



## ON THE ROLE AND SIGNIFICANCE OF INFORMATION AND COMMUNICATION COMPETENCE OF FUTURE CHEMISTRY TEACHERS

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### Annotation

In school education, chemistry is a subject, the study of which provides the necessary didactic opportunities and means of forming information and communication competence. In recent years, scientists, both theorists and practitioners, have been actively developing the idea of using information technologies to form the professional competencies of future chemistry teachers. At the same time, it is noted that the formation of information and communication competence of a future chemistry teacher at a university based on the methodology of teaching chemistry should be carried out consistently and continuously.

**Keywords:** chemistry, teaching methods, IT technologies, electronic support, Internet technologies, competence approach.

In modern educational activities, it is impossible to do without the use of information and communication technologies in the classroom. We turn to information technologies only if they provide a higher level of the educational process in comparison with other teaching methods. The computer is able to replace the main part of visual aids and models. When organizing practical work, the computer becomes an effective assistant. For example, when studying toxic substances (benzene, halogens, etc.), the virtual world makes it possible to conduct a chemical experiment without risking the health of students. With the help of electronic textbooks, you can show video clips of experiments that can not always be carried out in full in the lesson. Electronic textbooks are also provided with three-dimensional illustrations that contribute to the development of spatial thinking. It is possible to use computer technologies in the study of new material (presentations for lectures), in the primary consolidation of knowledge and skills acquired in the lesson, in the development of skills and abilities (training testing), during a chemical workshop, as well as in the control and correction of knowledge [1,2].

The use of information technologies in the educational process allows teachers to realize their pedagogical ideas, present them to colleagues and get a prompt response, and gives students the opportunity to independently choose the sequence and pace of





studying topics, a system of training tasks and tasks, ways to control knowledge. This is how the most important requirement of modern education is realized – the development of an individual style of activity, a culture of self-determination [3]. The use of computers and global communication tools can help students live and work harmoniously in the information society, learn more deeply and more diverse about the world around them, and develop intellectual potential. In connection with the use of new Internet technologies, the role of integrated knowledge is increasing, traditional methods are used - conversation, story, explanation, independent study using the display of tables, posters; new forms of organizing students' educational activities are used: project methods, working in a group and with partners, autonomous learning, etc. One of the most important methodological principles for the effective use of information and communication technologies (ICT) is the combination of computer technologies with traditional ones. The use of ICT in the classroom should be appropriate and methodically justified, and not serve as a tribute to the dictates of time [4].

The formation of the teacher's information competence is currently one of the most urgent tasks of the system of continuing pedagogical education. The analysis of the state of the problem of the formation of information competence of future specialists has shown that the scientific and educational society has not yet developed a consensus on its interpretation. Common to all definitions is the understanding of it as the ability of a person to cope with a variety of tasks [5].

The implementation of the strategy for the development of domestic education has largely exacerbated the problem of insufficient professional competence of specialists graduated from pedagogical universities. In this regard, the task of modern higher education is not just to form students' knowledge, develop skills and abilities, but also to promote the development of special professional and personal qualities that allow them to self-actualize in their upcoming professional activities, to be competitive in the labor market. At the same time, it should be noted that by now, in the theory and practice of higher professional education, there is a need for further searches for the most effective ways and means of forming information and communicative competence of students in the system of university training for pedagogical activity. This issue has become extremely relevant in connection with the transition of universities to level education (bachelor's and master's degrees) and therefore represents a pedagogical problem.

Its relevance is also enhanced by the fact that level-based education at the university is becoming more and more technological, involving not only computerization of the learning process, but also new forms of pedagogical management of this process, in





connection with which additional theoretical and applied pedagogical research becomes necessary. A special place among them should be occupied by works related to the preparation of students for pedagogical activity in specific areas of scientific knowledge. In particular, the analysis of pedagogical experience and the results of scientific research shows that among chemistry teachers of various types of educational institutions there is a lack of information and communication competence, which does not allow them to successfully solve professional and pedagogical tasks.

However, with all the undoubted theoretical and practical significance of these studies, their importance in solving priority tasks in developing a system for improving the quality of modern teacher training, it should be noted that the development of scientific foundations for the professional training of teachers in specific disciplines, in particular teachers in chemistry, is one of the little-studied problems. The essence and content of this process needs to be clarified in the conditions of a modern university and the latest achievements of pedagogical science, the activity of a chemistry teacher needs to be considered from the perspective of a competence-based approach and the introduction of information technologies into the learning process at the university, it is necessary to find out the specifics of its organization in relation to the practice of professional training of future chemistry teachers; to determine further ways to improve their professional training using the potential of information technology; theoretically substantiate and practically verify the. Many chemical scientists, methodologists and practical teachers are busy solving this problem. As a result, a wide range of educational chemistry software products has appeared. However, the chemistry teacher is not always prepared for their practical use, although the quality and effectiveness of the use of ICT in teaching chemistry depend on the teacher, the level of his psychological, pedagogical and subject-methodical training, computer literacy. That is why one of the tasks of higher pedagogical education should be the creation and implementation in practice of systematic methodological training of future chemistry teachers and practical teachers to work in the conditions of informatization of school chemical education [6].

A teacher should possess information competence and literacy, that is, be able to navigate the flow of information, work with various sources of information, find and select the necessary material, classify it, generalize it, and treat it critically.

In the new information conditions, information and communication competence should become an integral part of the professional competence of a future chemistry teacher, which is understood as a systemic quality of personality, which is not only an





ordered set of competencies in the field of chemistry, information and communication technologies, but also general and private methods of teaching chemistry and educational technologies [7,8].

The methodology of the formation of the IR competence of the future chemistry teacher in the process of his chemical and methodological training is based on the sequential step-by-step formation of students' key, basic, special competencies necessary

for a future chemistry teacher when using ICT tools in professional activities.

At the level of key competencies:

- skills of effective search, analysis and automated processing of information from various sources (printed and electronic publications, including the Internet) using modern technologies;

- the ability to present the result obtained in the form of a computer presentation or in another form convenient for presentation and understanding by students, etc.

At the level of basic competencies:

- the presence of general ideas about the didactic possibilities of information and communication technologies;

- knowledge of the basics of the methodology of using digital educational resources (CSR) in the educational process;

- knowledge of basic services and Internet technologies in the context of their use in educational activities;

- the availability of ideas about technologies and resources of remote support of the educational process and the possibility of their inclusion in teaching activities.

At the level of special competencies:

- the ability to search, select and evaluate the quality of the CSR in chemistry in order to design a chemistry lesson using local (school) and Internet collections;

- the ability to effectively use ICT in organizing the study of the theoretical foundations of chemistry, including conducting virtual chemical experiments in the classroom;

- skills of preparation of didactic materials for chemistry lessons based on special programs;

- ability to use modern computer learning tools (interactive whiteboard, graphic tablet) both to intensify the learning process and to increase motivation to learn chemistry.

Thus, it should be noted that the methodology for the formation of the IR competence of a future chemistry teacher in the process of his chemical and methodological training is based on the sequential step-by-step formation of students' basic, subject-specific and subject-methodical competencies necessary for a future chemistry





teacher when using ICT tools in professional activities. The methods of teaching students used involve a combination of computer-based learning methods (virtual chemical experiment, computer modeling of chemical objects).

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