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THE CURRICULA REVISION IN THE CONTEXT OF EDUCATION FOR SUSTAINABLE DEVELOPMENT: FROM THE PERSPECTIVE OF TWO PRIMARY SCHOOL SUBJECTS' CURRICULA*

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Abstract. This paper looks at the goals and objectives of education for sustainable development (ESD), including the competencies and value systems which can and should be developed in children in first cycle of primary education, and analyses the factors underlying this development. By using the Science and Social Studies teaching curriculum as an example, we pointed at the reasons for and possible directions of the curricula revision in the context of ESD. The method of theoretical analysis was applied in examining the curricula in terms of their topicality, preciseness and systematic approach as important prerequisites for a successful integration of the goals and content of ESD. The results of the research highlight the following problem areas: (1) significant, though selective representation, (2) lack of preciseness, (3) insufficient horizontal and vertical inter-connectedness of the key elements of this educational concept across all segments of the analysed curricula, as well as insufficient focus of the curricula on the development of the competencies and value systems which this concept encompasses. The paper proposes feasible steps in implementation of the ESD goals that could be taken in curricula revision, particularly in case of the World Around Us and Science and Social Studies subjects, taught in first cycle of primary education in the Republic of Serbia.
Keywords: competencies, educational standards, sustainability, Science and Social Studies teaching.

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INTRODUCTION

Sustainable development is a concept of development which is supposed to meet the needs of both present and future generations (WCED, 1987). The importance of sustainable development, as well as the pertaining concept of education, arises from the complexity of very serious local and global environmental issues and their inter-connectedness with economic growth and social isues. The environmental issues have been recorded in many reports, such as the *Living Planet Report 2016* (WWF, 2016), and their connection with human activities are indisputable. The mutual impact is the result of the fact that the environment and human needs and activities cannot be viewed separately. It is upon this fact that the concept of education for sustainable development (ESD) is based. It consists of three interconnected and interdependent components: environmental protection, economic growth, and social equality. The aim of the concept, in a broader sense, is to "improve harmony among human beings and between humanity and nature" (WCED, 1987: 73). The core idea is to harmonise, by applying a holistic approach, developmental goals with the limitations imposed by the environment (Ibid). The realisation of these goals largely depends on the knowledge, value system, skills and behaviour of each and every individual (of all age-groups), while sustainable development particularly depends on the involvement of the young generation. For this reason, education is a key factor of change and transformation of human society into a sustainable one (Andevski, Urošević & Stamatović, 2012; Rončević & Rafajac, 2012; The Earth Charter Initiative, 2000; UN, 2015; UNESCO, 2005; WCED, 1987). In addition, one of the prerequisites for a smooth functioning of education in this context is to integrate "sustainable development principles, values and practice in all aspects of education and learning" (UNESCO, 2005: 1). Furthermore, if sustainable development has been recognised as a concept which could preserve the vitality and variety of our planet, while simultaneously enabling the improvement of the quality of life (Jackson, 2005), the obligation to adhere to pedagogical principles of scientific approach and modernity requires the integration of this concept in all aspects and levels of education systems of all countries in the world. To conclude, the requirements relevant to this concept must be observed in the process of curricula design and/or revision for each subject, at all levels of statutory education.

However, a successful realisation of the said requirements has been hampered by a continous advancement of science and technology, changes in the character of human society and expectations of the society and economy with regard to education (Hodson, 2003). There are several other reasons which make the implementation of ESD goals in the curriculum of individual subjects a complex and demanding process. First, every attempt at integrating successfully this concept in a particular school subject should reflect the characteristics and core values of sustainability, despite the complexity of sustain-

able development and the concept of education arising from it. For instance, in the sustainable development literature, opinions vary regarding what should be preserved, developed, as well as regarding the time frame (see: National Reseach Council, Policy Division, Board on Sustainable Development, 1999), whereas little is known about the needs of future generations (De Žarden, 2006). The concept of ESD itself is also subject to different interpretations, while the conterporary responses of education to generated problems of „unsustainability" are criticized by many authors (Bonnett, 2013; Bonnett, 2016; Jickling, 2013; Rončević i Rafajac, 2012). Furthermore, the complexity of the process is clearly reflected in the need to adapt the goals of ESD to match the characteristics of a particular school subject in which they are to be integrated and the age-specific developmental characteristics of the pupils and young people who will be taught that subject. Finally, the seriousness of the concept is also reflected in the need to harmonise the above-mentioned requirements with the calls for the revision of the national curricula and reorientation of education towards teaching skills important and functional for both the individuals and the society as a whole. Each requirement is analysed in-depth in further text.

The most recent UN document, Sustainable Development Agenda until 2030 (UN, 2015: 17), in the chapter dealing with education, emphasises the importance of developing knowledge and skills necessary for the promotion of sustainability, and cites "sustainable way of life, human rights, gender equality, promotion of culture of non-violence and peace, global citizenship and respect for cultural diversity" as important goals and values of ESD. That clearly illustrates the complexity of the goals. The goals include the development of skills and value systems with regard to the environment, the purpose of which would be to: preserve biodiversity as well as the interconnectedness and inter-dependence of all living creatures and elements of inanimate nature; identify and find solutions for environmental issues, their causes and effects; protect the environment. This educational concept also encompasses values such as understanding and accepting cultural diversity, solidarity, tolerance, cooperation, peaceful conflict resolution and inter-generational responsibility. These values represent some of key tasks for the concept of global education, aiming to prepare young generations for the life in democratic society, as well as aiming to prepare them to act in responsible manner and to contribute to global community (Abdullahi, 2010). In addition, ESD enables the development of skills necessary for sustainable living: handling rational consumption (being able to distinguish needs from wants), recycling, repair and reuse of products, use of renewable energy sources. Enviromental issues were, to the great extent, created as a result of human consumption, and therefore, some solutions include a different system of values and competences of every individual consumer (Veinović, 2013). In addition, it is important that these goals can lead to the establishment of stronger moral values for every individual, and establishment of better harmony among humans, which are, as we have

seen, also the goals of sustainability. The fact that all these elements constitute a functional whole only if they are viewed together is reflected in another important characteristic of ESD – a holistic approach. This approach implies, above all, inter- and multidisciplinary, as well as simultaneous approaches to all issues related to sustainability. It also implies that ESD must be based on sustainability as a state of mind (Bonnett, 2003), given that the complexity, interconnectedness and volatility of modern societal issues require a holistic, systemic mindset (Andevski i Kundačina, 2004; Gadotti, 2010; Hodson, 2003).

The adaptation of the sustainability goals to comply with the characteristics of a particular subject is an important step in the process of integrating the goals in a curriculum. The process is hampered by the fact that some subjects are less open for integration of sustainability goals, and particularly for a holistic approach to the subject matter which is a key characteristic of ESD. This does not mean that all sustainability goals have to be implemented in a curriculum at all costs. On the other hand, attempts to integrate the goals which have similarities with the branch of science on which a particular subject is based should not be disregarded. Namely, apart from the requirement to treat the problems from different areas of sustainable development holistically and simultaneously, it is also true that the solution to one problem may lead to the solution or mitigation of other problems in the same or different components of this concept of education (WCED, 1987). Similarly, dealing with specific aspects of sustainability within one subject may contribute to the improvement and realisation of the goals of ESD as a whole. For instance, the science subjects can and should be oriented towards better knowledge of the nature and its laws, dependence of human beings upon nature, man-made problems, their causes and effects. Some research papers also show that in Serbia the above mentioned areas are represented in primary and secondary school curricula and didactic materials for subjects like biology, chemistry, physics and geography (Maravić, Ivković, Segedinac & Adamov, 2014; Stanišić & Maksić, 2014). However, when teaching social sciences and humanities related subjects, it is also possible and necessary to focus on implementation of the goals of ESD related to a good quality social relations and characteristics of a good quality lifestyle irrespective of its material dimension. On the other hand, there are also integrated subjects with an interdesciplinary approach to natural and social phenomena, which gives them a great potential (but also an obligation) for the realisation of *all* goals of ESD. Finally, the quality of integration of sustainability into curricula increases from the level of education *about* sustainable development, through education *for* sustainable development, and up to the level advocated by the authors of this model – *sustainability education*, which is characterized by innovative, holistic, participatory and interdisciplinary approach (Sterling & Thomas, 2006). However, our opinion is that specific model of integration of sustainability in curricula – through accommodation, reform or transformation – has to depend on specific char-

acteristics of every particular subject. It is crucial that the potential of all subjects within this context is explored well and fully utilized.

When considering the implementation of the goals of ESD in a curriculum, the age-specific developmental characteristics of the pupils and young people who will be taught that subject should be taken into account. This requirement is especially important in the context of children who are in the first cycle of compulsory education (ages 7–11 in Serbia). The rationale for the realisation of the goals as early as in the first cycle curricula can be found in some cognitive theories underpinning the modern concept of education and learning. For instance, according to Vygotsky (Vigotski, 1977), it is at this age that a transfer to a scientific thinking occurs. Some scholars claim that children in the early cycle of education can understand models and concepts, especially if theory is adapted to their capabilities and access to knowledge is provided through experimenting (Gelman, 2004, according to: Cvjetićanin, Pećanac, Sakač & Djurendić-Brensel, 2013). Piaget and Inhelder (Pijaže i Inhalder, 1978) observed that children age 7-8 understand causality more intensely, which is significant in the context of ESD. Latest neuroscience discoveries, based on cognitive development research, indicate that all forms of learning important for human cognition are present in first months of human life and that they depend on multi-sensory networks of neurons in brain (Goswami, 2015). Finally, just like all previously mentioned theoretical frameworks, this confirms that the quality of learning enviroment is important for stimulating congnition (Ibid). On the other hand, having in mind complexity of tasks as well as neccessary holistic approach in ESD, above mentioned theories support our premise that incorporation of sustainability goals in teaching would support cognitive development of children of this age. Furthermore, there is a number of authors who already pointed out and proposed a wide range of possibilities for effective implementation and achievment of the ESD goals in students in first cycle of primary education (Husanović-Pejnović, 2011; Uzelac, Lepičnik-Vodopivec i Anđić, 2014), or even conducted research in order to provide specific examples of what might count as learning about and for sustainability in children of that age (Summers & Kruger, 2003).

Results of the research conducted by Stanisic (Stanišić, 2009) showed weak correlation between school-acquired knowledge and students' willigness to get engaged in ecological activities, and consequently highlighted that teaching methods, which should equally address the development of the pupils' rational, emotional and sphere of individual values, ought to be improved. In other words, the efficient realisation of the goals of ESD requires a holistic approach to the development of the pupils' personality which would be cognitively, but also affectively, action and value oriented (Andevski i Kundačina, 2004). This approach is fully in line with modern requirements and trends regarding curricula revision and alternative evaluation of the pupils' achievements which focus on the holistic development of pupils' personality, their personal and professional development, as well as development

of competencies and skills functional for both individuals and the society as a whole. The requirements are based on the scientific and professional literature (Andevski, Urošević i Stamatović, 2012; Baucal, 2013; Letina, 2015; Sahlberg, 2013), the results of PISA and TIMSS student achievement tests, as well as the experience and practice of countries with a successful education systems, such as Finland and Singapore. Also, changes in understanding of nature and process of learning, under the influence of congnitive theories and constructivism, result in "changes in curricula, teaching methods and techniques within teaching practice" leading to "more authentic educational goals and education for 'real life'" (Kuzmanović i Pavlović Babić, 2011: 77). Namely, the understanding and dealing with the complex problems of today requires, apart from adequate information, the development of critical thinking, meta-cognitive interpretation of independently collected information and creative solving of existing problems, as well as comprehensive consideration of sustainability goals (Abdullahi, 2010; Andevski & Kundačina, 2004; Kahn, 2010; Sterling, 2010). In addition, there is a focus on the transfer of school knowledge, and the application of lessons learned – the application of knowledge and skills in real-life activities, as well as in every-day problem solving (Kuzmanović i Pavlović Babić, 2011), which in this context means participation in activities aimed at preventing and solving problems in the area of all three components of sustainable development, and the way of life in conformity with the objectives of sustainability. Finally, a factor which should contribute to the said transfer is a positive attitude towards this subject matter (Hodson, 2003). It implies the development of a responsible attitude towards nature, other people, as well as responsibility to oneself. According to Sterling (2010), the above-mentioned development changes, initiated by ecological and other problems that modern society is faced with, are conditioned by transformative and socially engaged, future oriented models of teaching. According to Andevski and associates (Andevski, Urošević i Stamatović, 2012), some preconditions for these changes include high-quality education programs, and standard-based learning.

Science and Social Studies teaching, or more precisely, the subjects World Around Us (1st and 2nd grades of primary school) and Science and Social Studies (3rd and 4th grades of primary school) are compulsory subjects in the first cycle (four-year-long) of primary education in the Republic of Serbia. The goals of ESD can easily be implemented in the curricula for these subjects (Veinović, 2007, 2013). The claim is based on an interdisciplinary approach to natural and social phenomena in these subjects, the orientation of the subjects towards scientific literacy of students, as well as the fact that the goals are realized at the age 7–11, when children develop intensively and are receptive to the formation of adequate competencies and acceptance of the value system in the field of sustainability (Ibid). The results of the recent research (Maravić *et al*., 2014; Stanišić & Maksić, 2014) show representation of the environmental education goals and contents in curricula of primary school

subjects in Serbia, including the World Around Us and Science and Social Studies. Yet, environmental education is a concept that is narrower than the concept of education for sustainability. On the other hand, full integration of all elements of ESD in Science and Social Studies teaching was addressed in our previous analysis (Veinović, 2007). However, teaching programs for these subjects, for first three years of primary school, were reformed in 2010. In the following year, educational standards at the end of the first cycle of compulsory education were introduced for the first time. This is the reason why, at the end of the period that was declared as a Decade of Education for Sustainable Development (2005–2014), we have chosen to determine if and how the concept of sustainability has been reflected in the reform of curricula for these school subjects.

METHODOLOGY

The aim of this research was to determine whether and how the concept of sustainable development and its elements are included in intended curricula for the school subjects World Around Us and Science and Social Studies. For the purposes of the analysis, the concept of a curriculum included: goals and objectives, content, suggested teaching methods and educational standards for the subject Science and Social Studies at the end of the first cycle of compulsory education (hereinafter, educational standards). Educational standards define key knowledge and competencies (in concrete and verifiable form) that students are expected to learn until the end of the first cycle, and these standards are based on the curricula of the primary school subjects World Around Us and Science and Social Studies (Pešić, Blagdanić i Kartal, 2009). This was the reason to integrate them into our analysis. The selection of these elements for analysis was made in compliance with the definition according to which a curriculum implies "scientific setting of goals and objectives, selection of content, defining the syllabus, setting up the organization and teaching methods, as well as the evaluation of results" (Vilotijević, 2012: 24). The research objectives were to determine in the analyzed curricula: (1) explicit representation of the sustainable development concept; (2) representation of specific elements of sustainable development: biodiversity; connectivity and dependence of living beings and inanimate nature; environmental problems, their causes and consequences; environmental protection; solidarity; tolerance; cooperation; peaceful resolution of conflicts; intergenerational responsibility; rational consumption; the difference between needs and wants; recycling; repair and reuse of products; renewable energy. These were the key words and concepts whose explicit and implicit presence was analyzed within all elements of curricula (this analysis was conducted based on Veinović, 2014); (3) orientation of the objectives and tasks of the subjects, as well as the educational standards of achievement, towards the development of academic knowledge, competencies and values, or, in other words, the development of

a positive attitude towards the values of sustainability. For the purposes of the paper, and considering the previously specified importance of the transfer of school knowledge in the field of sustainability to everyday life, a distinction was made between: academic knowledge and competencies focusing on the functional aspects of specific knowledge and skills (Baucal, 2013). The value system, that is, a positive attitude towards sustainability issues, was analyzed separately (socio-affective domain).

The method of theoretical analysis was applied in the research, while the data were collected by using the content analysis technique. The following documents were used as samples: The curricula for the subjects World Around Us and Science and Social Studies (Pravilnik o izmenama i dopunama pravilnika o nastavnom planu i programu za prvi i drugi razred osnovnog obrazovanja i vaspitanja, 2010; Pravilnik o nastavnom planu za prvi, drugi, treći i četvrti razred osnovnog obrazovanja i vaspitanja i nastavnom programu za treći razred osnovnog obrazovanja i vaspitanja, 2010; Pravilnik o nastavnom programu za IV razred osnovnog obrazovanja i vaspitanja, 2006) and General Standards of Achievement – educational standards for the end of the first cycle of compulsory education for the subject Science and Social Studies (Pravilnik o obrazovnim standardima za kraj prvog ciklusa obaveznog obrazovanja za predmete srpski jezik, matematika i priroda i društvo, 2011). The collected data were analysed by using a qualitative analysis, and, where possible, the results were presented in tables.

RESULTS AND DISCUSSION

(1) Explicit representation of the sustainable development concept in the analysed curricula is shown in Tables 1, 2 and 3.

Table 1: Explicit representation of the sustainable development concept in the curricula: subject World Around Us

Subject	World Around Us						
Element of the curriculum	Goal of the subject	Objectives	Objectives across grades		Content		Teaching methods
Grade	1. and 2.	1. and 2.	1.	2.	1.	2.	1. and 2.
Sustainable development		✓				✓	✓

Table 2: Explicit representation of the sustainable development concept in the curricula: subject Science and Social Studies

Subject	Science and Social Studies								
Element of the curriculum	Goals	Objectives		Objectives across grades		Content		Teaching methods	
Grade	3. and 4.	3.	4.	3.	4.	3.	4.	3. and 4.	
Sustainable development		✓				✓	✓	✓	

Table 3: Explicit representation of the sustainable development concept in the curricula:educational standards

Subject	Science and Social Studies
Element of the curriculum	Educational standards
Sustainable development	Not represented

The data show that the sustainable development concept: (1) is not represented in the goals of the said subjects; (2) is represented in the objectives of both subjects, except in the document referring to the subject Science and Social Studies in the 4th grade; (3) not represented in the objectives for all grades; (4) represented in the subject content for all grades, except in the 1st grade; (5) represented in the part of the curricula dealing with the methods of teaching in all four grades; and 6. not represented in the educational standards. The fact that sustainable development is represented in the objectives of both subjects in the documents related to the first three grades, but is missing from the same category of the curricula in the document related to the subject Science and Social Studies in the 4th grade, can be explained by the fact that the said document was written in 2006, while other documents (for the first three grades) were revised in 2010. However, the same data indicate that the corrections of the curricula made in 2010 were more reduced and insufficient rataher than substantial. What is also relevant for the evaluation of the quality of sustainable development integration in the curricula is the fact that only one topic deals with this issue in the subject content for the 2nd and 4th grades of primary school, and two topics in the 3rd grade. The recommended teaching methods for the 1st and 2nd grades suggest that the content of all topics should be taught in a manner which will familiarise pupils with the principles of sustainable development, while the same recommendation can be found only for the selected content topics in the curricula for the 3rd and 4th grades.

The results indicate that the concept of sustainable development is not systematically implemented in all elements of the curricula. It seems that the concept was randomly integrated in the curricula, while the results clearly indicate that there is a discrepancy among some parts of the curricula (the concept is represented in the objectives of the subject, but not in the educational standards which should serve as a basis for the evaluation of students' achievements). On the other hand, it can be concluded that sustainable development is not consistently included in the same category "over time", i.e. vertically (e.g. it is not included in the subject content for each grade).

(2) The goals of the subjects World Around Us and Science and Social Studies do not explicitly include a single specific element of sustainable development. This fact was expected, given the general character of this part of the curricula. However, as the development of skills for responsible living in the natural and social environments is partly included in the goals set for each subject respectively, such generalised formulation implicitly encompasses specific segments of sustainable development (Tables 4 and 5). Consequently, it turned out that certain specific elements are included in the goals, but not in the objectives and in contents, hence it is not clear how these goals are expected to be achieved. The objectives for the subjects World Around Us and Science and Social Studies, as well as the objectives set for each grade, contain some elements related to sustainable development, and it is quite difficult to understand the system behind their implementation. The only exception are the objectives which consistently include the element of environmental protection in both subjects and at all levels of grades 1 to 4. Nevertheless, it must be noted that almost identical formulation (and similar to the one used in the description of the subject goals) regarding the development of an attitude of responsibility towards the environment has been used in the specific objectives as well. It is possible, but not obligatory, for elements of every sustainable development component to be recognized in these and some other generally formulated objectives. For this reason, we expected to see more concrete goals (instead of their "truncated" form), and, consequently, a better representation of the sustainable development elements.

Table 4: Representation of specific elements of sustainable development in the curricula: Subject World Around Us

Subject	World Around Us						
Curriculum element	Goals	Objectives	Objectives across grades		Content		Teaching methods
Grade	1. i 2.	1. i 2.	1.	2.	1.	2.	1. i 2.
biodiversity					✓	✓	
interconnectedness/ dependency			✓		✓	✓	✓
issues						✓	✓
causes						✓	✓
effects						✓	
protection	✓	✓	✓	✓	✓	✓	✓
solidarity	✓						
tolerance	✓		✓		✓		✓
cooperation	✓						
peaceful conflict resolution	✓						
intergenerational responsibility	✓						
rational consumption	✓	✓			✓		
needs/wants	✓						
recycling	✓					✓	✓
repair/reuse	✓						
renewable resources	✓						

Table 5: Representation of specific elements of sustainable development in the curricula: Subject Science and Social Studies

Subject	Science and Social Studies							
Curriculum element	Goals	Objectives	Objectives across grades		Content		Teaching methods	
Grade	3. i 4.	3. i 4.	3.	4.	3.	4.	3.	4.
biodiversity					✓	✓	✓	✓
interconnectedness/dependency					✓	✓	✓	✓
issues					✓	✓	✓	✓
causes							✓	✓
effects								
protection	✓	✓	✓	✓	✓	✓	✓	✓
solidarity	✓					✓		✓
tolerance	✓		✓	✓	✓	✓	✓	✓
cooperation	✓							✓
peaceful conflict resolution	✓							
intergenerational responsibility	✓						✓	
rational consumption	✓	✓			✓	✓		✓
needs/wants	✓							
recycling	✓				✓	✓	✓	✓
repair/reuse	✓							
renewable resources	✓					✓		✓

A selective representation of the sustainable development elements and the absence of a system in their integration was observed in both the content and teaching methods sections of the curricula (Tables 4 and 5). All elements related to the environment as a sustainable development component are consistently integrated only in the subject content for the 2nd grade. In addition, the analysed elements of sustainable development are mostly (but not entirely) integrated in the part of the curriculum describing the teaching methods for the 4th grade. The results of the research also show that the contents in which the elements are integrated are not consistently connected either vertically or horizontally. For example, rational consumtion is represented in every subject content, except the 2nd grade one. Recycling is not mentioned in the 1st grade curriculum, whereas it appears, in almost identical form (with an emphasysis on the importance of recycling) in the subject content for the 2nd and 3rd grades. Environmental issues are also unsistematically and selectively represented: they are missing from the 1st grade subject content, while the 2nd grade content includes only water, air and soil pollution; pollution (unspecified) is included in the 3rd grade subject content, but not in the 4th grade content, where biodiversity issues appear for the first time.

When it comes to educational standards, only 16 out of 70 statements were identified as statements encompassing the elements of sustainable development (5 basic level, 10 intermediate and 1 advanced level statement). As Table 6 shows, a selective and insufficiently systematic representation of sustainable development elements is evident here as well. The majority of the statements contain the same sustainable development element (e.g. biodiversity), while other elements were mostly left out. Apart from this, some statements are over-generalised. This is the reason why the same basic-level statement "distinguishes between harmful and unharmful human activity upon the environment" was identified in the analysis as a statement which simultaneously encompasses several sustainable development elements (environmental issues, their causes and effects, environmental protection). It is also problematic that the difference in the level of knowledge is very vague in some statements which refer to the same subject content. This is evident in the following statements: "understands the inter-connectedness of animate and inanimate nature from obvious examples" (intermediate level), "understands the inter-connectedness of animate and inanimate nature from less obvious examples" (advanced level). This statement was also analysed in the research which dealt with the quality of educational standards. It was concluded that the difference between obvious and less obvious examples was vague and problematic (Veinović, Blagdanić & Marinković, 2016). The said problems hamper an objective and efficient evaluation of student achievements, which is one of the most important purposes of educational standards.

Table 6: Representation of specific elements of sustainable development in the curricula: Educational standards

Subject	Science and Social Studies		
Curriculum element	Educational standards		
Level of achievement	Basic	Intermediate	Advanced
biodiversity	✓	✓	
interconnectedness/ dependency		✓	✓
issues	✓		
causes	✓		
effects	✓		
protection	✓	✓	
solidarity			
tolerance			
cooperation			
peaceful conflict resolution			
intergenerational responsibility			
rational consumption		✓	
needs/wants			
recycling			
repair/ reuse			
renewable resources		✓	

This part of the analysis confirmed and deepened our observations and conclusions reached during and after our previous research task. Selective representation, lack of preciseness, unsystematic approach and vague, ocassionally non-existent, development of some concepts and elements of sustainable development through different grades and different levels of educational standards are among the key characteristics of the analysed curricula.

(3) The goals and objectives of the subjects in the analysed curricula, which had been singled out in the previous two research tasks because they

contain concept of sustainable development as a whole or some of its key elements, were analysed in terms of the orientation towards different aspects of students' characters. As the goals include development of capacities for responsible living in the environment, we concluded that the goals were oriented towards the competencies. The selected objectives and objectives across grades of the subjects World Around Us and Science and Social Studies were classified in three categories: (1) objectives referring to academic knowledge, or knowledge and comprehension, which are the first two categories in Bloom's taxonomy. The objectives include: objective "learning about civilisational heritage and how it can be preserved, improved and used rationally", which reappears in the same form in the objectives of both subjects, and the subject objective in the 1st grade "awareness that human beings are a part of their environment and that their actions have an impact on it, and development of ability to recognise the impact of human beings on health and the environment"; (2) objectives dealing with the development of positive attitudes towards the values of sustainability. One objective was identified to belong to this group, the task which repeatedly appears in a slightly modified form across grades and includes the development of responsible behaviour regarding the environment; (3) multi-oriented, but over-generalised objectives. Several objectives of this type were identified, including an objective of the subject Science and Social Studies "development of environmental awareness and understanding of the basic elements of sustainable development."

All statements given within educational standards that were singled out in the previous research task are cognitively oriented, which means that they refer to academic knowledge, or more precisely, knowledge and comprehension. Here are some examples: "distinguishes between harmful and unharmful human activity upon the environment" (basic level); "familiar with basic measures for the protection of animate and inanimate nature as natural resources (intermediate level); "understands the inter-connectedness of animate and inanimate nature from less obvious examples" (advanced level). The results of the previous research confirmed that educational standards and the curricula in general (in Serbian primary education) were predominantly oriented towards the acquisition of specific academic knowledge and the comprehension of that knowledge (Stanišić & Maksić, 2014; Veinović, 2013; Veinović, Blagdanić & Marinković, 2016). In the context of this research, and in terms of the importance of transfer of the sustainability-related knowledge acquired at school level to everyday life, the absence of the competence-oriented statements can certainly be considered as a deficiency of educational standards. The concept of standards as primarily educational ones is problematic in this context as well, given the fact that a holistic approach to students' personality is crucial for an efficient realisation of sustainabilty goals. The Finnish education system proves that the standards can be oriented towards the development of responsibility, moral traits and ethical attitudes (Sahlberg, 2013).

The goals, objectives and educational standards containing the elements of sustainability should be more (and better) oriented towards all aspects of students' personalities, as well as coordinated in a more effective manner. This would have a positive effect on the quality of teaching and a more efficient realisation of sustainability goals. There are other authors (Letina, 2015) who also view competence-oriented curricula as an opporutunity for the improvement of the evaluation process in education and modernisation of schools. The orientation towards the functional aspect of the specific knowledge in the area of ESD is not only necessary and important in itself, but also in the context of the modern curricula design. The same applies to the orientation towards the socio-affective domain.

ESD competencies in children of early primary school age could be developed based on every key element of sustainable development that we previously singled out as necessary for curricula analysis (e.g. ability to plant and nurture a plant; ability to explain how humans' everyday life and actions depend on natural resources; ability to propose a peaceful peer conflict solution; knowledge how to perform solidarity action with those who need help; ability to explain/investigate environmental impact of everyday consumer acts). In fact, all selected elements could be classified under the concepts of biodiversity, water, air, soil and energy, and treated from the perspective of their significance (by itself and significance for humans), environmental issues, their causes and possible solutions that can be found in men's (including young children's) direct environmental as well as in different social and consumer activities. Given the composite nature of the World Around Us and Science and Social Studies subjects, their curricula could be revised by constructing all of their elements and educational standards oriented towards competences, around the above mentioned cluster of inter-related concepts.

CONCLUSION

By using the World Around Us and the Science and Social Studies subjects, taught in the first (four-year-long) cycle of primary education in the Republic of Serbia as an example, the paper points out the deficiencies in the implementation of the goals of ESD, and proposes possible directions and key steps that could be taken in the revision of the curriculum for a specific subject. These subjects, because of their composite nature and interdisciplinary contents, are very suitable for integration of the concept of sustainability at the level of transformation, which, according to Sterling (2010), should lead towards expected paradigm changes. However, discouraging fact is that during the Decade of Education for Sustainable Development, implemented changes in analysed curricula are mostly of cosmetic nature. The results of the research highlight the following problem areas: (1) significant, though selective representation of sustainable development as a whole or of some of its key elements; (2) lack of preciseness in objectives and educational standards en-

compassing specific elements of sustainability; (3) insufficient horizontal and vertical inter-connectedness (systematic approach) of the key elements of this educational concept across all segments of the analysed curricula, while some concepts and elements of sustainability are not fully developed across different grades and at different levels of achievement in educational standards; (4) lack of preciseness in the curriculum, especially in educational standards, on the development of competencies and value systems, or appropriate attitudes regarding the ESD. The research on environmental impact of consumerism from the perspective of the Science and Social Studies teaching curriculum, showed the similar results (Veinović, 2013). Creating a basis for the formation of the systems of concepts, in this case the concepts of ESD, requires that students are offered support in terms of the selection and the way of structuring the concepts and clusters of inter-related concepts both horizontally (within the same grade) and vertically (across different grades). In our opinion, the beginning of this process should have already been included in the curriculum and manifested in all its elements. Our proposals are especially important in the context of the holistic approach to the complex problems of the modern world and sustainability issues, as well as in terms of cognitive development of students and formation of a holistic mindset and behaviour that will be functional in different everyday situations. Therefore, we support Hodson's (2003) idea that sustainability should be a common element in all global and local problems, and generally, social and environmental issues included in a single curriculum, as well as the idea that sustainable development becomes the basis for transformative learning (Sterling, 2010), at least in the subjects with integrated content such as the content of the subject Science and Social Studies. Indeed, the key prerequisite for a successful integration of the goals of ESD and objectives in every school subject intended curriculum is that these goals and objectives are adapted to suit the characteristics of a particular subject and the specificities of the children's age. Further, the requirements pertaining to ESD and encompassed in the different segments of the curriculum must be appropriately revised to become more concrete and explicit, without giving room to different interpretations and, consequently, non-compliance with the requirements. Some previously conducted research highlighted similar results (Veinović, 2013; Veinović *et al*., 2016). Available reaserch shows that other countries have similar problem with implementation of the ESD goals within curricula for first cycle of primary education. According to Kuzich and associates, Australian Curriculum „suffers" from the similar „lack of explicitness" which „makes it difficult for teachers to know what and how to teach about sustainability" (Kuzich, Taylor & Charles, 2015: 186). Lastly, the holistic approach requires that the curricula should be more competence-oriented, and that new ways should be found to make the orientation to the socio-affective aspects of the personality of students more effective.

Sustainable development has a potential to provide both preservation of the environment and a better quality of life for people. Education is viewed as a crucial factor in the transformation of the human society into a sustainable society. Given the importance of sustainable development and the educational concept arising from it, the revision of the curricula for all subjects and at all levels of compulsory education, which would include a carefully planned strategy for an efficient introduction of the relevant competencies and value systems, as well as goals pertaining to sustainability, is the necessary part of the education reform.

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РЕВИЗИЈА КУРИКУЛУМА У КОНТЕКСТУ ОБРАЗОВАЊА ЗА ОДРЖИВИ РАЗВОЈ: ИЗ ПЕРСПЕКТИВЕ КУРИКУЛУМА ОСНОВНОШКОЛСКА ПРЕДМЕТА

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Апстракт

У раду дајемо преглед циљева из домена образовања за одрживи развој, укључујући компетенције и систем вредности које је могуће и потребно развијати код деце млађег школског узраста и анализирамо их у контексту фактора који су условили њихово развијање. На примеру курикулума наставе природе и друштва указали смо на разлоге и могуће правце ревизије једног курикулума у контексту образовања за одрживи развој. Методом теоријске анализе курикулуме смо проучили са становишта актуалности, конкретности и систематичности, као предуслова успешне интеграције циљева и садржаја из подручја образовања за одрживи развој. Истраживање је указало на значајну, мада селективну заступљеност, недовољну конкретност и слабу хоризонталну и вертикалну повезаност кључних елемената овог образовног концепта у свим сегментима анализираних курикулума, а слаба је и оријентисаност курикулума на развој компетенција и система вредности из овог подручја. У раду предлажемо неке од кључних корака у процесу имплементације циљева из области образовања за одрживи развој које је могуће предузети приликом ревизије курикулума, посебно у случају предмета Свет око нас и Природа и друштво.
Кључне речи: компетенције, настава природе и друштва, образовни стандарди, одрживост.

РЕВИЗИЯ КУРРИКУЛУМОВ В КОНТЕКСТЕ ОБРАЗОВАНИЯ ДЛЯ ОДЕРЖИМОГО РАЗВИТИЯ: ИЗ ПЕРСПЕКТИВЫ КУРРИКУЛЮМОВ ДВУХ ПРЕМЕТОВ ДЛЯ НАЧАЛЬНОЙ ШКОЛЫ

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Аннотация

В работе предлагается обзор целей из сферы образования для одержимого развития, включая компетенции и систему ценностей, которые надо и необходимо развивать у детей младшего школьного возраста и анализируются в контексте факторов, которые обусловили их развитие. На примере куррикулюма Общество- и природоведения мы указали на причины и возможные направления ревизии одного куррикулюма в контексте образования для одержимого развития. Применением метода теоретического анализа куррикюлумы мы рассмотрели с тички зрения актуальности, конкретности и систематичности, как предпосылок успешной интеграции целей и содержаний из сферы образования для одержимого развития. Исследование указало на значительное, хотя выборочное присутствие, недостаточную конкретность и слабую горизонтальную и вертикальную связь между ключевыми элементами данного образовательного концепта во всех сегментах анализируемых куррикулюмов, причем отмечается слабая установка куррикулюмов на развитие компетенций и систем ценностей из данной сферы. Учитывая значение образования для одержимого развития, требования в данной сфере преставляют неотъемлемую часть процесса составления или ревизии куррикулюмов каждого предмета на всех уровнях образования.
Ключевые слова: компетенции, Общество- и природоведение, образовательные стандарты, одержимость.