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Original paper

Characteristics of Teaching Environmental Education in Primary Schools

Summary: *The results of the recent research in the field of environmental education point to the fact that it is not enough to incorporate environmental content in the curricula and expect the students to behave environmentally responsibly. This is only a small step on the long and complex path of developing environmental awareness. Apart from the fact that environmental issues are included in the curricula, it is very important how these environmental issues are conveyed to students. The aim of this paper is to determine the characteristics of the primary school lessons (didactic and methodological characteristics, encouraging critical and divergent thinking, correlation of teaching content, interaction between students and teachers, students' active participation) dealing with environmental content. Fifteen 8th grade classes were observed in three primary schools in Belgrade. The observation included biology, geography, physics and chemistry lessons. A Class Observation Protocol was designed for the purpose of a wider research. The results of the research show that teachers mostly applied frontal teaching and monologic method to teach environmental content to their students. Environmental content is a specific teaching and learning content requiring active learning methods, outdoor activities, encouraging students to explore and analyse, discuss issues, exchange opinions and observe specific issues from multiple perspectives. According to the results, these methods and forms of teaching are not sufficiently represented in our primary schools. The goals of environmental education can be fully realised only if the lessons covering environmental topics include: interactive and interdisciplinary approaches, active learning methods, outdoor classes and activities, classes where students are encouraged to explore and analyse, discuss issues, exchange opinions and observe specific issues from multiple perspectives. These activities are aimed at developing students' environmental awareness, acquisition of the environment-related knowledge, and shaping students' attitudes and behaviour.*

Key words: *environmental education, sustainable development, teacher, student, lesson, teaching methods, forms of teaching, critical and divergent thinking.*

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Introduction

Sustainable development is a complex concept that has many objectives and requires the involvement of individuals from different structures of social life. The essence of the concept of sustainable development is to look at the limits of natural resources, the capacity of ecosystems, and interactions between social, economic, political systems and the environmental systems. At the core of this concept is the necessity of finding the tools and strategies that would contribute to the sustainability of life, at the present moment and in the future. Sustainable development makes possible the fulfilment of the current needs, without threatening the possibility of meeting the needs of the future generations (WCED, 1987). Sustainable development has adopted the principles of equality and social responsibility. This means that it is necessary to achieve equality among nations, within nations, between humans and other living beings, but also between the present and future generations (Conseil des ministres de l'Éducation, Canada, 1999).

Sustainable development requires competence, knowledge, values and especially the attitudes concerning the environment, economy, health and welfare of the population. As Figure 1 shows, all three areas of sustainable development are intertwined and influence each other. This means that any change in one area affects the whole process of sustainable development.

Ecology as a science is concerned with environmental issues, and the environment is a component of sustainable development. The essence of environmental education lies in respecting the principles established by ecology. Consequently, environmental education has a significant role in the realisation of the concept of sustainable development. During the development of education, the need arose for its ecologisation and humanisation. The ecologisation of education implies the incorporation of environmental ideas, phenomena, principles and approaches in all levels of education, in the curricular and extra-curricular activities, as well as in all forms of educa-

tional work. An adequate approach to environmental protection requires understanding and acceptance of ecological principles. Education is the most efficient tool for acquiring knowledge about the consequences of pollution and adequate safeguards, as well as for developing a proper attitude towards the environment and a healthy lifestyle. Environmental knowledge, its application and developed environmental awareness constitute essential steps in protecting the environment. Education for environmental protection should be included in all social processes. For this reason, the role and importance of the school in this context is increasingly becoming a topical issue. The idea of learning about the protection of the nature in formal education is as old as pedagogy. The attitudes of the famous pedagogists, such as Komen-sky, Rousseau, Pestalozzi, Fröbel, Ushinsky, Makarenko and others, are well-known, and these scholars laid great stress on the study of the nature and the importance of organisation and humanisation of the learning environment (Lješević, 2005; Kundačina, 2006). As the creators of the concept of the pedagogically valuable impact of the nature and environment on the child development, these pedagogical thinkers influenced many educational concepts formulated in the late 19th and early 20th centuries. In the period of the reform-oriented pedagogical schools, alternative and free schools, the advocates of education about the nature and for the nature were Dewey, Montessori, Kay and Tolstoy, while the impact of the classics of pedagogy was evident in other pedagogical concepts as well (Anđić, 2007). However, a larger-scale integration of the environmental content in the curricula started in the late 20th century and continued in the early 21st century. The requests for incorporation of environmental topics in the entire educational system, from kindergarten to university level, have been gaining in strength and voice ever since. Modern environmental knowledge has reached high scientific and theoretical levels, which made possible the development of the systems of educational content based on scientific and theoretical knowledge, as well as the real life experiences.

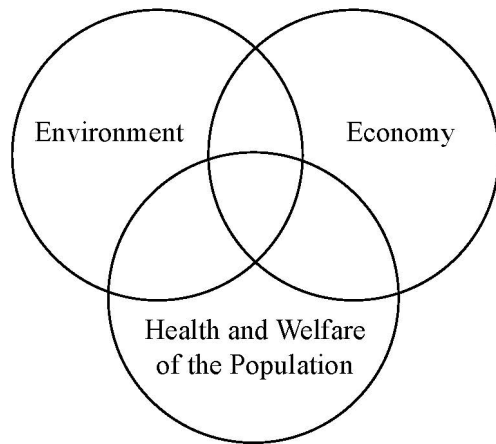


Figure 1. Sustainable development components.

The goal of environmental education is that students acquire knowledge, form habits and develop skills and feelings that will contribute to the development of environmental awareness. The role of primary school in developing environmental awareness in Serbia is determined by legal documents. The Law on the Foundations of the Education System stipulates, among other major goals, one goal which is relevant for environmental education: *The goal of education is to develop awareness of the importance of sustainable development, protection and conservation of nature and the environment, environmental ethics and protection of animals* (Zakon o osnovama sistema obrazovanja i vaspitanja, 2009).

The topic of environmental awareness has been widely discussed in the texts of many national authors, who also offer different definitions of this concept (Andevski, 1997; Cifrić, 1989; Kundačina, 2006; Marković, 1992, 2005; Mišković, 1997). However, the majority of the authors note that environmental awareness does not develop spontaneously, but under the influence of the specific social forces. In this sense, environmental education is an important means of developing environmental awareness in a society. Environmental awareness is developed

on the basis of three components: environmental knowledge, environmental attitudes and environmental behavior. All three components are interconnected. The task of the school is to act and direct their development.

Taking different theories and research as a starting point, many authors were trying to explain the connection between the three components of environmental awareness (knowledge, attitudes and behavior). Special attention was given to the research links between environmental knowledge and environmental behavior. At the end of the 20th century, it was believed that there was a linear, direct connection between environmental knowledge and environmental behavior (Kollmuss & Agyeman, 2002). This means that environmental knowledge is a sufficient prerequisite for encouraging a positive environmental behavior. For this reason, the experts insisted on introducing as much content as possible into the curriculum. The underlying assumption was that people who knew more about environmental issues would act more pro-environmentally than others. However, the subsequent studies showed that the relationship between environmental knowledge and behavior is very weak or even non-existent (Makki, Abd-El-Khalick, & BouJaoude, 2003; Negev et al, 2008; Kollumuss & Agyeman, 2002 Krnel & Naglič, 2009; Kuhlemeier, Van Den Bergh & Lagerweij, 1999).

Kollumuss and Agyeman (Kollumuss & Agyeman, 2002) argue that there are cognitive and psychological barriers preventing people to act pro-environmentally. People's lack of awareness of the effects of degradation of the environment threatens our emotional commitment and our readiness to act. Apart from these cognitive barriers, there are many psychological barriers to the development of environmental awareness, such as the inability of emotional involvement in social issues, denial, rational distancing, apathy, etc.

Andevski wrote about the specific relationship between knowledge, attitudes and behaviour

(Andevski, 1998). In her opinion, it is a mistake to study knowledge and attitudes without the corresponding actions. Lucas (Lucas, 1980) emphasises the importance of actions (behavior) relevant to the environment, rather than implicit confidence in the strong connection between attitudes and actions. Despite the fact that a large number of authors accept this view, the evaluation of attitudes towards the environment treats attitudes as a compensation for behavior. In contrast to the linear relationship (Figure 2), there is also a cyclical relationship (Figure 3) among these three variables (Andevski, 1998) in which we cannot tell easily which component stipulates another one. This means that all three components influence one another.



Figure 2. Linear relationship of environmental awareness components: knowledge-attitudes-behaviour

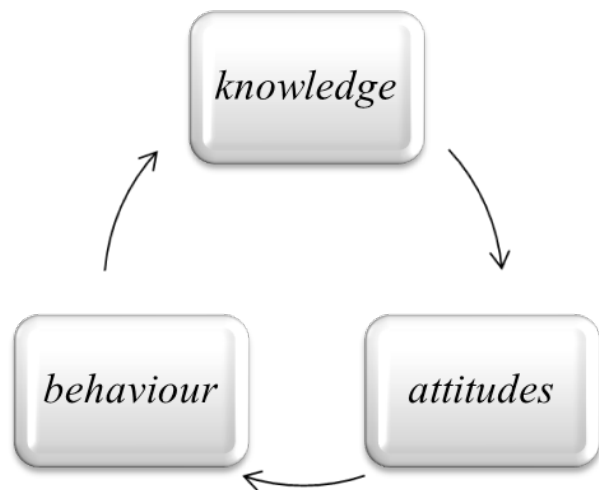


Figure 3. Cyclical relationship of environmental awareness components: knowledge-attitudes-behaviour.

If we accept the fact that environmental knowledge does not guarantee pro-environmental behavior, it becomes clear that it is not enough to incorporate environmental content in the curricula and expect the students to behave environmentally responsibly. This is only a small step on the long and complex path of developing environmental awareness.

Given that knowledge is not sufficient for the development of environmental awareness, then what is the role of school in this process? In what way, by applying what methods and tools should the environmental content be presented to students, without turning it into a mere collection of facts and information which will not enable them to realise their role and responsibility in environmental processes?

All countries are trying to find the ways, methods and programmes that would help solve a complex problem of developing environmental awareness of their citizens. The researchers of environmental education in our country often argue about which environmental issues should be incorporated into the curricula, or whether a new subject dealing specifically with the environmental protection should be introduced. While most experts discuss whether it is necessary to introduce new environmental content in the curricula or the existing material should be reduced because the students are overburdened, relatively few are tackling the changes related to instruction, teaching methods and forms of teaching. According to the analyses of the primary school curricula in Serbia, environmental content is incorporated in several school subjects, mostly science subjects (Jokić, Biočanin and Marjanović, 2007; Kamenov, 2001; Stanišić, 2008; Stanišić & Maksić, 2014; Šehović, Marjanović and Biočanin, 2008). Although it is true that environmental content is included in the curricula, the question is how this content is presented in teaching. Teaching practice in Serbia shows that teaching and learning processes are still based on the principles

of traditional teaching in which students are passive listeners and recipients of knowledge, while teachers convey the knowledge, dominate the classroom and demand reproductive knowledge and memorisation of facts (Lukić-Radojčić, 2011). However, environmental issues are specific teaching content that requires active learning methods, outdoor activities, classes that allow students to explore and analyse, discuss issues, exchange views and take into account specific problems from different perspectives.

Environmental topics are exemplary of the fact that modern education can and should include the interaction among different school subjects (sciences), to facilitate the acquisition of a comprehensive and more authentic knowledge that will allow students to understand the world around them and shape it in a better way (Stanisic, 2015). It is essential that the teachers organise classes in such manner to equip their students with high-quality knowledge and good understanding of the environmental phenomena and processes, and to encourage in students the appropriate attitudes and skills. To achieve this goal, it is necessary to organise instruction that will enable students to observe the phenomena thoroughly, acquire different types of knowledge and identify the links between them, as well as understand the importance of the acquired knowledge for everyday life situations. Students need to identify, connect and apply the knowledge from various scientific disciplines (Stanisic, 2015). The content relevant for achieving the goals of environmental education should be organised in a complex, integral and interdisciplinary manner, and in alignment with the principles of environmental protection.

Research methodology

Given the fact that teaching practice in Serbia is mostly oriented towards the reproduction of knowledge and memorisation of facts (Gašić-Pavišić, 2011; Lukić-Radojčić, 2011; Milanović-Nahod, 2005), and taking into consideration the

specific character of environmental content, the aim of this paper is to determine the characteristics of the primary school lessons in which this content is taught. More particularly, the goal of the research was to identify the methodological characteristics of these lessons.

The obtained results presented in the paper are a segment of the data obtained for the purpose of a wider research. The data were collected during the observation of the classes where environmental content was taught. Structured observation was implemented in the research. What would be observed and how the observed behaviour would be recorded had been planned in advance. *The Class Observation and Evaluation Protocol* was designed for the purpose of a wider research. The Protocol consists of seven segments: didactic and methodological characteristics of the lesson; encouraging students' critical and divergent thinking; correlation of educational contents; student-teacher, student-student, teacher-teacher interactions; and students' active participation. The purpose of the Protocol was to establish some general characteristics of the lessons, as well as the frequency and presence of the phenomena, processes and behaviors in the classroom. The observer had to circle, for each indicator within these segments, one of the offered answers or the frequency of the observed phenomenon (1 not present in the lesson; 2. observed only once during the lesson; 3. present several times during the lesson; 4. present during the entire lesson). Within the segment of didactic and methodological characteristics of the lesson, the observers focused on the following indicators: 1) Teacher clearly stated the objective of the lesson; 2) Teacher gives clear instructions and explanations; 3) Teacher points out the key concepts that students have to learn; 4) What forms of teaching were used in the lesson?; 5) What teaching methods were used during the lesson?; 6) Teacher applies teaching methods that are effective relative to the lesson objective; 7) What teaching aids were used during the lesson?; 8) Teacher uses the teaching aids

effectively; 9) Teacher prepared the lesson in advance; 10) Who uses teaching aids in the classroom?

The indicators for the segment “encouraging students’ critical and divergent thinking” were as follows: 1) Teacher teaches students how to use different ways/approaches to solve tasks/problems; 2) Teacher encourages students to produce a lot of ideas during the lesson; 3) Teacher encourages students to view things from different perspectives; 4) Teacher encourages students to support the topic with everyday life examples; 5) Teacher encourages students to make correlations between the contents taught in different subjects; 6) Teacher directly draws upon the content taught in other school subjects.

The student-teacher interaction was evaluated against the following indicators: 1) Teacher leaves enough time for additional questions of his/her students related to the topic of the lesson; 2) Teacher accepts students’ responses/ideas without criticism and gives the students the opportunity to realise their mistakes; 3) Teacher encourages students to ask questions, which will enable them to understand the subject-matter fully.

The student-student interaction was evaluated against the following indicators: 1) Students pay attention to each other’s responses; 2) Students explore the topic through conversation (presentation, discussion, debate); 3) Students help one another to solve a problem/task; 4) Students engage in pair-work or work group.

When it comes to students’ participation during the lesson, the observer focused on the following indicators: 1) The majority of students are interested in the lesson; 2) Some students are completely disinterested; 3) Students actively participate in the lesson; 4) Students’ activities/work show that they understand the content covered in the lesson; 5) All students were engaged in the lesson in some form.

Apart from the indicators, the observer noted down his/her observations that were helpful in the analysis of other lessons.

Students and teachers from three primary schools in Belgrade took part in the research. The total of 15 lessons in the 8th grade of primary school were observed. The lessons observed included biology, geography, physics and chemistry lessons. The obtained results were analysed by applying descriptive statistics (frequencies and percentages).

Research results

Didactic and methodological characteristics of the lessons

Good lesson preparation is the prerequisite for a successful lesson. It provides teachers with opportunity to achieve good class dynamics, shape their teaching in alignment with didactical and methodological principles, and monitor and evaluate the effects of the planned lessons. Every lesson plan contains basic didactic and methodological characteristics of the lesson. Therefore, the *Protocol for Class Observation and Evaluation* includes the monitoring of the lesson objective, as well as the forms, methods and teaching aids applied in the lesson.

In the majority of the observed lessons (73%), teachers clearly stated the objective and content of the lesson at the beginning of the class. Clear instructions and explanations are key to successful lessons. Teachers provided these in most of the lessons (80%), and also provided definitions and emphasised the key concepts to be learnt. In 73% of the observed lessons the teachers stressed the key con-

cepts several times and tried to define them together with their students.

Frontal teaching was the form of work applied in all observed lessons. Individual work was present in one third of the lessons (33%). Teachers did not assign pair-work or group work in any of the lessons. Topics related to environmental education are suitable for group work because they enable joint projects, joint work on assignments and discussion. Generally speaking, learning through cooperation contributes to better achievement, higher levels of reasoning, better retention and transfer of knowledge, enhanced motivation for learning, development of social skills, better interpersonal relationships, friendships, greater self-confidence, ethical reasoning and improved overall psychological health (Ševkušić, 1995). As solving complex environmental problems requires team work of a number of experts, it is good to train the school-age children to solve the problems together. In addition, team work creates appropriate atmosphere among students, develops team spirit and awareness of shared responsibility and individual rights within the team. Given that rights and responsibilities are the key precepts of sustainable development, team work enables the students to understand their role in the sustainable development processes. Frontal form of teaching is necessary in one part of the lesson, but the rest of the lesson should be devoted to group work.

The choice of appropriate methodology is also a key ingredient of a successful lesson. In the lessons observed, monologue and dialogue methods were most commonly used. The monologue method was used in 80% of the lessons, while the dialogue method was used in 60% of the observed lessons. Textual method was used in 40% of the lessons, and demonstration method was not used once. Illustration method was applied in 20% of the lessons. Practical and laboratory method was never used. Obviously, dialogue and monologue were the most used methods. However, if this data are compared with

the results on the applied forms of teaching, it becomes evident that the dialogue in the classroom amounted to conversation between the teacher and students, not among the students themselves. In addition, one of the most important methods of teaching environmental content – practical and laboratory classes – was not even used in the classroom. Research and experimenting can make environmental topics more interesting and engaging for students. Teaching environmental topics also requires outdoor classes and observation of the natural phenomena and processes. Contact with the nature, as well as exploring and observing natural phenomena, can have a positive effect on the attitudes. The teachers who took part in this observation did not plan their lessons to be held outside of the classroom.

Teachers have to plan in advance what teaching aids will be suitable for the selected form and method of teaching. In the lessons observed, teachers used textual (textbook) and audio-visual aids (Power Point presentations, pictures). As far as the lessons covering environmental topics are concerned, experimental teaching aids are very suitable, because they enable exploration and research. These aids were not used in any of the observed lessons. In the majority of the lessons (95%), the material and technical lesson preparation had already been done. Teaching aids were used in equal amount by students and teachers respectively in all lessons. The observers noted that teaching aids were not used effectively in approximately one half of the lessons (7 lessons). This refers particularly to textual aids. Students were instructed to read texts from the textbook and answer questions about the texts. Textbooks are undeniably the source of information for students, but it would have been more productive if they had been offered other texts to read as well. Teachers could have picked newspaper articles or texts on the Internet which would be suitable for the topic of the lesson. In this way, students would relate better to the textbook material, as the facts would be closer to their everyday experiences. As far as audio-visual aids are concerned, films and educational

programmes would be useful tools in environmental lessons, because they would help students to understand the environmental phenomena and processes more effectively.

Encouraging critical and divergent thinking

As already stated above, the mere possession of information is not enough to make someone behave pro-environmentally. For this reason, the development of environmental awareness is particularly important for encouraging students' critical and divergent thinking. In order to develop critical thinking, teachers have to encourage their students to define and analyse the issues taught in lessons, discuss and support their opinions with arguments. The students who are now in school, will be the important social decision-makers tomorrow, including decisions concerning environmental protection. For this reason, they must be willing to be critical of the information they are presented with for the benefit of the development of the consumer society and economic growth, but not for the benefit of sustainable development. Apart from critical thinking, students' divergent thinking should also be encouraged. Divergent (creative) thinking involves developing fluency, flexibility and originality of ideas (Guilford, 1967). In order to develop students' divergent thinking, teachers must encourage their students to produce a lot of ideas during lessons and look for different, unusual and non-standard solutions. Environmental topics are particularly suitable for this kind of engagement. Environmental issues can only be solved if we explore and apply different solutions. Also, to understand the concept of sustainable development, it is important that students know how to look at a problem from multiple perspectives. Sustainable development consists of three components (environmental, social and economic), and only the observation of the problem of sustainable development in terms of all three components can give a complete picture of the problem. In addition, if students fail to view the issue of environmental protection from a different perspective, they will

never understand the need to preserve the Planet for future generations.

Seven indicators were used in the observation of divergent and critical thinking in the classroom. Given that some indicators related to divergent thinking were not sufficiently present in the lessons observed, it can be concluded that there is plenty of room for encouraging divergent thinking in students. The observers observed and assessed whether teachers taught their students to apply different methods/approaches to solve problems/tasks. In most lessons (73%) teachers failed to do so. In some lessons it happened only once. There was also not a single lesson in which the teacher encouraged the students to consider the problem at hand from different perspectives. In addition, the teacher supported original and unusual ideas only in three observed lessons. Students were never encouraged to use multiple resources in dealing with the topic of the lesson. They were instructed to use the textbook only. Moreover, in most lessons (73%) students were not encouraged, or only once during the lesson, to produce a lot of new ideas. According to the obtained data, teachers rarely encouraged critical thinking. In 80% of the lessons teachers did not ask their students to define and analyse the issues covered in the lesson. Even when teachers did encourage discussion (in three observed lessons), they did not ask the students to give arguments for their opinions. For students to develop critical thinking, teachers must ask additional questions: *Why do you think so? How did you come to that conclusion?*

Correlation of teaching contents

Correlation of teaching contents can have several forms: correlation of the content within one school subject, correlation between teaching contents and everyday life experiences, and correlation of one subject content with the content of another subject. The correlation of teaching content within one subject is very important and makes learning easier. When it comes to teaching environmental

topics, correlation among different subjects is crucial. Teaching about environmental protection requires an interdisciplinary approach. It is virtually impossible to understand environmental problems and the entire concept of sustainable development without the correlation of different disciplines. Similarly, the correlation of the school subject content with everyday life experiences is especially important for the development of environmental awareness. Students encounter environmental problems on a daily basis, and that fact should be used in the classroom.

All three types of correlation were taken into account during lesson observation. In approximately 70% of the lessons, teachers encouraged the students several times to make correlations between the new subject-matter and the previously learnt one. In the remaining classes, the students were encouraged at least once. Teachers supported the teaching content with everyday life examples in all lessons. However, in most lessons (80%) they did not correlate the content of their lessons with the content of other school subjects. It is important to stress that in the rest of the lessons (20%), the correlation with other school subjects amounted to reminding the students of some content taught in other subjects. This is not the real correlation and integration of teaching contents. Environmental content requires integrative instruction.

Teacher-student interaction

The relationship between a teacher and his/her students largely determines the atmosphere in the lesson. A successful lesson depends on the atmosphere that teacher endeavours to create in the class. In modern pedagogy, students, and not teachers, are in the center of the teaching and learning process, while teachers are expected to show greater respect for their students. One of the important indicators of such respect is when a teacher devotes extra time to give an opportunity to students to ask an additional question related to the lesson topic. That

this is not always the case is evident from the fact that in only 46% of observed lessons teachers devoted some time to answer the questions of the students. In the same number of lessons, these teachers showed initiative and encouraged their students to ask questions that would help them understand the material better. In addition, it is important that teachers accept the students' answers/ideas without criticism and give them the opportunity to realise where they went wrong. In about 40% of the classes, teachers accepted every answer of the students without criticism and encouraged them to come to new solutions and insights about their mistakes.

Student-student interaction

Apart from teacher-student interaction, interaction among students is also important for the class dynamics. The observers paid attention to the frequency of the following indicators: *Students help each other to solve a problem/task; Through conversation (presentation, discussion, debate) students explore a specific topic; Students listen carefully to one another.* Interaction among students depends on the planned methods and forms of teaching. The relationships between students can be observed best when they work in pairs or groups. We have already stated that the students did not work in pairs or groups in any of the observed lessons. Similarly, in the majority of the classes the students were not helping each other to solve a task or a problem. Environmental issues are very complex and require a joint action of multiple actors. For the students to be prepared to respond to environmental issues, they must be able to work in a group and help each other to achieve a common goal. Also, in a fewer number of lessons (30%), the students were given an opportunity to exchange their views and discuss a topic. Observers also paid attention and noted down whether the students were listening to each other during the lesson. The data show that the students listened to each other in a little more than a half of the lessons (60%). The skills such as respect for others, mutual understanding and listening to oth-

ers are very useful in everyday life. As we already mentioned several times in this paper, the concept of sustainable development is feasible only if we all work towards achieving a common goal, along with showing respect for others and acknowledging our own and other people's needs.

Teacher-teacher interaction

The interdisciplinary approach is the most important characteristic of environmental subject matter. Students will learn about the environmental phenomena and processes more easily if the concepts are taught in different subjects. The correlation of different school subjects is best achieved, if teachers work together on lesson planning and teaching. The joint work of teachers on one topic is beneficial in many ways. By working together on a topic, teachers show their students how to approach the same process from different perspectives or disciplines. Moreover, teachers set a good example to students about pair work or group work, and how to discuss issues while showing respect for other people's opinions and accepting their points of view. However, teachers did not work jointly on any of the observed lessons.

Student activities

Engaging students to be active in the classroom is a prerequisite for a successful adoption and construction of knowledge. A well prepared and organised lesson is the lesson in which students are active and fully engaged. The researchers' task was to note down students' engagement and interest in the classwork.

In all observed lessons, the students were active in at least one part of the lesson and showed interest in the classwork. However, there were also students, a couple of them in each class, who were totally disinterested and did not participate in any activities. In only 20% of the lessons, teaching was organised to engage all students in some form of classwork. It is very important that teachers get the

attention of all students when teaching environmental content, because their active participation can be an important step in becoming an environmentally aware and engaged adult.

Conclusion

School as one of the most important social institutions must keep pace with all changes in the society. It educates the generations which will play vital social roles in the future and will have to deal with various social issues and crises. In this context, the development of environmental awareness and acceptance of the concept of sustainable development for overcoming environmental crisis has been one of the key goals of many educational systems for many years.

The recent changes of education policy and the curricula indicate that the importance of environmental education has been recognised in the Serbian educational system. Environmental content has been incorporated in the curricula, but it seems that teaching practice has to be changed as well. The research of the student achievement on the tests measuring the knowledge of environmental topics has been conducted throughout the country (Komlenović and Stanišić, 2011; Stanišić, 2008; Ševkušić, Miljanović and Drakulić, 2005). The findings are indicative of the fact that Serbian students are not thoroughly familiar with the environmental protection. This is mostly the consequence of an inadequate lesson preparation and teaching. Teachers must take into consideration the specificities of environmental topics when they prepare for their lessons.

Environmental content is indeed specific and requires special teaching and learning methods. The interdisciplinary approach is one of the key characteristics of environmental education. Environmental topics taught in school relate to students' personal experience and everyday life situations. However, as the research data indicate, environmental knowl-

edge is not sufficient to make students behave pro-environmentally. Environmental awareness should be developed by encouraging critical and divergent thinking.

The objective of the 8th grade lesson observation (biology, geography, physics and chemistry) was to determine whether, and to what extent, the specificities of environmental content are taken into account in lesson preparation and teaching. In other words, the idea was to observe the characteristics of the lessons in which environmental content was taught and learnt. According to the research findings, teachers mostly teach environmental content in a traditional way, without taking into account its specific characteristics. Monologue method, frontal teaching, and textual aids were predominantly used in the classroom, while dialogue method, group work, audio-visual and experimental teaching aids were used sporadically. Similarly, not enough attention was paid to developing critical and divergent thinking in students. The absence of an integrative and interdisciplinary approach, as well as an insufficient correlation with other school subjects, were also noted during the observation. The interaction between teachers and students, as well as student-student interaction, depend on the didactic and methodological characteristics of the lesson. As this

research indicates, the students were not engaged in group work or pair work, which means that they were unable to help each other in the task/problem solving, nor were they able to discuss, provide arguments, analyse problems and draw conclusions based on the discussions.

We strongly believe that teaching environmental topics requires both integrative and interdisciplinary approaches, active learning methods, outdoor lessons, encouragement of students to explore and analyse, discuss problems, exchange views and observe specific problems from different perspectives. All stated activities are aimed at developing students' environmental awareness, acquiring knowledge about the environment, and shaping students' attitudes and behaviour. The ultimate goal of environmental education is to make sure that students accept sustainable development concept. Developed environmental awareness is the prerequisite for understanding and acceptance of this concept. For this reason, a lot has to be done at all levels (institutional and non-institutional) to equip present generations with specific environmental knowledge, enable them to adopt a positive attitude towards the nature and natural resources and act pro-environmentally.

References

- Anđić, D. (2007). Učenje i poučavanje prirode i društva na otvorenim prostorima. *Metodički ogledi*. 2 (1), 7–23.
- Andevski, M. (1997). *Uvod u ekološko obrazovanje*. Novi Sad: Filozofski fakultet.
- Andevski, M. (1998). Škola i razvoj ekološke svesti. *Pedagoška stvarnost*. 1–2, 31–42.
- Cifrić, I. (1989). *Socijalna ekologija*. Zagreb: Globus.
- Conseil des ministres de l'Éducation (Canada) (1999). *Une éducation qui favorise la viabilité: La situation de l'éducation en matière de développement durable au Canada*. Retrieved December 20, 2007 from www.cmec.ca/else/environment.fr.pdf.
- Gašić-Pavišić, S. (2011). TIMSS 2007 u Srbiji: objašnjenje postignuća učenika i preporuke za poboljšanje nastave i učenja. U: Gašić-Pavišić, S. i Stanković, D. (ur.). *TIMSS 2007 u Srbiji* (308–334). Beograd: Institut za pedagoška istraživanja.

- Guilford, J. P. (1967). *The nature of human intelligence*. New York: McGraw Hill Book
- Jokić, D., Biočanin, R., Marjanović, R. (2007). Ekološki sadržaji u sistemu obaveznog obrazovanja u Srbiji. U: Tanasijević, Lj. i Ivanković, R. (ur.). *Kvalitet vazduha u zaštiti životne sredine*. Beograd: Privredna komora Srbije – Odbor za zaštitu životne sredine i održiv razvoj.
- Kamenov, E. (2001). Konceptija programa ekološkog vaspitanja i obrazovanja za osnovnu školu. *Norma*. 8 (3), 121–136.
- Kollmuss, A. & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental education research*. 8 (3), 239–260.
- Komlenović, Đ., Stanišić, J. (2011). Postignuća učenika i nastava geografije. U: Gašić-Pavišić, S. i Stanković, D. (ur.). *TIMSS 2007 u Srbiji* (175–210). Beograd: Institut za pedagoška istraživanja.
- Krnel, D. & Naglic, S. (2009). Environmental literacy comparison between eco-schools and ordinary schools in Slovenia. *Science Education International*. 20 (1/2), 5–24.
- Kundačina, M. (2006). *Činioci ekološkog vaspitanja i obrazovanja učenika*. Užice: Učiteljski fakultet.
- Kuhlemeier, H., Van Den Bergh, H. & Lagerweij, N. (1999). Environmental knowledge, attitudes, and behavior in Dutch secondary education. *The Journal of Environmental Education*. 30 (2), 4–14.
- Lucas, A. (1980). Science and environmental education: pions hopes, self and disciplinary chauvinism. *Studies in Science Education*. 7, 1–26.
- Lukić-Radojčić, Ž. (2011). Integrativna nastava u savremenom obrazovnom procesu. *Obrazovna tehnologija*. 4, 367–378.
- Lješević, M. (2005). *Životna sredina*. Beograd: Geografski fakultet, Univerzitet u Beogradu.
- Makki, M. H., Abd-El-Khalick, F. & BouJaoude, S. (2003). Lebanese secondary school students' environmental knowledge and attitudes. *Environmental Education Research*. 9 (1), 21–33.
- Marković, D. (1992). Ekološka svest i obrazovanje. *Pedagogija*. 1–2, 3–10.
- Marković, D. (2005). *Socijalna ekologija*. Beograd: Zavod za udžbenike i nastavna sredstva.
- Milanović-Nahod, S. (2005). Znanje učenika od očekivanog do ostvarenog. U: Antonijević, R. i Janjetović, D. (ur.). *TIMSS 2003 u Srbiji* (327–350). Beograd: Institut za pedagoška istraživanja.
- Mišković, M. (1997). *Ekološka kriza i ekološka svest omladine*. Šabac: Viša škola za obrazovanje vaspitača; Beograd: Eko centar.
- Negev, M., Sagy, G., Garb, Y., Salzberg, A. & Tal, A. (2008). Evaluating the environmental literacy of Israeli elementary and high school students. *The Journal of Environmental Education*. 39 (2), 3–20.
- Stanišić, J. (2008). *Ekološko vaspitanje i obrazovanje učenika u osnovnoj školi* (magistarski rad). Beograd: Filozofski fakultet, Univerzitet u Beogradu.
- Stanišić, J. (2015). *Evaluacija korelacijsko-integracijskog metodičkog sistema u obradi sadržaja ekološkog obrazovanja* (doktorska teza). Novi Sad: Filozofski fakultet.
- Stanišić, J. & Maksić, S. (2014). Environmental Education in Serbian Primary Schools: Challenges and Changes in Curriculum, Pedagogy, and Teacher Training. *The Journal of Environmental Education*. 45 (2), 118–131. DOI: 10.1080/00958964.2013.829019.

- Šehović, S., Marjanović, R., Biočanin, R. (2008). Ekološko obrazovanje u funkciji zaštite i unapređivanja životne sredine. *Zbornik radova* (221–235). Konferencija *Tehnika i informatika u obrazovanju*. Čačak: Tehnički fakultet.
- Ševkušić, S. (1995). Teorijske osnove i perspektive kooperativnog učenja. *Zbornik Instituta za pedagoška istraživanja*. 27, 138–157.
- Ševkušić, S., Miljanović, T., Drakulić, V. (2005). Postignuće učenika iz biologije. U: Antonijević, R. i Janjetović, D. (ur.). *TIMSS 2003 u Srbiji* (215–162). Beograd: Institut za pedagoška istraživanja.
- WCED (1987). *Our Common Future*. New York: Oxford University Press.

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Карактеристике часова еколошког образовања у основној школи

Резиме: Школа као једна од најважнијих институција друштва мора да пружи све промене које се дешавају на друштвеном плану. Школа образује и васпитава генерације које ће у будућности имати своје важне друштвене улоге и које треба да одговоре на сложenu мрежу проблема са којима ће се суочавати. Како би се решили еколошки проблеми и превазишла еколошка криза, већ дуже време се у многим образовним системима, као један од важних образовних циљева, истиче развој еколошке свесности и прихватање концепција одрживог развоја. Тако еколошко образовање има значајну улогу у остваривању овој значајној концепцији.

Промене у нашем образовном систему које су у последњих неколико година видљиве на пољу образовне политике и самих наставних програма потврђују да је значај еколошког образовања прекомерно велики. У наставним програмима су инкорпорирани еколошки садржаји, међутим, потребне су промене и у самој школској пракси. У нашој земљи рађена су истраживања која се односе на успех ученика на тестовима знања из области екологије. Резултати таквих истраживања указују на чињеницу да наши ученици недовољно познају области заштите животне средине. Осим тога, резултати истраживања јасно указују на чињеницу да није довољно инкорпорирани еколошки садржаји у наставне програме и очекивају да ће се ученици боље еколошки одговорно. То је само један мали корак на другом и сложеном путу развијања еколошке свесности. Осим чињенице да у наставним програмима постоје еколошки садржаји, веома је важно и на који начин се у настави развијају одговарајућа еколошка знања и ставови и подстицају еколошки пожељно понашање. Препорука је да су лоши резултати које наши ученици постижу из области екологије у великој мери последица лоше припреме и реализације часова на којима се обрађују еколошки садржаји и да наставници морају узети у обзир специфичности еколошких садржаја када планирају њихову обраду.

Циљ овој рада био је да се утврде карактеристике часова (дидактичко-методичка обележја часова, подстицање критичкој и дивергентној мишљења, односи између ученика и

наставника, активности ученика) на којима се обрађују еколошки садржаји у нашим основним школама. Посматрано је петнаест часова у осмом разреду у три основне школе у Београду. Посматрани су часови наставних предмета биологија, географија, физика и хемија на којима се обрађују еколошки садржаји. Ово истраживање је показало да наставници, углавном, часове на којима се обрађују еколошки садржаји реализују на традиционалан начин, не узимајући у обзир специфичности еколошких садржаја. На посматраним часовима доминира монолошка метода у односу на дијалогску методу; фронтални облик рада у односу на групни рад, текстуална наставна средства у односу на аудио-визуелна и експериментална наставна средства. Такође, развој и подстицање критичкој и дивергентној мишљења није у довољној мери заступљен на часовима. Као посебан проблем уочили смо нестојање интерактивне и интердисциплинарне припуца и суштинској повезивања садржаја различитих наставних предмета. Истраживање је показало да ученици нису радили у групама или у пару и да, самим тим, нису били у прилици да помогну једни другима у решавању појединих проблема, као ни да међусобно дискутују, аргументовано размењују мишљења, анализирају проблеме и изводе закључке на основу тих дискусија и анализа.

Насупрот овим налазима, сматрамо да су за обраду еколошких садржаја неопходни: примена интерактивне и интердисциплинарне припуца у настави, активне методе учења, настава која се одвија у природи, настава која омогућава ученицима да истражују и анализирају, да дискутују о проблемима, размењују мишљења и посматрају одређене проблеме из више различитих перспектива. Све наведене активности имају за циљ развијање еколошке свесности ученика, односно стицање еколошких знања, али и учесничко, деловање наставе и подстицање ученика.

Кључне речи: еколошко образовање, одрживи развој, наставник, ученик, наставни час, наставне методе, облици наставног рада, критичко и дивергентно мишљење.