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Original paper

Analysis of the new and previous biology curriculum for primary schools in the Republic of Serbia

Vera ŽUPANEC[1*], Tomka MILJANOVIĆ[1], Tijana PRIBIĆEVIĆ[1], Tihomir LAZAREVIĆ[1], Branka RADULOVIĆ[2]

[1]*University of Novi Sad, Faculty of Sciences, Department of Biology and Ecology, Trg Dositeja Obradovića 2, 21000 Novi Sad, Serbia*

[2]*University of Novi Sad, Faculty of Sciences, Department of Physics, Trg Dositeja Obradovića 4, 21000 Novi Sad, Serbia*

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Summary. The present study analyzes the new biology curriculum for primary schools in the Republic of Serbia in comparison with the previously used biology curriculum. The aim of this research was to determine the similarities and differences between them. The research was realized by the method of theoretical analysis of both curricula. These two curricula differ: in concept, content layout and content in individual classes. There are some similarities between them. Both curricula contain large amounts of content that students at this age have difficulties understanding and adopting. In addition, the contents of both curricula are inappropriate for the cognitive abilities of students at their age. This especially refers to the new biology curriculum, in which the teaching topic inheritance and evolution has been included in all grades, which is very difficult for elementary school students. This indicates that in the new biology curriculum, the request for its relief has not been realized. The previously valid biology curriculum, although extensive, was more appropriate to the cognitive abilities of students in certain grades than the new biology curriculum. Whether implementation of the new biology curriculum for primary schools in the Republic of Serbia will eliminate the shortcomings of the previous biology curriculum remains to be seen, following implementation over a longer period of time and appropriate research on the effectiveness of its implementation.

Keywords: curriculum analysis, new biology curriculum, previous biology curriculum, primary school, Republic of Serbia.

INTRODUCTION

In the Republic of Serbia, there is little research on biology curricula and little work in this field in relevant journals and thematic collections. Biology curricula and the overall organization of biology teaching in primary and secondary schools in Serbia were analyzed in the following works: Miljanović (2004, 2006a, 2006b, 2008), Miljanović and Sovilj (2004), Miljanović and Milivojević (2005), and Džamić Šepa and Miljanović (2013). The work of Djokić-Ostojić et al. (2014) presents a comparative analysis of the representation and structure of teaching biology in compulsory education in Serbia, Finland and England. Biological teaching contents in these countries are different from each other, but they are in line with modern trends in the development of biology curricula in other parts of Europe. Our education system in the Republic of Serbia is part of the European and world education system. Thus, in the paper by Miljanović et al. (2016) it was pointed out that recent changes in education in the Republic of Serbia must follow the general trends of changing concepts in education and be open to accept the positive experiences of other countries.

According to the syllabus for primary schools in the Republic of Serbia, biology is presented as a subject in the 5th, 6th, 7th and 8th grade, with two classes per week. The biology curiculum for primary school in the Republic of Serbia has

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E-mail: vera.zupanec@dbe.uns.ac.rs

not changed significantly over the past 50 years. Therefore, there was a need to modernize it. As part of the latest reform of primary education in the Republic of Serbia, a new biology curriculum for primary schools was adopted, which differs significantly from the previous biology curriculum, not only in terms of content in individual classes, but also in terms of the overall concept of the curriculum and didactic requirements for its realization in teaching practice.

METHODOLOGICAL FRAMEWORK OF RESEARCH

The contents of biology curricula in primary schools, as well as the quality organization and implementation of biology teaching in teaching practice significantly contribute to the efficiency of general education and the formation of a complex scientific view of the world among the younger generations.

The *aim of the research* in the present study was to analyze the previously valid biology curriculum for primary schools in the Republic of Serbia and the new biology curriculum, which was recently adopted, to identify similarities and differences in: concept of the curriculum, the schedule of content and contents in individual grades, and their compatibility with the cognitive abilities of primary school students.

This research is of theoretical-empirical character and was realized by applying the *method of theoretical analysis*.

The *material* used for the analyses are biology curricula (previous and currently valid), as official documents from the Ministry of Education, Science and Technological Development of the Republic of Serbia.

DESCRIPTION AND DISCUSSION

Analysis of the previous biology curriculum for primary school

The previous biology curriculum for primary schools in the Republic of Serbia was valid for more than 50 years without significant changes. The layout of the content was linear and covered basic biological disciplines: in 5th grade content from botany, in 6th grade content from zoology, in 7th grade content from anthropology and in 8th grade content from ecology.

In the previous biology curriculum in the 5th grade, the following topics were represented: Introduction to Biology, Characteristics of Living Beings and Diversity of the Living World, Plant Kingdom - Plant Structure and Life Processes, Plant Diversity, Significance and Protection and Mushroom Kingdom, Significance and Protection (Official Gazette of the Republic of Serbia No. 6/2007). During realization of the biology curriculum in this grade, teachers and students did not have any special problems, because there was room for a lot of activities and creativity for both students and teachers. The program envisaged the realization of 15 exercises, which contributed to the quality of the realization of the curriculum and the knowledge of students in biology in this grade. The biology curriculum in this grade also included field work by students in nature (in the field near local schools), with the aim of observing and monitoring natural phenomena and processes and collecting plants for a common herbarium. These activities aimed to introduce students to the representatives of the most important groups of plants: moss, ferns, gymnosperms and hybrids in their environment and thus contributed to the development of students' love for plants and nature in general.

In the 6th grade, the following teaching topics were presented: Introduction, Protozoa, Animal Kingdom, Endangerment and Protection of Animals and Introduction to the Evolution of the Living World (Official Gazette of the Republic of Serbia No. 5/2008). Only four exercises were planned in the biology curriculum in this grade, although there could have been a much larger number in this grade as well. Such an approach toward the realization of curriculum in this grade gave more emphasis on verbalism and traditional teaching, which is not appropriate for modern biology teaching. The lack of exercises in this class could be compensated by other activities that were provided in the program: students going out into nature and getting to know the local fauna, visiting the zoo and natural history museum, making aquariums, terrariums, houses for birds, dogs and cats, observing animal activities in nature and care for them during the year, cooperation with health and veterinary institutions. The above mentioned activities of the students could be realized within the regular classes, but also during the work of the biological section or additional biology classes. Unfortunately, few teachers have implemented these activities in practice or only sporadically.

In the previous biology curriculum in the 7th grade, the following topics were represented: Origin and development of the human species, Human body structure and Reproductive health (Official Gazette of the Republic of Serbia No. 6/2009). The curriculum predicted 11 exercises, which students could realize in biology classes at school or at home, which was very important for achieving the goals and tasks of teaching biology in this grade. The main problem in the implementation of the biology curriculum in this grade was the lack of correlation with the curricula of other natural sciences, and especially with the curricula of physics and chemistry. According to the teachers themselves, due to the nature of the content (human science), the students had the least problems in the implementation of biology curriculum in this grade (Miljanović et al. 2016).

In the previous biology curriculum in the 8th grade, the following teaching topics were: Introduction, Ecology and the Environment, Endangerment, Protection and Improvement of Ecosystems and the Environment, Global Consequences of Environmental Pollution, Environment and Sustainable Development, and Environment, Health and Culture of Living (Official Gazette of the Republic of Serbia No. 2/2010). In this grade, the biology curriculum planned implementation of numerous activities, two projects and debates on the topic of information and participation of young people in animal protection - animal welfare. The realization of the mentioned activities, projects and debates significantly contributed to the quality of biology teaching in this grade. However, a small number of teachers implemented them in practice. Therefore, in the teaching of biology in this grade, verbalism and traditional teaching were predominantly represented, which is in contrast to the requirements of modern teaching of biology, which for the most part should be based on various activities and research by the students (Miljanović 2001). Therefore, according to the results of the survey, teachers had the most difficulties in the implementation of biology curriculum in this grade, and students showed insufficient interest for the content in this grade (Miljanović et al. 2016).

Within this analysis, the key shortcomings of the previous biology curriculum for primary schools should be highlighted. The biggest is its large size and academic presentation of the content in approved textbooks for all grades, which blurred the essential topics for students, making them difficult to understand and adopt it (Đokić-Ostojić et al. 2014; Niklanović et al. 2014; Županec et al. 2018). During realization of the biology curriculum, traditional (verbal-textual and demonstrative-illustrative) teaching methods had a dominant place, while experiments, practical exercises and other student activities were insufficiently represented. Therefore, for elementary school students, biology was among the most difficult subjects. This is confirmed by the poor achievements of our students in international (TIMSS) tests in biology and ecology. Compared to the world average, our biology students scored better on questions focused on facts and understanding, while in the cognitive area of reasoning and analysis, their test scores were lower than the world average (Ševkušić et al. 2005). At the same time, the knowledge of our students in ecology on the TIMSS test was below the world average among the countries whose students participated in the test (Drakulić et al. 2011).

The disadvantage of the previous biology curriculum was the insufficient connection of biology content in individual grades and the curriculum as a whole (Niklanović et al. 2014). This overall connectedness of biology content was not present in the approved textbooks either. It largely depended on the teachers themselves. If the teachers did not attempt to connect the biological content, to explain and bring the content closer to the students, the students themselves had a hard time noticing and understanding the connections that really exist in nature between plants, animals, humans and microorganisms.

The previous biology curriculum was not connected or synchronized with the curricula of other natural sciences. Although the same content was taught from different subjects, each teacher interpreted them from the aspect of the subject he or she teaches, and not connected with all natural sciences as a whole. An example of this is the content covering environmental protection, which, in addition to biology, is also learned in chemistry, physics and geography, but is insufficiently interconnected. Although an integrated approach to their processing would be much more efficient.

The previously valid biology curriculum for primary schools, although extensive, was appropriate to the cognitive abilities of students in certain grades. Good teachers, with high professional and methodological competencies and pedagogical experience, were able to eliminate most of its shortcomings. Many teachers succeeded in their work.

Analysis of the new biology curriculum for primary school

Since the biology curriculum for primary schools in the Republic of Serbia has not changed significantly for a long period of time. Due to its shortcomings, there was a need for its modernization. As part of the latest reform of primary education in the Republic of Serbia, a new Biology curriculum for primary schools was adopted, which differs significantly from the previous biology curriculum, not only in the distribution of content in individual classes, but also in the concept of the program and didactic and methodological requirements for its realization in teaching practice. The changes began within the ongoing reform of the education system in the Republic of Serbia in 2017, when the new curriculum for the 5th grade of primary school was adopted. In the following years, biology teaching and learning curricula for 6th, 7th and 8th grade were adopted.

In the new biology curriculum for the 5th grade of primary school, the following topics are represented: Origin and diversity of life, Unity of material and function as the basis of life, Inheritance and evolution, Life in the ecosystem and Man and health (Official Gazette of the Republic of Serbia No. 15/2018). The new curriculum for 5th grade is extensive and very demanding for students of this age. Students in the fifth grade come with knowledge of the basic biological concepts they learned from the subject World around us in the 1st and 2nd grade and the subject Nature and Society in the 3rd and 4th grade. Their prior knowledge is insuf-

ficient for the very demanding biology curriculum in the 5th grade. The content from the teaching topic Inheritance and Evolution is especially difficult for them. The content of other teaching topics in biology in the 5th grade is easier, and their realization should not be a special problem in teaching practice. Within the teaching topic Man and Health, students of this age learn for the first time about changes in puberty and other important content for their health, such as: healthy diet and water intake, the harmfulness of tobacco smoke and psychoactive substances on health, and physical activity and health. In the previous biology curriculum, this content was taught only in the 7th grade. These changes are the result of the fact that students today develop faster and enter puberty earlier, and that in accordance with that, they should understand the essence of the changes they are going through. They also start smoking earlier and earlier, and try psychoactive substances earlier. That is why it is good that they now learn the listed content in the 5th grade. These facts are based on analysis of the biology curriculum for the 5th grade and the approved biology textbook for the fifth grade of primary school, by Pribićević et al. (2018).

The new biology curriculum for 6th grade presents the same teaching topics as in 5th grade: Unity of structure and function as the basis of life, Life in the ecosystem, Inheritance and evolution, Origin and diversity of life and Man and health (Official Gazette of the Republic of Serbia No. 15/2018). The new biology curriculum for the 6th grade of elementary school is very extensive and demanding for students. It contains the most difficult content from the teaching topics Inheritance and Evolution and The Origin and Diversity of Life for the same reasons as in the 5th grade. The contents of other teaching topics are much easier. Within the teaching topic Man and health, students learn about contents that are important for their health: examples of hereditary diseases, properties and structure of viruses and diseases caused by viruses, immunity and vaccines, changes in adolescence, drug addiction and the consequences of this disease on human health. This content was taught to students in the 7th grade under the previous biology curriculum. These changes were introduced in the biology curriculum for the 6th grade due to the need for students to get acquainted with the above content earlier. These facts are based on analysis of the biology curriculum for the 6th grade and the approved biology textbook for the sixth grade of primary school, by Lazarević et al. (2019).

The new biology curriculum for the 7th grade includes the following teaching topics: Inheritance and evolution, Unity of material and function as the basis of life, Origin and diversity of life, Life in the ecosystem and Man and health (Official Gazette of the Republic of Serbia No. 5/2019). The new biology curriculum for 7th grade is extensive and very demanding for students. In the teaching topic Inheritance and evolution in 7th grade, students learn about: the role and importance of the nucleus in cell metabolism, DNA and genes, cell division (mitosis and meiosis), life cycles and generational changes in plants and animals, Mendel's rules of inheritance, sex inheritance and hereditary diseases. This content is difficult for 7th grade students, because they do not have the necessary prior knowledge of chemistry, which they only start learning in this grade. This was also taught in the previous biology curriculum in the 7th grade, but not in such detail. In the teaching topic The Origin and Diversity of Life, students learn contents from evolution: about the origin and development of life on Earth and the tree of life, which is difficult for 7th grade students. In previous classes, they learned little about the most important groups of plants and animals, and now they need to arrange them on an evolutionary tree (tree of life), where each branch represents a special group of organisms with common characteristics. The content of other teaching topics in this class are easier, and their realization in practice can be successful. These facts are based on analysis of biology curriculum for the 7th grade and the approved biology textbook for the seventh grade of primary school, by Milivojević et al. (2020).

The new biology curriculum for the 8th grade includes the following topics: Unity of structure and function as the basis of life, Man and health, Origin and diversity of life, Inheritance and evolution and Life in the ecosystem (Official Gazette of the Republic of Serbia No. 11/2019). The new biology curriculum for the 8th grade of primary school is very extensive and demanding for students. In the teaching topic Inheritance and evolution in this grade, we learn about: the theory of evolution, the emergence of new species through evolutionary processes and human evolution. Within the teaching topic The Origin and Diversity of Life, students learn, among other things, about the evolution of different groups of organisms through geological ages and great extinctions, which is difficult for them. The contents of the teaching topic Unity of material and function as the basis of life in this class are very extensive and are more appropriate for high school students. The content of other teaching topics are easier and appropriate for primary school students, so that their realization for students in teaching practice can be successful. Within the teaching topic Man and Health, students learn content that is important for their health. These include content about biological changes during the period of adolescence, protection against sexually transmitted diseases and contraception, and a responsible attitude toward one's own health and the health of other people. Students learned about these contents earlier in the 7th grade, so it would be more useful for them to learn them earlier according to the new curriculum. Their earlier physical and sexual

maturation, the need for peer approval and general curiosity lead them to have sex earlier without adequate protection, which often leads to unwanted pregnancies and the appearance of sexually transmitted diseases at this age group. These facts are given based on analysis of the biology curriculum for the 8th grade and the approved biology textbook for the eighth grade of primary school by Miljanović et al. (2020).

The new biology curriculum for elementary school is difficult for students in all grades. This is especially true for the teaching topics Inheritance and Evolution and The Origin and Diversity of Life and Unity of Material and Function as the Basis of Life that were previously taught in high school. Since biology as a subject in secondary school curricula is minor, the contents of these topics were introduced in the new biology curriculum for primary school, with the expectation of the authors of the new curriculum that students will understand at least key topics and the importance of biology as a science in modern life. The content of the teaching topics Man and Health and Life in the Ecosystem are appropriate in all grades for the age of students and their cognitive abilities.

Comparison of the new and previous biology curriculum

Modern teaching of the natural sciences requires the application of strategies of active learning and teaching, and above all the application of inquiry-based learning, which develops student competencies at higher levels, which requires an appropriate amount of time (Shymansky et al. 1990; Londraville et al. 2002; Bevins and Price 2016; Gajić et al. 2021a, 2021b). It emphasizes the change towards the orientation of the conceptual understanding of the content and integration of different biological knowledge and knowledge from other natural sciences and the development of scientific literacy of students in the field of biology and natural sciences in general (Buchbinder et al. 2005; Nowacek 2005; Mansilla and Duraisingh 2007; Krajšek and Vilhar 2010; Dolenec Z and Dolenec P 2013). In accordance with these requirements, a new biology curriculum for primary schools has been conceived in the Republic of Serbia. It was needed because of the very rapid changes in society and the natural sciences on a global level and because of the international compatibility of the knowledge, skills and habits of our students, with students of similar age in other countries. In the development of biology curricula for primary and secondary schools in other countries, a conceptual approach has been applied in an effort to focus the learning and teaching of biology on understanding the most important ideas by connecting and integrating biological concepts. In the biology curriculum in primary and secondary schools in the Republic of Croatia, four macro-concepts are represented: Organization of the living world, Processes and interdependencies in the living world, Energy in the living world and the Natural Science approach. They derive from the conceptual framework of the science curriculum and are defined as "big ideas" key to acquiring knowledge, skills and attitudes that every citizen should apply throughout their life (Džamić Šepa 2008). The biology and ecology curriculum from 5th to 8th grade in Austria is divided into four key areas: People and Health, Understanding the World and Nature, Ecology and Environmental Protection, and Biology and Production (The Education System in Austria 2008/2009).

The new biology curriculum for primary schools in the Republic of Serbia includes a spiral arrangement of content, whose basic idea is to study life and life processes in biology as a science as a whole, which are interconnected, in accordance with specific conditions and environment. A better conceptual understanding of the content from biology contributes to the interconnection of individual topics in each class and in the program as a whole. In the earlier concept, which was based on a linear biology program for primary schools, linking content between individual classes and the program as a whole was insufficient. That is why students remembered information and data from biology less well, because after learning they did not repeat or connect this content with new content in the next grades.

One of the characteristics of the new biology curriculum for primary schools is its focus on achieving defined outcomes for each teaching topic. Outcomes are statements about what students will know and be able to do, based on knowledge that they have acquired while learning biology. They represent a description of the integrated knowledge, skills, attitudes and values of students from the above five areas of biology in each class. The new biology curriculum lists general outcomes for each teaching topic in each grade, while operational outcomes for each teaching unit within all topics are defined by the teachers themselves in the phase of writing lesson plans and their implementation, at three levels: those that should reach all students, most students or just some students. In this way, an indirect connection with the standards is achieved at three levels of student achievement: primary, secondary and advanced (Čaprić 2009).

An outcome-oriented biology program gives the teacher more freedom in creating and designing teaching and learning. The role of teachers in the implementation of the new biology curriculum is to: teach and support students in their independent learning, to continuously monitor and evaluate all of their activities and to, in accordance with the achieved student results, change and adjust teaching practice based on their specific abilities. The freedom of teachers in the implementation of the new curriculum is not limited by anything. This was not the case with the previous biology curriculum, whose content was strictly defined, including the order of

their processing, and the teacher did not have the freedom to change anything significant in its realization.

During realization of the new biology curriculum in all grades, maximum correlation with other subjects should be achieved, and especially with the content of other natural sciences, mathematics and informatics.

These characteristics of the new biology curriculum for primary school were not incorporated in the previous biology curriculum, which was classically conceived and predominantly focused on content rather than outcomes and educational standards.

One of the demands for the reform of primary education in the Republic of Serbia is the relief of previous programs in most subjects, including biology, which is one of the most difficult subjects in primary school. This requirement in the new biology curriculum has not been sufficiently met, because the new biology curricula in all grades is very demanding for students. To obtain better insight into the structure of the old and new biology curriculla, Table 1 includes teaching topics for each grade, as they are given in the two curricula.

In the new curriculum, in relation to the previous curriculum, extensive content from the morphology, anatomy and systematics of plants (which were studied in the 5th grade) and morphology, anatomy and systematics of animals (which were studied in the 6th grade) were reduced because of their difficulty for elementary school students to understand and adopt. In addition, content from genetics and evolution in the topic of the same name were introduced into the new biology curriculum early in the 5th grade, which is still present in all grades. The content of this topic is very difficult for 5th and 6th grade students. In our opinion, it would be better if the content of the teaching topic Genetics and Evolution is studied only in the 7th and 8th grade of primary school. The content of this topic in the 5th and 6th grade should be joined and studied in the 7th grade and its content in 7th and 8th grade joined and studied in the 8th grade. At the same time, that would mean moving the teaching topic The Origin and Diversity of Life, as well as its content from the 6th grade to the 7th grade, from the biology curriculum, and also, from the 7th grade to the 8th grade. In order to establish a balance in the scope of content and the number of biology classes in all grades, the teaching topic Man and Health could be fully represented only in the 5th and 6th grade. The contents of this topic in the new curriculum in the 5th and 6th grade should be combined and realized in the 5th grade, and its content in the 7th and 8th grade should also be combined and studied in the 6th grade. This would also enable students to get acquainted with the content of the topic of Man and health as a whole earlier, at a time that is more appropriate for their earlier (accelerated) growth and development. In our opinion, content students learn from the topic Man and health in 7th grade (Consequences of addiction - drug addiction) and in 8th grade (Protection against sexually transmitted diseases and contraception and Responsibility for their own health and the health of others) is for them late, because in real life students come in contact with these subjects much earlier. These changes would require some minor corrections in other topics, but would not change the overall concept of the new Biology curriculum for primary schools.

The new biology curriculum for primary schools in Serbia includes a large number of exercises and various tasks for independent work by students in all grades, which emphasizes the demand for a research approach in teaching biology at school and in nature around the school (Table 1). This encourages students to actively learn and research during the teaching of biology, to reach higher levels of knowledge and cognitive skills, to develop complete competencies in the field of biology and natural sciences in general. There were practical exercises and research tasks in the previous biology curriculum, but much less than in the new curriculum.

During realization of the new biology curriculum, the maximum use of ICT is recommended: computer simulations and applications for Android devices, the use of domestic and foreign sites and portals, because in that way the material, spatial and other limitations of traditional teaching can be overcome. In this regard, it is important that with the support of the Ministry of Education and the local community, appropriate working conditions are created in all schools in the Republic of Serbia. In the development of biology textbooks for primary schools according to the new curriculum, the obligation of all publishers is to create, in addition to print textbooks, electronic textbooks, which also undergo review and approval procedures by the Institute for the Improvement of Education. Electronic textbooks have proven to be very useful during the coronavirus pandemic and online classes, as publishing houses have provided students with free access to their electronic textbooks. In the implementation of the previous biology curriculum, there were no requirements for the application of ICT in teaching, nor were textbook publishers required to have electronic textbooks.

The changes in the new Biology curriculum for primary school are large and substantial compared to the previous curriculum. Nevertheless, at the beginning of its application, biology teachers were not adequately prepared for its implementation in teaching practice. At the conducted training sessions realized by the Ministry of Education, Science and Technological Development of the Republic of Serbia, immediately before its implementation at the beginning of the 2017/2018 school year, teachers received only basic informa-

Table 1. Comparison of the previous and new biology curriculum for primary schools in the Republic of Serbia.

5th grade previous	5th grade new	6th grade previous	6th grade new	7th grade previous	7th grade new	8th grade previous	8th grade new
Introduction to Biology	Origin and diversity of life	Introduction	Unity of material and function as the basis of life	Origin and development of the human species	Inheritance and evolution	Introduction	Unity of material and function as the basis of life
Characteristics of Living Beings and Diversity of the Living World	Unity of material and function as the basis of life	Protozoa	Life in ecosystem	Human body structure	Unity of material and function as the basis of life	Ecology and the Environment	Man and health
Plant Kingdom - Plant Structure and Life Processes	Inheritance and evolution	Animal Kingdom	Inheritance and evolution	Reproductive health	Origin and diversity of life	Endangerment, Protection and Improvement of Ecosystems and the Environment	Origin and diversity of life
Plant Diversity, Significance and Protection	Life in ecosystem	Endangerment and Protection of Animals	Origin and diversity of life		Life in ecosystem	Global Consequences of Environmental Pollution	Inheritance and evolution
Mushroom Kingdom, Significance and Protection	Man and health	Introduction to the Evolution of the Living World	Man and health		Man and health	Environment and Sustainable Development	Life in ecosystem
						Environment, Health and Culture of Living	
includes 15 exercises	includes 17 exercises	includes 4 exercises	includes 14 exercises	includes 11 exercises	includes 16 exercises	includes 2 projects, 1 debate	includes 10 exercises

tion about the new biology curriculum and its requirements, but not specific instructions and support for its implementation in practice. Therefore, via the mutual cooperation of teachers, home faculties and publishers of approved textbooks, quality teaching materials should be prepared that teachers will be able to adapt to the specific conditions of the schools in which they work, the needs and abilities of their students, which would contribute to the quality implementation of the new biology curriculum. In addition, it is necessary to organize the continuous professional development of biology teachers to monitor the modern achievements of biological science and its disciplines (due to their rapid development), as well as the development of teaching methods of biology (application of modern achievements of teaching and learning biology strategies). Results of biology curriculum implementation in other countries Dilkes et al. (2014) point out that if teachers are not provided with adequate and continuous support, even those who are highly motivated for quality teaching, quickly lose the will to improve teaching.

The problem with implementation of the new biology curriculum for primary schools may be that within the current reform, the curriculum of other natural sciences subjects has not changed significantly, so that no appropriate synchronization and integration of science content processing in primary school has taken place, which would contribute to more successful implementation of the new biology curriculum. These changes are expected in the future, which will require additional changes to the biology curricula for primary school.

Based on the present analyses, the previous Biology curriculum and the new Biology curriculum for primary schools in the Republic of Serbia are completely and substantially different: according to the concept of the curriculum, the schedule of content and the content presented in individual grades.

CONCLUSIONS

Today, education is faced with new and different tasks, with the goal of preparing young people for life and work under informationally and technologically changing and very demanding conditions. Traditional concepts of education

based on the teaching and transmission of content, facts and information to students can no longer adequately respond to the new demands of education. In many countries around the world, the relevant ministries are working responsibly and continuously to adapt their education systems to these needs, or to correct previously unsuccessful policies in their education system. That is why education reforms are more frequent today, during which curricula change more or less.

Previously valid biology curricula in the 5th, 6th, 7th and 8th grade of primary schools in the Republic of Serbia have been applied continuously for more than 50 years with almost no changes. That is why the biology curricula for primary schools has recently been substantially changed not only in terms of content, but also in terms of their concept and didactic-methodological design. The new curricula is designed according to the requirements of modern teaching of biology and the importance of biology as a science for the education of students in the modern age. We need such a biology curriculum in order for biology students to acquire functional knowledge in accordance with their real-life needs.

For efficient implementation of a new biology curriculum for primary schools and other documents (for example, student achievement standards), it is necessary to prepare materials to support teaching and organize continuous professional and methodological training of biology teachers, which should include professional societies and home faculties.

Educational practice is complex and its effects cannot be predicted in advance. It takes place through a dynamic combination of mutual relations and different activities in the unique context of specific local communities, specific schools and specific departments. Therefore, for a more complete analysis and the achieved effects of the application of the new biology curriculum for primary schools in teaching practice, its application over a longer period of time is necessary, through consideration of the achievements of students in biology teaching during extensive research.

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DEDICATION

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