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The Study of The Level of Environmental Consciousness and the Efficiency of Environmental Education Students

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A leading role of the ecological culture of society in solving the problems of the modern ecological crisis, the importance of environmental education in the formation of the ecological world outlook of young people, especially students, to ensure the successful sustainable development of the state, determines the relevance of research. The purpose of the work is to assess the level of environmental consciousness of students, the impact on it of environmental education during the period of study at universities. The research was carried out by questioning, testing students of the National Metallurgical Academy of Ukraine of different courses and directions of training with the following analysis of their results. During the research methods M. Rokicha, "Dominant" and "Naturfil" were used. These techniques are proven, fairly versatile, easy to use and very popular in practice. As a result, the structure of value orientations and the place of nature in the student values system, the degree of priority of their relation to nature, the indicators of the formation of environmental consciousness on individual components and in general, the dynamics of its changes during the study at the academy was determined. It is established that evaluation of the importance of instrumental and terminal values in different groups of students is close to each other and they attribute nature to secondary values. This is confirmed by the diagnostic data based on the modified "Dominant" techniques, where nature takes place in a group with average dominance. Most students have an average level of intensity in relation to nature, but environmentalists% of high levels are about 2 times more likely than other students and less than% of levels with a reduced attitude to nature. Ecologists have a close connection between the time of training and the level of components of environmental consciousness. Other students do not have such a positive dynamic. At the senior courses there is even a decline in the level of attitude to nature. This gives evidence of the urgent need to adjust the content of technical disciplines and strengthen their environmental component.

Keywords: Higher education; Environmental consciousness; "Dominant" techniques; Methods M. Rokicha

Introduction

Solving modern environmental problems largely depends on the level of morality in society and its ecological culture. In addition to environmental education - knowledge, skills, ecological culture are characterized by the harmony of human relations and nature; awareness of its place in nature and activities in its protection, preservation of ecological balance (Curry 2011). This is the way of life support, in which society shapes the needs and ways of their realization, which do not create threats of life on Earth. It can be seen as the main indicator of intelligence and civilization of the individual and society as a whole (Aikensetal 2016, Ivanovetal 2018). A modern specialist in any profile should have not only a high level of professional knowledge, but also an ecological world outlook. This allows him to analyze and evaluate his own production activity in relation to its action on the natural environment, to make informed decisions in its work, to avoid any damage to nature, or to minimize this damage (Bonnett 2012, Žeber-Dzikowskaetal 2016). The formation of the ecological culture of society is a priority direction of the state strategy of sustainable development (Kopnina & Meijers 2014, Babenkoetal, 2017). The sooner people will begin to critically assess the results of their activities and measure their goals with the resources available at the disposal of nature, the sooner it will be possible to move to correct already accepted and to prevent future mistakes.

The ecological culture of a person is determined by ecological education, ecological consciousness and ecological activity (Cherdymovaetal 2018). Ecological education includes environmental knowledge, skills. Environmental activities are ecological behaviors, participation in environmental events (Shelestetal 2017). It is determined by environmental beliefs, values, responsibility, moral attitude towards the natural world, love for nature.

The purpose of ecological education is to form a worldview that directs society to a co-evolutionary path of the development of nature and man and to overcome the consumer attitude to nature (Liu & Guo 2018). Ecological consciousness is not hereditary; its norms and rules are assimilated throughout life through learning, purposeful work and human activities.

Extremely important is the formation of the ecological consciousness of youth, which determines the future of the country and stimulates the sustainable development. This is especially true of environmental education and the upbringing of the most active and numerical part of it - student youth when studying at a high school (Jadhavetal. 2014, Khinkanina & Serova 2016, Ramirez 2017). In addition to study of the scientific foundations of nature use, at this stage, the necessary persuasion and skills behavior in the natural environment and a responsible attitude towards nature. It contributes to the future development of a specialist in the ecological style of thinking, a humane attitude towards nature, an active life position on environmental issues.

Diagnostics and detailed analysis of the level of ecological consciousness and trends in its changes can promptly identify the weak and strong points of the educational process and take measures to improve it. Naturally, the formation of a modern ecological worldview of students is possible only at a high level of the ecological culture of the teacher and his ability to implement the environmentalization of the learning process. This should become an important qualification of the teacher (Popova 2013). Increasing the level of environmental consciousness of students is the most objective integral indicator of the effectiveness of the teaching staff of higher educational institutions in this direction. The listed aspects determine the relevance of the topic research, the purpose of which was to assess the level of environmental consciousness and culture of students and the impact on them of environmental education during the period of study at a higher educational institution.

Materials and Methods

The object of the study was the structure of value orientations of students of different specialties and training directions on the example of the National Metallurgical Academy of Ukraine. The subject of the study was to determine the place of nature in the system of values of students and the effectiveness of the formation of their ecological consciousness during the study period.

Experimental studies were carried out by questioning, testing, analyzing their results with the involvement of the apparatus of mathematical statistics. The following techniques were used in the study, which are proven, fairly versatile, easy to use and widely used in practice (Dzhamalovaetal 2019, Slinkovaetal 2015, Maravić et al., 2014).

- Technique for the study of value orientations of M. Rokich, based on the procedure of direct ranking of terminal and instrumental values (Rokeach 1979, Vauclair 2011). Each of the subjects was offered two lists of these values (18 in each) and he performed their ranking, placing opposite each corresponding rank from 1 to 18. The list of terminal values allows us to reveal the domination of the investigated values of personal life, professional self-realization. Terminal values are the conviction of people about the purpose and the end state to which they are trying to get closer (for example, happiness, welfare, knowledge, etc.). The instrumental list allows to establish the tendencies of the benefits of the values of communication, self-affirmation, ethical, business, etc. It is an idea of the desirable behaviors for achieving terminal values (for example, responsibility, courage, talent, self-control, etc.). The research involved 160 students, among them 99 environmental students and 61 students of technical specialties - metallurgists, mechanics, power engineers. 102 girls and 58 boys were interviewed.

- Express method for the diagnosis of the dominance of the subjective relationship to the "Dominant" nature (Deryabo & Yasvin 1995). The method was used in the main version and in the modified. In the first series of testing, each subject chose three of the most and the least important concepts for him from the 9 proposed; They were assigned ranks 1, 2, 3, and 9, 8, 7 respectively, and three unselected - the middle rank 5. In the modified version, each person similarly evaluated these concepts in an emotional, informational, practical plan, and based on the calculation of the average rank, determined their priority. The rank obtained by a certain notion allows us to judge the dominance of the relation to it: if it is the top three of the ranks, then it is a question of the high dominance of the ratio, if the average is about the average, if the lower one is, accordingly, a ratio with low dominance.

The total sample size was 124 people, 67 of them students-environmentalists, and 57 students of technical specialties.

- a method for diagnosing the level of development of the intensity of the subjective relation to the nature of non-pragmatic modality and its structure "Naturafil" (Panovetal, 2004). The survey was conducted in writing and the respondents indicated on their form 25-30 minutes of their answers to the proposed 50 questions (on a "yes - no" basis).

Of the total of 10 questions corresponded to the perceptive-affective, cognitive and practical components. The perceptually-affective component determines the relation to the nature of the aesthetic and ethical nature. The cognitive component evaluates the degree of motivation and orientation of cognitive activity in relation to objects of nature. Practical component determines readiness and aspiration for practical interaction: perception of the world of nature as a source of material benefits; a component of actions that diagnoses the person's activity to change the attitude of the environment to nature. Another 10 points were additionally foreseen to determine the level of naturalistic erudition.

The survey data were compared with a control card (key); in the case of a match with the key she was given 1 point, and for non-conformity - 0. Then the amount of points for each scale was determined and there was a parameter of the intensity of the subjective relation to nature as the sum of points on the four basic scales. The results for each scale (from 0 to 10 points) were translated into a standard scale of states, where the estimates acquire values from 1 to 9 with a mathematical expectation of $M = 5$ and a standard deviation of $s = 2$. Similarly, the intensity parameter was translated into a standard T-scale with $M = 50$ and $s = 10$. According to the results presented on standard scales, the interpretation of indicators of the intensity of the relation to nature - from extremely low to very high - was performed using the estimation table.

In the study 180 people took part in this method, including 108 environmentalists and 72 students of other specialties.

Results and Discussion

Analysis of the structure of student value orientations

The histograms of the average rank of instrumental and terminal values on the 18-point scale, obtained from the results of the research according to M. Rokich`s method are giving Figures 1 and 2. If conditionally to assume that the values of paramount importance were occupied by the first 6 places, secondary values took from 7 to 12 places, while others are non-essential values, then we get the distribution presented in Table 1.

In the main assessment of the importance of both instrumental and terminal values to different groups of students are close to each other. A significant difference in the views on individual values, such as love or sensitivity, can be explained by the different composition of groups by gender: environmentalists are mostly girls, while others are boys.

Among instrumental values there is some agreement on the attribution of paramount values by good manners and accuracy, responsibility and honesty; to secondary values - the courage to defend their thoughts, tolerance and diligence; to the inessential - intransigence to flaws, efficiency in business and rationalism, firm will and high demands. These results largely correlate with the data of similar studies with students from other universities and specialties (Blyznyuk 2017, Zvereva 2015, Slezackovaetal 2018).

The main places among the terminal values occupy health and happy family life. Students attribute nature to secondary values: it is 8th place in ecologists, 12th in future engineers. Among the inessential values with averaged rank 11.67 and 13 in these groups "Social recognition", which testifies to the low level of ambition of respondents regarding their social status "Happiness of others" is in the last place with the highest average rank (13.86 and 15.57), which can reflect today's realities of dehumanization of our society. Students attribute "Public acceptance" to inessential values with an average rank of 11.67 and 13 that indicates a low level of ambition among respondents regarding their social status. "Happiness of others" is in the last place with the highest average rank

(13.86 and 15.57) that can reflect today's realities of dehumanization of our society (Figure 1).

Table 1. Distribution of value orientations of environmental students (a) and technical students (b).

The place	Instrumental values		Terminal values	
	a)	b)	a)	b)
Values that are a paramount importance				
1	Good manners	Accuracy	Health	Health
2	Accuracy	Responsibility	Love	Freedom
3	Cheerfulness	Honesty	Happiness in the family	Pleasure
4	Education	Self-control	Faithful friends	Happiness in the family
5	Responsibility	Mannerliness	The active life	The interesting job
6	Honesty	Independence	The interesting job	Self-confidence
The secondary values				
7	Independence	Courage	The wealthy life	Development
8	Self-control	Education	Nature	Love
9	Courage	Cheerfulness	Self-confidence	Faithful friends
10	Responsiveness	Diligence	Freedom	Creation
11	Tolerance	Tolerance	Development	The wealthy life
12	Diligence	Breadth of views	Pleasure	Nature
Unimportant values				
13	Rationalism	The firm will	Public acceptance	Cognition
14	Business efficiency	Responsiveness	Cognition	The active life
15	Firm will	Rationalism	Productive life	Public acceptance
16	Breadth of views	Exactingness	Wisdom	Productive life
17	Exactingness	Business efficiency	Creation	Wisdom
18	Intolerance to deficiencies	Intolerance to deficiencies	The happiness of others	The happiness of others
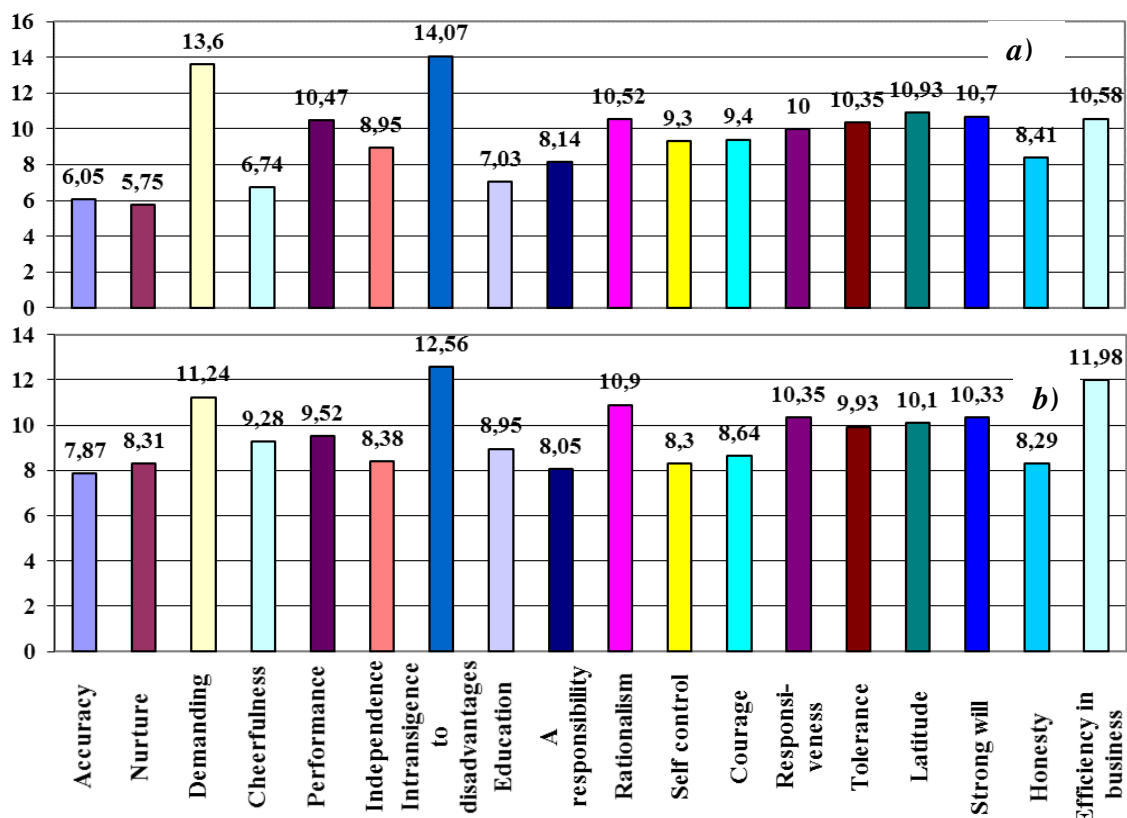
Figure 1. The average rank of instrumental values of environmental students (a) and technical students.

To assess the degree of communication of the average rankings of different groups of students, according to Table 1, the coefficient of Spirmen's double-rank correlation is determined that plays the role of the coefficient of objectivity. For instrumental values its value is r = 0.833; for terminal r = 0.585. The estimated values of Student's t-criterion for these groups of values are respectively tp = 6.02 and tp = 2.8555. The table values of this criterion for the number of degrees of freedom f = 16 are tT = 2.58 with a confidence probability P = 98% and tT = 2.92 at P = 99% (Bobylievetal 2014). This quantitatively confirms the high degree of coherence of ranking results between groups of students of environmentalists and students of technical specialties lists of instrumental and terminal values. (Figure 2, Table 1).
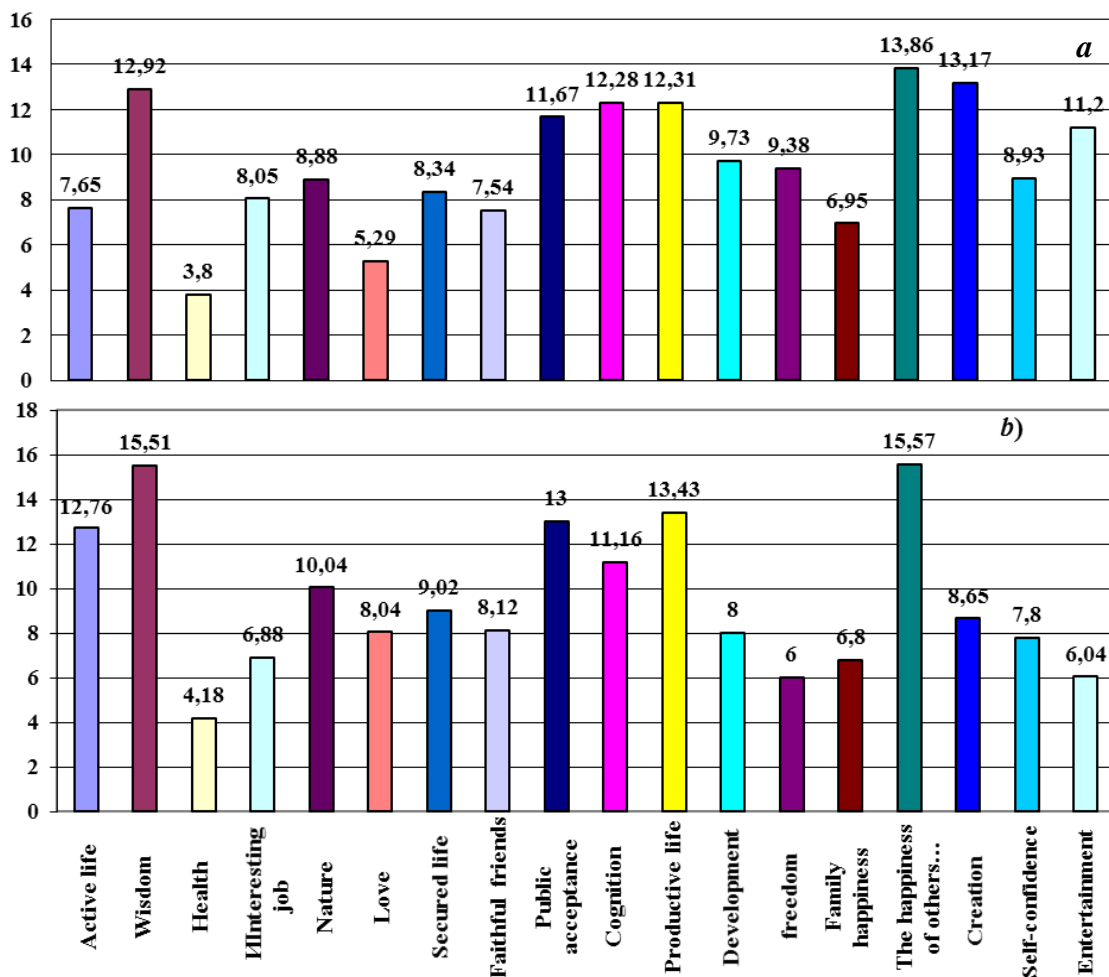
Figure 2. Average rank of terminal values of environmental students (a) and technical students (b) The determination of the degree of priority of the relation to nature in the minds of students.

Tables 2-4 show the meanings of the rankings in relation to the various categories of diagnostic objects obtained from the data of the general sample and separately for the students of ecology and other students, according to the "Dominant" method. According to this, the places occupied with the relation to themselves, education, work and material values, while the attitude toward nature takes 6th place in the group with average dominance with a rank of 5.16 for a simplified technique and 5th place with a rank of 4.99 for modified. In the rating of environmental students, this category occupied the same places as from other students for both 6 variants methodology took place. (Tables 2-4).

Table 2. Averaged (a) and normalized (6) ranks of categories of objects according to the main and modified diagnostic options according to the Dominant method (a total sample).

The object category	The main option		The modified option			a)	b)
	a)	b)	Emotional	The average rank Informational	Practical		
I myself	4,17	1	3,79	3,8	4,45	4,02	1
Education	4,21	2	4,89	3,94	3,78	4,2	2
Job	4,46	3	4,28	4,85	4,48	4,54	3
Material values	4,94	4	5,01	4,42	4,71	4,71	4
Morality	5,0	5	4,33	5,2	6,61	5,38	7
Nature	5,16	6	5,69	4,94	4,35	4,99	5
State	5,32	7	6,33	5,77	4,88	5,66	8
Sex	5,41	8	4,45	5,71	5,06	5,07	6
Others	6,33	9	6,23	6,37	6,68	6,43	9

Table 3. Average (a) and normalized (b) ranks of object categories by basic and modified Dominant diagnostics (environmental students).

The object category	The main option		Modified option			a)	b)
	a)	b)	Emotional	The average rank Informational	Practical		
I myself	4,25	2	3,52	3,43	5,17	4,04	1
Education	4,17	1	5,43	3,46	3,25	4,05	2
Job	4,31	3	4,21	4,25	4,69	4,38	3
Material values	5,37	7	5,34	5,45	5,12	5,3	6
Morality	5,57	8	4,58	5,93	6,69	5,73	8

|	a)	b)	Emotional	Informational	Practical	a)	b)
Nature	5,25	6	5,52	4,96	4,48	4,96	5
State	4,99	5	5,78	5,6	4,66	5,35	7
Sex	4,63	4	4,1	5,43	4,46	4,66	4
Others	6,46	9	6,52	6,49	6,48	6,5	9

Table 4. Average (a) and normalized (b) rank categories of objects according to the basic and modified variant of diagnostics by the method of "Dominant" (other specialties).

The object category	Main option		Modified option			a)	b)
				Average rank			
	a)	b)	Emotional	Informational	Practical		
I myself	4,07	1	4,12	4,23	3,58	3,97	2
Education	4,26	2	4,25	4,51	4,41	4,39	3
Job	4,63	5	4,37	4,56	4,25	4,73	4
Material values	4,44	4	4,39	3,21	4,23	3,94	1
Morality	4,33	3	4,03	4,35	6,52	4,97	5
Nature	5,05	6	6,12	4,91	4,21	5,08	6
State	5,71	7	6,98	5,96	5,14	6,03	8
Sex	6,33	9	4,86	6,04	5,75	5,55	7
Others	6,18	8	5,88	6,23	6,91	6,34	9

These data correspond to the distribution of the proportion of the ratio with the highest dominance (rank 1) for the considered categories of objects (Figure 3). Environmental students gave the rank 1 in the 7 questionnaires to the category «Nature». The category "I myself" in 10 cases received rank 1, that is 14.93% of the volume of this sample, while the category "Job" and "Education" in 9 questionnaires (13.43%). Thus, the 1 ÷ 3 place, that divides these three categories into ranking, indicates a high dominance of them.

Students of technical specialties ranked 1 most often - 8 times for material values, morality and attitude towards themselves, which is 14.03% of the 57 respondents. This rank was assigned to the categories "Nature" and "Job" (12.28%) in 7 cases. In the general sample of the category "Job" and "Material values" that received the highest rank in 14 questionnaires (12.9%), they occupy 2 ÷ 3rd place, yielding only to themselves (18 questionnaires or 14.52% of the total number of respondents).

According to the data of both the general sample and separately for different groups of students, the practical consideration of nature is more important than informational or emotional. The dominance of the attitude toward nature as an object of benefit to environmental students is characterized by rank 3, and to other students by rank 2, while the level of their emotional attitude has a rank 7th, and informational - 4 and 6. By the magnitude of the average rank from environmentalists the emotional component prevails, and information and practical components being stated to dominate for the students of technical specialist (Figure 3).
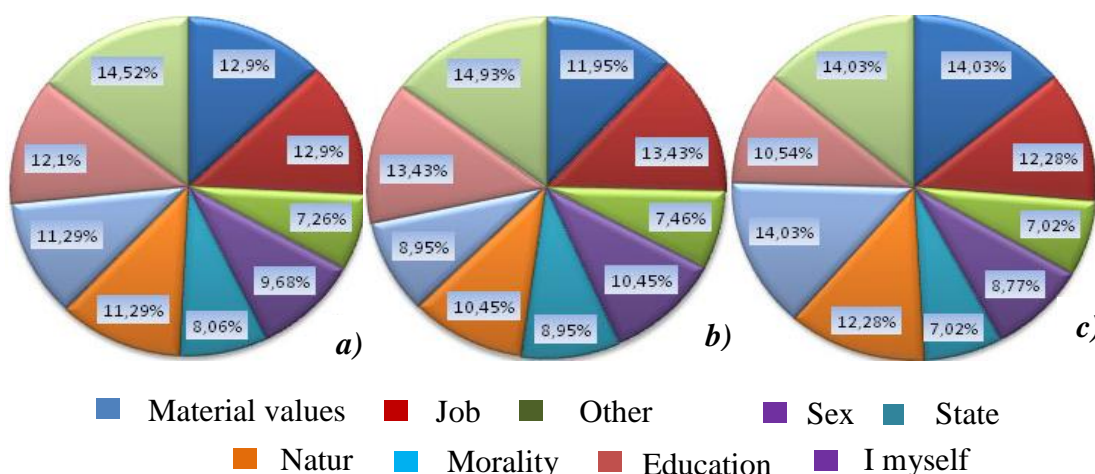
Figure 3. The distribution of the proportion of the highest dominant relationship by types of object categories.

Monitoring the quality of environmental education students.
The summarized results of the investigation of the level of the intensity of the attitude toward nature of the students with the «Naturafil» - the technique is given on Figure 4.

The majority of students are shown to have an average intensity of attitude toward nature: from environmentalists, 58%, for other students, 54%. As compared with environmentalists students of technical specialties are approximately 2 times lower for such levels as very high, high and above average. At the same time, they have a significantly higher percentage of levels with a reduced intensity of attitude toward nature.

On individual scales both the students of ecologists and students of technical specialties also prevail on the average level. Ecologists for perceptually-affective, practical scale and scale of deeds have a very low level of only 1 - 2%, and cognitive - 6%. According to the scale of naturalistic erudition, students show a higher level than on other scales: higher than average - 17%, high - 16%, very high - 12%.

The students of technical specialties in the first three scales do not have a very high level of intensity of the relation to nature. At the same time, they are well-developed in naturalistic erudition: 18% of those polled are above average on this scale; high - 20%; very high - 26%. This indicates that all students of the academy that were the objects of research have sufficiently high-quality basic knowledge about objects of nature, but future specialists in technology and production technology are much lower than other components of ecological consciousness.
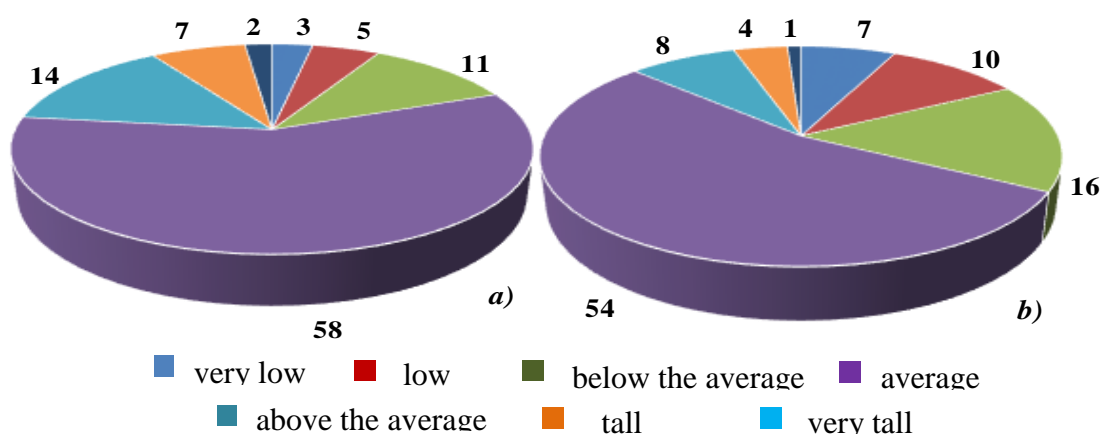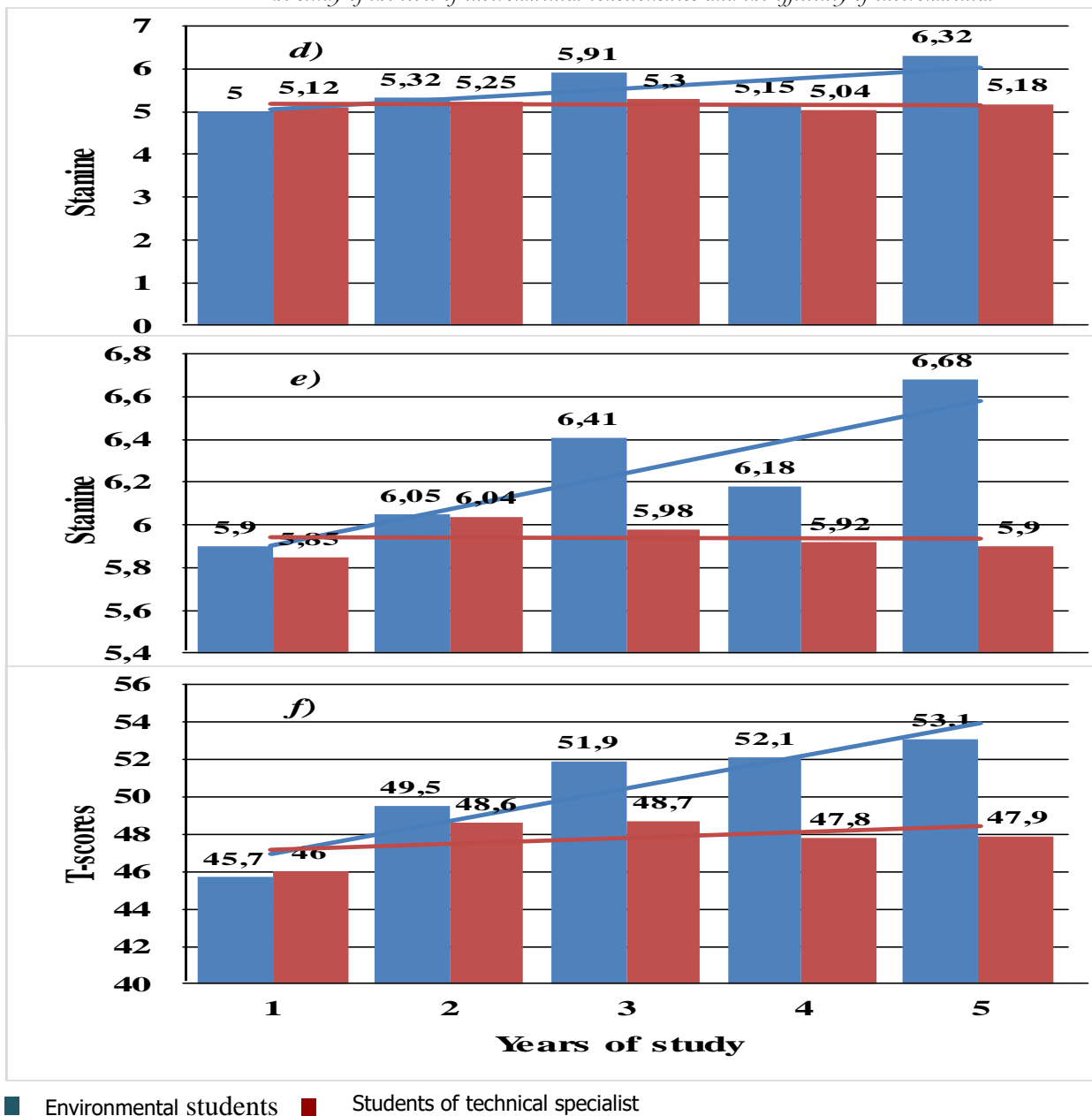
Figure 4. The level of subjective attitude towards the nature of environmental students (a) and students of technical specialties (b).

The change in the components of the environmental consciousness of students for the period of study is given in Figures 5 and 6. It confirms that the ecologists have a positive trend on all scales; there is a close connection between the time of training and the level of these components: the correlation coefficient is 0.9; 0.98; 0.84; 0,86 respectively for cognitive and practical scales, scales of deeds and naturalistic erudition; 0.92 by a generalized indicator, and only with a perceptive-affective scale it has a relatively low value of 0.62. Other students did not find such a positive dynamics in the formation of environmental consciousness, and in senior courses there is even a slight decrease in the average level of attitude to nature. This testifies to the urgent need to adjust the content of technical disciplines and strengthen their environmental component. (Figures 5 and 6).
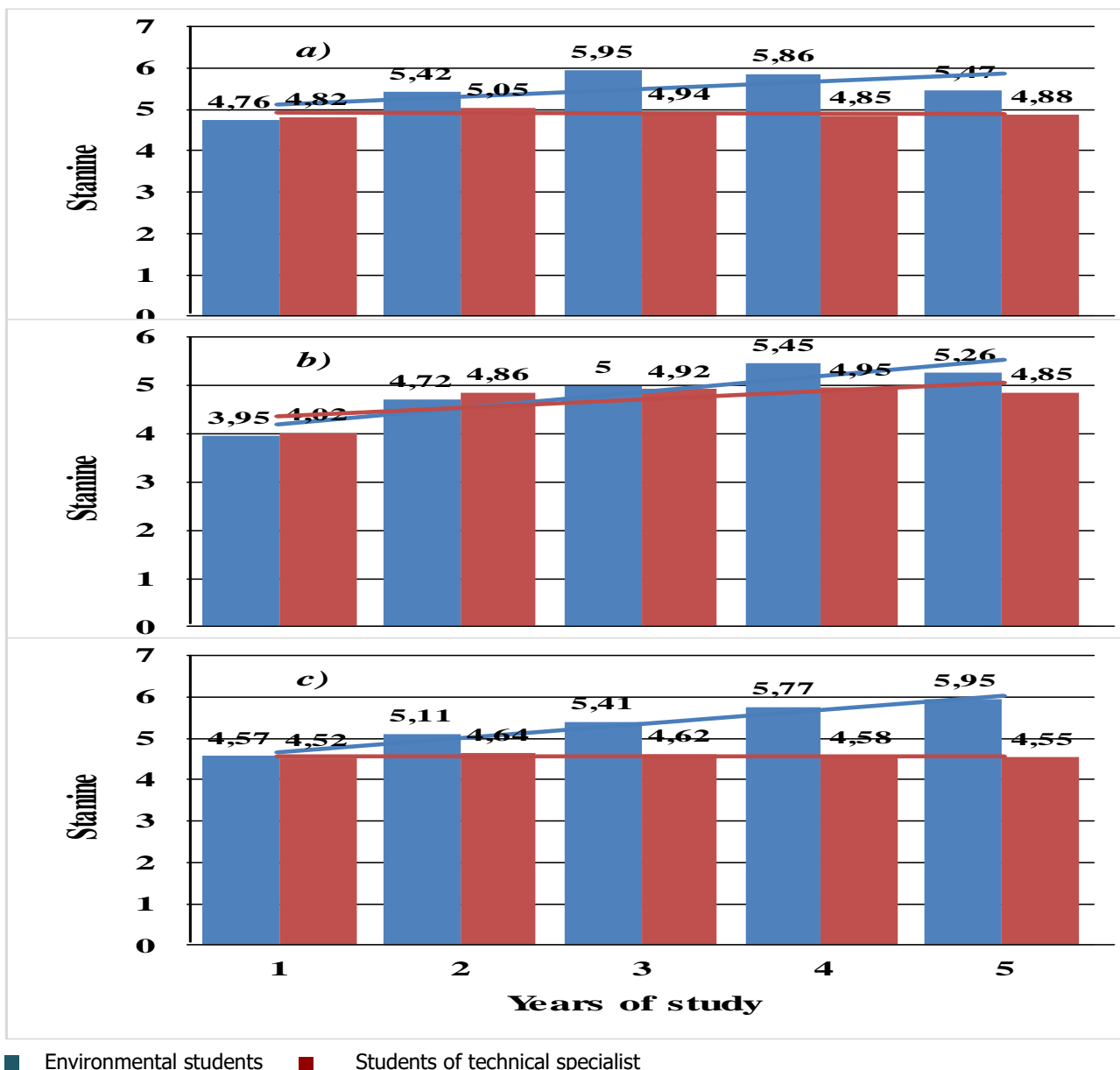
Figure 5. Changing the level of intensity of subjective attitude towards the nature of environmental students in courses in perceptual-affective (a), cognitive (b) and practical (c) scale.

■ Environmental students   ■ Students of technical specialist

Figure 6. Changing the level of intensity of subjective attitude towards the nature of students during study in the scale of actions (d) and naturalistic erudition (e) and the generalized indicator (f).

Conclusion

Upbringing of environmental culture in society is a key condition for solving ecological problems and sustainable development of the state. Environmental education is a powerful tool for creating a system of values and environmental awareness of student youth and one of the priority directions of the activity of higher education. Diagnosing the level of environmental consciousness of students and trends in its changes in the learning process creates the necessary feedback in the system of ecological education and provides an opportunity to timely implement measures for its improvement and efficiency improvement.

The system of values in different groups of students is close to each other. The main instrumental values aregood manners and accuracy, responsibility and honesty, and nonessential - irreconcilability to shortcomings and efficiency in business, rationalism and high demands. Among the terminal values, the main sites occupy health, happy family life and interesting work. The respondents attribute nature to secondary values, but to the inessential - public recognition and productive life, wisdom and happiness of others.

On the dominance of the relationship the nature has rank 5-6. This is an average dominance that inferior to attitude to yourself and education, work and material values. More important is the practical component of the attitude toward nature than informational or emotional. At the same time, ecologists dominate the emotional component, and students of technical specialties - informational and practical.

The majority of students have an average intensity of attitude toward nature. Compared with ecologists, other students have about 2 times lower rates for high levels and a much higher percentage of levels with a lower intensity of attitude toward nature. At the same time, all students have a good naturalistic erudition, indicating that they have received sufficiently high-quality basic knowledge about objects of nature.

The positive trend and the close relationship between the time of training of environmental students in the academy and the level of components of their environmental consciousness testifies to the effectiveness of the graduation department in shaping their ecological culture. The students of technical specialties do not have such a positive dynamic, and in the senior courses there is even a decline in the level of attitude towards nature. This necessitates the urgent need to adjust the contents of technical disciplines and increase the environmental component in corresponding issue departments.

Acknowledgements

References

Aikens, K., McKenzie, M. & Vaughter, P. (2016). Environmental and sustainability education policy research: A systematic review of methodological and thematic trends, Environmental Education Research, 22, pp. 333–359.

Babenko, L.V., Ivanov, I.I., Zosimov B.Yu. (2017). Ecologization of education and environmental education and their influence on the formation of consciousness from the standpoint of the concept of sustainable development, Theory and practice of metallurgy, 3-4, 110-111, pp. 174-176 (in Ukrainian).

Blyznyuk, T.P. (2017). Generational culture of baby boomers in Ukraine: value-oriented approach, in: Science and society: Collection of scientific articles, Edizioni Magi, Roma, Italy, pp. 41–47.

Bobyliev, V.P., Ivanov, I.I., Projdak, Yu. S. (2014). Methodology and organization of scientific research, IMA-press, Dnipropetrovsk 2014 (in Ukrainian).

Bonnett, M. (2012). Environmental concern, moral education and our place in nature, Journal of Moral Education, 41, pp. 285–300.

Cherdymova, E. I., Afanasieva, S. A. Parkhomenko A. G.,Ponyavina, M. B., Yulova, E. S., Nesmeianova, I. A.&Skutelnik, O. A. (2018). Student ecological consciousness as determining component of ecological-oriented activity, Eurasian Journal of Biosciences, 12, 2, pp. 167-174

Curry, P. (2011). Ecological Ethics, Polity Press, Cambridge, UK 2011.

Deryabo, S. D.&Yasvin, V. A. (1995). Methods of diagnostics and correction of attitudes towards nature, TsKFL RAO, Moscow 1995 (in Russian).

Dzhamalova, B. B., Sorokoumova, E. A., Glazkova, I. N., Dementieva, Y. V., Pavlushin, A. A, Shuaipov, M. M., Sayfutdinova, G. B. & Krasheninnikov, S. V. (2019). Research of Student Ecological Intention Development Level, Ekoloji, 28 (107), pp. 289-297.

Ivanov, I. I., Vaschchenko, K. V.& Lapina, O. S. (2018). Ecological component in the humanization of modern education, in: International scientific journal Acta Universitatis Pontica Euxinus. Special number, 2018 XIV international conference, Varna, Bulgaria, pp. 236 – 240 (in Ukrainian).

Jadhav, A.S., Jadhav, V.V. & Raut, P. (2014). Role of Higher Education Institutions in Environmental Conservation and Sustainable Development: A case study of Shivaji University, Maharashtra, India, Environmental Earth Sciences, 4, pp. 17–29.

Khinkanina, A. I. &Serova, O. E. (2016). Characteristics of Value and Professional Orientation of the Technical University Students as Ideal Views on the Activity Goals, International Journal of Environmental & Science Education, 11, 13, pp. 5942-5950.

Kopnina, H. &Meijers, F. (2014). Education for sustainable development (ESD). Exploring the oreticaland practical challenges, International Journal of Sustainability in Higher Education, 15, 2, pp. 188-207.

Liu, S. & Guo, L. (2018). Based on Environmental Education to Study the Correlation between Environmental Knowledge and Environmental Value.Eurasia Journal of Mathematics, Science and Technology Education, 14, pp. 3311–3319.

Maravić, M., Cvjetićanin, S. & Ivković, S. (2014). Level of Environmental Awareness of Students in Republic of Serbia, World Journal of Education, 4, 3, pp. 13-18.

Panov, V. I., Gagarin, A.V.& Serdakova, K.G. (2004). Ecological psychology, Science, Moscow 2004 (in Russian).

Popova, T. V. (2013). Ecological culture of a higher school teacher, Publishing House of Moscow State Technical University N. E. Bauman, Moscow 2013(in Russian).

Ramirez, R.I.S. (2017). Student Leadership Role for Environmental protection. Asia Pacific Journal of Multidisciplinary Research, 5, 2, pp. 204–211.

Rokeach, M. (1979). Understanding human values: individual and societal, The Free Press,New York 1979.

Shelest, K. D., Ionov V. V. & Tikhomirov, L. Y. (2017). Environmental awareness raising through universities – city authorities' cooperation,International Journal of Sustainability in Higher Education, 18, 1, pp. 39-49.

Slezackova, A., Cefai, C., Cejkova, E., & Gassmann, S. (2018). The role of life values in subjective well-being among Czech and Maltese university students. Psihološka Obzorja / Horizons of Psychology,27, pp. 35-47.

Slinkova, O. K., Slinkov, A. M., Grudistova, E. G., Koroleva, I. S. & Klimova, T. B. (2015). Study of Value Orientations among Russian Students, The Social Sciences, 10, 6, pp. 1493-1498.

Vauclair, Ch., Hanke, K., Fischer, R. &Fontaine. J. (2011). The Structure of Human Values at the Culture Level: A Meta-Analytical Replication of Schwartz's Value Orientations Using the Rokeach Value Survey, Journal of Cross-Cultural Psychology, 42, 2, pp. 186-205.

Żeber–Dzikowska, I., Chmielewski, Ja. & Lachowski, S. (2016). Natural resources as a value important to the development of ecological consciousness of the polish society, Environmental protection and natural resources, 27, 3(69), pp. 30-34.

Zvereva I.I. (2015). The Contents of Value Orientations of Students in the Conditions of Military Education, Psychological Science & Education, 7, 2, pp. 59-71. (in Russian).