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ART STUDIES

PEDAGOGY AND PSYCHOLOGY

BASIC INFORMATION AND COMPUTER COMPETENCE REQUIRED FOR A MODERN ENERGY ENGINEER

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A characteristic feature of the modern information society is the widespread use of the powerful potential of information and communication technologies, the creation of a single world information space that provides wide access to information and the production of various information resources. Therefore, one of the priorities of the higher education system is the training of a competitive professional with a high level of competence in his field, an integral part of which is the ability to productively use information and communication technologies in professional activities.

In their works devoted to the formation of ICT competence [1–4], they considered it as a set of interrelated personality traits (knowledge, abilities, skills, methods of activity) necessary for the productive and independent use of ICT in professional activities. By ICT competence, we mean a person's possession of a certain set of ICT competencies, including his personal attitude to the subject of activity.

The formation of ICT competencies begins in a general education school and continues at a university in the process of studying information disciplines. In particular, a significant development of the ICT competence of graduates should be received in pedagogical universities. This is due to the fact that the specifics of the activities of future power engineers are associated with the processing of rapidly changing technical information, large arrays of energy data, with complex methods of intellectual activity, for example, with the construction of various models of energy facilities and structures, and with other operations, the existence which becomes impossible without the possession of ICT competencies.

When analyzing the work plans for the direction of training 015 Vocational education "Energy" (qualification (degree) "Bachelor"), we highlight the most significant general cultural and professional competencies, the formation of which requires possession of ICT competencies, for example:

– possession of the basic methods, methods and means of obtaining, storing, processing information, skills in working with a computer as a means of managing information, the ability to work with information in global computer networks;

– the ability to choose tools for processing energy data in accordance with the task, analyze the results of calculations and substantiate the conclusions drawn;

– the ability, using domestic and foreign sources of information, to collect the necessary data, analyze them and prepare an information review or analytical report;

– the ability to use modern technical means and information technologies to solve analytical and research problems;

– the ability to use modern technical means and information technologies to solve communication problems.

In addition to the main identified competencies, the role of the student's ICT competence in the formation of other general cultural and professional competencies is significant, for example, understanding the essence and significance of information in the development of the modern information society and the future profession; the ability to find organizational and managerial decisions and be responsible for them; ability for self-development, improvement of one's qualifications and skills; the ability to search, analyze and process data necessary to perform calculations of economic and socio-economic indicators that characterize the activities of economic entities and present the results of work in the prescribed form; skills based on the description of technological processes and phenomena to build standard theoretical and energy models, analyze and meaningfully interpret the results, etc.

The study of the characteristics of the professional activity of bachelors from work programs in the field of study 015 "Energy" and the corresponding competencies made it possible to conduct an operational analysis of the professional tasks of the power industry, solved with the help of ICT, and highlight basic information and computer skills that need to be formed when teaching computer science, and on their basis to determine the main ICT competencies that are necessary for the formation of professional and general cultural competencies of energy bachelors:

1. Knowledge of the current state and prospects for the development of ICT in professional activities, classes of professional tasks solved using ICT.
2. Possession of means of searching and selecting professionally significant information, search and reference systems on the Internet.
3. Possession of system and service software for organizing work and ensuring security in a computer and network environment.
4. Possession of universal and professionally oriented ICT tools for building models, analyzing data, performing calculations, processing data arrays, analyzing calculation results, reporting and decision support.
5. Possession of means of communication, network communication, teamwork in the network.
6. Possession of ICT tools for organizing the learning process and self-learning. Ability to independently learn new software.

In addition to the identified basic information and computer skills and abilities, when teaching computer science to students, it is necessary to pay attention to the development of personality traits necessary for the formation of ICT competence of graduates: a high level of motivation, self-organization, self-control, the desire for self-development and self-education, the ability to adequately assess the results of one’s work, well-formedness professional type of thinking, cognitive and communication skills, as well as the skills of mastering and using software security, etc.

Undoubtedly, all disciplines of the information and professional cycle should contribute to the formation of ICT competencies of graduates, however, the foundations for its formation should be laid in the process of teaching computer science to first-year students, when students should be prepared to use ICT in the process of mastering future professional activities.

In its meaning, the formation of competencies, in particular ICT competencies, is possible only in the conditions of the implementation of activities that are close to real. However, the organization of real information activity in the conditions of the existing lecture and seminar training system is very difficult. A possible way to solve this problem is to use information and communication technologies in the learning process as a tool for the formation of ICT competencies, which will allow modeling real information activities, in particular, the activities of a power engineer.

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