

**Institute for Educational Research, Belgrade, Serbia**

29<sup>th</sup> International Scientific Conference  
“Educational Research and School Practice”

**TOWARDS A MORE  
EQUITABLE EDUCATION:  
FROM RESEARCH TO CHANGE**

**BOOK OF PROCEEDINGS**

**Editors**

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December 1<sup>st</sup>, 2023

Faculty of Philosophy, Belgrade

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*Note.* This book was funded by the Ministry of Science, Technological Development, and Innovation of the Republic of Serbia (Contract No. 451-03-47/2023-01/ 200018).

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 CIP - Каталогизacija y пyблиkацији  
 Народна библиотека Србије, Београд

37.014.1(082)  
 37.091(082)  
 371.13(082)  
 37.091.33(082)

**INTERNATIONAL Scientific Conference “Educational Research and School Practice” (29 ; 2023 ; Beograd)**

Towards a more equitable education: from research to change : book of proceedings / 29th International Scientific Conference “Educational Research and School Practice”, December 1st, 2023. ; editors Mladen Radulović, Marija Trajković. - Belgrade : Institute for Educational Research, 2023 ([Beograd] : Kuća štampe). - 199 str. : table ; 24 cm

Tiraž 100. - Napomene i bibliografske reference uz tekst. - Bibliografija uz svaki rad. - Registar.

ISBN 978-86-7447-165-4

a) Право на образовање -- Зборници б) Школство -- Реформа -- Зборници в) Наставници -- Стручно усавршавање -  
 - Зборници г) Настава -- Иновације -- Зборници д) Инклузивно образовање -- Зборници

COBISS.SR-ID 130997001  
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# THE IMPORTANCE OF SOCIODEMOGRAPHIC CHARACTERISTICS FOR THE DEVELOPMENT OF ENVIRONMENTAL LITERACY<sup>1</sup>

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## **Introduction**

Environmental problems have gained prominence in light of the emerging global environmental crisis and its devastating impact on all living beings (Beck, 1992; Ehrlich & Ehrlich, 2013; Rockstrom et al. 2009). Therefore, there is a need for environmentally literate citizens who understand the essence of these problems and are ready to respond to the challenges they pose. Research has shown that societies and social groups react to ecological problems differently. Socioeconomic factors are important since social groups

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1 *Note.* This research was supported by Science Fund of the Republic of Serbia, # GRANT No 1569, *Environmental Identity of Primary School Students in Serbia* - ELIPS.

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differ in terms of their ecological knowledge and awareness as well as environmental affect, behavior, and activism.

Many countries have looked to environmental education (EE) as a solution to the environmental threats faced locally and globally (Brennan, 1994). It is essential to address these issues at an early age, since studies have shown that the early teenage years are a crucial period for developing emotional relations with living beings in nature (Eames et al., 2018; Kals & Ittner, 2003). The main goal of EE is to improve environmental literacy (EL) (Stevenson et al., 2013). McBeth et al. (2008) operationalize EL comprehensively, encompassing four components: (1) ecological knowledge, (2) affect, (3) cognitive skills, and (4) behavior.

Research has shown that gender influences EL in many contexts. In Serbia, studies have found women to be more willing to engage in various activities aimed at resolving environmental problems (Mišković, 1997). A study conducted in Poland also identified gender differences in EL, with girls obtaining higher scores on knowledge, attitudes, and behavior (Svobodová, 2023). A Czech study reported similar findings, with girls scoring better on pro-environmental sensitivity, attitudes, and behaviors than boys (Svobodová, 2023; Svobodová & Chvál, 2022). In Turkey, research has shown that female students generally obtain higher scores on the EL scale's dimensions of Knowledge and Concern, while scores on the dimensions of Attitudes and Sensitivity tend to be similar among male and female students (Genc & Akilli, 2016; Teksoz, 2014). However, not all studies have found a relationship between gender and EL (Grůňová et al., 2018; Nastoulas et al., 2017; Svobodová, 2023). In Serbia, studies have reported no gender differences in knowledge, but girls have been found to be more committed to pro-environmental activism (Mišković, 1997; Stanišić, 2008). Despite these mixed findings, the prevailing view in the literature is that gender influences EL.

Concerning other background factors such as regional and residential differences, many researchers have reported that EL components differ according to cultural and social factors (Barraza & Walford, 2002; Deng et al., 2006; Olli et al., 2001; Van Petegem & Blicke, 2006). For example, a study in China found that environmental issues varied depending on regional and economic differences and local characteristics (Clayton, 2019). In Serbia, research has shown that students from urban dwellings are better informed about environmental problems compared to students from rural areas (Kundačina, 2006; Mišković, 1997). Furthermore, a study found respondents from

villages to be more inclined towards environmental engagement than urban residents (Kundačina, 2008).

## **Method**

In this study, we focused on several sociodemographic factors (gender, settlement type, and region of Serbia) and aimed to explain their effects on scores on the four components of EL (knowledge, behavior, and cognitive and affective aspects). Our study participants were seventh-grade students of primary schools in Serbia (13–14 years old). The number of participants was 877 participants. Data were collected using the Middle School Environmental Literacy Survey – MSEL<sup>3</sup> (McBeth et al., 2008). The instrument consists of seven segments with 77 closed-ended questions. Questions on the key sociodemographic characteristics are situated at the beginning of the survey, followed by a test of general ecological knowledge, the scale of affective relationship with the environment (measures verbal commitment, environmental sensitivity, and environmental feeling), and the behavior scale (measures actual commitment). In the data analysis process, we conducted a T-test and ANOVA.

## **Results**

The first step in the analysis entailed a gender comparison of EL results. Compared to boys, girls obtained higher scores on all four components of EL: ecological knowledge ( $p = .002$ ), affect ( $p < .001$ ), cognitive skills ( $p < .001$ ), and pro-environmental behavior ( $p < .001$ ). Consequently, girls obtained higher overall EL scores ( $p < .001$ ).

The achievements of respondents from urban and rural areas were compared in terms of the total score and scores on the individual components of EL. In line with previous findings, students from urban settlements had slightly higher scores on ecological knowledge ( $p = .004$ ) and cognitive skills ( $p = .002$ ), while students from rural dwellings showed a higher affinity for nature ( $p = .001$ ) and a greater tendency

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<sup>3</sup> Permission to use this instrument was given on February 18, 2022, by Thomas Marcinkowski, professor and the Program Chair of the STEM Education Program at the Florida Institute of Technology, USA.

towards pro-environmental behavior ( $p = .001$ ). There were no significant differences in the total score on EL depending on the settlement type.

Furthermore, ANOVA was performed comparing students from four regions: Belgrade, Vojvodina, Southern and Eastern Serbia, and Šumadija and Western Serbia. The post-hoc test revealed that students from Vojvodina obtained better results on the cognitive skills test compared to students from Belgrade ( $p = .031$ ) and Šumadija and Western Serbia ( $p = .013$ ). Concerning affect, a significant difference was found in favor of Southern and Eastern Serbia compared to Belgrade ( $p = .022$ ). Finally, students from Vojvodina obtained slightly higher total scores than students from Belgrade ( $p = .047$ ).

## **Conclusion and Implications**

The relationship between gender and EL is complex and influenced by a variety of factors. Concerning knowledge, according to TIMSS 2007 data obtained on eighth-graders, even though girls performed better in science internationally, in Serbia, there were no statistically significant differences in achievement between girls and boys. However, there were differences in achievement at the school-subject level. Specifically, boys performed better in physics and geography, while girls outperformed boys in biology and chemistry (Gašić-Pavišić et al., 2011, p. 36). Since the content of the MSELS knowledge test belongs to the domain of biology and girls performed better in our study, our results are in line with the results of TIMSS 2007 obtained in Serbia. In terms of the other components of EL, our results aligned with previous findings showing that girls tend to obtain higher scores on pro-environmental behavior and affect (Svobodová, 2023; Svobodová & Chvál, 2022; Svobodová, 2023; Genc & Akilli, 2016; Teksoz, 2014). Various explanations have been proposed for women's higher levels of EL. One explanation is that women have a higher ethic of care (Gilligan, 1982). Another explanation is that women's inferior position in society and experience of oppression make them more empathetic to others (Kalof, 2000).

Having in mind that students from rural areas proved to have less information and knowledge compared to their peers from cities but still showed greater readiness to act, we can assume that the everyday knowledge and experience students obtained by living close to nature was a more significant motivator for environmental activism



than school knowledge and knowledge from other sources (Stanišić, 2008). Kundačina (2006) found that respondents from rural areas were more ready to take part in pro-environmental activities because they were more emotionally connected to nature, home, and family and thus more active in pro-environmental practices with their families.

Environmental literacy is essential for addressing the environmental challenges of our time. By improving the environmental literacy of children and the youth, we can help create a more sustainable future for all. Nevertheless, the aims of environmental education must be supported by political, technical, and infrastructural conditions. Furthermore, education at an early age cannot replace the role of adult education, since it is adult education that can bring quicker changes in the processes of citizen participation and decision-making. The development of environmental education should be connected with promoting equity, inclusion, and the quality of education in general. Schools should offer influential role models and the possibility to frequently spend time in nature, especially because it is not available to all families (Stevenson et al., 2014). For this reason, it is crucial to simultaneously work on the development of EE, environmental justice, and social equity (Klawinski, 2022).

**Keywords:** environmental literacy, environmental education, gender, settlement type, regions of Serbia

## References

- Barraza, L., & Walford, R. A. (2002). Environmental education: A comparison between English and Mexican school children. *Environmental Education Research*, 8(2), 171–186. <https://doi.org/10.1080/13504620220128239>
- Beck, U. (1992). *Risk Society*. Sage.
- Brennan, A. (1994). Environmental literacy and educational ideal. *Environmental values*, 3(1), 3–16. <https://doi.org/10.3197/096327194776679827>
- Clayton, S., Bexell, S. M., Xu, P., Tang, Y. F., Li, W. J., & Chen, L. (2019). Environmental literacy and nature experience in Chengdu, China. *Environmental Education Research*, 25(7), 1105–1118. <https://doi.org/10.3197/096327194776679827>
- Deng, J., Walker, G. J., & Swinnerton, G. (2006). A comparison of environmental values and attitudes between Chinese in Canada and Anglo-Canadians. *Environment and Behavior*, 38(1), 22–47. <https://doi.org/10.1177/0013916505278458>

- Eames, C., Barker, M., & Scarff, C. (2018). Priorities, identity and the environment: Negotiating the early teenage years. *The Journal of Environmental Education*, 49(3), 189–206. <https://doi.org/10.1080/00958964.2017.1415195>
- Ehrlich, P. R., & Ehrlich, A. H. (2013). Can a collapse of global civilization be avoided? *Proceedings of the Royal Society of London B Biological Sciences*, 280(1754), 20122845.
- Gašić- Pavišić, S., Stanković, D., & Malinić, D. (2011). TIMSS 2007 u Srbiji-opis istraživanja i glavi rezultati [TIMSS 2007 in Serbia – description of research and main results]. U S. Gašić- Pavišić & D. Stanković (Ur.), *TIMSS 2007 u Srbiji* (11–40). Institut za pedagoška istraživanja.
- Genc, M., & Akilli, M. (2016). Modeling the relationships between subdimensions of environmental literacy. *Applied Environmental Education & Communication*, 15(1), 58–74. <https://doi.org/10.1080/1533015X.2016.1141724>
- Gilligan, C. (1982). *In a different voice: Psychological theory and women's development*. Harvard.
- Kalof, L. (2000). The multi-layered discourses of animal concern. In H. Addams & J. Proops (Eds.), *Social discourse and environmental policy: An application of Q methodology* (pp. 174–195). Edward Elgar.
- Kals, E., & Ittner, H. (2003). Children's environmental identity: Indicators and behavioral impacts. In S. Clayton & S. Opatow (Eds.), *Identity and the Natural Environment The Psychological Significance of Nature* (pp. 135–157). The MIT Press.
- Klawinski, T. P. (2022). *Achieving Environmental Literacy: An Evidenced-Based Model for Public Schools*. Wilmington University.
- Kundačina, M. (2006). *Činioci ekološkog vaspitanja i obrazovanja učenika* [Factors of environmental education and education of students]. Učiteljski fakultet.
- McBeth, B., Hungerford, H., Marcinkowski, T., Volk, T., & Meyers, R. (2008). *National Environmental Literacy Assessment Project: Year 1: National baseline study of middle grades students final research report*. [https://www.epa.gov/sites/default/files/documents/masternela\\_year1report\\_081208.pdf](https://www.epa.gov/sites/default/files/documents/masternela_year1report_081208.pdf)
- Mišković, M. (1997). *Ekološka kriza i ekološka svest omladine* [Environmental crisis and environmental awareness of youth]. Viša škola za obrazovanje vaspitača, Ekocentar.
- Nastoulas, I., Marini, K., & Skanavis, C. (2017). Middle school students' environmental literacy assessment in Thessaloniki, Greece. In *Health and Environment Conference Proceedings* (pp. 198–209). Hamdan Bin Mohammed Smart University.
- Olli, E., Grendstad, G., & Wollebaek, D. (2001). Correlates of environmental behaviors: Bringing back social context. *Environment and Behavior*, 33(2), 181–208. <https://doi.org/10.1177/0013916501332002>
- Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., Lenton, T. M., Scheffer, M., Folke, C., Schellnhuber, H. J., Nykvist, B., de Wit, C. A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P. K., Costanza, R., Svedin, U., Falkenmark,

- M. ... & Foley, J. A. (2009). A safe operating space for humanity. *nature*, 461(7263), 472–475. <https://doi.org/10.1038/461472a>
- Stanišić, J. (2008). *Ekološko vaspitanje i obrazovanje učenika u osnovnoj školi* [Environmental education of pupils in primary school] (Unpublished master thesis). University of Belgrade, Faculty of Philosophy.
- Stevenson, K., Peterson, N., Carrier, S., Strnad, R., Bondell, H., Kirby-Hathaway, T., & Moore, S. (2014). role of significant life experiences in building environmental knowledge and behavior among middle school students. *The Journal of Environmental Education*, 45(3), 163–177. <https://doi.org/10.1080/00958964.2014.901935>
- Stevenson, R. B., Brody, M., Dillon, J., & Wals, A. E. J. (2013). *International handbook of research on environmental education*. Routledge.
- Svobodová, S. (2020). Environmental literacy of pupils and its investigation in the Czech Republic. *Sociální pedagogika Social Education*, 8(1), 88–104.
- Svobodová, S. (2023). Environmental literacy of ISCED 2 pupils in Poland. *Journal of Elementary Education*, 16(1), 60–77. <https://doi.org/10.18690/rei.16.1.1665>
- Svobodová, S., & Chvál, M. (2022). Environmental literacy of lower secondary school pupils in the Czech Republic. *Journal of Biological Education*, 1–23. <https://doi.org/10.1080/00219266.2022.2067213>
- Teksoz, T., Boone, J.W., Yilmaz Tuzun, O., & Oztekin, C. (2014). An evaluation of the environmental literacy of preservice teachers in Turkey through Rasch analysis. *Environmental Education Research*, 20(2), 202–227. <https://doi.org/10.1080/13504622.2013.768604>
- Van Petegem, P., & Blicck, A. (2006). The environmental worldview of children: A cross-cultural perspective. *Environmental Education Research*, 12(5), 625–635. <https://doi.org/10.1080/13504620601053662>