

Be in: Teach Outdoors!

Eva Borsos¹, Edita Boric² and Mária Patocskai³

¹University of Novi Sad, Teacher Training Faculty in Hungarian in Subotica

²University of J. J. Strossmayer in Osijek, Faculty of Education

³Eötvös József College in Baja

Abstract

The effectiveness of outdoor education and the effects such education has on pupils, are undeniable, but often, teachers cannot conduct enough classes outdoors due to reasons beyond their influence (lack of time, lack of locations, etc.). The comparative analysis of the National Curricula of Serbia, Hungary and Croatia shows significant similarities.

In order to support the teachers, the authors composed a list of viable locations for outdoor learning and categorized these by teaching units. Such locations can be found near every school and thus easily used for outdoor classes. A model program was created containing two outdoor classes for every month. The devised program was implemented and tested in elementary school. Pupils' opinions on outdoor education were also examined.

The results proved the proposed program to be effective, helping pupils come closer to nature, motivating them to become familiar with their environment.

Key words: *environmental awareness; new model program; outdoor education; primary school.*

Introduction

According to research, American children spend an average of seven hours and thirty-eight minutes indoors in front of TV sets or playing computer games. This amounts to approximately fifty-three hours a week (Kevin, 2010). The time they spend outdoors in nature is often not more than a few minutes. This time is not enough for them to become familiar with, and more importantly, to become attached to their environment and animals and plants living around them. In the long run, their physical and psychological development will also suffer (Subrahmanyam et al., 2000). Pupils will not reach the basic psychophysical maturity which would be characteristic of their generation: they are not fit enough, they cannot concentrate on a certain topic

for a longer time and they are less efficient in school (Subrahmanyam et al., 2000). The solution proposed by the authors would be to spend quality time outdoors, in the fresh air, playing and learning.

Outdoor education or learning in nature is a method in which certain parts of the curriculum are placed outside the walls of the school. In this case, the pupils learn about given topics in the specific location: learning about nature outdoors, i.e. in nature, about society in society and about environment in their own environment (Jordet, 1998).

The most effective way for pupils to become familiar with their environment is to discover it and take an active part in the process of learning (Francis, 1997). Pupils will therefore develop and build their relationship with their peers as well as with nature (Beames & Ross, 2010; Thorburn & Marshall, 2014). Learning and playing outdoors also helps build pupils' awareness of their environment (Allen, 2013). In some schools, Biology is not the only subject in which learning outdoors is used effectively (Fägerstam & Blom, 2013). Other natural sciences, such as mathematics, are also taught outside the walls of the school (Aihui & Hakan, 2014; Peng & Sollervall, 2014). Outdoor learning is highly successful in adult learning, too (Pierre, 2013).

Outdoor learning is the only way that teachers and educators can awaken their pupils' interest in the world of living beings, to take the youngsters out into nature and let them spend time there, out of school and without any digital tools at hand. They can therefore experience how pleasant it is to walk in the freshly cut grass, observe the lives of animals and plants and trace the changes that occur in nature (Andersen et al., 1995). These are all significant steps in the development of their eco-consciousness (Allen, 2013). They will become eco-conscious adults only if they learn the basics in their early childhood (Hill, 2013). During the process of outdoor learning, every pupil can progress at their own speed, so everyone will experience success, which will make them motivated to learn more (Borić et al., 2014). Through such learning processes pupils discover new things for themselves (Auer, 2008). Apart from these effects, the most important aspect is the knowledge which they gain during outdoor classes since they will use it in the long term (Manni et al., 2013).

Locations which are specifically designed for the education of children in nature have been defined (Loebach, 2004). These places enable pupils to gain direct experience (Ballantyne & Packer, 2009). Learning in such an environment is based on different senses: tactile, visual, auditory, olfactory and even gustatory (Ballantyne & Packer, 2002).

Outdoor education implies different ways of teaching in different countries (Jickling, 1992). In some countries it is thought that outdoor education and environmental education are distinctly different. Others say that outdoor education is synonymous with environmental education.

Building a close relationship with nature is not only the parents' task, but the school and the teachers also have to take an active part in it (Jewell, 2002). However, while

teachers find it a very important and effective method, they cannot always implement it due to circumstance beyond their control (Borsos et al., 2018). In most countries, teachers complained about the lack of time (Borsos et al., 2018; Cengelci, 2013; Ham, 2010). Others have problems with weather, the cost of this form of education and the lack of appropriate locations (Christie et al., 2014). The most popular places for conducting outdoor classes are the schoolyard and the playground (Christie et al., 2014; Education Development Center, and Boston Schoolyard Collaborative, 2000; Norðdahl & Jóhannesson, 2014).

Despite these problems, all teachers agree that pupils generally enjoy outdoor classes and become motivated to spend more time in nature to become familiar with plants and animals (Borić et al., 2010; Borsos et al., 2018; Fägerstam & Blom, 2013; Magntorn & Helldén, 2006; Uitto et al., 2016).

It is very important to raise the interest in pupils towards their environment as early as possible, because they will care about and protect what they like (Chawla, 2006). This way, the pupils are brought up to be environmentally conscious citizens (Cooper, 1994).

The Serbian Education System

The Serbian education system begins teaching about wildlife and nature at a very young age. In kindergarten the children are taught about the environment once a week, while in the older groups, they are taught about it twice a week. Children start the compulsory elementary school at the age of seven. In the first and second grades, there are 45-minute lessons on environment twice a week (The National Curriculum Serbia, 2013). In the third and fourth grades, basically, only the name of the subject changes –it is officially called “Nature and Society”. The length of the lessons is, again, 45 minutes.

These classes are compulsory but there are two other subjects which are optional: “The little conservationist” and “Hands in the Dough” (National Curriculum Serbia, 2013). In these lessons pupils gain knowledge on different aspects of nature and society. They learn about plants and animals, among other things. The curriculum offers a number of opportunities for the teachers to teach outdoors. The choice of the teaching method is left up to the teacher, but teaching certain units in nature or the society is recommended for them. Field trips, walks and visits are suggested. As part of the curriculum, pupils have to spend 7-10 days in a ‘School in nature’ at least once in four years.

If pupils do not learn the rules of desirable behavior in nature, it will cause problems for them in upper grades when they start learning about biology.

The Hungarian Education System

In Hungary children start learning about the environment in kindergarten, in sessions called “Environmental Education”. In pre-school, there is one session a week

of environmental education. However, complex sessions, where mathematics and environmental education are taught together, are becoming increasingly popular. Kindergarten teachers are free to choose the methods they use in teaching about the environment; they can decide how many advantages offered by the natural environment in their immediate surroundings they can exploit.

The content requirements of Hungarian public education are regulated by the National Curriculum. The number of lessons needed for the realization of the content is determined by the National Curriculum, varying between certain limits. Having this in mind, as well as taking into consideration the local conditions, the schools themselves can decide how many sessions they will devote to teaching about the environment. This is referred to as the program (National Curriculum Hungary, 2014). In lower grades of elementary school, this content is covered in the lessons called “Man in Nature” which are normally conducted once a week. In the middle grades, pupils learn about the environment in the lessons called “Man in Nature” and “Our Earth – Our Environment” which are conducted once a week or once every two weeks. The aim is to raise and educate children who will care about the environment and protect it. The National Curriculum does not suggest a particular teaching method, but when it comes to supervision, the cooperative method is given the highest scores (National Curriculum Hungary, 2014).

The Croatian Education System

In Croatia, education is mandatory for children aged 6 to 15. It begins with kindergarten. The education system enables children from a young age to become familiar with nature and their immediate environment. They can attend special, so-called ‘eco-kindergartens’, too.

Children start elementary school from the age of six. It lasts for 8 years. Grades 1-4 have a classroom teacher for every subject, including the subject Nature and Society. In grades 1-3, there are 45-minute lessons on the environment, conducted twice a week, while in grade 4, these classes are conducted three times a week (National Curriculum Croatia, 2006). These classes are based on problem-solving and making progress, with practical work in the laboratory, as well as in nature. In grade 3, pupils go on an excursion, i.e. ‘School in nature’ for a few days.

In grades 5 to 8, the pupils have subject teachers, i.e. different teachers teaching different subjects: Geography, Biology, etc. In grades 5 and 6, pupils take the subject called ‘Nature’ over 90 minutes per week.

Aim of the Research

The aim of this work was to analyze the curricula of the three countries (Serbia, Hungary and Croatia), identify locations suitable for outdoor classes and to test the efficiency of the program.

The scope of this work also includes a one-year program. The effectiveness of this program was tested with two classes of fourth graders (pupils aged 9-10) in the local

elementary school. A further hypothesis was that pupils would enjoy the outdoor classes, and that their knowledge about and interest in nature would increase.

Methods

Collecting Locations for Conducting Outdoor Classes

The educational programs of the three countries (Serbia, Hungary and Croatia) were analyzed to discover the teaching units that can be taught outdoors. We analyzed the programs for elementary schools, grades 1 - 4. After the thorough analysis of the three programs, it can be established that they are very similar (National Curriculum Hungary, 2014; National Curriculum Croatia, 2006). An effort was made to list the locations which are easy to access, which are found in most towns and are useful for teaching the compulsory teaching units. The authors collected the topics and location ideas where teachers can implement outdoor learning to facilitate their work. A table was created containing these locations, categorized by age groups and the teaching units (Table 2).

Testing the Designed Model of the One-Year Program

A model of one-year program was designed containing two outdoor classes per month (Table 1). The compiled program was implemented in four elementary schools in the northern part of Serbia two years ago. These schools had two classes of fourth graders (pupils aged 9-10). In every school one class was set as the experimental group and the other as the control group. A total of 94 pupils belonged to the experimental group, while the remaining 94 pupils belonged to the control group. The groups were created based on the fact that they had the same grade point average (3.5) in grade 3. In that way, it was ensured that they had the same level of knowledge at the beginning of the experiment. The ratio of girls and boys was not taken into consideration for this study.

The experimental group took part in two outdoor classes per month during the whole school year. Teachers working with them implemented the designed one-year model program. These outdoor classes were held within the scope of the subject Nature and Society (in Serbia this is the subject in which pupils learn about nature and the plants and animals living in it). The experimental group learned through research-based outdoor teaching. The control group did not take part in any outdoor classes; they had all their classes in the school building and learned through lecture-based teaching. Both groups covered the same teaching units about plants, animals and nature, as required by the National Curriculum (National Curriculum Serbia, 2005). At the end of the study, the results achieved by the pupils in both groups in the subject Nature and Society were obtained. These marks were compared with the marks that the pupils had achieved in the previous school year.

The analysis of the results was performed using descriptive statistics (so as to calculate means, standard deviations, percentage) and unequal sample t-test in the

SPSS program (Statistical Package for the Social Sciences) in order to compare the results of the experimental and the control groups and paired-samples t-test in order to compare the results/marks before and after the experiment, so as to analyze their significance.

Table 1

The designed model of the program

September	- a walk around town in autumn: autumn changes in nature - autumn in the orchard and garden: fruits and vegetables ripening in autumn
October	- cultivation of the land: work in autumn - vineyards: grape harvest
November	- autumn in the park - a visit to the zoo: animals preparing for the winter
December	- winter in the park - a visit to the forest/park/nursery: observing deciduous and evergreen trees
January	- visiting the schoolyard: feeding and observing birds - winter in the forest/meadow: help feeding the animals
February	- a visit to the museum: natural history collections: animals - a visit to the museum/greenhouse: natural history collections: plants
March	- a visit to the park: nature wakes up - gardening work in spring, ploughing the land
April	- a visit to the zoo: the animals in spring - the plants and animals in the lake/river
May	- visiting a nature conservation area - visiting a nature conservation area
June	- a visit to the forest: the nature in summer - visiting the orchard/garden: the first fruits and vegetables are ripening

The analysis of the results was conducted using two-way ANOVA in the SPSS program (Statistical Package for the Social Sciences) that examined the effects of time (pre- vs post-testing) and treatment (experimental vs control group) on pupils' knowledge level.

Testing the Pupils' Opinions on Outdoor Education

The pupils' opinions on the method of teaching was assessed through a questionnaire containing the following four questions: 1) *Did you like the classes conducted outside of school, in nature?*; 2) *Do you feel that you learned more during these outdoor classes compared to classes conducted in the classroom?*; 3) *Do you feel that it was easier to learn outside of school, in nature, compared to the classes conducted in the school?*; 4) *Do you want to take part in more outdoor classes?* The questions were of multiple choice type, with three possible answers: 'yes', 'no' or 'neutral', and only one answer per question was permitted.

When using the Likert scale, there is always a risk of pupils opting for the middle or highest score, believing that to be the correct answer. However, the test was simplified

so that pupils could only choose from three possible answers: yes, no or neutral. It was explained to pupils that there were no correct or incorrect answers, and that they could give whatever answers they thought were correct, since they would not be graded. In order to ensure that the pupils would really give their honest opinion, this survey was anonymous. The control group did not fill in the questionnaire because the questions referred to the outdoor classes in which they had not participated.

In the evaluation process, the number of positive, negative, and neutral answers was meticulously counted, and analyzed with SPSS descriptive statistics.

Results

Locations for Conducting Outdoor Classes

The main goal was to help teachers by identifying and listing easily accessible locations for outdoor classes (Table 2). These are typically locations that can be found in every block of flats and are well-known to teachers. The data were compiled in a table grouped by classes and teaching units for 23 locations.

Table 2

Ideas for teachers on where they can conduct outdoor classes

Topic	Locations for outdoor classes
The parts of nature	park, forest, meadow, river bank, lake, national park
Animate and inanimate nature	park, forest, meadow, river bank, lake, national park
Everything changes around us	park, forest, meadow, river bank, lake
Forest plants and animals	deciduous forest, pine forest
Plants and animals of the meadow	meadow
Aquatic plants and animals	river, lake, canal, marsh, canal
Domestic animals	farm, a , village
Plants in the garden	farm, garden, schoolyard, field
The zoo	zoo
Parts of the plants	park, forest, meadow, schoolyard, field, botanical garden
Migratory and non-migratory birds	park, forest, zoo, meadow, schoolyard
Water in nature	river, lake, seaside, canal
The ground	schoolyard, park, forest, mountains
The warmth and light of the Sun	schoolyard, park, forest, meadow
Nature in autumn	park, forest, meadow, river bank, lake, national park
Nature in winter	park, forest, meadow, river bank, lake, national park
Nature in spring	park, forest, meadow, river bank, lake, national park
Nature in summer	park, forest, meadow, river bank, lake, national park
The park	park
Nature	park, forest, meadow, river bank, lake, mountains, seaside
Relation between animate and inanimate nature	park, forest, meadow, river bank, lake, seaside, mountains, canal

Plants (parts, reproduction)	park, forest, meadow, river bank, field, schoolyard
Topic	Locations for outdoor classes
Man growing plants	village, field, orchard
Animals	village, farm, zoo
Wild animals	zoo, forest, meadow
The weather	park, forest, meadow, schoolyard
Water as a condition for life in nature	lake, river, forest, meadow
The ground	park, forest, meadow, schoolyard
The seasons	park, forest, meadow, schoolyard, field
Rivers and lakes around my town	river, lake
The map	town, village, street
Orientation in nature	forest, park, meadow
Medicinal plants	meadow, forest
Flowing water	stream, river
Stagnant water	lake, marsh
Orientation in nature	forest, park, meadow
The Sun and the animate nature	park, forest, meadow, river bank, lake, national park
The water and the animate nature	park, forest, meadow, river bank, lake, national park
The ground and the animate nature	park, forest, meadow, river bank, lake, national park
The habitat	park, forest, meadow, river bank, lake, national park
The biocoenosis	park, forest, meadow, river bank, lake, national park
Interaction among living organisms	park, forest, meadow, river bank, lake, national park
Food cycle	park, forest, meadow, river bank, lake
Adaptation to life conditions	park, forest, meadow, river bank, lake, zoo
Water as a habitat	river, lake, marsh, stream
Land habitats	forest, meadow
Plants and animals of land habitats	forest, meadow
Artificial habitats	field, fruit-garden, park, farm
Plants and animals of artificial habitats	field, fruit-garden, park, farm
The weather	park, schoolyard, forest, meadow
The sounds of nature	park, forest, meadow, river bank, lake
Life in the past and present	museum
Environmental protection	park, forest, meadow, river bank, lake
What is nature?	park, forest, meadow, river bank, lake
The kingdom of plants	park, forest, meadow, river bank, lake, field
The kingdom of animals	park, forest, meadow, river bank, lake, zoo
Man as part of nature	park, forest, meadow, river bank, lake
Environmental protection	park, forest, meadow, river bank, lake
Man and animals	park, forest, meadow, river bank, lake, national park, zoo
Man and plants	park, forest, meadow, river bank, lake, national park

Testing the Designed Model of the One-Year Program for Teaching Outdoors

As mentioned before, a model of one-year program was created containing two outdoor classes for every month (Table 1). It was implemented and tested in four elementary schools. Prior to the start of the study, the pupils of the experimental group had had a grade point average of 3.5 (on a 1-5 scale, 1-insufficient, 5-excellent) (SD=1.01) in the subject Nature and Society at the end of the previous, 3rd grade. The analysis shows that 19.3% of the pupils had excellent marks, 30.7% of the pupils achieved very good success, 30.7% of the pupils were given good marks, while 19.3% of them earned a sufficient mark. There were no insufficient marks. After the experimental year, the pupils in the experimental group achieved a grade point average of 4.1 (SD=0.92) in this subject. The marks showed the following distribution: 38.4% of the pupils gained excellent marks, while approximately a third, in fact 34.6% of the pupils, earned very good marks, 20.2% of the pupils managed to gain good marks, while 6.4% of the pupils could reach only sufficient mark. As in the previous grade, there were no insufficient marks. When comparing the marks that pupils gained before and after the experiment, a significant difference can be observed ($t(93)=10.73$; $p=0.00$).

The comparison for the pupils of the control group is as follows: the pupils of the control group had had a grade point average of 3.5 (SD=1.01) at the end of the previous school year. A total of 23.0% of the pupils had excellent marks. Somewhat greater number of pupils, 26.9%, gained very good marks. An estimated third of the pupils (34.6%) achieved good marks and 15.4% of the pupils could reach only a sufficient mark. There were no insufficient marks.

These pupils spent regular Nature and Society classes in the classroom, therefore they did not participate in any outdoor classes during the experimental year. At the end of the school year, this group achieved a grade point average of 3.79 (SD=0.97) in the subject. The distribution of marks for this control group is presented here: 30.7% of the pupils achieved excellent marks, about 30.7% of the pupils had very good marks, 30.8% of the pupils earned good marks, whereas 9.6% of the pupils were given a sufficient mark. There were no insufficient marks given to pupils.

Comparing the marks that the pupils obtained before and after the experiment, a significant difference can be observed ($t(93)=-5.48$; $p=0.00$).

The two groups started with the same results ($t(93)=1.91$; $p=0.05$), but the experimental group achieved significantly better results after the experiment compared to the control group ($t(93)=-5.64$; $p=0.00$).

A two-way ANOVA was conducted to examine the effects of time (pre- vs post-testing) and treatment (experimental vs control group) on the pupils' knowledge level. There was statistically significant interaction between the time and intervention on knowledge level, $F(1,376)=15.518$, $p=0.000$.

Pupils' Opinions about the Outdoor Classes

A total of 73.1% of the pupils said that they had enjoyed the classes conducted outdoors (Table 3). Only 7.7% of the pupils stated that they did not like those classes, while 19.2% of the pupils remained neutral. A significant percentage (69.2%) of the pupils felt that they had learned more during outdoor classes in comparison with the classes conducted in the classroom. No more than 15.4% of the pupils disagreed with the previously mentioned statement, whereas 15.4% of the pupils remained neutral. Around three-quarters of them (73.1%) felt that it was easier to learn in nature than within the school walls. No more than 11.5% of the pupils disagreed with this statement and 15.4% of the pupils remained neutral. A considerable 90% of the pupils became highly motivated and wanted to participate in more outdoor classes. A small percentage of them (3.8%) believed they would have done better learning in a classroom setting, while 15.4% of the pupils remained neutral.

Table 3

The opinion of the pupils from the experimental group regarding the outdoor classes (values given in %)

question	"yes" answers	"no" answers	"neutral" answers
1. Did you like the classes conducted outside school, in nature?	73.1	7.7	19.2
2. Do you feel that you got more knowledge during these outdoor classes compared to classes conducted in the classroom?	69.2	15.4	15.4
3. Do you feel that it was easier to learn outside school, in nature, compared to the classes conducted in school?	73.1	11.5	15.4
4. Do you want to take part in more outdoor classes?	90.7	3.8	15.4

Discussion and Conclusions

It is widely known that for many teachers, the proper site for outdoor classes poses a problem (Borsos et al., 2018). The compiled table is intended to help teachers by listing the locations where outdoor classes can be conducted (Table 2). This table contains ideas that teachers may use as a starting point to create their own ideas since it offers a wide range of possibilities. With a little creativity, using teaching methodology and didactic principles, every location may become suitable for outdoor learning in order to realize an active learning process and to make pupils come closer to nature (Acar, 2014).

The designed model of one-year program is also a great help for teachers and can be implemented easily in any country. It must be pointed out that the application of the program resulted in significant progress regarding pupils' knowledge. As the testing of the program shows, the pupils in the experimental group got better marks, learned more and were more motivated to become familiar with nature. The grade point average of the experimental class showed significant increase (4.1) compared to the grade point average in the previous school year (3.5). The number of pupils who

obtained excellent marks increased substantially while the number of those pupils who gained sufficient marks decreased. It is crucial to bring pupils closer to nature, to motivate them to learn about the environment around them, to become familiar with plants and animals living in it (Martin, 2004). The underlying idea behind this concept is that pupils will learn to love that which they become familiar with; moreover, they will care about it enough to protect it (Chawla, 2006).

The pupils' opinions also indicated that the designed new program is effective and motivates them to learn more about nature, plants and animals. The same results were obtained as those presented by Borić and Škugor (2014), namely that pupils enjoyed outdoor classes and research-based learning. This knowledge gained by learning outdoors, based on experience, cannot even be compared with the knowledge obtained solely by seeing the plants in a picture or observing a page in a herbarium.

Teaching certain units in nature is highly effective since pupils can become familiar with nature in a natural setting in the most effective manner (Jordet, 1998). Even a suitably designed schoolyard can offer a number of educational opportunities, such as discovering plants, raising awareness of wildlife conservation, aesthetic training and more (Broda, 2007). Pupils can plant their own garden and by performing the gardening tasks, their sense of duty and responsibility will also develop. Moreover, schoolyard classes foster pupils' social relationships and strengthen their public spirit.

Our results are in line with other studies on the effectiveness of outdoor teaching. In Croatian setting, it was found to improve problem-solving abilities and skills (Borić et al., 2014). Eaton and others said that it is effective for developing cognitive skills (Eaton, 2000). Such results were obtained in the USA and Hong Kong (Lai, 1999; Mittelstaedt et al., 1999) as well.

Pupils need help and guidance to become familiar with and attached to the environment they live in and to learn what they can do to protect it: to collect waste selectively, not to litter, to place bird feeders into trees, etc. This ensures that pupils will get closer to nature, become fond of it with the help of school, through tireless efforts of their teachers.

Awakening pupils' interest in the world of living beings can be achieved by exposing them to nature, letting them spend time outside, out of the school building, without digital tools. In this way they can experience how pleasant it is to walk in the freshly cut grass, they can observe the life of the animals and plants and they can trace the changes that occur in nature. These are all significant steps towards developing the pupils' eco-consciousness (Allen, 2013). They will become eco-conscious adults on condition they learn the basics of plants and animals living in nature during their early childhood. In terms of saving the planet, this is a vital step, since the pupils of today will be the adults of the future.

References

- Acar, H. (2014). Learning environments for children in outdoor spaces. *Procedia-Social and Behavioural Sciences*, 141, 846 – 853. <https://doi.org/10.1016/j.sbspro.2014.05.147>
- Aihui, P., & Håkan, S. (2014). Primary School Students' Spatial Orientation Strategies in an Outdoor Learning Activity Supported by Mobile Technologies. *International Journal of Education in Mathematics, Science and Technology*, 2(4), 246-256. <https://doi.org/10.18404/ijemst.61603>
- Allen, H. (2013). The place of experience and the experience of place: Intersections between sustainability education and outdoor learning. *Australian Journal of Environmental Education*, 29, 18-32. <https://doi.org/10.1017/ae.2013.13>
- Andresen, L., Boud, D., & Cohen, R. (1995). *Experience-based learning*. In G. Foley (Ed.), *Understanding Adult Education and Training* (pp. 1-10). Sydney: Allen & Unwin.
- Auer, M. R. (2008). Sensory perception, rationalism and outdoor environmental education. *International Research in Geographical and Environmental Education*, 17(1), 6-9. <https://doi.org/10.2167/irgee225.0>
- Ballantyne, R., & Packer, J. (2002). Nature - based excursions: School students' perceptions of learning in natural environments. *International Research in Geographical and Environmental Education*, 12(1), 1–19. <https://doi.org/10.1080/10382040208667488>
- Ballantyne, R., & Packer, J. (2009). Introducing a fifth pedagogy: Experience-based strategies for facilitating learning in natural environments. *Environmental Education Research*, 15(2), 243–262. <https://doi.org/10.1080/13504620802711282>
- Beames, S., & Ross, H. (2010). Journeys outside the classroom. *Journal of Adventure Education and Outdoor Learning*, 10(2), 95-109. <https://doi.org/10.1080/14729679.2010.505708>
- Borić, E., Škugor, A., & Perković, I. (2010). Stavovi učitelja o izvan učioničkoj istraživačkoj nastavi prirode i društva. *Odgojne znanosti*, 12(20), 361-373.
- Borić, E., & Škugor, A. (2014). Achieving students' competencies through research-based outdoor science teaching. *Croatian Journal of Education*, 16(1), 149-164.
- Borsos, E., Patocskai, M., & Borić, E. (2018). Teaching in nature? Naturally! *Journal of Biological Education*, 52(1), 1-11. <https://doi.org/10.1080/00219266.2017.1420679>
- Broda, W. H. (2007). *Schoolyard-enhanced learning*. Portland, USA: Stenhouse Publishers.
- Brown, M. (2008). Outdoor Education: Opportunities provided by a place-based approach. *New Zealand Journal of Outdoor Education*, 2(3), 7-25.
- Cengelci, T. (2013). Social studies teacher' views on learning outside the classroom. *Educational Sciences: Theory and Practice*, 13(3), 1836 – 1841.
- Cooper, G. (1994). The role of outdoor education in education for the 21st century. *The Journal of Adventure Education and Outdoor Leadership*, 11(2), 9-12.
- Christie, B., Beames, S., Higgins, P., Nicol, R., & Hamish, R. (2014). Outdoor Learning provision in Scottish Schools. *Scottish Educational Review*, 46(1), 48-64.
- Chawla, L. (2006). Learning to Love the Natural World Enough to Protect it. *Barn*, 2, 57-78.
- Education Development Center, and Boston Schoolyard Funders Collaborative (2000). *Schoolyard Learning: The Impact of School Grounds*. Newton, MA: Education Development Center. Retrieved from http://promiseofplace.org/research_attachments/schoolyard.pdf
- Eaton, D. (2000). Cognitive and affective learning in outdoor education. *Dissertation Abstracts International – Section A: Humanities and Social Sciences*, 60, 10-A, 3595.

- Fägerstam, E. (2013). High school teachers' experience of the educational potential of outdoor teaching and learning. *Journal of Adventure Education & Outdoor Learning*, 14(1), 56–81. <https://doi.org/10.1080/14729679.2013.769887>
- Fägerstam, E., & Blom, J. (2013). Learning biology and mathematics outdoors: Effects and attitudes in a Swedish high school context. *Journal of Adventure Education and Outdoor Learning*, 13(1), 56–75. <https://doi.org/10.1080/14729679.2011.647432>
- Francis, C. (1997). Particular places: School environments over time. In S. Stine (Ed.), *Landscapes for Learning: Creating Outdoor Environments for Children and Youth* (pp. 13-43). USA, New York John: Wiley & Sons, Inc.
- Ham, S. H., & Sewing, D. R. (2010). Barriers to Environmental Education. *The Journal of Environmental Education*, 19(2), 17-24. <https://doi.org/10.1080/00958964.1988.9942751>
- Hill, A. (2013). The place of experience and the experience of place: Intersections between sustainability education and outdoor learning. *Australian Journal of Environmental Education*, 29, 18-32. <https://doi.org/10.1017/ae.2013.13>
- Jewell, N. (2002). Examining children's models of seed. *Journal of Biological Education*, 36(3), 116–122. <https://doi.org/10.1080/00219266.2002.9655816>
- Jickling, B. (1992). Why I don't want my children educated for sustainable development. *Journal of Environmental Education*, 23(4), 5–8. <https://doi.org/10.1080/00958964.1992.9942801>
- Jordet, A. N. (1998). *Nærmiljøet Somklasserom. Utes koleiteoriog praksis [The local environment as classroom; in Norwegian]*. Oslo: Cappelen Akademisk Forlag.
- Kevin, J. C. (2010). Back to School: Back Outside! *National Wildlife Federation*, United States, Reston. Retrieved from <https://www.nwf.org/~media/PDFs/Be%20Out%20There/Back%20to%20School%20full%20report.ashx>
- Lai, K. C. (1999). Freedom to learn: a study of the experiences of secondary school teachers and students in a geography field trip. *International Research in Geographical and Environmental Education*, 8(3), 239–255. <https://doi.org/10.1080/10382049908667614>
- Loebach, J. (2004). *Designing learning environments for children: An affordance-based approach to providing developmentally appropriate settings* (Unpublished master's dissertation). Environmental Design Studies, Dalhousie University, Halifax, Nova Scotia.
- Magntorn, O., & Helldén, G. (2006). Reading Nature – Experienced Teachers' Reflections on a Teaching Sequence in Ecology: Implications for Future Teacher Training. *NorDiNa: Nordic Studies in Science Education*, 5, 67–82.
- Manni, A., Ottander, C., Sporre, K., & Parchmann, I. (2013). Perceived learning experiences regarding Education for sustainable development - within Swedish outdoor education traditions. *NorDiNa: Nordic Studies in Science Education*, 9(2), 187-205. <https://doi.org/10.5617/nordina.653>
- Martin, P. (2004). Outdoor adventure in promoting relationships with nature. *Australian Journal of Outdoor Education*, 8(1), 20-28. <https://doi.org/10.1007/BF03400792>
- Mittelstaedt, R., Sanker, L., & Vanderveer, B. (1999). Impact of a week-long experiential education program on environmental attitude and awareness. *Journal of Experiential Education*, 22(3), 138–148. <https://doi.org/10.1177/105382599902200306>
- [National Curriculum, Croatia] Zakon o odgoju i obrazovanju u osnovnoj i srednjoj školi. (2006). Članak 11, Stavak 1; Članak 12, stavak 1; Članak 26, stavak 1, Članak 30 [Act on Education in Primary and Secondary Schools. Article 11, Paragraph 1; Article 12, Paragraph 1; Article 26, Paragraph 1; Article 30].

- [National Curriculum, Hungary] Nemzeti Alapntanterv (2014). A Nemzeti alaptanterv kiadásáról, bevezetéséről és alkalmazásáról szóló 110/2012. (VI.4.) Kormány Rendelet módosításáról, *Magyar Közlöny*, Hungary.
- [National Curriculum Serbia]. Pravilnik o nastavnom planu za prvi, drugi, treći i četvrti razred osnovnog obrazovanja i vaspitanja i nastavnom programu za treć irazred osnovnog obrazovanja i vaspitanja („Sl. glasnik RS – Prosvetni glasnik”, br. 1/2005, 15/2006, 2/2008, 2/2010, 7/2010, 3/2011 - dr. pravilnik, 7/2011 - dr. pravilnik 1/2013), Serbia.
- Norðdahl, K., & Jóhannesson, I. Á. (2014). ‘Let’s go outside’: Icelandic teachers’ views of using the outdoors. *Education 3–13: International Journal of Primary, Elementary and Early Years Education*. Retrieved from <http://www.tandfonline.com/doi/full/10.1080/03004279.2014.961946>.
- Peng, A., & Sollervall, H. (2014). Primary School Students’ Spatial Orientation Strategies in an Outdoor Learning Activity Supported by Mobile Technologies. *International Journal of Education in Mathematics, Science and Technology*, 2(4), 246-256. <https://doi.org/10.18404/ijemst.61603>
- Pierre, W. (2013). Greening the net generation: outdoor adult learning in the digital age. *Adult Learning*, 24, 151-158. <https://doi.org/10.1177/1045159513499551>
- Subrahmanyam, K., Kraut, E. R., Greenfield, P. M., & Gross, E. F. (2000). The impact of home computer use on children’s activities and development. *The Future of Children*, 10(2), 123-144. <https://doi.org/10.2307/1602692>
- Thorburn, M., & Marshall, A. (2014). Cultivating lived-body consciousness: Enhancing cognition and emotion through outdoor learning. *Journal of Pedagogy*, 5, 115–132. <https://doi.org/10.2478/jped-2014-0006>
- Uitto, A., Juuti, K., Lavonen, J., & Meisalo, V. (2006). Students’ interest in biology and their out-of-school experiences. *Journal of Biology Education*, 40(3), 124–129. <https://doi.org/10.1080/00219266.2006.9656029>

Eva Borsos

University of Novi Sad,
Teacher Training Faculty in Hungarian in Subotica
Strosmajerova 11, 24000 Subotica, Serbia
bborsoseva@gmail.com

Edita Borić

University of J. J. Strossmayer in Osijek, Faculty of Education
Trg Svetog Trojstva 3, 31000 Osijek, Croatia
editaboric@yahoo.com

Mária Patocskai

Eötvös József College in Baja
Szegediút 2, 6500 Baja, Hungary
patocskai.maria@ejf.hu

Budimo in! Podučavajmo vani!

Sažetak

Učinkovitost obrazovanja na otvorenom i učinci takvog obrazovanja na učenike neporecivi su, ali nastavnici često ne mogu održavati dovoljno sati na otvorenom zbog razloga koji su izvan njihova utjecaja (nedostatak vremena, nedostatak mjesta itd.). Usporedna analiza Nacionalnog kurikula Srbije, Mađarske i Hrvatske pokazuje znatne sličnosti.

S ciljem podrške nastavnicima autori su sastavili popis održivih lokacija za učenje na otvorenom i kategorizirali ih prema nastavnim jedinicama. Takve se lokacije mogu naći u blizini svake škole i na taj se način lako mogu koristiti za izvanučioničku nastavu. Izrađen je program koji sadrži dva izvanučionička nastavna sata za svaki mjesec. Program je proveden i testiran u osnovnoj školi. Pitali smo i mišljenje đaka o izvanučioničkoj nastavi.

Rezultati su pokazali da je predloženi program učinkovit, pomaže učenicima da se približe prirodi, potiče ih da se upoznaju sa svojom okolinom.

Ključne riječi: *ekološka svijest; izvanučionička nastava; novi model programa; osnovna škola.*

Uvod

Američka djeca, kako pokazuju rezultati istraživanja, provode u prosjeku 7 sati i trideset i osam minuta u zatvorenom prostoru ispred televizora ili igrajući računalne igre. To je oko pedeset tri sata tjedno (Kevin, 2010). Vrijeme koje provode vani u prirodi često nije više od nekoliko minuta. To nije dovoljno da upoznaju okoliš, i još važnije, da razviju privrženost svom okruženju, životinjama i biljkama koje oko njih žive. Dugoročno će i njihov tjelesni i psihički razvoj također zaostajati (Subrahmanyam, 2000). Učenici neće doseći osnovnu psihofizičku zrelost koja bi bila karakteristična za njihovu generaciju: oni nisu dovoljno u formi, ne mogu se koncentrirati na određenu temu i manje su učinkoviti u svladavanju nastavnih sadržaja (Subrahmanyam i sur., 2000). Rješenje koje su predložili autori bilo bi provesti kvalitetno vrijeme na otvorenom, na svježem zraku, u igranju i učenju.

Izvanučionička nastava ili učenje u prirodi metoda je u kojoj su određeni dijelovi kurikula smješteni izvan zidova škole. U ovom slučaju učenici uče o određenim temama na određenom mjestu: učenje o prirodi na otvorenom, tj. u prirodi, o društvu u društvu i o okolišu u vlastitom okruženju (Jordet, 1998).

Najučinkovitiji način da se učenici upoznaju sa svojim okolišem jest otkrivanje i aktivno sudjelovanje u procesu učenja (Francis, 1997). Učenici će tako razviti i izgraditi svoj odnos sa svojim vršnjacima, kao i s prirodom (Beames, 2010; Thorburn i Marshall, 2014). Učenje i igranje na otvorenom također pomaže u izgrađivanju svijesti učenika o vlastitom okolišu (Allen, 2013). U nekim školama, biologija/priroda nije jedini predmet u kojem se učenje na otvorenom koristi učinkovito (Fägerstam, 2013). Druge prirodne znanosti, poput matematike, također se podučavaju izvan škole (Aihui i Hakan, 2014; Peng, 2014). Izvanučionička nastava je vrlo uspješna i u obrazovanju odraslih (Pierre, 2013).

Izvanučionička nastava jedini je način na koji nastavnici i odgojitelji mogu probuditi zanimanje učenika za svijet živih bića, odvesti mlade ljude u prirodu i dopustiti im da tamo provode vrijeme, izvan škole i bez ikakvih digitalnih alata. Tako mogu iskusiti kako je ugodno hodati po svježe pokošenoj travi, promatrati živote životinja i biljaka i pratiti promjene koje se događaju u prirodi (Andersen i sur., 1995). To su sve važni koraci u razvoju njihove ekološke svijesti (Allen, 2013). Oni će rasti u ekološki osviještene odrasle osobe samo ako nauče osnove u ranom djetinjstvu (Hill, 2013). Tijekom učenja na otvorenom svaki učenik može napredovati prema vlastitoj brzini, tako da će svatko doživjeti uspjeh i time biti motiviran da nauči više (Borić i sur., 2014). Putem takvih procesa učenja učenici sami otkrivaju novosti (Auer, 2008). Osim tih učinaka najvažniji je aspekt znanje koje oni stječu tijekom nastave na otvorenom, jer će se njime dugoročno koristiti (Manni i sur., 2013).

Definirane su lokacije koje su posebno oblikovane za obrazovanje djece u prirodi (Loebach, 2004). Ta mjesta omogućuju učenicima izravno iskustvo (Ballantyne i Packer, 2009). Učenje u takvom okruženju temelji se na dodiru, vidu, zvukovima, mirisima, pa čak i okusima (Ballantyne, 2002).

Izvanučionička nastava podrazumijeva različite načine poučavanja u različitim zemljama (Jickling, 1992). U nekim zemljama smatra se da su obrazovanje na otvorenom i obrazovanje o okolišu izrazito različiti. Drugi kažu da je obrazovanje na otvorenom sinonim za obrazovanje o okolišu.

Izgradnja bliske veze s prirodom nije samo zadatak roditelja, već i škola pa učitelji u njemu moraju aktivno sudjelovati (Jewell, 2002). Međutim, iako učitelji smatraju da je to vrlo važna i učinkovita metoda, oni je ne mogu uvijek provesti jer nisu pod njihovom kontrolom (Borsos i sur., 2018). U većini zemalja nastavnici su se žalili na nedostatak vremena (Borsos i sur., 2018; Cengelci, 2013; Ham i Sewing, 2010). Drugi imaju problema s vremenom, troškovima tog oblika obrazovanja i nedostatkom odgovarajućih lokacija (Christie i sur., 2014). Najpopularnija mjesta za održavanje izvanučioničke nastave školsko su dvorište i igralište (Christie i sur., 2014; Norðdahl i Jóhannesson, 2014).

Unatoč navedenim problemima svi se učitelji slažu da učenici uglavnom uživaju u izvanučioničkoj nastavi i postaju motivirani da provode više vremena u prirodi kako bi upoznali biljke i životinje (Borić i sur., 2010; Borsos i sur., 2018; Fägerstam, 2013; Utto i sur., 2016; Magntorn i Helldén, 2006).

Vrlo je važno povećati interes učenika prema svom okolišu što je moguće prije, jer će se učenici brinuti za ono što im se sviđa i to štiti (Chawla, 2006). Na taj se način učenici odgajaju kao ekološki svjesni građani (Cooper, 1994).

Srpski obrazovni sustav

Srpski obrazovni sustav započinje učiti učenike o divljini i prirodi u vrlo mladoj dobi. U vrtiću djeca se podučavaju o okolišu jednom tjedno, a u višim skupinama dva puta tjedno. Djeca počinju polaziti obveznu osnovnu školu u dobi od sedam godina. U prvom i drugom razredu postoji dvotjedna 45-minutna nastava o okolišu (National Curriculum Serbia, 2013). U trećem i četvrtom razredu u osnovi se mijenja samo ime predmeta, koji se sada službeno zove „Priroda i društvo”. Duljina nastave i dalje iznosi 45 minuta.

Ti sati su obvezni, ali postoje i još dva predmeta koji su izborni: „Mali konzervator” i „Ruke u tijestu” (National Curriculum Serbia, 2013). Na tim satima učenici stječu znanja o različitim aspektima prirode i društva. Uče o biljkama i životinjama. Kurikul nudi brojne mogućnosti za učitelje da poučavaju na otvorenom. Izbor nastavne metode ostavlja se nastavniku, ali im se preporučuje poučavanje određenih jedinica u prirodi. Predlažu se terenski izleti, šetnje i posjeti. U okviru nastavnog plana učenici moraju provesti 7 do 10 dana u »Školi u prirodi« najmanje jednom u četiri godine.

Ako učenici ne nauče pravila poželjnog ponašanja u prirodi, to će im uzrokovati probleme u višim razredima, kada se upoznaju s biologijom.

Mađarski obrazovni sustav

U Mađarskoj djeca počinju učiti o okolišu u vrtiću, na satima pod nazivom „Edukacija o okolišu”. U predškolskom odgoju postoji tjedan edukacije o zaštiti okoliša. Međutim, integrativni sati, na kojima se uče i matematika i ekologija, postaju sve popularniji. Odgojitelji u vrtiću slobodni su odabrati metode kojima će se koristiti u poučavanju o okolišu; oni mogu odlučiti koliko prednosti nudi prirodni okoliš u njihovoj neposrednoj okolini.

Sadržajni zahtjevi mađarskog javnog obrazovanja regulirani su nacionalnim kurikulumom. Broj lekcija potrebnih za realizaciju sadržaja određen je Nacionalnim kurikulumom, koji varira između određenih granica. Imajući to na umu, kao i uzimajući u obzir lokalne uvjete, same škole mogu odlučiti o tome koliko će se sati posvetiti poučavanju o okolišu. To se naziva programom (National Curriculum Hungary, 2014). U nižim razredima ti su sadržaji obrađeni u lekcijama pod nazivom „Čovjek u prirodi”. Obično se uče jednom tjedno. U srednjim razredima učenici uče o okolišu u lekcijama pod nazivom „Čovjek u prirodi” i „Naša Zemlja-naša okolina”, koje se uče jednom tjedno ili jednom svaka dva tjedna. Cilj je podizati i educirati djecu koja će se brinuti za okoliš i zaštititi ga. Nacionalni kurikulum ne sugerira određenu metodu, ali kada je u pitanju nadzor, suradničko učenje dobiva najvišu ocjenu (National Curriculum Hungary, 2014).

Hrvatski obrazovni sustav

U Hrvatskoj je obrazovanje obavezno za djecu od 6 do 15 godina. Počinje s predškolskim vrtićima. Odgojno-obrazovni sustav omogućuje mladima da se upoznaju s prirodom i svojom neposrednom okolinom. Oni mogu pohađati i posebne, tzv. „ekološke vrtiće”.

Osnovna škola traje osam godina. Djeca je počinju polaziti sa šest godina. Od 1. do 4. razreda učenici imaju jednog učitelja za sve predmete, uključujući predmet Prirode i društva. U razredima od 1. do 3. održavaju se sati koji traju po 45 minuta, dva puta tjedno, a u 4. razredu održavaju se tri puta tjedno (National Curriculum Croatia, 2006.). Navedena nastava temelji se na rješavanju problema, s praktičnim radom u laboratoriju, kao i u prirodi. U 3. razredu učenici idu na izlet u „Školu u prirodi” na nekoliko dana.

U razredima od 5. do 8. učenici imaju različite učitelje koji predaju različite predmete: geografija, biologija itd. Imaju različite učitelje za svaki predmet. U 5. i 6. razredu učenici imaju predmet „Priroda” 90 minuta tjedno.

Cilj istraživanja

Cilj je ovoga rada analiza obrazovnih programa triju zemalja (Srbije, Mađarske, Hrvatske), prikupiti lokacije koje su prikladne za izvanučioničku nastavu i testirati ovaj program.

Ovaj rad uključuje i jednogodišnji program. Učinkovitost ovog programa testirana je u dva razredna odjela u 4. razredu (učenici u dobi od 9 do 10 godina) u lokalnoj osnovnoj školi. Pretpostavka je bila da će učenici uživati u izvanučioničkoj nastavi te da će se njihova znanja i interesi prema prirodi povećati.

Metodologija

Prikupljanje mjesta za održavanje izvanučioničke nastave

Analizirani su obrazovni programi triju zemalja (Srbija, Mađarska, Hrvatska) kako bi se identificirale nastavne jedinice koje se mogu naučiti na otvorenom. Analizirali smo programe za osnovne škole od 1. do 4. razreda. Nakon temeljite analize triju programa može se utvrditi da su oni vrlo slični (Marinković i sur., 2008, 2010, 2012, 2013; Nacionalni kurikulum Mađarska, 2014). Nastojalo se prikupiti lokacije koje su lako dostupne, koje se nalaze u većini gradova i koje su korisne za podučavanje obveznih nastavnih jedinica. Autori su prikupili teme i ideje o lokaciji na kojoj učitelji mogu ostvariti izvanučioničko učenje kako bi olakšali svoj rad. Izrađena je tablica koja sadrži navedene lokacije, one su kategorizirane po dobnim skupinama i nastavnim jedinicama (Tablica 2).

Testiranje stvorenog modela jednogodišnjeg programa za poučavanje na otvorenom

Izrađen je model jednogodišnjeg programa koji sadrži izvanučioničku nastavu dva puta tjedno (Tablica 1). Sastavljeni program primijenjen je u četiri osnovne škole u

sjevernom dijelu Srbije prije dvije godine. Te su škole imale dva razredna odjela u 4. razredu (učenici u dobi od 9 do 10 godina). U svakoj je školi jedan razredni odjel postao eksperimentalna skupina, a drugi kontrolna skupina. Eksperimentalnu i kontrolnu skupinu činila su po 94 učenika. Skupine su stvorene na temelju činjenice da su imale jednak prosjek ocjena (3,5) u 3. razredu. Na taj je način osigurano da imaju isti stupanj znanja na početku eksperimenta. Omjer djevojčica i dječaka nije uzet u obzir u ovom istraživanju.

Tablica 1
Osmišljeni model programa

rujan	- Šetnja gradom tijekom jeseni: jesenske promjene u prirodi - Jesen u voćnjaku i povrtnjaku: sazrijevanje voća i povrća u jesen
listopad	- Obrada zemlje: rad u jeseni - Vinogradi: berba grožđa
studeni	- Jesen u parku - Posjet zoološkom vrtu: životinje se pripremaju za zimu
prosinac	- Zima u parku - Posjet šumi/parku/vrtu: promatrajte listopadna i zimzelena stabla
siječanj	- Posjet školskom dvorištu: hraniti i promatrati ptice - Zima u šumi/livadi: pomaganje hranjenja životinja
veljača	Posjet muzeju ili prirodnoj zbirci – životinje - Posjet muzeju/stakleniku: biljke
ožujak	- Posjet parku: priroda se budi - Vrtlarstvo u proljeće, oranje
travanj	- Posjet zoološkom vrtu: životinje u proljeće - Biljke i životinje jezera/rijeke
svibanj	- Posjećivanje područja zaštite prirode - Posjećivanje područja zaštite prirode
lipanj	- Posjet šumi: priroda ljeti - Posjet voćnjaku/vrtu: prvo voće i povrće zrije

Eksperimentalna skupina sudjelovala je u dva izvanučionička sata mjesečno tijekom cijele školske godine. Nastavnici koji su s njima surađivali provodili su izrađeni program jednogodišnjeg modela u okviru predmeta „Priroda i društvo”. (U Srbiji je to tema u kojoj učenici uče o prirodi i biljkama i životinjama koje u njoj žive.) Eksperimentalna skupina učila je putem istraživačke, izvanučioničke nastave. Kontrolna skupina nije sudjelovala u izvanučioničkoj nastavi; svi su samo imali predavanja u zgradi škole. Obje skupine učile su iste nastavne jedinice o biljkama, životinjama i prirodi, kako to zahtijeva Nacionalni kurikulum (Službeni Glasnik, 2013). Na kraju istraživanja skupljeni su rezultati učenika obje skupine u predmetu „Priroda i društvo”. Te su ocjene uspoređene s ocjenama koje su učenici postigli u prethodnoj akademskoj godini.

Analiza rezultata provedena je primjenom metode deskriptivne statistike (kako bi se izračunali srednja vrijednost, standardna odstupanja, postotak) i T-test nejednakih uzoraka u SPSS programu s ciljem usporedbe rezultata eksperimentalne i kontrolne skupinu i rezultata t-testa s ciljem usporedbe rezultata prije eksperimenta i s ciljem analize njihove značajnosti.

Analiza rezultata provedena je s pomoću dvosmjerne ANOVA u SPSS programu koji je ispitivao učinke vremena (pre/post test) i tretmana (eksperimentalna i kontrolna skupina) na razini znanja učenika.

Testiranje mišljenje učenika o nastavi na otvorenom

Učeničko mišljenje o načinu nastave ocijenjeno je upitnikom koji sadrži sljedeća četiri pitanja: „Je li vam se sviđela nastava koja se održavala izvan škole u prirodi?; Smatrate li da ste usvojili više znanja tijekom nastave na otvorenom, u usporedbi s nastavom održanom u razredu? Osjećate li da je bilo lakše učiti izvan škole, u prirodi, nego na satima održanim u školi? Želite li sudjelovati u izvanučioničkoj nastavi? „Pitanja su bila višestrukog izbora, s tri moguća odgovora: ‚da‘, ‚ne‘ ili ‚neutralno‘ i bio je moguć samo jedan odgovor po pitanju.

Pri primjeni Likertove ljestvice uvijek postoji rizik da učenici odaberu srednji ili najviši rezultat, vjerujući da je to točan odgovor. Međutim, test je pojednostavljen tako da su učenici mogli odabrati samo tri moguća odgovora: da, ne ili neutralni. Učenicima je objašnjeno da ne postoje točni odgovori ili netočni odgovori. Mogli su dati odgovore za koje su mislili da su točni i za to ne bi bili ocijenjeni. Kako bi se osiguralo da učenici doista daju svoje iskreno mišljenje, ovo istraživanje bilo je anonimno. Kontrolna skupina nije popunila upitnik, jer su se pitanja odnosila na izvanučioničku nastavu u kojoj članovi kontrolne skupine nisu sudjelovali.

U procesu evaluacije broj pozitivnih, negativnih i neutralnih odgovora pažljivo je prebrojan i analiziran s pomoću SPSS deskriptivne statistike.

Rezultati

Mjesta za održavanje izvanučioničke nastave

Glavni je cilj bio pomoći nastavnicima prikupljanjem lako dostupnih lokacija za izvanučioničku nastavu (Tablica 2). To su obično lokacije koje se mogu naći u svakom naselju i dobro su poznate nastavnicima. Podatci su sastavljeni u tablici grupiranoj po nastavnim satima i nastavnim jedinicama za 23 lokacije.

Tablica 2

Ideje za nastavnike gdje mogu održavati nastavu na otvorenom

Tema	Mjesto gdje se može održati izvanučionička nastava
Dijelovi prirode	park, šuma, livada, riječna obala, jezero, nacionalni park
Živa i neživa priroda	park, šuma, livada, riječna obala, jezero, nacionalni park
Sve se mijenja oko nas	park, šuma, livada, riječna obala, jezero
Šumske biljke i životinje	listopadna šuma, borova šuma
Biljke i životinje livade	livada
Vodne biljke i životinje	rijeke, jezera, močvara
Domaće životinje	farma, zoološki vrt, selo
Biljke u vrtu	farma, vrt, školsko dvorište, polje
Zoološki vrt	zoološki vrt
Dijelovi biljaka	park, šuma, livada, školsko dvorište, polje, botanički vrt
Tema	Mjesto gdje se može održati izvanučionička nastava

Ptice selice i ptice stancarice	park, šuma, zoološki vrt, livada, školsko dvorište
Voda u prirodi	rijeke, jezera, mora, kanali
Tlo	školsko dvorište, park, šuma, planine
Toplina i svjetlost Sunca	školsko dvorište, park, šuma, livada
Priroda u jesen	park, šuma, livada, riječna obala, jezero, nacionalni park
Priroda zimi	park, šuma, livada, riječna obala, jezero, nacionalni park
Priroda u proljeće	park, šuma, livada, riječna obala, jezero, nacionalni park
Priroda u ljeto	park, šuma, livada, riječna obala, jezero, nacionalni park
Park	park
Priroda	park, šuma, livada, riječna obala, jezero, planine, more
Veza između žive i nežive prirode	park, šuma, livada, riječna obala, jezero, more, planine, kanal
Biljke (dijelovi, reprodukcija)	park, šuma, livada, riječna obala, polje, školsko dvorište
Čovjek koji uzgaja biljke	sela, polja, voćnjaci
Životinje	selo, farma, ZOO
Divlje životinje	ZOO, šuma, livada
Vrijeme	park, šuma, livada, školsko dvorište
Voda kao uvjet života u prirodi	jezero, rijeka, šuma, livada
Tlo	park, šuma, livada, školsko dvorište
Godišnja doba	park, šuma, livada, školsko dvorište, polje
Rijeke, jezera oko moga grada	rijeka, jezero
Karta	grad, selo, ulica
Orijentacija u prirodi	šuma, park, livada
Ljekovito bilje	livada, šuma
Vode tekućice	potok, rijeka
Vode stajaćice	jezero, močvara
Orijentacija u prirodi	šuma, park, livada
Sunce i živa priroda	park, šuma, livada, riječna obala, jezero, nacionalni park
Voda i živa priroda	park, šuma, livada, riječna obala, jezero, nacionalni park
Tlo i živa priroda	park, šuma, livada, riječna obala, jezero, nacionalni park
Staništa	park, šuma, livada, riječna obala, jezero, nacionalni park
Biocenoza	park, šuma, livada, riječna obala, jezero, nacionalni park
Interakcije između živih organizama	park, šuma, livada, riječna obala, jezero, nacionalni park
Hranidbeni ciklus	park, šuma, livada, riječna obala, jezero
Aklimatizacija na životne uvjete	park, šuma, livada, riječna obala, jezero, zoološki vrt
Voda kao stanište	rijeke, jezera, močvare, potoci
Kopnena staništa	šuma, livada
Biljke i životinje kopnenih staništa	šuma, livada
Umjetna staništa	polja, voćnjak, park, farma
Biljke i životinje umjetnih staništa	polja, voćnjak, park, farma
Vrijeme	park, školsko dvorište, šuma, livada
Zvukovi prirode	park, šuma, livada, riječna obala, jezero
Život u prošlosti i sadašnjosti	muzej
Zaštita okoliša	park, šuma, livada, riječna obala, jezero
Što je priroda?	park, šuma, livada, riječna obala, jezero
Carstvo biljaka	park, šuma, livada, riječna obala, jezero, polje
Carstvo životinja	park, šuma, livada, riječna obala, jezero, zoološki vrt
Čovjek kao dio prirode	park, šuma, livada, riječna obala, jezero
Zaštita okoliša	park, šuma, livada, riječna obala, jezero
Čovjek i životinje	park, šuma, livada, riječna obala, jezero, nacionalni park, zoološki vrt
Čovjek i biljke	park, šuma, livada, riječna obala, jezero, nacionalni park

Testiranje stvorenog modela jednogodišnjeg programa za poučavanje na otvorenom

Kao što je već spomenuto, napravljen je model jednogodišnjeg programa koji sadrži dva sata izvanučioničke nastave za svaki mjesec (Tablica 1). Implementiran je i testiran u četiri osnovne škole. Prije početka studije učenici eksperimentalne skupine imali su prosječnu ocjenu 3,5 (1-5, 1 nedovoljno, 5-izvršno) (SD = 1,01) iz predmeta «Priroda i društvo» na kraju prethodnog završenog trećeg razreda. 19,2% učenika dobilo je odličnu ocjenu, 30,7% učenika postiglo je vrlo dobru ocjenu. Ukupno 30,7% učenika dobilo je dobru ocjenu, a 19,2% učenika postiglo je samo dovoljnu ocjenu. Nije bilo nedovoljno ocijenjenih učenika. Nakon eksperimentalne godine učenici eksperimentalne skupine postigli su prosječnu ocjenu 4,1 (SD = 0,92) iz tog nastavnog predmeta. 38,4% učenika dobilo je odličnu ocjenu. Oko trećine, 34,6% učenika, postiglo je vrlo dobru ocjenu. 20,2% učenika postiglo je ocjenu dobar, a 6,4% učenika postiglo je ocjenu dovoljan. Kao ni u prethodnom razredu, nije bilo nedovoljne ocjene. Uspoređujući ocjene koje su učenici stekli prije i poslije eksperimenta, može se uočiti značajna razlika ($t_{(93)} = 10,73$, $p = 0,00$).

Usporedba učenika s kontrolnom skupinom je sljedeća: učenici kontrolne skupine imali su prosjek ocjena 3,5 (SD = 1,01) na kraju prethodne školske godine, u 3. razredu. Ukupno 23,0% učenika imalo je odličnu ocjenu. Nešto više, 26,9% učenika, dobilo je vrlo dobru ocjenu. Trećina učenika, tj. 34,6%, postigla je dobru ocjenu, a 15,4% učenika ocijenjeno je ocjenom dovoljan. Nije bilo nedovoljne ocjene.

Učenici kontrolne skupine proveli su nastavu iz predmeta „Priroda i društvo” u učionici i nisu sudjelovali u izvanučioničkoj nastavi. Na kraju školske godine ta je skupina postigla prosječni rezultat ocjena 3,79 (SD = 0,97) u predmetu Priroda i društvo. Distribucija ocjena za kontrolnu skupinu je sljedeća: 30,7% učenika postiglo je izvrsnu ocjenu. Oko 30,7% učenika imalo je vrlo dobru ocjenu. 30,8% učenika bilo je ocijenjeno ocjenom dobar, a 9,6% učenika postiglo je ocjenu dovoljan. Nije bilo nedovoljno ocijenjenog učenika.

Uspoređujući ocjene koje su učenici dobili prije i poslije eksperimenta, može se uočiti značajna razlika ($t_{(93)} = -5,48$, $p = 0,00$).

Dvije skupine počele su s istim prosječnim ocjenama ($t_{(93)} = 1,91$, $p = 0,05$), ali je eksperimentalna skupina postigla znatno bolje ocjene nakon eksperimenta u usporedbi s kontrolnom skupinom ($t_{(93)} = -5,64$, $p = 0,00$),

Provedeno je dvosmjerna ANOVA koja je ispitala učinke vremena (pre/post test) i intervencije (eksperimentalna vs kontrolna skupina) na razinu znanja učenika. Postojala je statistički značajna interakcija između vremena i intervencije na školske ocjene, $F(1,376) = 15,518$, $p = 0,000$).

Mišljenje učenika o nastavi na otvorenom

Ukupno 73,1% učenika izjavilo je da su uživali u nastavi na otvorenom (tablica 3). Samo 7,7% učenika izjavilo je da im se ona ne sviđa; 19,2% učenika ostalo je neutralno.

Značajan postotak od 69,2% učenika smatra da su više naučili tijekom nastave na otvorenom u odnosu na sate održane u učionici. Nešto više od 15,4% učenika nije se složilo s prethodno navedenom izjavom, a 15,4% učenika ostalo je neutralno. Oko tri četvrtine njih, tj. 73,1% ispitanika, smatra da je lakše učiti u prirodi nego unutar školske zgrade. Nešto više od 11,5% učenika nije se slagalo s tom izjavom, a 15,4% učenika ostalo je neutralno. Značajan dio, 90% učenika, postalo je visoko motivirano i htjelo je sudjelovati u što više sati na otvorenom. 3,8% učenika nije vjerovalo da je bolje učilo u učionici, a 15,4% učenika bilo je neutralno.

Tablica 3

Mišljenje učenika iz eksperimentalne skupine o izvanučioničkoj nastavi (vrijednosti navedene u%).

Pitanje	da	ne	neutralan
1. Jeste li voljeli nastavu koja se održavala izvan škole, u prirodi?	73,1	7,7	19,2
2. Osjećate li da ste usvojili više znanja tijekom sati u prirodi, u usporedbi s onima u učionici?	69,2	15,4	15,4
3. Osjećate li da je bilo lakše učiti izvan škole, u prirodi, u usporedbi s nastavom održanom u školi?	73,1	11,5	15,4
4. Želite li sudjelovati na više sati u prirodi?	90,7	3,8	15,4

Rasprava i zaključci

Poznato je da je mnogim učiteljima problem nedostatak odgovarajućeg mjesta za izvođenje izvanučioničke nastave (Borsos, 2018). Pripremljena tablica namijenjena je pomaganju nastavnicima navođenjem mjesta na kojima se mogu održavati sati izvanučioničke nastave (Tablica 2). Ta tablica sadrži ideje kojima se nastavnici mogu koristiti kao polaznom točkom za stvaranje vlastitih ideja, budući da postoji mnogo mogućnosti. S malo kreativnosti, koristeći se metodološkim i didaktičkim principima, svako mjesto može postati pogodno za učenje na otvorenom, kako bi se postigao aktivan proces učenja i kako bi se učenici približili prirodi (Acar, 2014).

Stvoreni model jednogodišnjeg programa također je velika pomoć nastavnicima i može se lako implementirati u svakoj zemlji. Treba naglasiti da je znatan napredak u znanju učenika postignut s pomoću izrađenog programa. Kao što pokazuje testiranje programa, učenici eksperimentalne skupine dobivaju bolje ocjene, saznali su više i bili motiviraniji da se upoznaju s prirodom. Prosječno postignuće eksperimentalnog razreda (prosječna ocjena) pokazalo je značajan porast (4,1) u usporedbi s prosječnim postignućem prethodne školske godine (3,5). Broj učenika koji su dobivali izvrsne ocjene znatno se povećao. Smanjen je broj onih učenika koji su imali dovoljnu (2) ocjenu. Od ključne je važnosti približiti učenicima prirodu, motivirati ih da upoznaju okolinu oko sebe, upoznati ih s biljkama i životinjama koje žive u njihovoj sredini (Martin, 2004). Osnovna ideja tog koncepta je da, što učenici upoznaju, također će to naučiti voljeti, štoviše, za to se brinuti i to štititi (Chawla, 2006).

Mišljenja učenika također su pokazala da je stvoreni novi program učinkovit i potiče ih da uči više o prirodi, biljkama i životinjama. Jednaki su rezultati dobiveni u sličnom

istraživanju koje su predstavili Borić i sur.; učenici su uživali u nastavi na otvorenom i obrazovanju na temelju istraživanja (Borić i sur., 2014). Znanje stečeno učenjem na otvorenom, utemeljeno na iskustvu, ne može se ni usporediti sa znanjima stečenim samo gledanjem biljaka na slici ili promatranjem stranica iz herbarija.

Podučavanje određenih nastavnih jedinica u prirodi vrlo je učinkovito jer se učenici mogu na najbolji način upoznati s prirodom, u prirodnom okruženju (Jordet, 1998). Čak i prikladno dizajnirano školsko dvorište može ponuditi niz obrazovnih mogućnosti, kao što je otkrivanje biljaka, podizanje svijesti o očuvanju životinja i još mnogo toga (Broda, 2007). Učenici mogu posaditi vlastiti vrt i obavljati poslove u vrtu, razvijati osjećaj dužnosti i odgovornosti. Štoviše, nastava u školskom dvorištu potiče društvene odnose učenika i jača njihov timski duh.

Naši rezultati su u skladu s ostalim radovima o uspješnosti nastavi u prirodi. U Hrvatskoj je autor utvrdio da pojačava sposobnost rješavanja problema (Borić i sur., 2014). Eaton i sur. kažu da je uspješno u razvoju kognitivne sposobnosti (Eaton, 2000). Iste rezultate dobili su u SAD-u i u Hong Kong (Lai, 1999; Mittelstaedt i sur., 1999).

Učenici trebaju pomoć i vodstvo kako bi upoznali okoliš u kojem žive i kako bi saznali što mogu učiniti kako bi ga zaštitili: selektivno prikupljanje otpada, kompost, briga o pticama itd.

Time se osigurava da će se učenici približiti prirodi, zavoljeti ju uz pomoć škole i neumornih napora svojih učitelja.

Buđenje zainteresiranosti učenika za svijet živih bića može se postići izlažući ih prirodi, dopuštajući im da provode vrijeme vani, izvan škole, bez digitalnih alata. Na taj način mogu doživjeti kako je ugodno hodati u svježe pokošenoj travi, mogu promatrati život životinja i biljaka i mogu pratiti promjene koje se događaju u prirodi. To su sve važni koraci prema razvoju ekološke svijesti učenika (Allen, 2013). Oni će postati ekološki svjesne odrasle osobe pod uvjetom da nauče osnove biljaka i životinja koje žive u prirodi tijekom ranog djetinjstva. U smislu spašavanja planeta to je bitan korak budući da će današnji učenici u budućnosti biti odrasle osobe.