TEACHERS' PERCEPTION OF ENVIRONMENTAL CRISIS IN SELECTED SLOVENIAN REGIONS

ANDREJA KOZMUS, MATEJA PŠUNDER
University of Maribor, Faculty of Arts, Maribor, Slovenia
andreja.kozmus@um.si, mateja.psunder@um.si

Attention to the environmental agenda in Slovenia is growing in line with perceived environmental changes and is also being translated into school practice. Teachers are particularly important in educating about and raising awareness of the environmental crisis among young people. Within the framework of the ZELEN.KOM project, among other activities and with multiple respondents, we have identified 204 sets of perceptions of the environmental crisis among teachers, including their concerns about it, and the extent to which they are willing to be educated about it. We were interested in the differences between teachers according to individual variables (gender, age, place of residence and level of education). We found that teachers recognise and are very concerned about environmental issues in Slovenia; overall, there are no significant differences in their responses to the individual variables. In future it would be worthwhile to explore the transition from teachers' declared views on the environmental crisis to their active, sustainable action.

DOI
https://doi.org/10.18690/um.pef.2.2024.19

ISBN
978-961-286-899-4

Keywords:
education,
environmental crisis,
sustainability,
teachers' perceptions,
teachers' education

University of Maribor Press

DOI
https://doi.org/10.18690/um.pef.2.2024.19

ISBN
978-961-286-899-4

Ključne besede:
vzgoja in izobraževanje,
okoljska kriza,
trajnostnost,
zaznave učiteljev,
izobraževanje učiteljev

ZAZNAVANJE OKOLJSKE KRIZE MED UČITELJI V IZBRANIH REGIJAH SLOVENIJE

ANDREJA KOZMUS, MATEJA PŠUNDER
Univerza v Mariboru, Filozofska fakulteta, Maribor, Slovenija
andreja.kozmus@um.si, mateja.psunder@um.si

Pozornost do okoljske krize v Sloveniji narašča skladno z zaznanimi okoljskimi spremembami, kar se prenaša tudi v šolsko prakso. Pri izobraževanju in ozaveščanju mladih o okoljski krizi so še posebej pomembni učitelji. V okviru projekta ZELEN.KOM smo med drugimi aktivnostmi in različnimi anketiranci ugotavljali, kako okoljsko krizo zaznavajo 204 učitelji, njihovo zaskrbljenost zaradi okoljske krize in v kolikšni meri so se na področju okoljske krize pripravljeni izobraževati. V vsem navedenem so nas zanimale razlike med učitelji glede na posamezne spremenljivke (spol, starost, kraj bivanja in stopnja izobraževanja). Ugotovili smo, da učitelji prepoznavajo okoljsko problematiko v Sloveniji, ta jih zelo skrbi, v njihovih odgovorih glede na posamezne spremenljivke pa v glavnem ne obstajajo statistično pomembne razlike. Ugotavljamo, da bi bilo v prihodnjih raziskavah smiselno pozornost nameniti preučevanju prehoda od deklarativnih stališč učiteljev o okoljski krizi do njihovega aktivnega trajnostnega delovanja.

Univerzitetna založba Univerze v Mariboru

1 Introduction

Attention to the environmental agenda is growing in line with perceived environmental changes, which in Slovenia have been most visible in recent years in the public's perception of more frequent natural disasters. The global environmental crisis does not manifest as an isolated issue but is intertwined with other global problems, e.g., energy, the economy, and equity crises, all requiring that people learn to adapt and transform (Lerch, 2017).

In 2015 the United Nations defined 17 sustainable development goals (SDG's) (UN, 2015), where sustainable development was explained as meeting human needs worldwide while simultaneously not endangering the ability of future generations to meet their future needs (WCED, 1987). The 2023 SDG Summit highlighted the transformative and accelerated actions leading up to 2030 and towards these SDG's (UN, 2023), by balancing economic, environmental, and social factors. Two concepts; sustainable development and sustainability are often used as synonyms; however, it is impossible to talk about further economic growth and environmental sustainability in a limited planet (Redclift, 2006); therefore, new environmental approaches are needed. Some authors (Kallis, 2011; Kothari, Demaria, & Acosta, 2014) suggest that we need to develop a new vision that is not linked to growth and that environmental sustainability will yield only economic decline, with our objective to make it socially sustainable. Ruggerio (2021) understands sustainability as a principle and sustainable development as a social process based on sustainable choices and decisions in various areas of social life, including education. Among global issues, teachers have a responsibility to continually seek ways to promote environmental sustainability in learning, teaching, and the management of educational institutions (UN, 2015). In other words: teachers' (environmental) awareness, and knowledge, and their application constitute essential steps in protecting the environment.

Teachers represent an important stakeholder in educating students for sustainable action, fostering harmonious coexistence, and constructing a fairer society. From the perspective of Peček Čuk & Lesar (2020,) teachers play two central roles. The first one refers to setting an example or being a role model for the students, and the second to their leadership or guidance in the pedagogical process. At the time of entry into primary school, children usually make the transition from imaginary to

symbolic identification. One object of identification can be the teacher. As leaders and guides in the educational process, teachers have autonomy to decide about the content and methods of teaching (Eurydice, 2008). According to Kroflič, teachers in both roles establish the authority of the superior pole. Namely, teachers' pedagogical authority can be interpreted in line with its predominant a) substantial or b) dialogical origin, which also interrelate. The first one can be recognised in the personal (teacher's personality traits) or social (teacher's social power) substantial, the second one in the relational connection between the teacher and the group of learners (different educational styles), or between the teacher and each individual student (the establishment and building of a relationship).

The dialogical perspective therefore posits that effective communication hinges on relationships where the primary purpose is the reciprocal acknowledgment of both superior and subordinate authority positions (Kroflič, 2010). A dialogical perspective can be linked to transformative learning (in comparison with transmissive learning), which is a dynamic process wherein pre-existing (uncritically embraced) ideas, beliefs, values, or attitudes are confronted and replaced with new ones that offer increased validity for the individual. This transformative shift occurs as patterns of thinking undergo a fundamental change (Novak, 2006; Kitchenham, 2008). Over the years, transformative learning has undergone many improvements. Marentič Požarnik (2000) calls it innovative learning, which is anticipatory (based on foresight about the future) and participatory (since it presupposes the democratic participation of all those affected by future decisions). Here, learning is conceived as a qualitative process of progressive enhancement, creating meaning-making and deeper understanding, and thus of changing oneself as a person, as opposed to a transmissive transfer of knowledge, where focus lies on content and a quantitative accumulation of information. Teacher (professional) autonomy is a prerequisite for the development of innovation and creativity in schools, but greater autonomy is closely linked to greater responsibility (Eurydice, 2008). Blake et al. (2013) distinguishes between the transmission of knowledge from teacher to learner, which is still (too) common in formal education, metacognitive learning, where young people learn to look at and critically evaluate their assumptions, beliefs, norms and values from a distance, and epistemological, transformative learning, where the individual's perception of the world and their participatory agency is changed (Blake et al., 2013).

Education for sustainability is closely intertwined with education for human rights, social justice, environmental protection etcetera. University teachers in particular are recognised as agents of change in the training of future teachers to become capable of addressing environmental problems (UN, 2015). A key element in realizing this objective is the advancement of novel learning and teaching approaches, requiring simultaneous investment in the ongoing professional development of educators and school leaders. Additionally, it entails the establishment of environmentally sustainable learning environments and school ecosystems, as emphasized by UNESCO (2021). This requires from all of us interrelated knowledge, skills, values, and attitudes, concerning the environment, economy, peoples' health, and welfare (Stanišić, 2016).

2 Empirical study

2.1 Research method

Our study is based on the descriptive and causal non-experimental method of empirical pedagogical research.

2.2 Aim of the empirical research

In this paper, we present only part of the results of a larger survey on the environmental crisis, which was carried out within the framework of the ZELEN.KOM project.

The main research question in this paper is how teachers perceive environmental problems. We assumed that teachers' perceptions of the environmental crisis were not irrelevant, as teachers are objects of identification for students and the leaders of and guides to the pedagogical process (Peček Čuk, & Lesar, 2020), which is discussed in more detail in the theoretical part of the paper. In more detail we were interested in addressing the following questions:

- How do teachers perceive the problem of individual environmental issues in Slovenia?
- How do teachers perceive the responsibility of individual stakeholders in the environmental crisis?

- What is the general concern of teachers about environmental problems and individual environmental issues?
- How do teachers perceive the consequences of the environmental crisis?
- To what extent are teachers willing to be educated about the environmental crisis?

In all these questions we were interested in differences between teachers according to gender, age, level of education (primary/ secondary school) and place of residence.

2.3 Research sample

The data was collected through an online anonymous survey questionnaire designed for the project by a research team composed of experts at the Faculty of Arts, University of Maribor, from different research fields. The questionnaire was sent by email to employers in the economic and non-economic sectors and to students. Employees in the business and non-business sectors from the regions of Pomurska, Podravska, Koroška, Savinjska, Zasavska, and Spodnjeposavska, were addressed by project participants and asked for cooperation. These regions were included because most students and university employees originate from these regions. The survey for economic and non-economic sectors was available online and in hard copy from 9. 2. 2023. As we wanted to show some concrete commitment to our project, €0.5 from each completed survey was donated to the Association for Birdwatching and Bird Studies of Slovenia, Pomurje Section (DOPPS-Pomurje Section).

The survey is based on an ad hoc sample. Two hundred and four teachers completed the questionnaire in the total sample covered by the survey. The gender of 202 teachers was given, of whom, as expected, in line with the feminisation of the teaching profession, there were more female teachers (170 or 84.2%) than male teachers (32 or 15.8%). The age of 198 teachers was given, which was classified into four groups: up to 30 years (19 or 9.6%), 31 to 40 years (46 or 23.2%), 41 to 50 years (65 or 32.8%) and 51 years and over (68 or 34.3%). In terms of level of teaching, there were slightly more teachers working in primary schools (116 or 56.9%) than in secondary schools (88 or 43.1%). The highest percentage of teachers (110 or 53.9%) said they lived in a village, followed by teachers living in a small town (52 or 25.5%),

teachers living in a suburban settlement (22 or 10.8), and the lowest percentage of teachers living in a large city with more than 30,000 inhabitants (20 or 9.8).

2.4 Measurement tool

In the framework of the ZELEN.KOM project, various research tools, such as surveys, interviews, analyses of company and institution documentation, and expressions of viewpoints in the media, have been and will continue to be employed for exploration and analysis within the project. This approach allows us to engage with various sectors, including industry, agriculture, tourism, public administration, teachers, and students in certain university programs at the University of Maribor. The questionnaire was made jointly by representatives from 10 departments of the Faculty of Arts, University of Maribor.

The data was collected through an anonymous online questionnaire designed for the project by a research team composed of experts from different research fields. In the following, we describe only those questions that are relevant for the purposes of this paper. First, some basic demographic data (gender, age, teaching level, type of settlement of residence and others) were obtained from the teachers. To find out how teachers perceived the problem of individual environmental issues in Slovenia, we offered them six statements (see Table 1), to which they responded on a five-point rating scale ranging from 1 - not problematic at all to 5 - very problematic. Perceptions of the responsibility of individual stakeholders in the environmental crisis were obtained by providing teachers with six answers and asking them to choose the most relevant one for them: it is mainly the responsibility of humans; it is caused equally by humans and natural processes; it is mainly caused by natural processes in the environment; none of these because the climate crisis does not exist; I don't know; and others. Teachers expressed their general concern about environmental problems by stating the following on a five-point scale from 1 - disagree to 5 - strongly agree that environmental problems worry me. They expressed their concern about individual environmental issues by addressing the five items (shown in Table 2) on a five-point scale from 1 - not at all concerned to 5 - very concerned. The next question was designed in a similar way to find out how teachers perceived the consequences of the environmental crisis. Teachers addressed three statements on a five-point scale from 1 - not agree at all to 5 – strongly agree. They indicated their willingness to be educated about the environmental crisis on a

five-point scale from 1 - not at all willing to be educated to 5 - very willing to be educated.

2.5 Data collection and analysis procedure

The questionnaire was published on the website https://www.1ka.si/ and was active from 9. 2. 2023 to 21. 3. 2023. The link to the questionnaire was sent to institutions with different sectors of activity (primary, secondary, tertiary, and quaternary). The content of the survey was explained to the contact persons in the selected institutions. We asked them to forward the link to the questionnaire to their staff and encourage them to complete it. Employee participation in the survey was voluntary and anonymous.

The collected data was analysed with the statistical analysis software SPSS and by suitable multivariate statistical methods at the level of descriptive and inferential statistics. When analysing data, we used various statistical proceedings: frequency distribution (f, f %), $\chi 2$-test (in places where frequencies were low Likelihood Ratio), the Mann-Whitney test and the Kruskal-Walli's test. In the following, we only provide calculations for cases where statistically significant differences or tendency were found.

3 Results

3.1 Perceived problem of individual environmental issues in Slovenia

We were interested in teachers' perceptions of the problem of individual environmental issues in Slovenia. The data are shown in Table 1.

From the mean values shown in Table 1, we can see that among the environmental issues mentioned, teachers ranked the quality of drinking water as the least problematic in Slovenia, followed by air quality. These are the only two environmental issues that scored a mean of less than 3. All other environmental issues scored more than 3, which means that teachers perceive them as problematic. Among these, teachers consider the destruction of nature to be the most problematic, followed by environmental pollution from waste, climate change and loss of biodiversity.

Table 1: Measures of descriptive statistics and percentage frequencies of perceived problem of individual environmental issues in Slovenia

Perceived problem	N	M	SD	(1)	(2)	(3)	(4)	(5)
air quality.	204	2.99	0.893	5.4	20.1	48.5	22.1	3.9
drinking water quality.	204	2.75	1.016	10.3	31.9	33.8	20.1	3.9
climate change.	204	3.34	0.930	3.9	10.8	42.2	33.8	9.3
waste pollution.	203	3.51	0.982	2	12.7	33.8	34.3	16.7
loss of biodiversity (species extinction).	204	3.26	0.951	3.9	15.2	39.7	32.8	8.3
destruction of nature (development of fertile land. deforestation).	204	3.57	1.055	2.9	12.7	29.9	32.8	21.6

Legend: N - number of responses, M - arithmetic mean, SD - standard deviation, (1) - Not at all problematic, (5) - Very problematic.

The percentages shown in Table 1 indicate that teachers are most likely to be undecided on all but two environmental issues (waste pollution and destruction of nature). They are most undecided about air quality. The most extreme responses in the positive direction (not at all problematic) are found for drinking water quality and in the negative direction (very problematic) for destruction of nature and waste pollution.

We wanted to know whether there were differences in teachers' responses by gender, age, level of education and place of residence. There was no statistically significant difference in teachers' responses by age, place of residence and level of teaching for any of the environmental issues. There is a tendency ($U = 5855.000$; $p = 0.056$) for teachers in secondary school ($M = 111.03$) to rate climate change as more problematic than teachers in primary school ($M = 96.03$). Only one individual environmental issue showed a statistically significant difference in teacher responses by gender, namely the destruction of nature ($U = 1818.500$; $p = 0.002$), which is considered more problematic by female teachers ($M = 106.80$) than by male teachers ($M = 73.33$). A tendency is observed for two individual environmental issues, climate change ($U = 2173.000$; $p = 0.055$) and biodiversity loss ($U = 2174.000$; $p = 0.057$), to be perceived as more problematic by female teachers ($M = 104.71$ and 104.71) than by male teachers ($M = 84.41$ and 84.44).

3.2 Perceived responsibility of individual stakeholders for the environmental crisis

Next, we wanted to know whether teachers believed in the existence of an environmental crisis and, if so, who or what they think is responsible for it. Not all teachers answered this question (n = 187). More than two-thirds of teachers (70.1%) believe that there exists an environmental crisis and that humans are primarily responsible for it. Just under a third of teachers surveyed (25.7%) believe that the environmental crisis is caused equally by humans and natural processes. The remaining answers are sparsely represented: only two teachers (1.1%) think that the crisis is mainly caused by natural processes in the environment, two teachers (1.1%) think that there is no climate crisis, and one teacher (0.5%) chose the answer "I don't know". Three respondents (1.6%) chose the answer "Other" and wrote down their opinion. Two pointed out that the weather is being made or deliberately changed, and one wrote that the biggest corporations in the world are to blame for the existence of the crisis.

The chi-square calculations showed no statistical difference between teachers' answers according to gender ($X^2 = 7.027$, df = 5, p = .219), age ($X^2 = 12.228$, df = 15, p = .662), school level ($X^2 = 3.292$, df = 5, p = .655), and place of residence ($X^2 = 19.082$, df = 15, p = .210).

3.3 Perceived general concerns about environmental problems and concerns about individual environmental issues

In the previous question, most teachers confirmed that they perceived an environmental crisis, so we next wanted to know how concerned they were about environmental problems in general and about individual environmental issues.

Teachers expressed their concern about environmental problems by responding to "I am concerned about environmental problems" on a five-point scale from 1 - disagree to 5 - strongly agree. The mean score of the statement is 4.06 (SD = 0.939), indicating that teachers are quite concerned about environmental problems. Of the 203 teachers who answered this question, 38.4% agree and about the same proportion (37.9%) even strongly agree that they are concerned about environmental problems. 17.2% expressed neither a positive nor a negative view of

the statement. Only a small percentage of teachers disagree (4.9%) or strongly disagree (1.5%) that they are concerned about environmental problems.

We were interested to see whether there was a statistically significant difference in teachers' responses by gender, age, level of teaching and place of residence. The chi-square calculations showed no statistical difference between teachers' answers according to age, school level and place of residence. There was a difference in teachers' answers according to gender ($X^2 = 10.821$, df = 4, p = .029), with female teachers expressing more general concern about environmental problems than male teachers.

Next, we were interested in how concerned teachers were about individual environmental issues. The results are shown in Table 2.

Table 2: Measures of descriptive statistics and frequency table for statements related to teachers' concerns about individual environmental issues.

To what extent are you concerned about…	N	M	SD	(1)	(2)	(3)	(4)	(5)
pollution of the environment.	203	4.27	0.856	1.0	2.5	13.3	35.0	48.3
more and more natural disasters.	203	4.05	0.958	2.0	4.4	18.2	37.4	37.9
rising global temperatures.	204	3.90	1.012	2.9	5.4	22.5	36.8	32.4
climate crisis.	204	3.99	1.022	2.9	4.4	21.6	32.8	38.2
extinction of plant and animal species.	204	4.04	0.987	2.0	4.9	20.1	33.3	39.7

Legend: N - number of responses, M - arithmetic mean, SD - standard deviation, (1) - Not at all worried, 5 - Very worried.

The mean values for all statement in Table 2 are around 4, which means that teachers' answers tend to indicate a high level of concern about individual environmental issues. They are most concerned about pollution, and only slightly less concerned about the increasing number of natural disasters and the extinction of plant and animal species. Among the environmental issues mentioned, the climate crisis and the rise in global temperatures are the least of their concerns, but it should not be ignored that these two environmental issues are also still of considerable concern (M = 3.90 and 3.99).

The following environmental issues showed statistically significant differences in teachers' responses by gender: environmental pollution (U = 1793.00; p = 0.001), increasing natural disasters (U = 1839.00; p = 0.002), climate crisis (U = 2052.500; p = 0.020) and extinction of flora and fauna (U = 1901.00; p = 0.004). For all these individual environmental issues, female teachers (M for the above statements: 106.39; 106.12; 105.43 and 106.32, respectively) express greater concern than male teachers (M for the above statements: 72.53; 73.97; 80.64 and 75.91, respectively). There is a tendency (U = 2162.500; p = 0.053) concerning the rise in global temperature, which is of greater concern to female teachers (M = 134.78) than to male teachers (M = 84.08). There is no statistically significant difference in the teachers' responses with respect to age, level of teaching and place of residence for any of the environmental issues.

3.4 Perceived consequences of the environmental crisis

We looked at teachers' perceptions of the consequences of the environmental crisis, with a particular focus on whether they perceived the consequences of the environmental crisis as more likely to affect them personally or the next generation. The answers are shown in Table 3.

Table 3: Measures of descriptive statistics and frequency table for statements related to the perception of the consequences of the environmental crisis

Statement	N	M	SD	(1)	(2)	(3)	(4)	(5)
Pollution harms my health.	204	4.27	0.954	2.0	3.4	13.2	27.9	53.4
Environmental problems affect my life.	204	4.06	0.991	1.5	6.9	16.7	34.3	40.7
Environmental problems are a threat to my children's future.	204	4.41	0.828	0.5	3.4	8.8	29.4	57.8

Legend: N - number of responses, M - arithmetic mean, SD - standard deviation, (1) - Disagree, (5) – Strongly agree.

All the statements had a high mean value, above 4. The mean values show that teachers are most concerned about environmental problems because they pose a threat to children's futures, but they also perceive the adverse impact of pollution on their health and the impact of environmental problems on their lives. Looking at

the percentages in Table 3, we see that teachers strongly agreed with all the statements; for all statements, the most frequent answer was "Strongly agree".

The calculation showed that there was a statistically significant difference in teachers' responses by gender for the statement "Environmental problems pose a threat to children's future" ($U = 1919.500$; $p = 0.003$). Female teachers ($M = 106.21$) were more likely to agree with this statement than male teachers ($M = 76.48$). For the other two statements, there was no statistically significant difference in the responses by gender. For the statement "Environmental problems affect my life", there was a tendency ($U = 2189.000$; $p = 0.063$) for female teachers ($M = 104.62$) to agree with this statement more than male teachers ($M = 84.91$). There is no statistically significant difference in teachers' responses to these statements by age, teaching level and place of residence.

3.5 Willingness to be educated about the environmental crisis

Given that teachers expressed considerable concern about the environmental crisis, but also overwhelmingly pointed out that the environmental crisis is mainly the responsibility of human beings, we were interested in the extent to which they were willing to educate themselves about the environmental crisis. Of the 183 teachers who answered this question, the majority (60.7%) said they were willing to educate themselves, while 14.8% said they were even very willing to educate themselves. Only 3.3% of teachers answered that they were unwilling to be trained. Approximately one fifth (21.3%) of teachers were undecided.

Again, we tested whether there were statistically significant differences in teachers' answers for each variable. In the calculation, we grouped the responses into three categories: unwilling to be educated, undecided, and willing to be educated (grouped responses for "I am willing to be educated" and "I am very willing to be educated"). There was no statistically significant difference in the teachers' responses regarding any of the variables studied. There was a tendency ($X^2 = 12, 278$, $df = 6$, $p = .56$) for the age group 30-39 years to be the most willing to be educated in the field of the environmental crisis (87.8%; 2.5% of this group declared themselves unwilling to be educated, 9.8% were unspecified), followed by the age group up to 30 years (76.5%; 23.5% of this group answered unwilling to be educated, 9.8% were unspecified), teachers aged 41-50 (78.9%; 5.3% were unwilling to be trained and 33.8% were

undecided), and those aged 50+ (63.1%; 3.3% were unwilling to be trained and 33.8% were undecided).

4 Discussion and conclusions

The main purpose of this paper was to present some results of a larger survey carried out within the framework of the ZELEN.KOM project. In this paper we focus on teachers and their perceptions of the environmental crisis. Below we highlight some of the most important findings of this study.

The survey shows that among the environmental issues discussed, teachers perceive the destruction of the natural environment as the most problematic, followed by waste pollution, climate change and biodiversity loss. Teachers ranked the quality of drinking water as the least problematic issue. It should be recalled that in Slovenia the right to drinking water is enshrined in the Constitution, in Article 70a (URS, 2016; UL 75/16), which states that everyone has the right to drinking water and that water resources are a public good managed by the State. Perhaps these answers can be linked to the latter.

A good two-thirds of teachers believe that there is an environmental crisis, and that people are mainly responsible for it. Just under a third of the teachers surveyed believe that the environmental crisis is caused equally by humans and natural processes, and only two teachers surveyed do not believe that there is an environmental crisis. These results are in line with those of other researchers (Milfont, 2010; Climate Change: Evidence & Causes, 2020; UN, 2023), which also confirm that humans are responsible for climate change.

A good three-quarters of teachers admitted to being concerned about environmental problems, with about half of them saying they were even very concerned about environmental problems. According to a survey (Pew Research Center, 2022) conducted among 24,525 adults in 19 nations, among the many threats facing the globe, climate change stands out as an especially strong concern among citizens in advanced economies. 75% of participants across 19 countries in North America, Europe and the Asia-Pacific region label global climate change as a major threat. In our study looking at teachers' concern about specific environmental issues, teachers are most concerned about pollution, and only slightly less concerned about

increasing natural disasters and the extinction of flora and fauna. Among the individual aspects, the climate crisis and the rise in global temperatures are the least of their concerns, but it cannot be ignored that teachers' concern about these aspects of the environmental crisis is also quite high. The findings of previous research (Cavolla et al., 2023) revealed a noteworthy and positive impact of participants' pro-environmental attitudes on their actual pro-environmental behaviours. In this paper, we did not check whether this high level of concern among teachers about environmental issues means that they trying to behave in a manner as environmentally friendly as possible. The latter, i.e. how the transition from declarative attitudes about the environmental crisis to active sustainable action is manifested, should certainly be examined, and presented in a future publication.

Teachers are most concerned about environmental problems because they pose a threat to children's futures, but teachers are simultaneously aware that environmental pollution also affects their health, and environmental problems affect their lives. These answers show that teachers are also concerned about the long-term consequences of the environmental crisis, which has also been confirmed by another study (Reckien, & Petkova, 2018).

SDG 4 of the 2030 Agenda (UN, 2023) aims to deliver comprehensive education to every adolescent, ensuring that all students gain the knowledge and competences essential for fostering sustainable development. Among almost 60,000 teachers surveyed (UNESCO, 2021), most of them (95%) were aware of the importance and motivated to teach students about the severity of environmental changes, but only a third feel they can explain these issues well to their students.

It is encouraging that 60% of teachers in our research are willing to be educated about the environmental crisis and about 15% are even very willing to be educated. It would be interesting to explore the ways in which they are willing to be educated - in the form of lectures, workshops, or perhaps self-education. According to Demirkaya et al. (2020,) ecology-based environmental education contributed positively to teachers views towards national parks, e. g. We can conclude that, with the knowledge gained in our project ZELEN.KOM, university teachers can contribute to student views on the environmental crisis.

The results showed mainly no differences between teachers according to the individual variables. In some cases, there were differences between teachers according to gender. Research shows mixed findings on which gender is more sensitive to environmental issues, with women reported to have a more moralistic attitude toward the environment (Oncu, & Unluer, 2015). We should also mention the tendency for younger teachers to be more willing to be educated on the issues, a finding which should be investigated further.

Limitations and future directions

It is necessary to point out some shortcomings of the survey. The sample was small and ad hoc, so it is not possible to generalise the results to the general population of teachers. The sample was also not evenly structured with respect to all the variables studied in the paper. As this is a sensitive topic, it is possible that some teachers may have given socially desirable answers. Despite these shortcomings, the survey provided welcome insight into teachers' perceptions of the environmental crisis. Future research will therefore be needed to investigate whether attitudes influence individual actions in relation to the environmental crisis. The latter will be the focus of research in a future paper.

Data from the full survey will serve as the basis for the development of modules for short-term training (micro credentials) targeting various groups, including adult employees or graduates who need to requalify, current students, potential dropouts, and those who have never been involved in higher education; as a career opportunity or aim to enrich the overall range of their competences and knowledge.

Acknowledgements

The article was funded by the ZELEN.KOM project; Komuniciranje podnebne krize za uspešen prehod v zeleno družbo, which is funded by the Ministrstvo za visoko šolstvo, znanost in inovacije under the program: Pametna, trajnostna in vključujoča rast; NOO 2022–25; 3330-22-3514 (PP5) up to €934.423,40 (FF UM). Its primary objective is the interaction between new scientific knowledge on environmental changes and how it is communicated to the wider public.

References

Blake, J., Sterling, S., & Goodson, I. (2013). Transformative Learning for a Sustainable Future: An Exploration of Pedagogies for Change at an Alternative College (online), *Sustainability, 5*(12). http://www.mdpi.com/2071-1050/5/12/5347

Brundtland G. H. (1987). *Our common future, from one earth to one world: An overview by the world commission on environment and development.* World commission on environment and development. https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

Cayolla, R., Escadas, M., McCullough, B. P., Biscaia, R., Cabilhas, A. & Santos, T. (2023). Does pro-environmental attitude predict pro-environmental behavior? Comparing sustainability connection in emotional and cognitive environments among football fans and university students. *Heliyon, 9*(2023) e21758. https://doi.org/10.1016/j.heliyon.2023.e21758

Climate Change Remains Top Global Threat Across 19-Country Survey (2022). *Pew Research Center.* https://www.pewresearch.org/global/2022/08/31/climate-change-remains-top-global-threat-across-19-country-survey/

Climate Change: Evidence & Causes (2020). US: Royal Society and National Academy of Sciences. https://royalsociety.org/~/media/royal_society_content/policy/projects/climate-evidence-causes/climate-change-evidence-causes.pdf

Demirkaya et al., (2020). An Investigation of Prospective Teachers' Attitudes Towards National Parks and Views on Ecology-Based Environmental Education. *Journal of Educational Issues, 6*(2), 2377-2263. https://doi.org/10.5296/jei.v6i2.17379

Kallis, G. (2011): In defence of degrowth. *Ecological Economics, 70*(5), 873-880.

Kitchenham, A. (2008). The Evolution of John Mezirow's Transformative Learning Theory. *Journal of Transformative Education, 6*(2), 104-123.

Kothari, A., Demaria, F., & Acosta, A. (2014). Buen Vivir, degrowth and ecological Swaraj: alternatives to sustainable development and the green economy. *Development, 57*(3-4), 362–375. https://doi.org/10.1057/dev.2015.24

Kroflič, R. (2010). A dialogical concept of authority as a struggle for mutual recognition (A feminist critique of the Lacanian view on authority). *Journal of Contemporary Educational Studies, 61*(127), 134-154.

Lerch, D. (ed.) (2017). *The Community Resilience Reader: Essential Resources for an Era of Upheaval.* https://doi.org/10.5822/978-1-61091-861-9

Marentič Požarnik, B. 2000. *Psihologija učenja in pouka.* Ljubljana: DZS

Milfont, T. L. (2010). Global warming, climate change and human psychology. In V. Corral-Verdugo, C. H. Garcia-Cadena, & Frias-Arment (EDS.). *Psychological approaches to sustainability: Current trends in theory, research and practice*. New York: Nova Science Publishers. https://cssn.org/wp-content/uploads/2020/11/pub_climate.pdf

Novak, B. (2006). *Moč družbe in transformacija šole.* Ljubljana: Pedagoški inštitut.

Oncu, E. C., & Unluer, E. (2015). Environmental views and awareness of preschool teacher candidates. *Social and Behavioral Sciences, 174*, 2653 – 2657.

Peček Čuk, M., & Lesar, I. (2020). *Moč vzgoje.* Ljubljana: Pedagoška fakulteta.

Ravni avtonomije in odgovornosti učiteljev v Evropi (2008). Eurydice - informacijsko omrežje o izobraževanju v Evropi, T. Plevnik (ed.). Ljubljana: Ministrstvo za šolstvo in šport. https://www.eurydice.si/publikacije/Ravni-avtonomije-in-odgovornosti-u%C4%8Diteljev-v-Evropi-SI.pdf?_t=1570524811

Reckien, D., & Petkova, E. P. (2019). Who is responsible for climate change adaptation? *Environmental Research Letter, 14*, 014010. https://doi.org/10.1088/1748-9326/aaf07a

Redclift, M. (2005). Sustainable Development (1987-2005): An oxymoron comes of age. *Sustainable Development, 13*(4), 212-227. https://doi.org/10.1002/sd.281

Ruggerio, C. A. (2021). Sustainability and sustainable development: A review of principles and definitions. *Science of The Total Environment, 786*(2021), 147481. https://doi.org/10.1016/j.scitotenv.2021.147481

Stanišić, J. M. (2016). Characteristics of teaching environmental education in primary schools *Inovacije u nastavi*, *XXIX*(4), 87–100. doi: 10.5937/inovacije1604087S

Teachers have their say: Motivation, skills, and opportunities to teach education for sustainable development and global citizenship (2021). Paris, Brussels: UNESCO and Education International.https://unesdoc.unesco.org/in/documentViewer.xhtml?v=2.1.196&id=p::usm

arcdef_0000379914&file=/in/rest/annotationSVC/DownloadWatermarkedAttachment/attach_import_94f069db-fc96-48cd-baf6-db5fad268a70%3F_%3D379914eng.pdf&locale=en&multi=true&ark=/ark:/48223/pf0000379914/PDF/379914eng.pdf#1112_21_TEACHERS_HAVE_THEIR_SAY.indd%3A.20128%3A912

The 2030 Agenda for Sustainable Development (2023). New York: United Nations, SDG Summit, 18-19 September 2023. https://www.un.org/en/conferences/SDGSummit2023

Transforming Our World: The 2030 Agenda for Sustainable Development (2015). New York: United Nations, SDG Summit, 25-27 September. https://sdgs.un.org/publications/transforming-our-world-2030-agenda-sustainable-development-17981

Ustava Republike Slovenije (URS) (1991). http://pisrs.si/Pis.web/pregledPredpisa?id=USTA1