DIDACTIC ASPECT OF TEACHING ENVIRONMENTAL GEOGRAPHY (THE DRAFT OF ENVIRONMENTAL GEOGRAPHY TEXTBOOK FOR PRIMARY SCHOOLS)

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Abstract: Nowadays, we can observe that there is still not sufficient amount of textbooks in various areas of Education. One of these areas is also Environmental geography which is an important part of geography lessons at primary school. Therefore, our main intention in this contribution is to introduce design of the textbook for Environmental geography. Textbook that we have created introduces and solves environmental problems on global, regional and local level in a very detailed way. The aim of the textbook is to applicate all of the dimensions of environmental geography into each class at the second grade of primary schools in Slovakia. We have created didactic material which helps teachers during their teaching, as well as material interesting and engaging for students. The proposed textbook could be motivating because of many additional illustrations, various games and tasks using not only classical, but also modern didactic methods.

Key words: environmental geography, textbook, didactic methods

INTRODUCTION

Nowadays, environmental problems fall into the most discussed topics not only among scientific or specialized society, but also among society as a whole. These problems are the result of considerably negative human impacts on environment, which affect each of its segments. There is an obvious connection among particular environmental problems and their growth during the last decades. Firstly, there are just local problems which grow into regional and finally into global dimensions. Therefore, education of children is very important and leads to better knowledge, responsibility and protection of environment. Environmental geography has a significant role in solving environmental problems. It represents a part of geography which stands at intersection within environmentalism. The main function of environmental geography is to characterize, explain and suggest changes in the relationship between human being and environment. Environmental geography and its topics have their role in education of geography at the second grade of primary school, mainly in regional geography. Particular topics are specified in the National Curriculum (Štátny vzdelávací program, Geografia, 2010) or more precisely in updated version of this document (Inovovaný štátny vzdelávací program, Geografia, 2014). Environmental topics are put into education of geography through cross-sectional themes of environmental education (ŠVP, Environmentálna výchova, 2010). A little attention is paid to environmental topics in geographic textbooks. We can observe the same situation within textbooks for environmental education. The lack of textbook is partially solved by teachers who try to make their own didactic materials or organisations which deal with environmental education.

The aim of this paper is to introduce a draft of the textbook designed for environmental geography at the second grade of primary school. The content and character of the textbook might contribute to improvement of environmental education or environmental problems.

THEORETICAL AND METHODICAL APPROACHES

The study of environment has got an irreplaceable role and importance in Slovak geography. First articles which deals with environmental problems were written by geographers from Slovak Academy of Sciences in Bratislava – Mazúr (1977), Urbánek (1977) and Drdoš (1978) in the eighties. The articles on explicit environmental problems is systematically observed in works of Hanušin, Lehotský (1998), Huba (1993, 1994), Ira (1992) and the others in the nineties. In Slovak geography, the term "Environmental geography" was used for the first time by Drdoš (1991). He described environmental geography as one of the basic direction of geographic research. The object of the research was defined by Drdoš as a knowledge of natural four-dimensional reality on the Erath´s surface, as a zone of contact and intersection of various natural materials for the purpose to protect human needs. Among these needs, the question of human survival (and a whole biosphere) predominates in the times of natural threat, created by technical civilisation. From this period of time, many summarizing papers in scientific or specialized

literature were made to conduct a survey of interest in environmental issues in Slovakia (e. g. Drdoš, 1994, Huba, 2009, Ira, 2007). Many researches were also made at university geography departments, e.g. papers written by Machová and Tremboš (1995), Minár and Tremboš (1995), Spišiak and Bartková (1998), Čižmárová (1997, 1998), Drdoš and Michaeli (2001, 2005), Drgoňa and Kramáreková (1995).

Basic knowledge of environmental geography is contained in didactic literature designated for primary schools, mainly in regional geography topics in geography textbooks. The knowledge is clearly defined in geographical education standards in National Curriculum (2010), or more precisely in updated version of this document (2014). Except of these standards, geography implements also cross-sectional themes of environmental education.

The textbook, as a classical didactic material, is still the most effective form of teaching geography. Therefore, environmental issues were put to geography education through this typical didactic material. Principles of composition of the textbook proceeded from the theory of textbooks, as well as from works written by Zujev (1986), Průcha (1998, 2002), or Turek (2014). Comparison of old and a new concept of the term "textbook" was described in Sikorová (2010), Mikk (2000), Johnsen (1993), or Janko (2012). Mladý (1988) also deals with the question of how the textbook might be designed.

DIDACTIC ASPECTS OF TEACHING EVIRONMENTAL GEOGRAPHY

In comparison with the other geographical disciplines, environmental geography deals with environmental problems to the largest extent. Its main task is to characterize, interpret and suggest the changes in the relationship between human being and environment in a space-time connection, with a sense of sustainable development. Throughout environmental geography, students will find out not only current facts, but they also learn how to analyse, explain and search for possible ways of solutions which are arisen from potential of the landscape and human interests. Simultaneously, their environmental awareness, knowledge and action are developed.

The Role and Importance of Environmental Geography

We regard environmental geography as a sub-discipline in geography, which stands in intersection with environmentalism, and was created as a result of growing specialization in each discipline. Environmental geography deals with geographic study of environmental problems and interaction between environment and human society (Drgoňa, Kramáreková, 2005). We proceed from thesis of Hagget (1976) who considers geography to be a science of the relationship between human being and environment. Therefore, environmental geography is considered to be a specific attitude to solve this relationship, focused on each structure of environment in its space-time changeability.

Environmental geography represents sub-discipline, which takes into account that historical basis of scientific solutions for environmental problems of human being were

originated by geography, which also forms concept of geographic surrounding. According to Mičian (2008), there are plenty of reasons why geography deals with environmental problems. Firstly, geography falls into the most equipped science because it concentred on study of interaction between nature environment and society from the beginning. Secondly, geography stands at the boundaries of natural, social and technical sciences. Another reason is that it has traditionally the widest range of solutions, and also sees the problems in their complete and specialized reality – the landscape reality. So that, geography sees spatial aspects of environmental problems in the background of systematic theory, which we can consider to be the main contribution of geography into interdisciplinary environmentalism.

Environmental Topics in Geography within the National Curriculum for the Second Grade of Primary School

Content of geography directions and education standards are clearly, in very detailed way, characterized in National Curriculum which was formed in 2010 (ŠVP, Geografia, 2010) and its updated version formed in 2014 (IŠVP, Geografia, 2014). In both documents, geography at second grade of primary schools is a part of the field called "Human being and a society". The content of geography, as a school subject, focuses on environmental problems and solves the relationship between nature and human society because of the growth of problems which arise from human activities and their impact on natural landscape and society. During the process of education, students achieve experiences how to react to changes in surround, they learn how to understand and solve these changes in the future. We can find environmental topics mainly in regional geography. The knowledge of regions consists of three parts. First of all, there are basic information about region in the context of the Earth. Then the second part deals with the evaluation of physical geographical, human geographical conditions and the individuality of regions and their comparison to Slovakia. Last but not least, there are various environmental curiosities which contain interesting facts about a region. We focus on National Curriculum (2010) in more detailed way because of its content, which is oriented on environmental topics more than updated version (2014). Despite the fact that the National Curriculum (2014) tries to be more innovative, environmental topics are significantly reduced.

Except of the geography´s own education and content standards, cross-sectional themes of environmental education are also implemented into its content (ŠVP, Environmentálna výchova, 2010).

Tab. 1: Environmental Topics in Geography within the National Curriculum for the Second Grade of Primary Schools

Thematic Unit	Environmental Topics
Australia and Oceania	Ozone hole, Natural sources (the problem of fresh water), UNESCO heritage and nature reservations

America	Nature protection – national parks, cultural monuments, Greenland - icebergs, Origin and activity, Problems of life in big cities, Causes of deforestation in South America
Africa	Problems in Africa (poverty, diseases, disturbances, pests), Extension of deserts (Sahel), Education system and Health care in Africa, National Parks
Asia	Extreme population growth of certain areas in Asia, Boom of industrial production (Asian Tigers), The threat of typhoons, Earthquakes and floods
Europe	Emissions, Smog, Ecologization of industrial production, Transport´s impact on environment
Slovakia	Nature pollution, Disasters and nature threats

Source: ŠVP Geografia, 2010

Crucial role of environmental education at the second grade of primary school is to encourage students, through various school subjects, to comprehend the relationship among organisms and also between human being and environment. The main idea is to improve and comprehend an inevitable changeover to sustainable development of society, which enable observation and awareness of dynamic relationship between human being and environment. Ecologic, economic and social aspects are mutually interconnected in this relationship. The final process is student´s understanding, as a basic requirement of active approach to effective protection and sustainable state of environment.

The Draft of Environmental Geography Textbook

The main aim of this paper is to introduce our draft of Environmental geography textbook which is designated for students at second grade of primary school. Syllabus of the textbook is divided into three main parts, which are based on geographic dimensions of the environment – global, regional and local levels. At the global level (Fig. 1), the textbook deals with worldwide environmental problems, such as climate change, deforestation, use of natural sources, water pollution, and the others. Regional level of previously mentioned problems (Fig. 2) presents the problems in Slovakia, and the local level introduces the problems in north-west part of Slovakia – the Rabča village.

1. 5 Znečistenie vody

Každý deň sa vo svete vypustí do vody vyše 2 miliónov ton priemyselného, poľnohospodárskeho či biologického odpadu. Celosvetovo je ohrozených až 24% cicavcov a 12% vtákov, ktoré žijú vo vnútrozemských vodách. Významným faktorom, ktorý vplýva na znečistenie vody je poľnohospodárska výroba, ktorá sa zvyšuje v dôsledku rastu populácie a jej potravinovej spotreby. Viac než 1/3 ľudí priamo pociťuje nedostatok pitnej vody.

Zdroje znečistenia vody:

- ťažké kovy z priemyselnej výroby (nikel, chróm, meď, zinok, olovo, ...),
- poľnohospodárstvo (chemikálie určené na podporu rastu plodín, pesticídy),
- kontaminácia arzénom (veľmi negatívne účinky na zdravie človeka, najviac v Bangladéši, Indii, Vietname a Kambodži),
- baníctvo (najviac znečisťuje vodné zdroje ťažba uhlia a lignitu),
- ropné havárie,
- farmaceutické spoločnosti, ktoré vypúšťajú odpad do vody (najviac v USA a Európe).

Fig. 1: Processing the topic of water pollution at the global level

Podzemné vody

Vodný zákon označuje ako podzemné vody tie, ktoré sa nachádzajú pod povrchom zeme v pásme nasýtenia, a sú v kontakte s pôdou, alebo pôdnym podložím. Podzemné vody sú určené najmä na zásobovanie obyvateľstva pitnou vodou.

Vedeli ste, že ...

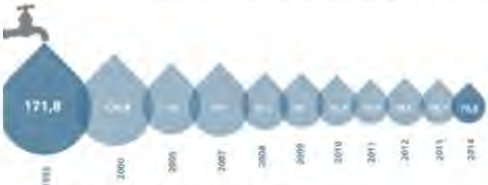
Žitný ostrov, ktorý sa nachádza na juhu Slovenska je najväčším riečnym ostrovom v Európe a zároveň najväčšou zásobárňou pitnej vody v celej strednej Európe.

Aký je stav kvality podzemných vôd na Slovensku?

Hodnotením chemického stavu, ktoré prebiehalo v rokoch 2009-2012 sa zistilo, že v SR má 85,7% podzemných vôd dobrý chemický stav, zatiaľ čo až 14,3% majú zlý chemický stav. Podľa dostupných informácii z monitorovania podzemných vôd v roku 2011 pozorujeme prekročenie prípustného množstva železa (66-krát), mangánu (54-krát) a ďalších prvkov. Oblasť dolného Váhu vykazuje najvyššie percento prekročení prípustného množstva prvkov v rámci všetkých monitorovaných oblastí. Najmenej sú znečistené podzemné vody v horských a podhorských oblastiach.

Zásobovanie pitnou vodou

Počet obyvateľov SR, ktorí sú napojený na verejný vodovod sa neustále zvyšuje, zatiaľ čo spotreba pitnej vody klesá. Kvalita pitnej vody je dlhodobo na vysokej úrovni. Podľa meraní v roku 2014 až 99,6% pitnej vody je vyhovujúcej. Slovensko nemá problémy s ochoreniami v dôsledku zlej kvality pitnej vody. Na obr. 22 môžeme pozorovať výrazný pokles spotreby pitnej vody, najmä kvôli zvyšovaniu cien a meraniu spotreby.



Obr. 20 Spotreba pitnej vody v domácnostiach v SR

Fig. 2: Processing of the topic – water pollution at the regional level

The textbook deals with environmental problems at each level, which are ordered according to the components of the environment – air, water, soil, rocks, flora and fauna.

The draft of the textbook is designed in such way that students are motivated and also interested in knowing new facts about environment. Except of the main body of the text, there are also various supplementary texts, tasks, interesting facts, suggestions for a discussion, didactic games or manuals for experiments. The textbook also offers tasks for revision and strengthening of achieved knowledge. The content of the textbook significantly goes beyond geographic standards in National Curriculum. Various tasks force students to search for another information and achieve more knowledge about environment on their own. The priority of the textbook is to take cross-sectional themes into account and connect environmental problems with other fields of study, e.g. biology (Fig. 3), or history (Fig. 4). Students use not only achieved knowledge, but they also work with geographic atlas or the Internet. The aim of the textbook is to enrich geography education with environmental problems and introduce possible solutions to each problem.

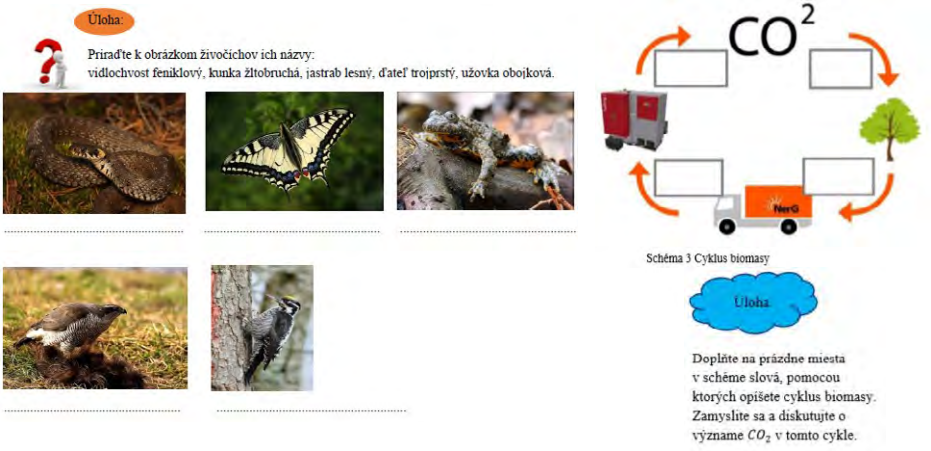


Fig. 3: Fill in the blank spaces

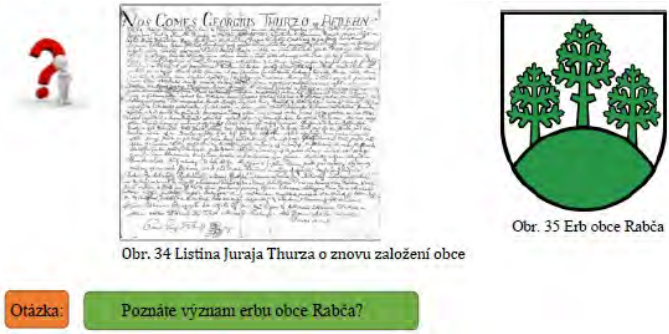


Fig. 4: Do you know the meaning of Rabča´s heraldry?

The textbook is appropriate for each phase of the lesson. It consists of parts whose priorities are to motivate students, introduce and revise the knowledge. Except of the main and supplementary texts, textual part of the textbook also contains links to various webpages (Fig. 5) or applications, which can be downloaded to student´s tablets (computers) or smartphones (Fig. 6). Moreover, the textbook incorporates plenty of elements, using information and communication technologies.

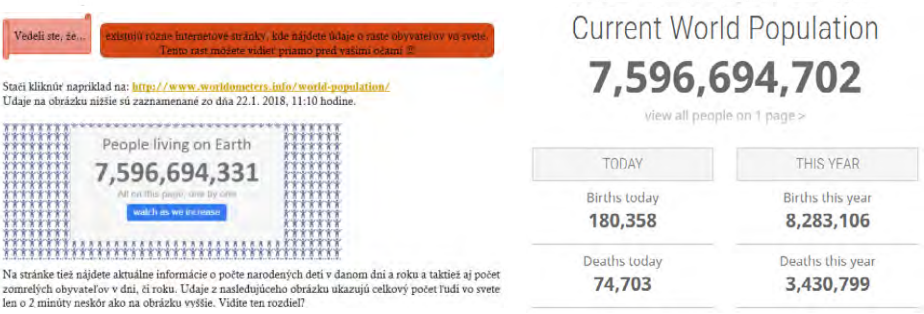


Fig. 5: World population

Fig. 6: Waste atlas

The textbook is also supplemented by substandard parts such as comics, which point out environmental problems in a funny way (Fig. 7).

Fig. 7: Comics

In addition, the textbook contains also several didactic games which are designated mainly for group work, contribute to socialization of students and strengthen class relationships (Fig. 8 and 9). It is possible to play the games indoors but also outdoors, where students can clearly observe the changes made by human being.

Fig. 8: Ozone layer Expert

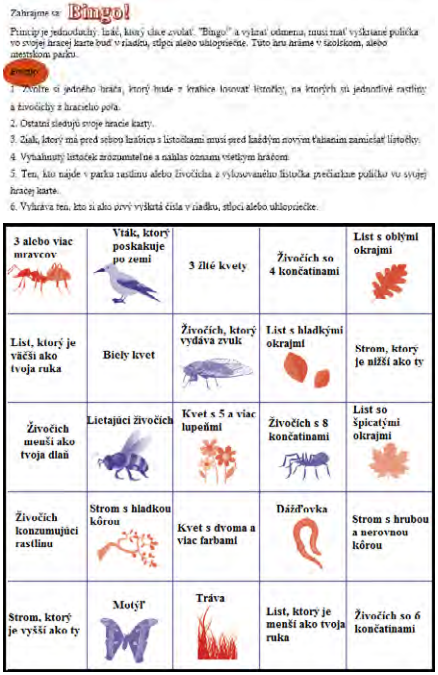


Fig. 9: Bingo

The other interesting segments of the textbook are experiments, which are appropriate not only for school setting but also for home setting. The main task of the experiments is to allow students to experiment at the lessons and see the real problems, by which we support illustrative nature in geography classes. Various methods, such as statistical analysis and working with graphs, are used in experiments. Last but not least, the textbook offers practical, everyday advices or instructions for students and also their parents, which can contribute to improvement of environmental conditions, not only at local level but also at regional and what is more, at global one.

CONCLUSION

Textbooks are considered to be a significant source of education in our country. The character of the textbooks forms the human being and their vision of the world, they teach to know an oddness of the environment in a very detailed way. The textbook has become a symbol of the school. It is the most important source of education, and simultaneously one of the basic educational resource which has its own form. Because of its important role in education, the textbook is one of most crucial teaching aid for a pupil and also a support for a teacher.

In this paper we introduced the draft of environmental geography textbook which might be used as the resource for second grade students in primary schools but also for the first grade students within a school subject – national history. The textbook is appropriate to be a supplementary literature within environmental education. It is very important to emphasize, that the draft of the textbook covers wider-ranging and more detailed area of environmental problems as we can observe in National Curriculum for second grade students in primary schools.

The textbook is designed to catch student´s attention and to force them to study not only at a lesson but also at home. We have tried to make all of important information about environmental problems easily available for every student. In addition, the textbook also offers topics for group or individual work and forces students to carefully perceive their environment, and try to solve environmental problems. The main aim of the work was to encourage students to be interested in today´s environmental problems.

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Zhrnutie

V súčasnom období sledujeme stále nedostatočné množstvo učebníc vo viacerých oblastiach vzdelávania. Jednou z týchto oblastí je aj environmentálna geografia, ktorá je významnou časťou vyučovania geografie už na základných školách. V príspevku sme predstavili návrh učebnice Environmentálnej geografie, ktorá má prioritne slúžiť pre potreby žiakov druhého stupňa základných škôl, ale vybrané časti je možné využívať tiež na prvom stupni v rámci vyučovacieho predmetu vlastiveda. Učebnica je vhodná aj ako doplnková literatúra v rámci environmentálnej výchovy. Považujeme za dôležité zdôrazniť, že návrh učebnice v sebe zahŕňa oveľa rozsiahlejšie a detailnejšie riešené pole environmentálnych problémov ako nájdeme v rámci geografie a tém ŠVP pre druhý stupeň základných škôl.

Učebnica je koncipovaná tak, aby zaujala žiakov natoľko, aby s ňou samostatne pracovali aj mimo vyučovania geografie. Charakterom spracovania by mohla byť silne motivačná aj z dôvodu množstva obrázkových príloh, rôznorodých úloh a hier využívajúc nielen klasické ale aj moderné didaktické metódy. Jednoduchou ale pri tom zábavnou formou sa snaží sprístupňovať všetky podstatné informácie o vybraných environmentálnych problémoch v rámci troch základných dimenzií – globálnej, regionálnej i lokálnej. Vytvára námety na spoločnú i samostatnú prácu, vedie žiakov k pozornejšiemu vnímaniu svojho okolia a následnému riešeniu problémov životného prostredia. Hlavným cieľom bolo dosiahnuť, aby sa žiaci viac zaujímali o environmentálne problémy súčasného sveta, na základe čoho možno podporiť ich environmentálne povedomie, ktoré bude viesť nielen k lepšiemu poznaniu ale aj ochrane a starostlivosti o životné prostredie.