

MODEL AND METHODOLOGY FOR IMPROVING ECOLOGICAL CULTURE IN AN EDUCATIONAL CLUSTER

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ABSTRACT

In the context of increasing global environmental problems, the development of ecological culture is one of the priority tasks of the modern education system. In particular, the opportunities for the integrated and systematic formation of ecological knowledge, skills and values are expanding within the framework of educational clusters. The educational cluster plays an important role in the development of ecological culture as an innovative model that ensures cooperation between general education schools, higher education institutions, research institutes, industrial enterprises and public institutions.

Keywords: Education cluster, environmental culture, environmental education, sustainable development, ecological competence, ecological awareness, interdisciplinary integration, educational model, teaching methodology, environmental responsibility.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

Current transformations in the education system necessitate a rethinking of the professional environmental competence of students, focusing on psychological and pedagogical competence as a key element of professional maturity. Competence is defined as a set of integral personal characteristics of a person with a high level of individual development, possessing knowledge, abilities, skills and methods of performing activities that are assessed based on the subject's performance. The concept of "competence" in pedagogy is interpreted as an integrative personality characteristic that includes not only the level of knowledge but also the ability to effectively apply it in teaching [1].

The psychological and pedagogical rationale for environmental competence is viewed as an optimal combination of professional and personal characteristics, ensuring the achievement of sustainable and high results in the development of qualified personnel [2].

Psychological and pedagogical competence is a complex entity, primarily comprising the professional and personal qualities of students who ensure effective education, taking into account the age, individual and psychological characteristics of a large audience. This is a key component of overall professional competence, encompassing the entire range of professional and personal qualities required by a teacher in their work [3]. Despite the many definitions of the concept of "culture" most authors point to its integrative nature. For example, J. Raven notes that competence is a phenomenon that consists of a large number of components [4]. As a rule, in any professional activity, key competencies come to the forefront, which are usually considered to include professional knowledge, abilities, and skills, as well as the abilities and personal qualities necessary for performing work in a particular profession. In the scientific community, the understanding of pedagogical skills is represented by a diverse set of methodological and didactic skills and the accompanying mental and behavioral operations. However, all of them, to one degree or another, overlap with the system of pedagogical skills proposed by V. A. Slavenin, which the author correlates with the teacher's readiness for professional activity, highlighting its theoretical (skills: analytical, prognostic, projective,

reflective) and practical components (organizational skills: mobilization, informational, developmental, orientation; communication skills: perceptual, pedagogical communication skills, pedagogical technique) [5].

An important step in our study was identifying and substantiating the key components of environmental competence among students. We included the key professionally important qualities of the psychological and pedagogical components of environmental competence, which include:

No. Definitions of Psychological and Pedagogical Components of Environmental Competence

1. Environmental thinking: a systemic understanding of the fundamentals of ecology, sustainable development, environmental risks and their consequences, as well as the legal and ethical aspects of environmental protection.

2. Rational thinking: the ability to analyze environmental issues in the educational and professional spheres and evaluate the impact of educational activities on the development of environmental awareness.

3. Forecasting Skills: the ability to anticipate the potential environmental consequences of pedagogical and management decisions, and the development of environmentally-oriented trends in education.

4. Projective Skills: the ability to design educational programs and activities that take into account environmental objectives and sustainable development values.

5. Reflective Skills: the willingness to self-analyze and critically evaluate one's environmentally significant teaching activities, and the search for ways to improve their effectiveness.

6. Organizational Skills: the ability to organize environmental education for students, engaging them in project-based, research, and social activities focused on environmental protection.

7. Perceptual Skills: the ability to perceive and consider students' environmental sensitivity, attitudes, and values.

8. Communication Skills: the ability to effectively convey environmental ideas, build constructive dialogue on sustainable development issues, and conduct educational outreach.

9. Empathic Skills: the development of environmental empathy and an ethical attitude toward nature and other people in the educational process.

Ecological Thinking: Ecological thinking combines knowledge and beliefs regarding the relationship between humans and nature. Environmental awareness encourages people to recognize the close relationship between humans and nature, and that its protection is an objective necessity, as is the wise use of natural resources and the preservation of flora and fauna. This is not just information; it is a kind of investment in our shared future. The environmental situation has its own specific characteristics. People must utilize nature's potential not recklessly, but in a balanced manner [6].

Ecological thinking develops the knowledge, skills, values, and attitudes necessary for understanding the relationships between the environment and human activity, as well as for making responsible decisions and actions aimed at preserving and improving the environment. It includes both theoretical knowledge of ecology and sustainable development and practical skills in environmental conservation, as well as the development of environmental awareness and responsible behavior.

This knowledge development includes teaching the basics of ecology, understanding the interrelations in nature, studying the causes and consequences of environmental problems, and familiarizing oneself with the methods and means of environmental protection.

Skill development is acquired through the development of practical skills in waste management, resource conservation, and participation in environmental conservation activities.

Values are fostered through the cultivation of a love and respect for nature, and an awareness of the importance of preserving natural resources and biodiversity.

Environmental awareness is developed through the understanding that human well-being directly depends on the state of the environment, as well as an awareness of responsibility for one's actions toward nature.

Rational thinking is the ability to solve problems using a logical, systematic, and objective approach, enabling a person to analyze situations from multiple perspectives, objectively evaluate facts, and make decisions while reducing the influence of emotions. This approach is based on factual analysis, the evaluation of possible options, and the avoidance of emotional and cognitive distortions [7].

In the context of a growing environmental crisis, the higher education system plays a key role in shaping the values of sustainable development. Students are becoming the central agents of these transformations, determining the quality of the training of environmentally conscious specialists. However, sustainable behavioral and professional models are formed not only by knowledge but also by cognitive attitudes, including rational thinking.

Rational thinking is the ability to consciously, logically, and objectively analyze information, predict consequences, and make decisions based on facts. Rationalistic thinking is characterized by a desire for conceptual laconicism and a concise picture of reality [8]. In an environmental context, rationality extends beyond individual analysis and becomes a tool for sustainable pedagogical choice.

Students with developed rational thinking: predict the environmental consequences of curriculum content; choose teaching methods that not only inform but also shape values (e.g., project-based learning on sustainable development topics); and recognize the importance of developing behavioral patterns oriented toward environmental conservation.

Students with environmental culture should be able to analyze the pros and cons of various educational and management decisions from an environmental perspective. They should distinguish sustainable approaches from superficial trends (e.g., "green marketing"). They should develop critical thinking, which is important for countering environmental fakes and manipulation.

Rational thinking allows for: identifying the underlying causes of environmental problems (e.g., institutional, cultural, economic); learning to verify sources of information and focusing on scientific data; Develop environmental research skills through case studies, natural observations, and primary data analysis.

Environmental education is associated with high emotional stress—anxiety, frustration, and hopelessness—and it is essential to develop emotional intelligence: be calm, but not indifferent; teach environmental empathy while avoiding radicalization; and rationally justify the need for lifestyle and behavioral changes.

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