

Connection Between Environmental Awareness and Personal Attitudes Towards Education as a Prerequisite for Forming Environmental Educational Strategies

Oksana STRILCHUK¹

Svetlana KRAVCHUK^{2*}

Nataliia DOVGAN³

¹ Berdyansk State Pedagogical University, Zhukovsky street, 66, 69011 Zaporizhia, Ukraine; bumby@ukr.net; ORCID: <https://orcid.org/0000-0002-8854-2597>;

² Taras Shevchenko National University of Kyiv, Volodymyrska Street, 64/13, 01601 Kyiv, Ukraine; 757kravchuk@gmail.com; ORCID: <https://orcid.org/0000-0002-6951-1912>; Web of Science Researcher ID AAB-6464-2021; Scopus Researcher ID 59810780300;

³ Institute of Social and Political Psychology, National Academy of Pedagogical Sciences, Andriyivska street, 15, 04070 Kyiv, Ukraine; 1511ndovgan@gmail.com; ORCID: <https://orcid.org/0000-0001-6150-5211>;

*corresponding author: 757kravchuk@gmail.com;

Abstract: *The article presents a study on the connection between environmental awareness and personal attitudes to education as a prerequisite for the formation of environmental education strategies. The empirical data were obtained during research conducted in 2022-2024. A total of 1734 people participated in our empirical research. Personal environmental awareness correlated positively and significantly with subjective assessments of the importance of education and with the desire to learn something new. The importance of education correlated positively with the importance of environmental issues, the participants' concern for environmental cleanliness, and painful feelings about the environmental consequences of the war. The desire to learn something new correlated positively with the assessed importance of environmental issues, concern for environmental cleanliness, and with painful feelings about the environmental consequences of the war. Personal awareness about one's own actions and behaviour had a positive impact on the assessed importance of environmental issues, greater concern for environmental cleanliness, painful feelings about the environmental consequences of the war, and the implementation of practical environmental measures to improve ecology. There was also a willingness to invest resources in ecological improvement in one's own community. In addition, reflection on actions aimed at ecological improvement correlated positively and significantly with changes in beliefs and values during the war and with awareness in one's own actions and behaviour. People with higher or incomplete higher education had better environmental awareness than did people with general secondary education. Respondents with low financial status had lower indicators of environmental awareness compared to other groups.*

Keywords: *education; attitudes towards education; environmental awareness; environmental education; environmental actions.*

How to cite: Strilchuk, O., Kravchuk, S., & Dovgan, N. (2025). Connection between environmental awareness and personal attitudes towards education as a prerequisite for forming environmental educational strategies. *Revista Românească pentru Educație Multidimensională*, 17(4), 555-574. <https://doi.org/10.18662/rrem/17.4/1069>

Introduction

Modern education is an important factor with regard to personality formation. Scientific studies on attitudes to an individual's education and environmental awareness is gaining importance, because humanity is beginning to understand the concept of responsibility for the consequences of one's environmentally harmful impact and consumer attitude to the natural environment.

Acquired environmental knowledge helps people to understand the catastrophic consequences of excessive exploitation of natural resources, natural and man-made disasters and military action (Ahmed et al., 2020; Novotný et al., 2021; Xue et al., 2023).

Education should inform the personal attitudes, values and behaviours that are necessary for active participation in environmental conservation (Summers et al., 2000). Today, all over the world, environmental education is becoming a priority area as educational institutions are driving factors of change in modern societies (Şahin & Erkal, 2017).

Environmental education should provide tools designed to improve the natural environment. However, this is only possible if, in terms of practical care, effective tools for the protection of the environment are used.

In practice, the ultimate goal of environmental education is to increase environmental consciousness, since only such consciousness influences an individual's specific behaviour, actions and deeds.

Researchers consider environmental consciousness as a multidimensional construct consisting of cognitive, emotional and behavioural components (Navia et al., 2024). Awareness of one's own actions and behaviour is a psychological factor associated with environmentally-responsible life (Apaolaza, 2022).

Before developing effective environmental education strategies, it is worth assessing the importance of ecology for different people and their readiness for environmentally-oriented actions. Arguably, an important personality feature should be a formed ecological consciousness of the ecocentric type that combines knowledge of universal ecology with ethnohumanistic values, and the historical and cultural experience of society.

This is why it is important to empirically identify predictors of an individual's environmental awareness, the links between his/her environmental awareness and his/her attitude to education, which serve as prerequisites when it comes to forming environmental education strategies.

Objectives

The purpose of this study is to determine links between environmental awareness and attitudes to education as a prerequisite for forming environmental education strategies; links between people's environmental awareness and their awareness of their own actions and behaviour, changes in values and beliefs; the identification of features of environmental awareness depending on education, age, and income level; the determination of predictors of an individual's environmental awareness.

Hypotheses

We propose the following hypotheses:

H1. Experiencing environmental losses leads to the development of ecological consciousness.

H2. An individual's ecological consciousness correlates positively with his/her subjective assessment of the importance of education and with his/her desire to learn something new.

H3. An individual's awareness of his/her actions and behaviour and changes in his/her values and beliefs correlate positively with the perceived importance of ecological issues, with his/her painful experience of the ecological consequences of the war, the practical ecological steps implemented by him/her, and the willingness to invest resources to improve the ecology in his/her community.

H4. People with higher or incomplete higher education have greater ecological consciousness than people with general secondary education.

H5. Changes in values and beliefs, and increased awareness of one's own actions and behaviour have a positive effect on people's ecological consciousness.

H6. People with low incomes have less environmental awareness than people with high or average incomes.

Methodology

Participants

The empirical data presented in this article were obtained during the empirical research conducted in 2022-2024.

The total number of participating respondents was 1734 people. At the first stage of the empirical research in November 2022, 107 respondents aged 18 to 72 were surveyed.

During the second stage in February 2023, 421 people were surveyed; 61% were women (257 people) and 39% were men (164 people). The sample was divided into the following age groups: 18-29 year old respondents – 53.4% (225 people), 30-44 year old respondents – 26.8% (113 people), 45-59 year old respondents – 16.9% (71 people); over 60 year old respondents – 2.9% (12 people).

In the third stage (2023-2024), 1206 people took part in the survey; of these, 43% (519 people) were men, 57% (687 people) were women. The age groups of the respondents were as follows: 18-29 year olds (493 people) made up 40.9% of the sample; 30.9% (373 people) were aged 35-44; 22.1% (266 people) were aged 45-59; 6.1% (74 people) were over 60 years of age at the time of the survey.

43.1% (520 people) of the sample had received a higher education, 29.3% (353 people) had an incomplete higher education, while 15% (181) had received a general secondary education.

Measurement instruments

As part of this research, we developed three research questionnaires.

The first research questionnaire contained a single question: “Has your attitude towards environmental issues changed since the full-scale invasion? Explain your answer”. This suggests a “yes/no” response. Respondents were required to provide detailed answers to this question.

The second research questionnaire consisted of statements constructed using the semantic differential method. “Circle the response which most closely resembles your attitude”:

- “I have become less concerned about environmental cleanliness 1 2 3 4 5 I have become more concerned about environmental cleanliness”;
- “Environmental issues have become less important for me 1 2 3 4 5 Environmental issues have become more important for me”;
- “I do not care about the environmental consequences of the war 1 2 3 4 5 I care about the environmental consequences of the war”;
- “Education has become less important for me 1 2 3 4 5 Education has become more important for me”;
- “My desire to learn something new has weakened 1 2 3 4 5 My desire to learn something new has increased”.

The third research questionnaire consisted of the following statements which were evaluated on a 5-point Likert scale (1 – low agreement, 5 – high agreement):

- “After the full-scale war started, environmental issues have become more important for me”,
- “I have become more concerned about environmental cleanliness”;
- “It is painful for me to see the environmental consequences of the war”;
- “I am thinking about measures that can improve the environmental situation in my community or country”;
- “I am already implementing practical environmental measures to improve the natural environment”;
- “I am personally ready to make efforts to improve the environmental situation in my community or country”;
- “I believe that information about Russian terrorist attacks on strategic facilities and about the environmental consequences of such attacks is exaggerated”;
- “My beliefs and values have changed during the war”;
- “I have become more conscious in my own actions and behaviour”;
- “I feel afraid of the nuclear threat”,
- “I feel ready to express disagreement and resist unlawful actions if we are talking about socially significant issues”.

The questionnaires also gathered information about the respondents' education, financial status and age.

The statements from the research questionnaires were approved by the Ethical Council of the Institute of Social and Political Psychology of the National Academy of Sciences of Ukraine.

Study design and statistical analysis

In this research we conducted a cross-sectional survey.

We used the IBM SPSS Statistics 23 statistical package for data processing. The statistical analysis of the data was carried out in 5 stages.

First, the sample was checked for normal distribution using the Kolmogorov-Smirnov test.

Secondly, in order to study correlations between environmental awareness and attitude to education, we used Spearman correlation analysis.

Thirdly, Spearman correlation analysis was used to study correlations between people's awareness of their own actions and behaviour, changes in values and beliefs, and the importance of ecological issues for them, the painfulness of their experience of the environmental consequences of the war, the application of practical ecological steps, and the willingness to invest resources to improve the natural environment in their communities.

Fourthly, the predictors of ecological awareness were determined with the use of regression analyses.

Fifthly, the Kruskal-Wallis test was used to determine the features of ecological awareness in terms of the respondents' age, education and income.

Results and discussion

According to the Kolmogorov-Smirnov test, all variables had significance levels of $p < 0.05$, indicating that the examined sample data did not correspond to a normal distribution. Therefore, we choose non-parametric criteria for data analysis: Spearman correlation analysis and the Kruskal-Wallis test.

Table 1 presents correlations between people's environmental awareness and their subjective assessment of the importance of education and their desire to learn something new.

Table 1 Correlations between environmental awareness and attitudes towards education

#	Indicators	Education has become more important for me	My desire to learn something new has increased
1.	Environmental issues have become more important for me	.417**	.372**
2.	I have become more concerned about environmental cleanliness	.334**	.318**
3.	I care about the environmental consequences of the war	.382**	.346**

** – a correlation is significant at $p < .001$.

The correlation analysis between environmental awareness and attitude towards education showed that all correlations were statistically significant ($p < .001$).

We found that the more important education was for an individual, the more important were environmental issues for him/her (correlation coefficient $p = .417$), the more he/she was concerned about environmental cleanliness (correlation coefficient $p = .334$), and the more pain he/she felt with regard to the environmental consequences of the war (correlation coefficient $p = .382$).

It was also found that the desire to learn something new correlated positively and significantly with the importance of environmental issues (correlation coefficient $p = .31$), the concern for environmental cleanliness

(correlation coefficient $p = .334$), the painful feelings resulting from the environmental consequences of the war (correlation coefficient $p = .346$).

In order to assess how changes in beliefs and values impacted environmental awareness during the ongoing Russian-Ukrainian war, we applied several simple regression analyses. The obtained data are shown in Table 2.

Table 2 The influence of values and beliefs on indicators of environmental awareness

Predictor	Dependent variable	Non-standardised coefficients		Standardised coefficients	t	p	R ²
		B	Standard error	Beta			
My beliefs and values have been changed during the war	Environmental issues have become more important for me	.453	.028	.458	9.964	<.001	.523
	I have become more concerned about environmental cleanliness	.360	.027	.363	8.472	<.001	.471
	I care about the environmental consequences of the war	.279	.026	.285	4.118	<.001	.412
	I am already implementing practical environmental measures to improve the natural environment	.265	.029	.269	3.604	<.001	.524

The regression analyses indicated that changed values and beliefs over the course of the war had a positive impact on the following indicators of environmental awareness at a statistically significant level ($p < .001$): increased importance of environmental issues (Beta = .458); increased

concern about environmental cleanliness (Beta = .363); painful feelings with regard to the environmental consequences of the war (Beta = .285); implementing practical environmental measures to improve the natural environment (Beta = .269).

Based on the regression analyses performed, we determined the impact of changed awareness of one's own actions and behaviour on the indicators of environmental awareness. The results are presented in Table 3.

Table 3 The impact of increased awareness of one's own actions and behaviour on the indicators of environmental awareness

Predictor	Dependent variable	Non-standardised coefficients		Standardised coefficients	t	p	R ²
		B	Standard error	Beta			
I have become more conscious with regard to my own actions and behaviour	Environmental issues have become more important for me	.492	.034	.512	9.608	<.001	.518
	I have become more concerned about environmental cleanliness	.328	.032	.355	8.177	<.001	.541
	I care about the environmental consequences of the war	.272	.032	.283	6.684	<.001	.429
	I am already implementing practical environmental measures to improve the natural environment	.265	.035	.271	5,987	<.001	.438

The results indicated that increased awareness of one's own actions and behaviour had a positive impact on the indicators of environmental consciousness at a statistically significant level ($p < .001$), in particular with

regard to the increased importance of environmental issues (Beta = .512); increased concern about environmental cleanliness (Beta = .355); painful feelings associated with the environmental consequences of the war (Beta = .283); the implementation of practical environmental measures to improve the natural environment (Beta = .271).

Several empirical studies have described predictors of environmental consciousness (Ertz & Sarigöllü, 2019; Primc et al., 2021). Kollmuss and Agyeman (2002) believed that environmental knowledge, values, attitudes, and emotional involvement form a single complex that can be defined as pro-environmental consciousness. This complex is integrated into the overall system of personal values and is formed under the influence of personality traits, as well as a number of internal and external factors (Kollmuss & Agyeman, 2002).

Ecological awareness is considered as a predictor of ecological change (Xu et al., 2019; Polas et al., 2023). Such studies confirmed the relationship between high self-efficacy in terms of environmentally-oriented actions, and the development of people's ecological self-awareness (Bleidorn et al., 2021).

Based on Spearman's correlation analysis, we obtained correlations between the willingness to invest resources to improve the environment in a community and changes in beliefs and values during the war, together with greater awareness in terms of actions and behaviour. The obtained results are presented in Table 4.

Table 4 Spearman's correlation analysis for indicators of environmental awareness

№	Indicators	Changed beliefs and values during the war	Greater awareness in one's own actions and behaviour
1.	I am willing to invest resources to improve the environment in our community	.346**	.426**
2.	I am thinking about measures that can improve the environmental situation	.386**	.356**
3.	I feel afraid of the nuclear threat	.185	.229**

** – a correlation is significant at $p < .001$

Willingness to invest resources with regard to improving the environment in a community and reflecting on actions to improve the environment correlated positively and significantly with changed beliefs and

values during the war and greater awareness in one's own actions and behaviour ($p < 0.001$).

Respondents who were characterised by greater awareness in their actions and behaviour felt fear of the nuclear threat ($p < 0.001$). The scientific literature showed that ecological losses were considered a rather powerful factor increasing the value of the natural environment (Ardoin et al., 2020; Milfont et al., 2020).

We compared different age groups using the Kruskal-Wallis test for non-parametric samples and found statistically significant differences between different age groups. These are presented in Table 5.

Table 5 Average ranking of respondent groups of different ages in terms of their indicators of environmental awareness

#	Statement	18-29 year old	30-44 year old	45-59 year old	over 60 year old	Sig.
1.	Environmental issues have become more important for me	572.41	634.44	594.2	750.66	$P < .001$
2.	I have become more concerned about environmental cleanliness	572.40	630.97	612.75	676.80	$P < .001$
3.	I care about the environmental consequences of the war	561.30	604.97	657.83	750.79	$P < .001$
4.	I am thinking about measures that can improve the environmental situation in my community or country	559.69	611.82	660.08	700.35	$P < .001$
5.	I am already implementing practical environmental measures to improve the natural environment	548.92	618.59	682.10	636.19	$P < .001$

As we can see from Table 5, the youngest respondents were characterised as having the lowest environmental awareness for all indicators.

We also compared respondent groups depending on their levels of education using the Kruskal-Wallis test. Groups of respondents with higher, incomplete higher and secondary education levels were compared. The results are presented in Table 6.

Table 6 Average ranking of respondent groups in terms of their education with regard to their indicators of environmental awareness

#	Statement	Higher education	Unfinished higher education	General secondary education	Sig.
1.	Environmental issues have become more important for me	644.73	637.63	481.10	$p < .001$
2.	I have become more concerned about environmental cleanliness	652.75	623.56	484.51	$p < .001$
3.	I care about the environmental consequences of the war	615.48	627.13	602.60	$p > .05$
4.	I am thinking about measures that can improve the environmental situation in my community or country	637.47	641.14	563.54	$p < .001$
5.	I am already implementing practical environmental measures to improve the natural environment	635.52	622.67	472.26	$p < .001$

As we can see from Table 6, statistically significant differences between respondents existed for all the selected indicators, with the exception of pain experienced because of the environmental consequences of the war. People with higher or incomplete higher education had better environmental awareness in comparison with people having general secondary education.

The scientific literature also showed that environmental responsibility was higher in older people (Milfont et al., 2020). Milfont et al. (2020) found that over time people increasingly demonstrated a willingness to make changes to their daily routine or stated that they would make such changes in order to protect the environment. In this context, it is important to talk about the important role of environmental education. In foreign countries, the need was noted for developed environmental education and for more environmental initiatives on the part of the younger generation (Wu et al., 2023).

We found differences in the environmental awareness indicators between groups of respondents having high, average and low income. The findings are presented in Table 7.

Table 7 Average ranking of respondent groups by income in terms of environmental awareness indicators

#	Statement	High	Average	Low	Sig.
1.	Environmental issues have become more important for me	653.73	626.63	495.10	$p < .001$
2.	I have become more concerned about environmental cleanliness	687.75	663.56	474.61	$p < .001$
3.	I care about the environmental consequences of the war	618.58	637.14	605.70	$p > .05$
4.	I am thinking about measures that can improve the environmental situation in my community or country	658.49	639.15	453.74	$p < .001$
5.	I am already implementing practical environmental measures to improve the natural environment	685.52	668.68	471.39	$p < .001$

The presented results demonstrate statistically significant differences between groups of respondents with different financial status in terms of their attitudes towards environmental issues, with the exception of the pain experienced due to the environmental consequences of the war. We found that, compared to other groups, respondents with low financial status had lower indicators of environmental awareness.

The highest level of significance among the respondents was related to environmental losses. This was explained as an emotional component associated with negative experiences resulting from the environmental destruction due to the war. The impact of environmental anxiety and environmental losses on human pro-environmental behaviour has become the subject of many scientific studies. Environmental loss is considered as a powerful factor related to the increasing value of the environment, and linked to the danger from an environmental threat (Eakin, 2019). At the same time, studies of the phenomenon of environmental anxiety, which is similar to emotional load resulting from environmental loss, demonstrate contradictory results. In some cases, they indicate an increasing in pro-ecological behaviour (Shershunovich, 2025). Carasso Romano et al. (2025) explore environmental anxiety as a constructive force that manifests itself markedly in collective actions

aimed at improving the ecological state and overcoming stress, and can be directed towards environmental activism and environmental education. However, there are studies that reveal negative correlations between environmental anxiety and pro-ecological behaviour (Wolf & Moser, 2011). Researchers researching environmental anxiety found two forms of reaction – an increase in pro-ecological behaviour, and a decrease, referred to as ecoparalysis (Innocenti et al., 2023). Ecoparalysis can be caused by irrational thoughts that require therapeutic correction (Innocenti et al., 2023).

The exploration of the relationship between environmental anxiety and pro-environmentalism on the part of adolescents has shown the presence of negative correlations between these two variables (Qin et al., 2024). A similar conclusion was found in our study, where pro-environmentalism decreases with the age of the respondents, regardless of the war circumstances. There are also studies that fix the negative impact of a high level of anxiety on pro-environmentalism, where a medium level is enough for positive changes in terms of environmentally-oriented behaviour (Coates et al., 2024). Other studies, conducted among young people, also did not reveal direct correlations between environmental anxiety caused by media coverage of climate change and the increase in pro-environmental behaviour levels (Shao & Yu, 2023).

In our research environmental anxiety has not received proper empirical expression as a factor of the growth of environmental awareness levels in comparison with environmental losses. However, the negative emotional experience caused by environmental losses did not affect the improvement in environmental behaviour on the part of the Ukrainian participants, what was also proved by the results highlighted above. The lack of significant change with regard to the environmentally-oriented behaviour of the Ukrainian participants and the low level of environmental awareness among the younger generation, confirm the importance of forming pro-environmental behaviour through education. The study by Notaro & Grilli (2022), demonstrates the variability of emotions in the desire to protect wildlife, the direction of which is determined by the context. According to these results, the experience of environmental losses can only act as a occasional incitement, but not as a strategic factor in changing environmental behaviour.

The scientific literature with regard to environmental education, in particular among students, indicated the significant role of environmental awareness formed during environmental protection activities (Boca & Saraçlı, 2019). There are a number of issues that point out the deficient role of environmental education in the forming of pro-environmental forms of behaviour (Estrada Araoz et al., 2023; Van de Wetering et al., 2024; Tafese

& Kopp, 2025). However, the differences between the levels of pro-environmentalism and education which were found in our research has also been reflected in the other scientific studies. The study by Piao and Managi (2023), which included 37 countries, demonstrated that people benefitting from higher education showed pro-environmental forms of behaviour such as the use of recycled goods and energy-saving technologies. In addition, in all 37 countries, there was found to be a connection between an increase in education level and an increase in income. The last circumstance is in line with the results of our research, where people with a higher level of financial well-being are more inclined to exhibit environmentally responsible behaviour. Financial well-being was considered by some researchers as a factor increasing environmental awareness. In addition, environmental literacy is formed by the social environment, in particular in families, via their influence and their socio-economic status (Edsand & Broich, 2020).

A number of other studies also empirically confirm the existence of correlations between the level of education, the quality of institutions and a responsible attitude towards the environment, in particular, lower levels of carbon emissions (Mandarić & Hunjet, 2023; Zheng et al., 2024). Such data confirm the need to transform the growth of environmental awareness on the part of Ukrainians into rational actions within the institutional boundaries of higher education, with the inclusion of effective practices with regard to environmental education. There are the numerous foreign studies which have presented very many practically-oriented steps in terms of interaction with the environment, which positively affect environmental responsibility. Particular attention has been drawn to educational practices involving direct interaction with nature, the effectiveness of which has been proven (Otto & Pensini, 2017; Meitiyani et al., 2022; Yang et al., 2022).

The growing informal educational sector and environmental initiatives on the part of young people indicate the importance of caring for the natural environment with regard to the younger generation. The experience of environmental losses can restore the sacred meaning of nature for people. Strengthened links with the natural environment as part of identity can be a prerequisite for assimilation of the values of environmentally-responsible behaviour.

Limitations and future directions

The presented empirical study has certain limitations. One such limitation is the insufficient sample size. Futures studies need to involve more participants. Despite the fact that 1734 people participated in the study, the sample is institutionally limited. We were unable to incorporate a

larger and more diverse sample due to the Russian-Ukrainian war. Although we took into account socio-demographic variables such as age, gender, and level of education, one of the limitations is the lack of generalisability due to the wartime context and the non-random sampling method.

In the future, we aim to conduct the study again with a well-formed randomised sample. The prospective study could be significantly improved by involving a more diverse sample, which would contribute to increasing the representativeness of the results obtained. To ensure representativeness, a wider range of educational institutions, both national and international, should also be included.

Another limitation is that we conducted a cross-sectional study due to the wartime context, which makes it difficult to establish cause-and-effect relationships between variables. This study did not examine aspects of the dynamics of change in the structure of environmental consciousness in connection with attitudes towards education over time, which indicates the prospects of this direction for further scientific exploration.

Therefore, it will be necessary to conduct future longitudinal studies that will allow us to determine in detail the process of the formation and development of such dynamic relationships over time. The results obtained contribute to the theoretical and methodological progress in scientific research on the problem of environmental consciousness, but it is necessary to expand the research by conducting further longitudinal empirical analyses of the role of the emotional, motivational and value component in the development of environmental consciousness on the part of Ukrainians.

Prospects for further research also include the formation and implementation of environmental education strategies, as well as the study of socio-psychological factors in the development of environmental awareness among Ukrainians.

Conclusions

The hypotheses that we formulated were confirmed in our empirical study.

Personal ecological consciousness correlated positively and significantly with subjective assessments of the importance of education and the desire to learn something new.

The importance of education correlated positively and significantly with the importance of environmental issues, the concern for environmental cleanliness, the painful feeling associated with the environmental consequences of the war.

The desire to learn something new also correlated positively and significantly with the importance of environmental issues, the concern for environmental cleanliness, and the painful feeling with regard to the environmental consequences of the war.

Changed values and beliefs during the war affected positively and significantly the following indicators of environmental awareness: the importance of environmental issues; the concern for environmental cleanliness; the feeling of pain due to the environmental consequences of the war; practical environmental measures to improve the natural environment.

Improved awareness of one's own actions and behaviour significantly and positively influenced the participants' understanding of the importance of environmental issues; concern for environmental cleanliness; painful feelings due to the environmental consequences of the war; the implementation of practical environmental measures to improve the natural environment.

Willingness to invest resources to improve the environment in a community and reflection on actions to improve the environment correlated positively and significantly with changes in beliefs and values during the war, and a greater awareness of one's own actions and behaviour.

Greater awareness of one's own actions and behaviour correlated positively and significantly with the fear of nuclear threat.

People with higher or incomplete higher education had greater environmental awareness than people with general secondary education.

People with low income had lower indicators of environmental awareness compared to more affluent groups.

The obtained empirical results have an important role to play with regard to the future development of environmental education strategies.

We see the prospects for further research in the development of environmental education involving elements of direct interaction with nature. Currently, there is a need to develop such educational initiatives, to implement them, and test their effectiveness in terms of their impact on people's environmental behaviour.

Declaration of interest | *The authors declare no competing interest.*

Statement on the Use of AI Tools | *No AI tools were utilized for preparing this paper.*

References

- Ahmed, Z., Asghar, M., Malik, M., & Nawaz, K. (2020). Moving towards a sustainable environment: The dynamic linkage between natural resources, human capital, urbanization, economic growth, and ecological footprint in China. *Resources Policy*, 67, 1–11.
<https://doi.org/10.1016/j.resourpol.2020.101677>
- Apaolaza, V., Paredes, M. R., Hartmann, P., Barrutia, J. M., & Echebarria, C. (2022). How does mindfulness relate to proenvironmental behavior? The mediating influence of cognitive reappraisal and climate change awareness. *Journal of Cleaner Production*, 357, Article 131914.
<https://doi.org/10.1016/j.jclepro.2022.131914>
- Ardoin, N. M., Bowers, A. W., & Gaillard, E. (2020). Environmental education outcomes for conservation: A systematic review. *Biological Conservation*, 241, Article 108224. <https://doi.org/10.1016/j.biocon.2019.108224>
- Bleidorn, W., Lenhausen, M., & Hopwood, C. (2021). Proenvironmental attitudes predict proenvironmental consumer behaviors over time. *Journal of Environmental Psychology*, 76, Article 101627.
<https://doi.org/10.1016/j.jenvp.2021.101627>
- Boca, G. D., & Saraçlı, S. (2019). Environmental education and student's perception for sustainability. *Sustainability*, 11(6), 1553.
<https://doi.org/10.3390/su11061553>
- Carasso Romano, G. H., Sippori, R., & Soroker, S. (2025). Examining the relationship between ecological anxiety and pro-environmental behavior: Personal and collective actions. *Frontiers in Psychology*, 16, Article 1505564.
<https://doi.org/10.3389/fpsyg.2025.1505564>
- Coates, Z., Kelly, M., & Brown, S. (2024). The relationship between climate anxiety and pro-environment behaviours. *Sustainability*, 16(12), 5211.
<https://doi.org/10.3390/su16125211>
- Eakin, H., Shelton, R., Siqueiros-Garcia, J., Charli-Joseph, L., Manuel-Navarrete, D. (2019). Loss and social-ecological transformation: pathways of change in Xochimilco, Mexico. *Ecology and Society*, 24(3), Article 15.
<https://doi.org/10.5751/ES-11030-240315>
- Edsand, H. E., & Broich, T. (2020). The impact of environmental education on environmental and renewable energy technology awareness: Empirical evidence from Colombia. *International Journal of Science and Mathematics Education*, 18, 611–634. <https://doi.org/10.1007/s10763-019-09988-x>
- Ertz, M., & Sarigöllü, E. (2019). The behaviour-attitude relationship and satisfaction in proenvironmental behavior. *Environment and Behavior*, 51(9–10), 1106–1132. <https://doi.org/10.1177/0013916518783241>

- Estrada-Araoz, E. G., Gallegos Ramos, N. A., Paredes Valverde, Y., Quispe Herrera, R., & Mori Bazán, J. (2023). Examining the relationship between environmental education and pro-environmental behavior in regular basic education students: A cross-sectional study. *Social Sciences*, 12(5), 307. <https://doi.org/10.3390/socsci12050307>
- Innocenti, M., Santarelli, G., Lombardi, G. S., Ciabini, L., Zjalic, D., Di Russo, M., & Cadeddu, C. (2023). How can climate change anxiety induce both pro-environmental behaviours and eco-paralysis? The mediating role of general self-efficacy. *International Journal of Environmental Research and Public Health*, 20(4), Article 3085. <https://doi.org/10.3390/ijerph20043085>
- Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8(3), 239–260. <https://doi.org/10.1080/13504620220145401>
- Mandarić, D., & Hunjet, A. (2023). Does the education level of consumers influence their recycling and environmental protection attitudes? Evidence from Croatia. *Naše Gospodarstvo/Our Economy*, 69(4), 51–61. <https://doi.org/10.2478/ngoe-2023-0023>
- Meitiyani, M., Astra, I. M., & Safitri, D. (2022). The relationship between personality and environmentally responsible behavior in Green High School. *Cypriot Journal of Educational Science*, 17(9), 3439–3449. <https://doi.org/10.18844/cjes.v17i9.8084>
- Milfont, T. L., Poortinga, W., & Sibley, C. G. (2020). Does having children increase environmental concern? Testing parenthood effects with longitudinal data from the New Zealand attitudes and values study. *PLOS ONE*, 15(3). <https://doi.org/10.1371/journal.pone.0230361>
- Navia, J. M., Zapata, E. J., Falla, G. H., Sánchez, S. S., Guevara, D. C. (2024). Environmental awareness of university students in Colombia. *Knowledge and Performance Management*, 8(1), 104–114. [https://doi.org/10.21511/kpm.08\(1\).2024.08](https://doi.org/10.21511/kpm.08(1).2024.08)
- Notaro, S., & Grilli, G. (2022). How much fear? Exploring the role of integral emotions on stated preferences for wildlife conservation. *Environmental Management*, 69(3), 449–465. <https://doi.org/10.1007/s00267-022-01593-z>
- Novotný, R., Huttmanová, E., Valentiny, T., & Kalistová, A. (2021). Evaluation of environmental awareness of university students: the case of the University of Presov, Slovakia. *European Journal of Sustainable Development*, 10(2), 59–72. <https://doi.org/10.14207/ejsd.2021.v10n2p59>
- Otto, S., & Pensini, P. (2017). Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour. *Global Environmental Change*, 47, 88–94. <https://doi.org/10.1016/j.gloenvcha.2017.09.009>

- Piao, X., & Managi, S. (2023). The international role of education in sustainable lifestyles and economic development. *Scientific Reports*, 13, 8733. <https://doi.org/10.1038/s41598-023-35173-w>
- Polas, M. R. H., Tabash, M. I., Bhattacharjee, A., & Dávila, G. A. (2023). Knowledge management practices and green innovation in SMES: The role of environmental awareness towards environmental sustainability. *International Journal of Organizational Analysis*, 31(5), 1601–1622. <https://doi.org/10.1108/IJOA-03-2021-2671>
- Primc, K., Ogorevc, M., Slabe-Erker, R., Bartolj, T., & Murovec, N. (2021). How does Schwartz's theory of human values affect the proenvironmental behavior model? *Baltic Journal of Management*, 16(2), 276–297. <https://doi.org/10.1108/BJM-08-2020-0276>
- Qin, Z., Wu, Q., Bi, C., Deng, Y., Hu, Q. (2024). The relationship between climate change anxiety and pro-environmental behavior in adolescents: The mediating role of future self-continuity and the moderating role of green self-efficacy. *BMC Psychology*, 12, Article 241. <https://doi.org/10.1186/s40359-024-01746-1>
- Shao, L., & Yu, G. (2023). Media coverage of climate change, eco-anxiety and pro-environmental behavior: Experimental evidence and the resilience paradox. *Journal of Environmental Psychology*, 91, 102130. <https://doi.org/10.1016/j.jenvp.2023.102130>
- Shershunovich, Y. (2025). Climate risk perception as a catalyst for pro-environmental behavior. *Discover Sustainability*, 6, Article 902. <https://doi.org/10.1007/s43621-025-01896-1>
- Summers, M., Kruger, C., Childs, A., & Mant, J. (2000). Primary school teachers' understanding of environmental issues: An interview study. *Environmental Education Research*, 6(4), 293–312. <https://doi.org/10.1080/713664700>
- Şahin, H., & Erkal, S. (2017). An investigation of university students' attitudes toward environmental sustainability. *European Journal of Sustainable Development*, 6(4), 147–154. <https://doi.org/10.14207/ejsd.2017.v6n4p147>
- Tafese, M. B., & Kopp, E. (2025). Education for sustainable development: Analyzing research trends in higher education for sustainable development goals through bibliometric analysis. *Discover Sustainability*, 6, 51. <https://doi.org/10.1007/s43621-024-00711-7>
- Van de Wetering, J., Grapsas, S., Poorthuis, A., & Thomaes, S. (2024). Promoting adolescents' pro-environmental behavior: A motive-alignment approach. *Journal of Research on Adolescence*, 35(1), 13044. <https://doi.org/10.1111/jora.13044>
- Wolf, J., & Moser, S. C. (2011). Individual understandings, perceptions, and engagement with climate change: Insights from in-depth studies across the world. *Wiley Interdisciplinary Reviews: Climate Change*, 2(4), 547–569. <https://doi.org/10.1002/wcc.120>

- Wu, Y., Wan, J., & Yu, W. (2023). Impact of environmental education on environmental quality under the background of low-carbon economy. *Frontiers in Public Health*, 11. <https://doi.org/10.3389/fpubh.2023.1128791>
- Xue, P., Wei, Z., & Yi, H. (2023). An analysis of environmental awareness among Chinese higher education groups due to differences in different majors. *E3S Web of Conferences*, 393, Article 01028. <https://doi.org/10.1051/e3sconf/202339301028>
- Xu, L., Prybutok, V., & Blankson, C. (2019). An environmental awareness purchasing intention model. *Industrial Management & Data Systems*, 119(2), 367–381. <https://doi.org/10.1108/IMDS-12-2017-0591>
- Yang, B., Wu, N., Tong, Z., & Sun, Y. (2022). Narrative-based environmental education improves environmental awareness and environmental attitudes in children aged 6-8. *International Journal of Environmental Research and Public Health*, 19(11), 6483. <https://doi.org/10.3390/ijerph19116483>
- Zheng, L., Umar, M., Safi, A., & Khaddage-Soboh, N. (2024). The role of higher education and institutional quality for carbon neutrality: Evidence from emerging economies. *Economic Analysis and Policy*, 81, 406–417. <https://doi.org/10.1016/j.eap.2023.12.008>