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CONTENT, FORMS AND METHODS OF BUILDING THE ENVIRONMENTAL COMPETENCE OF EDUCATION RECIPIENTS ON THE BASIS OF AXIOLOGY

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The article contains the results of scientific research on the process of building ecological competence of schoolchildren on the basis of axiology. The analysis of the integrated educational process in general secondary and out-of-school education institutions through their transversal ecologization has been carried out. A number of social reasons that determine the urgency of these issues has been characterized. The definition of the term "environmental competence of students" has been defined as awareness of the ecological foundations of nature management, the need to protect nature, compliance with the rules of behavior in nature, economical use of natural resources, understanding of the context and relationship of economic activity and the importance of nature conservation to ensure the sustainable development of the society. The analysis of the legislative field on determining the axiological basis for building environmental competence of schoolchildren, particularly through the provisions of the Law of Ukraine "On Education" and the State Standard of Basic Secondary Education has been carried out. The formation of the concept of "value" in certain periods of development of educational process subjects has been studied. The axiological principles of building ecological competence of schoolchildren have been determined, the significance of upbringing as an integral part of the educational process has been revealed. The methodology of determining the content (environmental knowledge, skills, personal willpower), establishing forms (forms of general secondary education, forms of extracurricular education) and methods (organization and implementation of educational and cognitive activities, active learning, control and self-control, stimulating learning activities), building ecological competence of schoolchildren has been created. It has been proved, that the social effect of qualitative building of environmental competence of schoolchildren will be manifested in improving their nearest environment; upbringing conscious, ecologically competent citizens able to think critically and make competent decisions about the environment; actualizing socially significant functions of education; increasing social cohesion around environmental issues; promoting social formation of schoolchildren

Keywords: education recipient, ecological competence, scientific and methodological tools, educational institution

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1. Introduction

The importance of the natural environment for the existence of human beings, animals or plants lies in the provision of their right to life. Contrary to widespread calls for a safer environment, made in conventions and global agreements on contemporary environmental issues, the implementation of environmental measures remains dubious and insufficient.

Solving environmental problems depends not only on the scientific and technological development of society, but also on the level of environmental awareness and human responsibility for the environment. It is necessary to change the consumer attitude to natural environment. This can be done through building environmental awareness and environmental competence of the population by means of education.

The urgency of these issues is also due to a number of social reasons:

– tangible changes in natural environment, related to anthropogenic activities (climate change, species mi-

gration, biodiversity loss, irrational consumption, landscape degradation, etc.);

– the need to form competent behavior of students in the environment;

– integration of public institutions in solving environmental problems;

– intensive formation of information space, which complements the purposeful pedagogical influence of educational institutions;

– lack of educational initiatives for transforming the problems of formation of environmental and coevolutionary values.

2. Literary review

The Law of Ukraine "On Education" stipulates that education is the key to the development of a society, united by common values and culture. For its part, the goal of education is the all-round development of human as a person and the highest value of society; the development of his/her talents, intellectual, creative and

physical abilities; formation of values necessary for successful self-realization and building competencies; education of responsible citizens able to make conscious social choice and direct their activities to the benefit of other people and society; enrichment of intellectual, economic, creative and cultural potential of the Ukrainian people; raising the educational level of citizens to ensure sustainable development of Ukraine and its European choice [1].

The analysis of psychological and pedagogical literature on the research topic showed its extensive study, practical application and wide interpretation.

Thus, the analysis of the legislative field for determining the axiological basis for the formation of environmental competence of students is represented in [1, 2]. Knowledge and modern vital orientations as well as the development of environmental ethics are presented in [3, 4], the specific features of building environmental competence of students as one of the current needs of modern society in reforming the Ukrainian education system are identified in [5, 6]. Requirements for scientific and pedagogical support of sustainable development by means of environmental education are given in [7, 8]. The role of environmental education as a sphere of change in public consciousness of broad social and educational paradigms, particularly regarding the ecology of plants, animals and humans, is presented in [9, 10]. Ecological and psychological factors of life quality in modern society are disclosed in [11]. The importance of the basics of environmental management and product life cycle as well as methodology of environmental impact assessment is proved in [12, 13]. The role of environmental informatics for sustainable development and environmental research using environmental information systems is disclosed in [14, 15]. The importance of physics teacher training for the formation of environmental competence of students has been proved in [16], in lifelong learning in particular [17]. The analysis of the environmental education system at comprehensive school in the process of studying the subjects of natural science cycle as well as the implementation of a transversal line in education is presented in [18, 19]. Methodological bases of building ecological competence of schoolchildren [20], particularly at the lessons of chemistry [21], biology [22], geography [23] have been analyzed. Specific features of building ecological competence of primary school students by means of local lore are determined in [24]. Possibilities of forming natural and scientific thinking of high school students by means of cognitive educational tasks are revealed in [25], research activity is revealed in [26]. Special features of ecological education of students through cooperation of general secondary education institutions with higher education institutions are presented in [27], particularly in continuing education [28]. Greening of the educational process as one of the ways of forming ecological culture is revealed in [29], the formation of ecological consciousness of schoolchildren by ecological and educational activities is revealed in [30, 31]. Specific features of training specialists in the field of environmental protection for environmental monitoring in the system of postgraduate education are represented in [32]. The role of educational hub as a

space for the development of professional and practical competence of environmental safety specialists is determined in [33].

The use of the case method and research projects in problem-based learning [34, 35] as well as the use of distance learning technology in online, mixed and flipped format has been analyzed [36, 37].

The analysis of literary sources shows that much attention is paid to the problems of changing and updating educational paradigms on the basis of sustainable development. The role of environmental competence of people has been determined. However, the problem of building ecological competence of schoolchildren in the context of modern reform of the educational system in Ukraine has not been revealed.

3. The Purpose and Objectives of the Study

The purpose of the study is to reveal the significance of building environmental competence of students through the definition of its content, the establishment of forms and methods based on axiology.

To achieve this goal, the following tasks were set:

- 1) to analyze the content of ecological competence of schoolchildren on the basis of axiology;
- 2) to investigate the forms of ensuring the process of building ecological competence of schoolchildren;
- 3) to identify and analyze the methods of building environmental competence of students.

4. Methods of Research

The following methods were used to conduct the study: analysis and generalization of pedagogical, normative and methodological sources in order to identify a range of issues that require scientific and methodological support; methods of comparative analysis, interpretation and generalization of facts; comparative and analytical method to analyze the environmental competence of students; system analysis for the development of methodology for determining the content, establishing forms and methods of formation of environmental competence of students.

5. Results

5.1. Analysis of the Legislative Field to Determine the Axiological Basis for the Formation of Environmental Competence of Students

The conceptual and categorical apparatus of the study updates the interpretation of the definition of "environmental competence of students at the level of basic secondary education", which in accordance with the State Standard of Basic Secondary Education involves awareness of environmental principles, the need for nature protection, compliance with the rules of behavior in nature, economical use of natural resources, understanding of the context and relationship of economic activity and the importance of nature conservation to ensure sustainable development of society [2].

According to the general provisions of the Law of Ukraine "On Education", the components of competence (competence – a dynamic combination of knowledge, skills, abilities, ways of thinking, views, values, other personal qualities that determine a person's ability to successfully socialize, conduct professional and/or further educational activities) values have been determined [1].

Values are also related to learning outcomes (learning outcomes - knowledge, skills, abilities, ways of thinking, views, values, other personal qualities, acquired in the process of learning, education and development that can be identified, planned, evaluated and measured and which a person is able to demonstrate after the completion of the educational program or separate educational components) [1].

The Law [1] is also about the creation of conditions for realizing the values of civil (free democratic) society and rule of law by the participants of educational process.

The promotion of respect for the cultural values of the Ukrainian people, their historical and cultural heritage and traditions is among the most significant principles of state policy in the field of education and principles of educational activities [1]. In the context of the provisions of the Law of Ukraine "On Education" teaching, academic and research staff is obliged [1]:

- to promote respect for public morals and social values, including truth, justice, patriotism, humanism, tolerance, diligence, by guidance and personal example;

- to instill respect for the state language and state symbols of Ukraine, national, historical, cultural values of Ukraine and the environment.

Legislative conditionality of the system of values in the educational process is primarily explained by the

fact that the system of values as a phenomenon is considered in the social and personal dimensions. The first dimension takes into account the fact that a person, carrying out goals throughout life, determining their purpose in the chosen activity and self-realization, contributes to the functioning and development of society. The personal dimension of the system of values shows that only a person is the bearer and subject of value orientations. The system of values as a component of consciousness affects:

- the direction of a person's essential forces as a figure;

- the definition of the meaning of his/her own life;
- the formulation of the purpose and selection of means for achieving the planned targets.

Any conscious human activity is determined by the system of values or principles that determine:

- the specific perception of the world;
- the motivational orientation of a person;
- the attitude to key areas of life, that is manifested in cognitive assessments and emotional reactions.

For modern educational theory and practice, it is typical to consider the phenomena of "values" and "system of values" and to study purposefully their formation in certain periods of educational process subjects' development (Table 1).

Table 1

Research of the formation of the concept of "value" in certain periods of development of the subjects of the educational process

Periods of development	The essence of the phenomena of "values" and "system of values "
preschool period	– development of emotional and value-based attitude to nature in preschool children (V. Marshynska); – formation of value-based attitude to nature in preschoolers by means of art (M. Roganova)
period of primary school age	– reflexive and value-based regulation of educational abilities development at an early school age (N. Nikonchuk); – emotional and value-based factors of teaching junior schoolchildren (O. Kormylo)
adolescence	– psychological factors of developing the value-based and motivational sphere of teenagers in scout organizations (S. Melnychenko); – formation of the healthy style system of values in senior adolescents (S. Lapayenko); – formation of moral and value-based orientations in adolescent girls under conditions of interaction between school and out-of-school educational institutions (N. Sinkevych); – formation of the teenager system of values in the activities of children's theater (V. Shahrai);
the period of early adolescence	– formation of value-based attitude to other people in high school students during extracurricular activities (G. Kyrmach); – development of value-based attitude to nature in high school students (O. Kolonkova); – formation of the moral and value-based attitude to work in high school students in a market economy (S. Omelchenko); – development of the system of values in high school students in the educational process of a gymnasium (O. Rudina); – development of system of values in high school students by means of media (S. Shadruk).

However, the study of the student system of values during building their environmental competence remains out of the attention of Ukrainian scientists.

Therefore, in previous studies [4] we identified axiological principles of environmental competence of students, revealed the importance of education as an integral part of the educational process, which should be based on universal, cultural, civil society values, principles of new personality (carrier of ecological consciousness – ecoperson) and

greening the discursive and everyday practices of small social groups (family and local) through upbringing and education. Environmental competence, in our opinion, should ensure the development of global consciousness to take into account the interests of future generations and the formation of ecological lifestyle.

Conditions for successful interaction (including with nature) determine the presence of motivation for interaction:

- the importance of the activity, encouraging the interaction with nature and its objects to achieve a certain goal;

- the availability of means necessary for the implementation of the process of interaction with nature;

- individual psychological characteristics of the subjects that contribute to successful interaction with nature on the basis of value-based attitude;

- the presence of socio-psychological conditions that contribute to the most effective process of value-based interaction with nature.

The value-based interaction with nature is determined by the following provisions: correct and acceptable is only that, which does not harm nature and ensures ecological balance. Ethical norms and rules are applied both to human interaction and interaction with nature [4].

5.2. Methods of Determining the Content, Establishing Forms and Methods of Building Environmental Competence of Schoolchildren

The state standard of basic secondary education defines the content of environmental competence of schoolchildren, which includes:

- skills (identification and analysis of environmental problems; responsible and economical use of natural resources; responding to challenges, related to the environment; initiating solutions to local environmental problems, implementation of environmental projects; forecasting the environmental consequences of human activities);

- attitude (awareness of the importance of rational use of nature; evaluation of their own actions in nature from the standpoint of security; life activity, ethical norms and principles of sustainable development of society; appreciation of the diversity of nature, recognition of life as the highest value) [2].

The formation of environmental competence of students is positioned as a purposeful process of developing experience, sense of personal involvement, responsibility and environmental values in the process of personally and socially significant educational and practical activities to solve environmental problems.

The development of the educational environment as a methodological and technological basis for the formation of environmental competence of students, critical analysis of world problems, value systems, environmentally responsible and creative thinking requires the establishment of forms and methods based on axiology.

The following non-traditional methods and forms of teaching contribute to the significant effectiveness of the teacher's educational activity during the formation of students' environmental competence:

- micro-teaching; role-playing games or simulations; scientific workshops (group work, pedagogical training, creative workshops);

- introduction of modular courses (main direction - development of skills of independent work on formation of ecological competence);

- use of modern digital (information, information and communication) technologies in educational practice;

- expanding the range of educational services with the help of multimedia;

- use of distance/mixed education.

Through the meetings of creative groups, teachers of experimental institutions comprehended the system of goals, objectives of the educational institution and the tasks of developing environmental competence of students, planning the expected results of joint environmentally oriented activities.

The developed content of designing the educational process was introduced through a series of seminars, trainings, practical classes, round tables, pedagogical readings with participants of the educational process and aimed at:

- raising the level of knowledge about the structure and model of environmental competence;

- practical and theoretical substantiation of the advantages of integrative design over traditional planning of the educational process;

- improving the environmental culture of participants in the educational process;

- increase of ecological self-awareness and activity of students by involving schoolchildren in ecological actions;

- improving the process of greening and environmental education, etc.

This information is structured in Table 2.

Means of building ecological competence of schoolchildren get noticeable transformations when audiovisual and video means as well as visual planes both in the format of hyperpages and in a graphic or video kind are used along with usual books, manuals, textbook, demonstration herbariums, models.

However, new teaching aids are also being updated: electronic educational resources (multimedia textbooks and universal encyclopedias, online educational resources, etc.); Internet services (e-mail, search systems, bookmarking and multimedia storage services, blogs, WikiWiki, knowledge maps, collaboration services, social geoservices, etc.).

The social effect of qualitative formation of environmental competence of schoolchildren will be manifested in the improvement of the nearest environment; education of conscious, ecologically competent citizens able to think critically and make competent decisions about the environment; actualization of socially significant functions of education, growth of social cohesion around environmental issues, promotion of social development of schoolchildren.

Despite the significant increase in the number of studies on the formation of environmental competence and its values in Ukrainian pedagogy there is a significant gap between the theoretical and methodological principles, their experimental implementation and technological and methodological support. The systematic continuous process of updating the content of ecological competence of schoolchildren, development of interactive methods of formation of its value, motivational components, exercise of skills and abilities in environmental protection and rational use of nature requires detailed substantiation.

Table 2

The specific use of forms and methods of building environmental competence of pupils		
Content	Form	Teaching methods
environmental knowledge basic concepts and laws of ecology, characteristics of different forms of life and their interaction with each other and with the environment; circulation of matter in nature; structures and characteristics of the main components of the environment, the impact of anthropogenic factors on the environment; global and regional environmental issues; methods of studying the state of the environment; methods of environmental research and its improvement	forms of general secondary education institutional (full-time, part-time, remote, network); individual (external, family (home), pedagogical patronage)	organization and implementation of educational and cognitive activities verbal (explanation, story, conversation, lecture); visual (illustration, demonstration, observation in nature); practical (laboratory, practical, graphic, research, experiment)
environmental skills identification of harmful phenomena and factors in the surrounding world; conducting environmental research; interpretation and processing of data, obtained during research; monitoring the state of environmental components; use of environmental knowledge to solve practical environmental problems; assessment of the feasibility of implementing environmental measures; safe (for themselves, others, environment) waste management; understanding the role of ecology in the development of society and ensuring human well-being	forms of organization of extracurricular education classes; hobby group work; club work; remote work; lesson; lecture; individual lessons; conference; seminar; quiz; camping; excursion, expedition; practical work in laboratories, workshops, greenhouses, research land plots, in nature	active learning productive; heuristic; problematic; interactive
personal volitional qualities responsibility; activity; organization; diligence; love for nature; kindness; mercy; dignity; honesty; entrepreneurship; humanity		control and self-control oral; written; graphic; programmed; self-control; testing; self-esteem
		stimulating educational activities creative; problem-searching; educational discussion/debate; brain storm; case study/situation analysis; workshops; hackathons; hubs; project activities

6. Conclusions

1. The analysis of the content of ecological competence of schoolchildren on the basis of axiology has been carried out. The problem of its formation through the definition of a number of social causes as well as the analysis of the legislative field to determine the axiological basis for the formation of environmental competence of students, namely the necessary environmental knowledge, skills, personal willpower has been updated.

2. Forms of providing the process of building ecological competence of schoolchildren have been investigated. The forms of obtaining general secondary education have been singled out as follows: institutional (full-time, part-time, distance, network); individual (external, family (home), pedagogical patronage). The forms of organizing extracurricular education have been defined as follows: classes, group work, club work, distance work, lesson, lecture, individual lessons, conference, seminar, quiz, hike, excursion, expedition, practical work in laboratories, workshops, greenhouses, research land, in nature.

3. Methods of building ecological competence of schoolchildren have been defined and analyzed: organization and implementation of educational and cognitive activities (verbal, visual, practical), active learning (productive; heuristic; problem; interactive), control and self-control (oral; written; graphic; programmed; self-control; practical testing; self-assessment), stimulation of educational activities (creative; problem-searching; educational discussion/debate; brainstorming; case studies/situation analysis, workshops, hackathons, hubs, project activities, etc.).

Conflicts of interest

The authors declare that they have no conflicts of interest.

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