



to bring people closer to nature through aesthetic education in contact with the beauty of nature. The environmental education conducted by national parks is also a widely recognised instrument for shaping the relationship between the national park and the local community (Hibszer, 2013).

The environmental education should be organised according to the category of participants, for which appropriate methods should be chosen and the language adapted to the level of perception. Among the participants of the educational classes create pro-environmental behaviours, and thus change the way of everyday life (Bizubová & Nevřelová, 2006; Haas et al., 2008; Žeber-Dzikowska, 2012; Moždzeń et al., 2016).

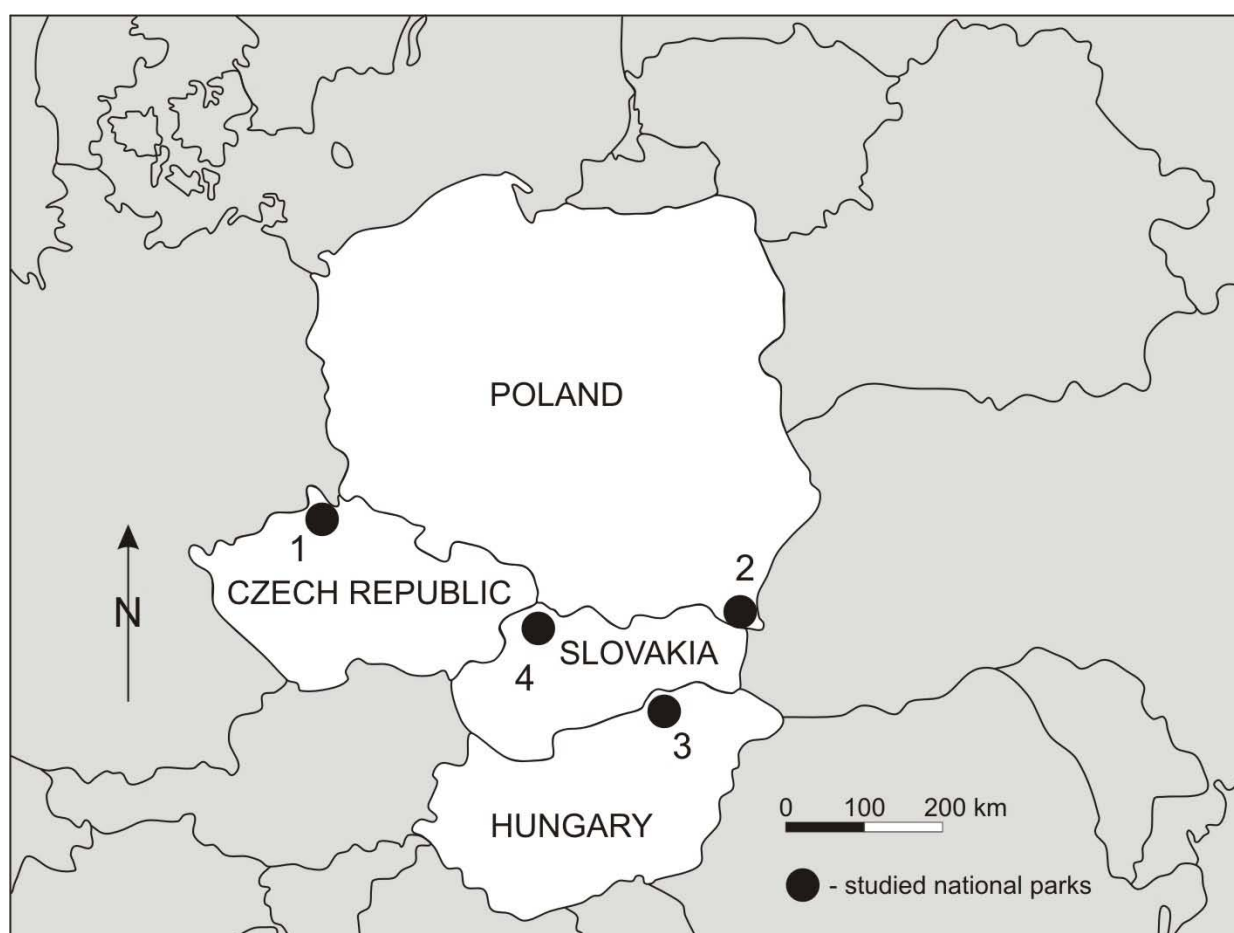
The aim of this study was to evaluate and compare the level of environmental awareness and knowledge of students of gymnasium and secondary schools in the countries of the Visegrád Group (i), in the vicinity or further away from the selected national parks (ii). An additional aim was to propose new potential solutions to improve environmental education in the analysed national parks (iii).

## Material and Methods

### STUDY AREA, SAMPLES, INSTRUMENT.

Four national parks were chosen for the studies: Veľká Fatra National Park 48°55'N 19°04'E (Slovakia), Bohemian Switzerland National Park 50°50'N 14°15'E (Czech Republic), Bieszczady National Park 49°17'17"N 22°29'49"E (Poland) and Bükki National Park 48°02'53"N 20°31'41"E (Hungary) – Fig. 1.

The study of ecological awareness and knowledge of nature were conducted in the period of 2012–2014 among 1301 students of gymnasium and secondary schools (778 girls and 523 boys) living in the direct vicinity of the selected national parks or at some distance from them. The school selection criterion was the distance to the park, which in the case of schools far from the park exceeded 100 km. The detailed data concerning statistic population, name of the place, the number of respondents answering the studies are shown in Table 1, the percentage of respondents in particular countries and the region of their residence are presented in Table 2.



**Fig. 1.** Localisation of the National Parks selected for the study; 1 – Bohemian Switzerland National Park (Czech Republic), 2 – Bieszczady National Park (Poland), 3 – Bükki National Park (Hungary), 4 – Veľká Fatra National Park (Slovakia).

**Table 1.** General characteristics of the target groups of the survey

National Park/ Country	The city in vicinity of National Park	The city further away from the National Park	Name of school	Number of respondents
Bohemian Switzerland NP (Czech Republic)	Šluknov	–	Secondary School of Forestry and Social Vocational School	127
	–	Nymburk	Middle School of Nymburk	133
	–	Kolín	Middle School of Kolín	
	–	Čáslav	Middle School and Secondary Technical School of Education	
	–	Kutná Hora	Middle School of Jiří Orten	
Bükki NP (Hungary)	Heves	–	Catholic School of Technology and Economics of Janos Vak Bottyán and Middle School	99
	–	Debrecen	Gabor Bethlen Economic Secondary School and Vocational School	94
Bieszczady NP (Poland)	Ustrzyki Dolne	–	Team of High Schools of Józef Piłsudski and Lyceum	170
	Krosno	–	Municipal Team of School No. 4, II Lyceum of the Constitution of May 3	30
	–	Kraków	II Lyceum of King Jan III Sobieski	100
	–	Kraków	X Lyceum of the National Education Commission	96
Velká Fatra NP (Slovakia)	Žilina	–	Trade School of St. Thomas Aquinas	171
	Martin	–	Middle School of William Paulína-Tóth	98
	–	Poprad	Secondary Vocational School “Svit“	118
	–	Lučenec	Middle School of Božena Slančíkova-Timravy	65
Total	6	8	15	1301

**Table 2.** Division of respondents according to their region of residence

Residence	Czech Republic		Hungary		Poland		Slovakia		Total
	village	city	village	city	village	city	village	city	
in vicinity of the national park	36	91	50	49	96	104	130	139	695
further away from the national park	60	73	26	68	77	119	65	118	606
Total	96	164	76	117	173	223	195	257	1301
Percentage	7	13	6	9	13	17	15	20	100

Explorations concerning the environmental awareness and the level of students education were carried out by a properly designed questionnaire. The questionnaire consisted of 20 questions, which were divided into three areas: students knowledge about the park – P (8 questions in total), general environmental awareness of students – E (5 questions) and understanding the necessity of nature protection – O (4 questions in total). The first three questions concerned identification of the data of the survey respondents: gender, age and place of residence. Two survey questions: *What sources did you obtain the information about the park from?* and *Which attractions do you use the most often when visiting the national park?* – were not included into any of the three above mentioned groups but they were analysed separately. The survey included 14 closed questions and 4 opened questions in the questionnaire which were prepared in four languages (Czech, Hungarian, Polish and

Slovakian) and in four versions tailored to each of the selected national parks. The questionnaire was distributed in printed forms (80.1% of the respondents) or in electronic forms (19.9% of the respondents). All respondents were informed about the purpose of the research. The content of the survey and the method of completing the answers were explained to them in details. The survey was anonymous.

**DATA ANALYSIS.** During the statistical analysis, for each answer the points were awarded: «+5» points – when the response confirmed understanding of issues related to environmental education, «-5» points – if the received answer did not confirm the kind of respondents awareness, «0» points – if the student did not give any answer. Answers to the open questions which confirmed knowledge of issues relating to environmental education received the maximum of 5 points. The results for each respondent were entered

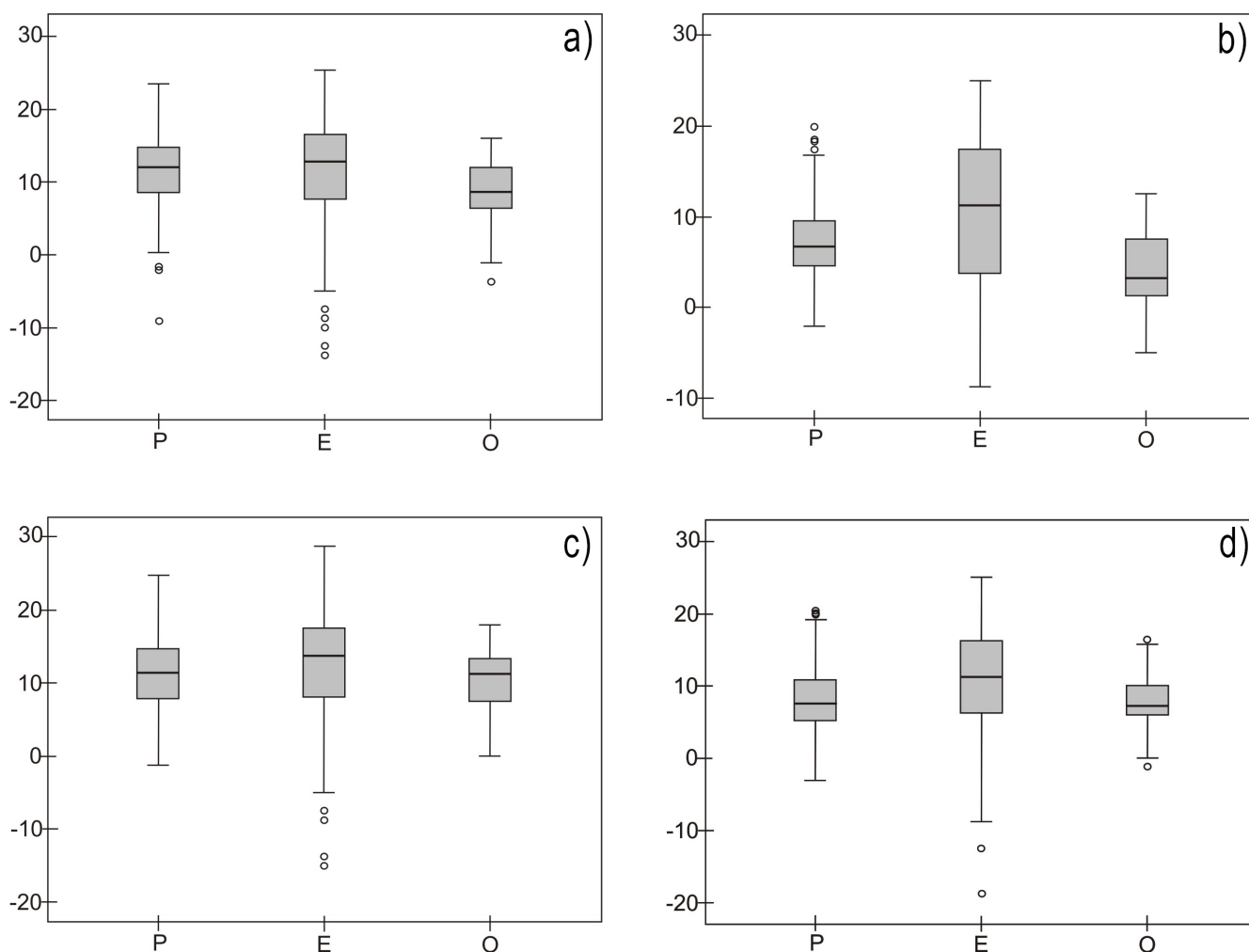




The hypothesis  $H_{03} =$  in answers to the questions concerning the areas P (Kruskal-Wallis test:  $\chi^2 = 201.461$ ;  $df = 3$ ;  $p = 0.000 < 0.05 \rightarrow H_3$ ), E ( $\chi^2 = 22.461$ ;  $df = 3$ ;  $p = 0.000 < 0.05 \rightarrow H_3$ ) O ( $\chi^2 = 225.201$ ;  $df = 3$ ;  $p = 0.000 < 0.05 \rightarrow H_3$ ), there was no significant difference between students from different countries, was rejected. For all analysed countries, the best total result occurred in the answers given by the students to the questions concerning the area E (50% of respondents achieved not more than 12.5 points), and the poorest one in the area O (50% of respondents achieved not more than 7.5 points) (Fig. 3). In comparison with other areas, in the area E the greatest dispersion of results was also observed. There were respondents who had extremely poor knowledge concerning the problem. Some of them achieved a negative result. Comparing the level of knowledge expressed as the number of points obtained in the studies for each country separately showed that in area P students from the Czech Republic achieved the

60





**Fig. 4.** Comparison of the level of students knowledge: a) in Czech Republic (median: P = 12.0, E = 12.5, O = 8.5), b) in Hungary (median: P = 7.0, E = 11.0, O = 3.0), c) in Poland (median: P = 11.5, E = 14.0, O = 11.0), d) in Slovakia (median: P = 8.0, E = 11.3, O = 7.0), expressed as the amount of points obtained in surveys into areas: knowledge about the park – P, general environmental awareness of students – E, and understanding the necessity of nature protection – O; explanations see Fig. 3.

The hypothesis  $H_{04}$  = in answers to the question: *What is in the logo of the analysed national park?*, was a significant difference between students from the analysed countries, was also rejected (Kruskal Wallis test:  $\chi^2 = 320.197$ ;  $df = 3$ ;  $p = 0.000 < 0.05 \rightarrow H_4$ ). The highest number of students who knew the logo of the selected park were in the Czech Republic, the lowest one were in Slovakia. Also differences in answers to the questions *Do you know how many national parks are in your country?* and *What is in the logo of the analysed national park?* were statistically significant (Kruskal-Wallis test: for the first question the value was  $\chi^2 = 315.856$ ,  $df = 3$ ,  $p = 0.000 < 0.05$ , for the second one it was  $\chi^2 = 320.197$ ,  $df = 3$ ,  $p = 0.000 < 0.05$ ). In case of the first question, the highest number of answers confirming the knowledge of the subject were from students of Poland, the Czech Republic, Slovakia, Hungary, in case of the second one – from the Czech Republic, Poland, Hungary and Slovakia. Unsatisfactory answers given by the Slovak respondents in case

of the knowledge of the national park logo can be explained by the fact, that the Management of the Veľká Fatra National Park is not perceived as an institution in such form as the managements of other foreign national parks. Such an unfavourable effect is partly caused by the lack of a website and a relatively small number of appearances of the board of the park in the local and national media. Comparison of national parks websites from Slovakia, Poland and the Czech Republic showed that the websites of national parks from Slovakia were evaluated the lowest (Repiský & Švajda, 2012). Probably this factor had a significant impact for recognition of the Veľká Fatra National Park logo by respondents from the analysed Slovakian students group. It also confirms the fact, that the Internet is one of the most frequently mentioned sources of information about parks used by students.

When testing differences between the answers given to the questions: *Would you like to engage in environmentally beneficial activities organised*

by the management of the national park?, Do you agree with the principles of conservation in the national park? and Will closing the national park as an institution have a negative impact on the region?, there were statistically significant differences between the answers to these questions in the studied countries (Wilcoxon test: Czech Republic – between the first and the second question –  $Z = -7.160^a$ ,  $p = 0.000 < 0.05$ , between the second and the third one –  $Z = -2.500^b$ ,  $p = 0.012 < 0.05$ ; Hungary – between the first and the second question –  $Z = -3.780^a$ ,  $p = 0.000 < 0.05$ , between the second and third one –  $Z = -3.130^b$ ,  $p = 0.002 < 0.05$ ; Poland – between the first and the second question –  $Z = -10.818^a$ ,  $p = 0.000 < 0.05$ , between the second and the third one –  $Z = -2.000^b$ ,  $p = 0.046 < 0.05$ ; Slovakia – between the first and the second question –  $Z = -1.103^a$ ,  $p = 0.000 < 0.05$ , between the second and the third one –  $Z = -3.545^b$ ,  $p = 0.000 < 0.05$ ). Most answers, which are indicators of knowledge of the environmentally-friendly activities organised by the national park, were given by students from Hungary and the Czech Republic, and least one from Poland and Slovakia (a total of 32.40% of the respondents wanted to participate in this activity, 29.30% did not want to be involved, and 38.30% of the respondents did not reply to this issue). Most students, who agreed with the principles of protection in national parks, were from Slovakia and the fewest from Hungary (in total, there were 90.10% «yes», 2.60% «no», and 7.30% «I do not know» answers of the respondents). In all countries, students thought that liquidation of the national park would harm the region, but in Hungary, compared to the other countries, there were less students of this view – 85.20%. On the contrary, most such answers were given by the students from Poland – 94.50%.

It is important for the management of the national parks to focus on the target group of students who were responded «I do not know» to the above questions. By means of appropriate forms (promotional materials, lectures, discussions with experts), it should be explained clearly to the group why it is essential to engage in such type of activities and what are intentions and functions of national parks (Powell et al., 2011; Stern et al., 2012; Weiland & Morrison, 2013; Stern et al., 2014). In this way, the number of «undecided» students could be reduced and lead to a closer co-operation between the school and the national park. Greater participation in the work of voluntary brigades might result in general increase of public interest in

voluntary assistance provided for the national parks. For example in 2014, 18 brigades of volunteers, which consisted of 458 people, worked in the Bohemian Switzerland National Park. In contrast, the Bükk National Park Brigades are called in only on a given day. This park has a very well developed co-operation with social organisations, which is not based on financial aid, but on attracting volunteers to the earlier announced work carried out in a voluntary form. In the Veľká Fatra National Park, there is only one active voluntary brigade a year and the number of people involved in the activity is different. In 2014, 35 people signed up for voluntary work in the Bieszczady National Park. However, voluntary work has some restrictions there. It is not a one-off event as volunteers involved to the work in the park spend a few days there (costs of travel, food and accommodation are financed by the park). The volunteers must be of legal age, fit, have a basic knowledge of the park and a good sense of directions in the area. The situation is more favourable in the Czech Republic and Hungary because the conditions of volunteering there are not as strict as in Poland. In those countries, the seasonal activities which enable to engage people (cleaning natural and cultural areas, garbage collection, transfer of amphibians, etc.), can be promoted throughout the year. The offer of this type is addressed to the general public, not only to gymnasium and secondary schools students or adults (Górecki et al., 2007; Český Švýcarsko NP, 2015).

### Conclusions

The studies confirmed differences in the environmental awareness of students from gymnasium and secondary schools from the countries belonging to the Visegrád Group (i) who live in the vicinity or further away from the selected national parks, especially in case of understanding the needs of nature conservation (ii). The fact is associated with activities of national parks which are institutions functioning for the whole society. Those activities should be expanded as in case of the analysed student groups the knowledge about parks and general ecological awareness seems to be insufficient. In that area, it might be recommended to focus on strengthening cooperation between the national parks and schools. Students from Poland and the Czech Republic achieved the best overall results in the carried out studies. It seems to be appropriate to introduce measures increasing environmental awareness of students, similar to



the education models functioning in national parks and schools in those countries. It is necessary to revise the ways of environmental education in the individual countries as well as to strengthen volunteer activities (iii).

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## ЭКОЛОГИЧЕСКАЯ ОСВЕДОМЛЕННОСТЬ СТУДЕНТОВ, ЖИВУЩИХ БЛИЗ НЕКОТОРЫХ НАЦИОНАЛЬНЫХ ПАРКОВ В СТРАНАХ ВЫШЕГРАДСКОЙ ГРУППЫ

П. Репка<sup>1</sup>, Б. Барабаш-Красны<sup>2</sup>, К. Можджен<sup>2</sup>, П. Урбан<sup>1</sup>, Ю. Швайда<sup>1</sup>

<sup>1</sup>Университет Матей Бела в Банксе Быстрице, Словакия

<sup>2</sup>Институт биологии педагогического университета, Польша  
e-mail: kasiamozdzen@interia.pl

Целью настоящего исследования было оценить экологическую осведомленность молодых людей и эффективность образования, проводимого национальными парками. Исследование проводилось с 2012 по 2014 гг. Были выбраны следующие национальные парки стран Вышеградской группы: национальный парк Велька Фатра (Словакия), национальный парк Чешская Швейцария (Чешская Республика), национальный парк Бещады (Польша) и национальный парк Бьюкки (Венгрия). Исследование было направлено на целевую группу учащихся гимназий и школ в регионах, где выбранные национальные парки находятся и за пределами этих территорий. Во всех исследованных странах нами был использован метод анкетирования, примененный на 1301 учащемся. Ответы каждого опрошенного были внесены в анкету и статистически проанализированы. Были использованы следующие статистические тесты: Крускал-Уолиса, Фридмана, Уилкоксона и Mann-Whitney. Наилучшие результаты были отмечены среди учащихся Польши и Чешской Республики. Таким образом, в остальных странах Вышеградской группы уместно проведение мероприятий по повышению экологической осведомленности учащихся в соответствии с функционирующими моделями проведения образовательной деятельности в национальных парках и школах Польши и Чешской Республики. Также необходима ревизия методов, которыми осуществляется экологическое образование во всех странах, а также усиление волонтерской деятельности.

**Ключевые слова:** Вышеградская группа, национальные парки, студенты гимназий и школ, экологическая осведомленность