

Recognition of the region's natural wealth as an important determinant of the formation of environmental literacy

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Abstract The paper presents new information within the research determining the impact of selected variables on creating a relationship with nature and the readiness to act in favor of the environment among students of pre-school and elementary pedagogy in Slovakia. Empirical research was quantitative. The aim of the research was to find out whether the students' interest in regional knowledge of nature has an impact on their level of environmental literacy and their relationship to nature. The research shows that students who were more interested in learning more about the region's natural wealth had a positive relation with the place, were more protective, reached higher level of motivation to act in favor of the environment and were more convinced of their own impact to solve environmental problems.

Key words Environmental literacy, region's natural wealth, relationship to nature, students of pre-school and elementary pedagogy

1. INTRODUCTION

These days, it is necessary that everyone is aware of their responsibility, but also the duty to protect and develop the natural wealth in an effort to save it for the future generations and to contribute to the sustainable development of their region.

Environmental disasters, such as extinction of plant or animal species, landslides, erosion, flash floods, global warming, depletion of the ozone layer, haze, air pollution, river and sea pollution prove the impacts of human's irresponsible actions towards the environment. Thus, countless efforts are taken to increase the awareness and actions in protecting the environment locally and globally (Rahman, N., Nasri, N., 2018). Through environmental education it is possible to operate in the field of education and training, while opening the way especially to increase the shared responsibility of people for the current and future state of the environment. At the same time, it encourages creativity to cope with problems and care for the natural environment. Big emphasis is also on creation of positive values, which lead in affective sphere to sensitivity towards environment and to the search for problems of

environmental crisis with its gradual solutions. Educational institutions are important and often primary mediator of environmental knowledge (Klocoková, 2014). Attitudes of children and their behavior towards environmental questions are being formed during the pre-school and younger school age (Kroufek, R., Látová, M., 2014). Thus, teachers who educate and teach future generations have an important role, and it's in their competence whether they use the education space to implement environmental education and develop environmental literacy among children. Environmental literacy can be seen as a complex of following dimensions: knowledge (cognitive dimensions), dispositions (affective dimensions), competences and environmentally responsible behavior (conative dimensions).

The common goal of environmental education is the development of competencies needed for environmentally responsible behavior. Taking into account goals of environmental education, following areas of competencies for environmentally responsible behavior have been defined: Relationship with nature; Relationship to place; Ecological acts and laws; Environmental problems and conflicts; Readiness to act in favor of the environment (Broukalová, L., & Novák, M. (2012). The most important areas of competencies for children of younger school age are relationship with nature and relationship to place. Among children of pre-school age, areas related to the development of environmental sensitivity are considered to be key areas (Simmons et al., 2010; Krajhanzl, 2012 In Činčera, 2013). In this context, we focused on mentioned indicators in the paper. With regard to the regional aspect of learning about the natural wealth (in relation to the region of Liptov in central Slovakia), we focus on the local level. Some authors focus on different aspects due to the relation to the place. According to Činčera (2013) it is possible to focus in research on these indicators: sense of place, in two items which are place attachment and place meaning (Činčera, 2013). We will pay attention to the place meaning in the paper.

Research also points to the impact of an individual's stay in nature on his or her responsible behavior towards nature (Dutcher, D. et al., 2007, Zelenski et al., 2015, Whitburn et al., 2019). The process of shaping students' relationship towards nature, which also influences their pro-environmental behavior should be

applied non-violently and focused on specific environmental conditions (Macko a kol., 2013). Knowledge of the immediate environment leads students to effectively solve environmental problems, understand their causes, encourages them to be active and thus contributes to the overall improvement of the environment. The relationship to the place with regard to learning about nature and the formation of environmental literacy can be positively developed in the educational space in primary education through approaches directly associated with staying in the immediate vicinity of the school (in site learning). These approaches include, for example, outdoor education, place-based education, experiential education (Čipková et al., 2015). Gamification can also be considered as one of the proven strategies of the educational process. Play or games can also be used effectively in pre-school and primary education (Vargová et al., 2021). Environmental education combined with service learning takes the school into a higher purpose and creates rich learning incentives (Sobel, 2014). In this context, the implementation of regional education into the educational process proves to be effective (Uhrinová, Zentko, 2014, Uhrinová, 2015).

Place-based education (PBE) is recognized as a best practice among professional educators. PBE includes the selection, design and engagement with science using the geographic place as the content (Coleman, 2014). It is an approach that uses the region and the local environment as a starting point for teaching in all subjects within education (mathematics, languages, social sciences, natural sciences, etc.). Emphasis is placed on active learning in the real world, using practical hands-on activities and experiences. It enables pupils to develop stronger ties with the region, increases their appreciation of the importance of the natural world and leads them to be active citizens who contribute to society (Sobel, 2014). Educational activities can be effectively interdisciplinary connected through primary education. Orr (1994) also states that educators using education based on the local context in the educational process believe that this education will prepare people for life and work in order to maintain the cultural and ecological integrity of the places they inhabit. To do this, people must have knowledge of environmental laws, causal systems and the long-term effects of human activity on these laws.

The teacher plays an important role in the educational space in developing positive relationship of students to nature. Kubiátko et al. (2021) state that in order for children to develop a positive relationship to nature, their educators need to have a like-minded personal quality.

Teachers and students in the role of future teachers are of great importance in terms of using effective strategies in developing students' environmental literacy. From this point of view, we focused our research on the undergraduate training of future teachers. In the field of environmental education, space is opened not only for the relationship with nature, but also for the study of factors with regard to the readiness to act in favor of the environment. In this dimension, one of the goals is to believe in our own impact on the prevention and solution of environmental problems, with two variables, Environmental Responsibility and Locus of Control (Činčera, 2013, Powell et al., 2011). In these intentions, we will focus our research on the variable Locus of control.

The paper presents the results of research aimed at determining the impact of selected variables on creating a relationship with nature and the readiness to act in favor of the environment among students of pre-school and elementary pedagogy in Slovakia.

2. RESEARCH METHODOLOGY

The research was quantitative. The subject of the research were selected aspects of environmental education and the level of environmental literacy of students of pre-school and elementary pedagogy. In this paper, we want to focus on the presentation of partial research results, which was aimed to determine whether the students' interest in regional knowledge of nature has an impact on their level of environmental literacy and their relationship to nature. When determining the relationship to the place, we chose the variable place meaning. With regard to the conative component in relation to nature, we focused on the readiness of the individual to act in favor of the environment - the Locus of control. We were determining the motivation and willingness to get involved in solving environmental problems. The NRS - Nature Relatedness Scale (adapted according to Franěk, 2012) was used to determine the degree of affective dimension of environmental literacy (specifically the respondents' relationship to nature), reflecting the appreciation and understanding of our connection with other living beings/creatures on Earth.

2.1 Sample of Research

The research was carried out in 2019-2020 at the Faculty of Education of the Catholic University in Ružomberok, Slovakia. The research group consisted of students of the study program Preschool and Elementary Pedagogy. Occasional and quota selection was used in the research. The research sample consisted of 254 respondents, of which 230 were bachelor's students and 24 were master's students.

2.2 Instrument and Procedures

The main research method was the questionnaire method. We created the questionnaire on the basis of the Methodology for the evaluation of environmental education for pre-school and younger school age (Činčera, 2013), which summarizes the questionnaires for determining the level of environmental literacy of students of several foreign authors. The reliability and validity of the created questionnaire was verified in the preliminary research. Standard methods used in pedagogical research were used to determine the reliability of the scales used. The Cronbach coefficient α was calculated for the tools using the five-point Likert scales for the respondents' answers. Reliability of the scales used (Cronbach α): place meaning ($\alpha = 0.92$), locus of control ($\alpha = 0.63$) and for NRS ($\alpha = 0.82$). In the statistical analysis, we chose specific methods according to the type and distribution of data. The data were first tested by the Shapir-Wilk normality test. Based on the normality test, the appropriate methods of statistical analysis were subsequently selected. The Mann-Whitney U test for comparing the two groups was used to analyze the results and the Kruskal-Wallis ANOVA test was used to compare several groups. Statistical analysis was performed via Statistica 12 program (Statsoft, 2016).

3. RESULTS OF RESEARCH

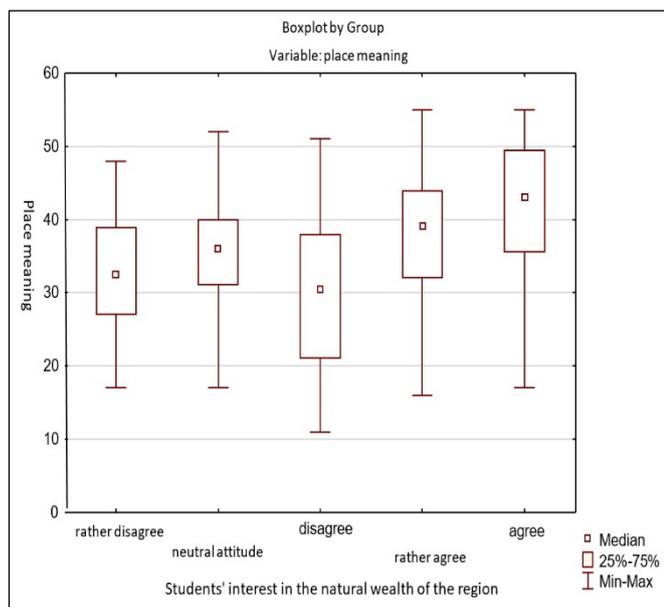
In the research, we were interested in whether students of pre-school and elementary pedagogy change their relationship to nature and the relationship to the place where the faculty is located, depending on whether they are interested in learning about the natural wealth in the region. With regard to the relationship to the place, we focused specifically on the variable place meaning. In the research, we were also interested in whether their interest in learning about nature also changes their motivation for responsible environmental behavior (locus of control) and their protective attitudes (NRS) (Tab. 1).

Tab. 1 Values found - Students' interest in the natural wealth of the Liptov region

Scale	Kruskal-Wallis ANOVA
Place meaning	H = 31,39, p < 0,001
Locus of control	H = 15,14, p = 0,0044
NRS	H = 40,25, p < 0,001

In developing environmental literacy, relationship to the place, which person has with given locality is also very important. We investigated whether it is possible for students to change their relationship to the place, specifically in the variable place meaning, through interventions such as learning about the region and its natural heritage during their studies in the region. We were interested in whether students show interest in the natural wealth of the Liptov region during their studies and how it affects the values in the variable place meaning. The results are presented in Graph 1 and Tab. 2.

Graph 1: Students' interest in the natural wealth of the region in connection with place meaning



Tab. 2 Values found - Students' interest in the natural wealth of the region in connection with place meaning

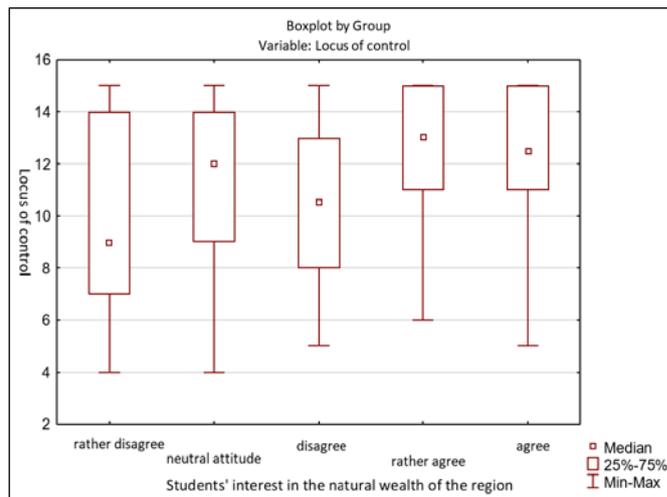
Depend. : Place meaning	Multiple Comparisons p values (2-tailed); Place meaning Independent (grouping) variable: Students' interest in the natural wealth of the region Liptov Kruskal-Wallis test H (4, N=254) =31,38533 p= .0000				
	rather disagree R: 92,544	disagree R:87,864	neutral attitude R:120,61	rather agree R: 139,25	agree R:170,06
rather disagree	-	1,000000	0,588724	0,025365	0,000038
disagree	1,000000	-	0,617542	0,044237	0,000183
neutral attitude	0,588724	0,617542	-	1,000000	0,002749
rather agree	0,025365	0,044237	1,000000	-	0,306759
agree	0,000038	0,000183	0,002749	0,306759	-

It is clear from Graph 1 that students who, during their studies at the Faculty of Education, showed a greater interest in the natural wealth of the Liptov region, achieved higher values in the variable place

meaning. By learning about the natural wealth of the region, their relationship to the place intensified.

With regard to the conative component in the intentions of environmental literacy, we found out in relation to nature whether the students' interest in learning about the natural environment affects the student's readiness to act in favor of the environment - variable locus of control. We focused on motivation and willingness to get involved in solving environmental problems. The results are presented in Graph 2 and Tab. 3.

Graph 2: Students' interest in the natural wealth of the region in connection with the locus of control



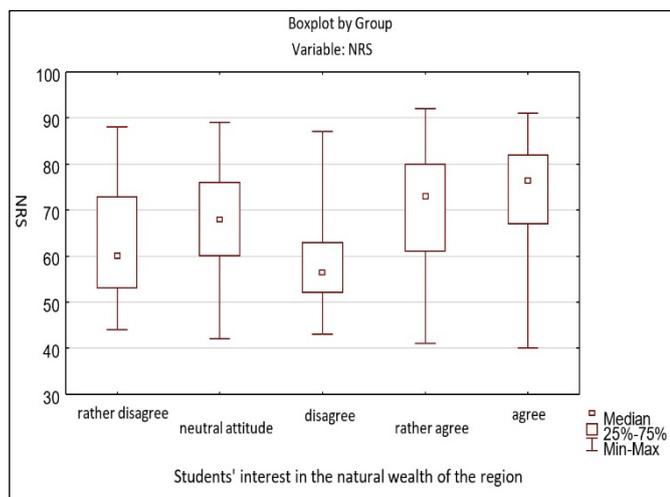
Tab. 3 Values found - Students' interest in the natural wealth of the region in connection with the locus of control

Depend. : Locus of control	Multiple Comparisons p values (2-tailed); Locus of control Independent (grouping) variable: Students' interest in the natural wealth of the region Liptov Kruskal-Wallis test H (4, N=254) =15,13770 p= .0044				
	rather disagree R: 102,85	disagree R: 89,205	neutral attitude R: 126,90	rather agree R: 143,68	agree R: 142,24
rather disagree	-	1,000000	1,000000	0,083123	0,188848
disagree	1,000000	-	0,315402	0,025485	0,057001
neutral attitude	1,000000	0,315402	-	1,000000	1,000000
rather agree	0,083123	0,025485	1,000000	-	1,000000
agree	0,188848	0,057001	1,000000	1,000000	-

Graph 2 shows that students who have shown more interest in learning about the region's natural wealth are more protective and more motivated to act in favor of the environment, are more convinced of their own impact in solving environmental problems.

We were interested in whether students' interest in the region's natural wealth could have an impact on students' level of environmental literacy in the affective dimension (in the NRS variable). The results are shown in Graph 3 and Tab. 4.

Graph 3: Students' interest in the region's natural wealth in connection with the NRS



Tab. 4 Values found - Students' interest in the region's natural wealth in connection with the NRS

Depend. variable: NRS	Multiple Comparisons p values (2-tailed); NRS				
	Independent (grouping) variable: Students' interest in the natural wealth of the region Liptov				
	Kruskal-Wallis test $H(4, N=254) = 40,25129$ $p = .0000$				
	rather disagree R: 90,412	disagree R: 64,568	neutral attitude R: 125,07	rather agree R: 145,89	agree R: 164,43
rather disagree	-	1,000000	0,196795	0,003356	0,000102
disagree	1,000000	-	0,005589	0,000067	0,000002
neutral attitude	0,196795	0,005589	-	0,812602	0,037762
rather agree	0,003356	0,000067	0,812602	-	1,000000
agree	0,000102	0,000002	0,037762	1,000000	-

Based on the results in Graph 3, it can be stated that the students' interest in the region's natural wealth has an impact on their protective attitudes in the NRS variable. Students who were more interested in learning about nature showed more frequent protective attitudes in nature.

4. CONCLUSION

The results of the research show that students who during their studies at the Faculty of Education showed greater interest in the natural wealth of the Liptov region, achieved higher values in the variable place meaning, the locus of control and in the variable NRS. Based on the given results, it can be stated that it is necessary to motivate students to learn about the natural wealth of the region in the process of education (in direct and indirect educational activities).

Students who put more importance to the place, place emphasis on getting to know the place, but also on its protection in all dimensions (cognitive, affective and conative). Students who are more interested in learning about the natural wealth of the region are also more convinced of their own impact on preventing and solving environmental problems. They are more motivated and willing to get involved in solving environmental problems. At the same time, they achieve higher values with regard to the affective dimension of the level of environmental literacy and more often show their protectionist attitudes.

It is with regard to primary education that importance is placed on the living space of the home in a regional context. According to Rindaningsih (et al., 2020), environmental education should improve pupils' awareness and appropriate behavior towards nature. Teachers as well as students, future teachers, have a great influence in this area. It is in their undergraduate studies where we see space for developing their competencies in the field of developing environmental literacy. When they understand the importance and need to know the natural wealth of the region in the intentions of developing environmental literacy, it is assumed that they will implement the given aspects into the educational process within their pedagogical practice.

We would like to point out that the research was carried out in the period before the outbreak of the Covid-19 pandemic situation and the respondents involved in the research had full-time teaching at the Faculty of Education in the researched region, while they also had the space for a real knowledge of nature in the region. The next stage of research is currently underway, involving respondents who spend some time online in their undergraduate training. This opens up further space for comparing the researched aspects in the changed conditions.

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