



## Formation Of Environmental Competence: Theory And Practice

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### ABSTRACT

This article deals with peculiarities of formation of ecological competence as an important part of ecological education. The basis of environmental competence, the basis for its formation as an integral quality is the corresponding knowledge and skills. Ecological competence includes the ability to apply the acquired knowledge, practical activities and behavior for their use and is almost identical to the “ecological culture of the individual”.

### KEYWORDS

Ecological competence, ecochemistry, theory, practice.

### INTRODUCTION

The urgent task of today's education is to prepare a competitive personality that is capable of perceiving globalization and integration processes, functioning in new socio-economic and socio-cultural transformations, taking into account modern

ideas about the joint evolution of man and nature (co-evolution). Therefore, without abandoning national characteristics and interests, each country should generalize its own experience, take the best experience of foreign countries on these problems and adapt

it to national soil. In particular, this concerns the training of specialists who must be competent in the field of environmental issues.

Achievements of fundamental chemistry largely determine the current level of understanding the structure of the material world, and chemical approaches and technologies play a key role in solving global problems of sustainable development and environmental conservation, in providing the planet's population with clean water, food, effective medicines, energy.

The relationship of humans with species, populations, biogeocenoses in our time is environmentally unbalanced. As a result of this, significant crop losses due to pests take place, lower organisms cause significant losses to raw materials, materials, equipment, buildings and structures, cultural monuments, their numbers are reduced and some species disappear, ecological discomfort of the urbanized environment arises, which aggravates stressful situations, and the incidence increases people.

The balance of human relations with nature can be achieved through integrated efforts on the part of man through environmental regulation of economic activity, targeted, environmentally sound impact on species, populations and ecosystems, through environmental education of the younger generations, as well as by acquiring environmental competence of graduates of higher educational institutions, and especially future chemical engineers.

### **The Concept Of Environmental Competence.**

First of all, the concept of environmental competence in pedagogy becomes important in connection with the introduction of new educational standards and is considered as an important indicator of knowledge of pupils and

students. An analysis of modern publications indicates that the environmental aspect is underrepresented in the list of key competencies, as well as in the structure of the concept of "life competence". And environmental competence, as an indicator of the quality of environmental education, has only recently been gaining momentum. The basis of environmental competence, the basis for its formation as an integral quality is the corresponding knowledge and skills. Ecological competence includes the ability to apply the acquired knowledge, practical activities and behavior for their use and is almost identical to the "ecological culture of the individual." The condition for the successful formation of environmental competence of students is the use of forms and methods of pedagogical impact, including experiment and scientific research (especially at the master's level), develop intellectual skills (analysis, synthesis, conclusions, etc.), the ability to critically interpret phenomena, information and experience, find and justify solutions to environmental problems.

Environmental competence - the ability of a person to conduct situational activities in everyday life and the natural environment in which the acquired environmental knowledge, skills, experience and values are updated in the ability to make decisions, perform appropriate actions, be responsible for decisions made, being aware of their consequences for the environment [5]. Unlike environmental culture, which can concern both society and an individual, environmental competence, like competence in general, applies only to the individual.

Regarding the implementation of the provisions of the Bologna Declaration in the system of higher education and science, the

creation of a system for determining the level of competence of graduates of higher educational institutions and the development of methods for objectively assessing the level of competence of specialists of different educational qualification levels were noted. Higher educational institutions play a special role in this task, since they create the necessary conditions for free development, the formation of a sustainable environmental position and the professional competence of each student. At the same time, the practice of teaching environmental information in universities does not always comply with the provisions of the Bologna Declaration and causes corresponding contradictions.

The main methodological and didactic principles of the organization of the educational process at the university were reflected in the works [1, 3, 4, 6, 7, 9]. An analysis of the works on the formation of environmental competence of students in the works showed that the formation of environmental competence of students is one of the strategic objectives of higher education [2].

Formation of environmental competence of future engineers is one of the priority tasks of education for sustainable development, the decade of which was proclaimed by the UN in 2005-2014. Environmental competence allows a future specialist to solve life and work situations, subjecting them to the principles of sustainable development. The harmonization of the economic and social development of society and the preservation of the environment leads to special attention to environmental education.

Acquisition of environmental competencies should not be limited to graduation. The

program of retraining of teachers and university professors should include the course "Ecochemistry", which will give new environmental knowledge to the students of the courses. In particular, at the Conference of Ministers of Education at the Council of Europe (Lublin, Slovenia, 2010), it was noted that the main requirement today should be paid not so much to training future specialists at universities as to issues of advanced training for teachers and teachers, their professional retraining. This also applies to a large extent to the acquisition of environmental competence [8].

Environmental competence is an important component of life competency. Its theoretical foundations and some questions of practical implementation are disclosed in the studies of many scientists. However, environmental engineering competency is an integral part of professional competence for students of chemical engineering specialties.

The environmental competence of future chemical engineers consists of motivational, cognitive, activity and reflective components and requires further development of the criteria and indicators of these components. The use of the latest and highest technologies in modern conditions and at the same time an increase in harmful emissions into the atmosphere and water bodies, unsatisfactory development of technologies for the secondary processing of raw materials determine new and high requirements for the professional competence of engineers and especially chemical engineers. The training of a chemical engineer who is capable of carrying out professional activities is certainly associated with the formation of his environmental competence. The latter implies the ability of a specialist to take an active part

in overcoming the environmental crisis, requires the ability to mitigate the harmful effects of chemical wastes, prevent emergency environmental situations, and, if necessary, be able to eliminate them. The environmental crisis, in turn, leads to a rethinking of relations in the triangle "nature-man-society" and the search for ways to harmonize them.

The main directions of the problem of the formation of environmental competence: theory and practice. Our analysis of psychological and pedagogical sources on the formation of environmental competence of future engineers allowed us to identify three main areas of consideration of this problem: features of training engineering personnel; substantiation of the need for environmental education, environmental education and thinking; theoretical and methodological foundations of the formation of environmental competence of the individual. The results of the analysis of the literature data and the facts of the growing threat to the state of the environment show that the question of the formation of the environmental competence of chemical engineers requires further study and development, in particular in the direction of studying the didactic conditions for the formation of the environmental competence of future chemical engineers. At the same time, in pedagogical science and practice, the process of forming the environmental competence of future chemical engineers requires clarification of precisely these conditions. Today, the need arose to resolve the contradictions that objectively take place in the theory and practice of learning. The main ones are the discrepancy:

a) The requirements for a chemical engineer as a subject of environmentally friendly activities offered by the curriculum, on the

one hand, and the level of professional training of students of the specified specialty, on the other;

- b) The practically revealed experience of environmental training of future chemical specialists and the lack of purposeful organization of environmental training;
- c) The need to develop and implement modern effective forms and methods of training in order to build environmental competence, on the one hand, and on the other, with an excess of outdated approaches to the training of chemical specialists in the education system of engineers.

It is clear that the impact on the environment of ecologically incompetent engineering is extremely dangerous and in some cases can lead to environmental disasters. Therefore, one of the most pressing problems of higher education is the formation in students of the attitude towards the natural environment that is responsible for future generations. Thus, the formation of environmental competence of future chemical engineers is of no small importance in pedagogy.

## CONCLUSIONS

Today, ecology is gaining global importance. Specialists in the field of chemistry, like no other, should be aware of the effect of harmful substances on nature, because the key role in solving environmental problems is assigned to specialists. Indeed, most environmental problems are of a chemical nature, and chemical agents and methods are actively used to solve them.

Academician V. A. Legasov in his work pointed out that the problems of environmental chemistry are caused by man himself and are the result of a long and extremely stormy

production activity. But at the same time he emphasized the need for the development of modern chemical science and technology in all areas of management, because without chemistry it is difficult to imagine progress in any field.

A chemical engineer of the 21st century needs an understanding of the relationship between the problems of resource saving, optimization of technological processes and improving the environmental safety of the enterprise, understanding that ensuring the environmental safety of production only by using effective treatment equipment is an expensive and not the most effective solution, often associated with additional problems of disposal and disposal pollutants.

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