupils the significance of the environment protection, thus showing them their role in the process of environmental awareness development. The contents of the subject Science and Social Studies offer great possibilities for knowledge, skills and habits acquisition in the area of the environment protection and promotion.*

Key words: *environmental education, environmental contents, science and social studies teaching, curriculum.*

1. INTRODUCTION

Specific and favorable conditions – air, water, fertile soil, sunlight and sun's heat make life diversity possible on Earth. Normal natural conditions have provided a good and quality life of mankind for millenniums, and the biosphere has always been powerful enough to neutralize the negative effects of all human activities. However, in 20th and now in 21st century, due to the offensive, one-sided and uncontrolled technological development, great exhaustion of resources, uncontrolled population growth and lack of

Received March 28, 2017/Accepted July 11, 2017

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knowledge and environmental ethics, nature has been degraded. Extensive environment pollution in the last decades seems to be reaching a critical point. That can lead to the disorder in the biosphere with profound consequences.

Nowadays the environmental basis of the living world has been so damaged that it appears it will reach such a level of degradation where recovery will not be possible anymore. If the current trend of environmental pollution continues, some authors think that one third of fertile soil will be turned into barren land soon, the number of extinct plants and animals will exceed one million, while weather patterns on Earth will be significantly changed.

It could be said that mankind is already dealing with such predictions. Actually, we stepped into 21st century with global environmental problems:

- damage to the biosphere and its ecosystems;
- demographic explosion – till the year of 2040. the population of 10 billion people is expected;
- global climate changes;
- exhaustion of natural resources;
- insurmountable amount of waste;
- damaged health of people etc. (UNESCO-UNEP, International environmental education program according to Đurović, 2009, 154).

The economic and technological development of society is considered to be directly related to the possibility of environmental pollution. Although it may seem that the environmental pollution is a necessity and a progress principle that cannot be avoided, experiences and findings on the present level of development imply it is possible and necessary to adjust technological development in such a way that there are no negative impacts on the environment. The entire material and cultural progress should create more pleasant and healthier environment. Only the harmonization of both can result in genuine society's progress and establishing prerequisite for a happier life of us all (Đuković, 1990 9–10).

In the last few decades we have started a serious work on the environment protection. Nowadays environmental problems are handled by experts, and future generations will properly understand this problem and solve it in more favorable technological and economic conditions. Therefore, apart from educating personnel at universities, it is of vital importance to implement environmental education and develop environmental culture of society in the widest sense, especially of younger generations. The purpose of this paper is to show that environmental education and training should start even at an earliest age of institutional education, how the available curriculum of the compulsory subject Science and Social Studies in the third and fourth grade of primary education contributes to this process, and what the role of science and social studies teaching is in the process.

2. ENVIRONMENTAL CONTENTS IN SCIENCE AND SOCIAL STUDIES TEACHING

In the first stage of primary education environmental contents often permeate almost all subjects, by correlation and integration. Nevertheless, they are mostly present in the following subjects the World around us in the first and second grade and Science and Social Studies in the third and fourth grade of primary education (Šehović, 2012).

There is no subject in the first stage of primary education that covers such a variety of contents in the area of natural and social sciences as the subject of Science and Social Studies does (Lazarević & Bandur, 2001). The majority of contents aimed at environmental education can be found in the teaching contents of this subject. One of the most important questions of primary education related to the environment protection and promotion is the one of defining contents that would be appropriate for the time we are living in and, at the same time, for psycho-physical abilities of pupils as well as for teaching aims and tasks of school and after-school activities (Andevski & Kundačina, 2004). In order to gain insight into presence of contents aimed at environmental education in the subject of Science and Social Studies for 3rd and 4th grade of primary school, its teaching contents have been analyzed and examined. The contents analysis has been done based on the current teaching curriculum of the above mentioned subject for 3rd and 4th grade of primary education prescribed by the Ministry of Education of the Republic of Serbia.

Teaching contents of the subject **Science and Social Studies in the third grade** are classified into five units: *Nature – man – society*, *Movement in space and time*, *Our heritage*, *Materials and their use* and *Human activity* (The curriculum for Third Grade of Primary Education, 2005). By the realization of teaching contents within the above mentioned units, pupils acquire new knowledge, systematize already existing knowledge, handle the transfer in the process of framing and understanding the basic notions of nature and society. The teaching contents are conceived in such a way that pupils are first introduced to basic characteristics of communities (land, water, cultivated ones), then the properties of water, air and soil and their significance for living organisms, different forms of movements and symbols for space and time presentations. Moreover, it has been envisaged to get familiar with particular qualities of different types of materials, traces of the past and national cultural heritage as well as rules that people make and have to obey in order to protect themselves, others and their surroundings (health-hygienic, traffic, children's and human rights that facilitate coexistence as well as rules that provide environmental balance in the surroundings).

Based on the curriculum analysis of the subject Science and Social Studies in the third grade, it has been established that the environmental content is present within the three units: **Nature–man–society**, **Materials and their use** and **Human activity**. Within the above mentioned thematic units pupils gain basic knowledge of air, water and soil and extend their knowledge about plants and animals. The teaching process realization indicates interdependence of living and nonliving things and establishes knowledge of the importance of the sun and soil for life preservation. Also, love towards nature as the living environment is being developed with the emphasis on the protection of certain environmental elements. Teaching contents that point out the importance and protection of waters could emphasize the water pollution problem, which also refers to teaching contents about air and soil as basic living conditions. Within the unit dedicated to the man as a part of nature, it is necessary to underline how men can change nature and affect the environment in many different ways, how they can endanger it and how that degradation of nature boomerangs on people.

The table no.1 shows the environment contents within the mentioned thematic units.

Table 1 Environmental contents of the subject Science and Social Studies in 3rd grade

Lesson (contents in the field of environmental education)
<p>Nature – man - society</p> <ul style="list-style-type: none"> ▪ Importance of terrain or relief (soil and terrestrial ecosystems) ▪ Soil properties and their significance for the living world ▪ Importance and protection of waters and aquatic ecosystems ▪ Water and air properties that are important for living organisms and human activities (influence of water and air on soil, wildlife, water and wind power etc.) ▪ Weather conditions and their importance for life in the surroundings ▪ Connection of biological communities and the man's role in their sustainability <p>Materials and their use</p> <ul style="list-style-type: none"> ▪ Significance and necessity of materials recycling and rational consumption of products made of glass, plastics, metal ▪ Collection and classification of recycling waste (paper, plastics, tins...) – an activity <p>Human activity</p> <ul style="list-style-type: none"> ▪ A village and a town- similarities and differences (pollution...), their connection, mutual dependency ▪ Mutual impacts of the man and environment (the way in which a man changes the environment), impact on health and life through behavior principles contributing to sustainable development

The listed contents deal with basic questions in the area of environment protection and promotion. As a matter of fact, in order to cover the lessons referring to the importance and protection of relief, water, soil, air and biological communities, pupils should be introduced to pollution problems, causes and consequences. The contents indicating to the necessity of materials recycling and rational product consumption explicitly relate to the environment and, through pupils' practical work, enable the development of environmental habits. The last topic – **Human activity** emphasizes the man as a creative and social being on whom the relations in biological communities depend. The man is a „crucial factor in maintaining natural balance or a cause of environmental imbalance within a biological community. Often the man is a regulator of relations in different biological communities, which should be taken into consideration when covering not only this topic contents, but also other topics within the teaching contents of Science and Social Studies subject” (The Curriculum for Third Grade of Primary Education, 2005, 188).

The concept of Science and Social Studies teaching contents in 4th grade suggests the tendency to intensify knowledge acquisition in the area of natural sciences which is visible in aims, contents choice and ways of contents' realization. In addition, a new approach to studying past at this age is being emphasized, the approach free of wide political history contents because pupils learn them with difficulty and forget them quickly (The Curriculum for Fourth Grade of Primary Education, 2006).

The analysis of the Science and Social Studies contents has established that environmental contents are present in the first three units: **My homeland a part of the world, Meeting nature and Work, energy, production and consumption.**

The environmental contents within the mentioned units are given in the table form.

Table 2 Environmental contents of the subject Science and Social Studies in 4th grade

Lesson (contents in the field of environmental education)
<p>My homeland a part of the world</p> <ul style="list-style-type: none"> ▪ Endangered and protected areas in Serbia (national parks, natural monuments) <p>Meeting nature</p> <ul style="list-style-type: none"> ▪ Living world classification based on similarities and differences ▪ Flora of our country (significance, typical, rare and endangered plants; diversity, wealth, protection, revitalization) ▪ Fauna of our country (significance, typical, rare and endangered animals; diversity, wealth, protection, revitalization) ▪ Domestic animals and grown plants (significance, demands and possibilities; potentials for healthy food production) ▪ The man as a part of nature – a conscious and social being ▪ Basics of healthy living – how I can affect life quality (diet, hygiene, clothing, housing, health culture etc.) ▪ Responsible attitude towards yourself and others (peers, the elderly, patients, pets, abandoned animals etc.) <p>Work, energy, production and consumption.</p> <ul style="list-style-type: none"> ▪ Work – a conscious activity of men (comparison of people’s work and animals’ activities) ▪ Natural and social factors impact on people’s lives and work ▪ Natural resources and their exploitation (resources, technologies, products, rational production and consumption, recycling, revitalization) ▪ Resources: water, fuel, ores and minerals, soil, forests, wildlife ▪ Natural raw materials processing – technologies of obtaining metal, paper, rubber...Water treatment and healthy food production ▪ Sun, air, water – renewable energy sources ▪ Coal, oil, gas – non-renewable energy sources, environment protection issues ▪ Insufficiently utilized and ecological energy sources ▪ Human activities in different regions of Serbia (plain, valley, hilly-mountainous regions; villages and towns) ▪ Work, production, consumption and sustainable development (notice the connections between resources exploitation, applied technologies and sustainable development)

The purpose of the given contents is environmental education. The contents assume the improvement of knowledge, attitudes, values and behavior with reference to the ways of environment protection, healthy living style, saving of food, water and energy, recycling, rational product consumption as well as alternative and renewable energy sources. The terms highlighted in the context of contents include essential educational components of environmental protection and improvement (importance, vulnerability, protection, recycling, revitalization).

The environmental contents within the second unit systematize knowledge and upgrade living nature notions from previous grades through grouping and classifying based on specific similarities and differences, getting familiar with our country’s flora and fauna but also through consideration of an important role of the man in the living world protection and regeneration, namely maintaining environmental balance for the purpose of people’s own survival. Furthermore, possibilities and significance of healthy food production in regard to animals raising and plant growing are also taken into consideration.

Observing and tracking natural phenomena and adaptation forms through changes and behavior of the living world is a main prerequisite for understanding and perception of

adaptation process as a basic survival requirement. It is useful to follow these processes in chronological sequence in different living things and relate them to the annual cycle of seasons and perceive the connection between living and non-living things. The aforementioned contents refer to complex perception of people as living and conscious social beings, recognition of basic life necessities and healthy living style development. In addition to a responsible attitude towards ourselves, it is essential to adopt equally responsible attitude towards others and the environment, to cultivate coexistence through the appreciation of differences, tolerance, solidarity, humanity and empathy (The Curriculum for Fourth Grade of Primary Education, 2006, 197).

The teaching of the third unit contents should perceive work as a vital and planned human activity and understand all the necessary requirements, purpose and sense of human activity as well as relations to the process and results of the man's work. At the same time, available resources and suitable production technologies have to be taken into consideration and the need for rational consumption recognized. The consequences of uncontrolled natural resources consumption need to be identified and related to the necessity of saving, recycling and revitalizing renewable resources.

Pupils ought to get familiar with renewable and non-renewable energy sources and understand the necessity to save energy in everyday life and work. It is important to turn their attention to considering insufficiently utilized and ecological energy sources in their surroundings (wind, water, the sun, straw, maize stalks etc.). With regard to natural resources processing, it is important to take into consideration technologies used for raw materials processing and procedures of getting finished products as well as methods of energy production and consumption. It is relevant to distinguish between „clean and dirty” technologies and notice the significance of the environment protection. Moreover, it is necessary to understand what human activity depends on in various regions and areas of Serbia and notice the connections between supply and demand, trade and consumption. The parts of this unit should be examined preferably from the aspect of sustainable development.

It all points to the conclusion that teaching contents of the subject Science and Social Studies in fourth grade of primary school are in accordance with not only the aims of environmental education but also teaching aims and tasks of the subject itself. Besides, we can draw a conclusion that there are more contents providing knowledge, skills and habits synthesis in the area of environment protection and improvement than in the curriculum of the previous grade. In our opinion, separated unit-related contents in both the third and fourth grade offer a wide range of possibilities and offer strong support for the development of pupils' environmental knowledge.

Since the teaching contents are given in general, a teacher is allowed to centralize, update and put them into practice. He unobtrusively provides pupils with information about the man and the environment. Moreover, a teacher represents an important factor in the process of pupils' environmental attitudes formation. He organizes and manages the process of environmental knowledge acquisition, forms pupils' attitudes and habits and immediately affects their personalities by his deeds and actions providing that, of course, he is familiar with environmental problems and ecologically educated (Živković, Živković & Jovanović, 2007). Apart from curriculum implementation, a teacher is required to be the initiator and organizer of extracurricular and after-school forms of environmental education „that contribute to the development of pupils' responsible and willing attitude to the environment they are living in” (Kundačina, 1998, 94).

3. CONCLUSION

The area of environment protection is one of the basic postulates of a country's national concern. In this respect, we should have in mind that only a fundamental change of people's attitude to the environment can ensure further progress of human society. In that sense, environmental education has the most important role. Its strategy should make it possible to understand that the education about environmental protection continues whole life, create a sense of responsibility for the state the environment is in, take appropriate legal measures, provide everyone with correct and complete information, point out the principles of sustainable development, develop the partnership of all relevant participants, „use all available resources, explore optimum methods for the education in the area of environmental protection and apply them” (Šehović, 2012, 19).

In order to be able to expect and insist upon people's environmentally-friendly behavior, it is necessary to educate them first. It could be done by introducing environmental contents on all levels of institutional education system. The question of organizing environmental science classes should be approached seriously and effectively by innovating existing curricula and introducing environmental contents in different subjects.

Even though the environmental science as a separate subject is not present in the first stage of primary education, it can be concluded that the curriculum of the subject Science and Social Studies in the 3rd and 4th grade includes the contents of environment protection and improvement and, also, there is a continuity in their studying. Environmental contents of this subject teaching refer to understanding nature and the man's relation to it and to the development of a responsible attitude towards the surroundings. Curriculum analysis indicates that the contents are aimed more at knowledge transfer than the acceptance of environmental values in the function of environmental education. The lack of textbooks, insufficient environmental information about the environmental problems make it necessary to pay attention in a more systematic and continued way to increasing pupils' environmental awareness and environmental culture through curriculum contents.

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SADRŽAJI NASTAVE PRIRODE I DRUŠTVA U FUNKCIJI EKOLOŠKOG OBRAZOVANJA I VASPITANJA

U sklopu ukupnog institucionalnog obrazovanja i vaspitanja značajna pažnja se posvećuje ekološkom obrazovanju u osnovnoj školi. Poslednjih decenija svedoci smo izražene ugroženosti životne sredine, pa je ekološka edukacija mladih neminovnost koju treba kontinuirano proučavati i unapređivati. Pored obrazovne, sve više se ukazuje i na potrebu kvalitetnijeg ostvarivanja ekološke vaspitne komponente. U ovom radu izvršena je analiza nastavnog programa predmeta Priroda i društvo u III i IV razredu osnovnog obrazovanja i vaspitanja radi utvrđivanja zastupljenosti sadržaja koji su u funkciji ekološkog obrazovanja i razvijanja ekološke kulture učenika. Analizom sadržaja nastave prirode i društva, uočene su nastavne teme u okviru kojih se učenicima, direktno ili indirektno, ukazuje na značaj zaštite životne sredine, a time i na njihovu ulogu u razvijanju ekološke svesti. Nastavni predmet Priroda i društvo svojim programskim sadržajima pruža velike mogućnosti za sticanje znanja, umenja i navika iz oblasti zaštite i unapređivanja životne sredine.

Ključne reči: ekološko obrazovanje i vaspitanje, ekološki sadržaji, nastava prirode i društva, nastavni program.