



Methodological System For Using Digital Technologies In Training Future Engineers

Uktamov Davronjon

Independent researcher at Jizzakh Polytechnic Institute

uktamovdavronjonjiz@gmail.com

Phone: +998 88 074 50 54

ABSTRACT

This article discusses the state of use of renewable energy sources in the Republic of Uzbekistan, current issues in ensuring sustainable development in the energy sector, and the problems of improving the system of personnel training in engineering. The authors analyze the didactic conditions for the use of digital technologies in the process of energy education and justify the need to strengthen the integration of education and production.

Keywords:

Digital technologies, engineering education, renewable energy, energy efficiency, innovative education, didactic conditions, information and communication technologies.

Today's information age, it is impossible to imagine our daily lives in education, arts, social and humanitarian fields, engineering and manufacturing without digital technologies. Also as in other areas, the introduction of digital technologies in the education system is fundamentally changing the functioning of the entire system. This is not only related to the relationship between students and teachers, but also the processes from the time applicants submit documents for study at a higher educational institution, to the time they form a full-fledged contract, receive a certificate of study, monitor the entire educational process, and even receive a diploma of graduation from a higher educational institution, are completely digitalized. Also today almost all higher educational institutions in our country are connected to a single electronic platform, a single digital system HEMIS. As a result, the formation of a lesson schedule for organizing classes in the higher education system has reduced the work of deputy deans for academic affairs by 4-5 times. Department heads enter the curriculum through the head's profile and assign the relevant subjects to the professor-

teacher of the department. Then, the professor-teacher of the department enters the subject concerned, forms a calendar plan and allocates resources to each subject, and takes theoretical, seminar, practical or experimental classes based on the schedule drawn up by the deputy dean, and the lessons and attendance taken based on the schedule are reviewed, and if necessary, control work is taken and assigned to the personal profile, and at the end of the course, the student's grades or points are formed. The student can monitor this situation from his profile. As a result, transparency is ensured in the relationship between the instructor and the student.

Today, one of the most promising areas for the targeted formation of an innovative human resource base in any country is the education system. The implementation of the digital transformation process poses new challenges for the education system that can only be solved with a comprehensive approach to digital transformation. Achieving this goal is especially important in connection with the widespread use of cloud computing, high-speed Internet, smart digital devices, the use of artificial

intelligence methods, and the widespread introduction of virtual technologies [1]. Digital transformation in the educational process is determined by the global processes of transition to a digital economy and a digital society. Education largely determines how these challenges will develop. Digital transformation of education has been developed by a number of authors. The term “digitalization” arose in connection with the strengthening of information and communication technologies. It is considered to be the translation of information into numbers and, at the same time, the infrastructural, managerial, behavioral and cultural components of education. Main components of the educational environment are undoubtedly of great importance today in the process of forming a digital information educational environment and integrating it into the general education system, in the development of an electronic education system [2].

The person-centered learning environment, the formation of skills in the use of digital information technologies is considered an important factor. This is based on the identification of his personal abilities as a subject of knowledge and activity, which, in turn, is based on the recognition of the constancy or stability of each person's choice of his own development path through the study of alternative forms of abilities. Proceeding from this educational theory, it is emphasized that the role of differentiation and individualization of education is growing, while explaining this role differently than previously accepted, taking into account the specifics of modern society [3]. A.Yu. Okladnikov notes in his research that the content of the digital transformation of education should be combined with a synergistic update, which will lead to a radical improvement in the quality of education - it is impossible not to agree with his opinion, because if the education system meets the requirements and opportunities of a digital society, then the digital transformation of education will lead society to a digital economy. As a result of our research, an electronic textbook is a comprehensive educational

software system that ensures the continuity and completeness of the didactic cycle of the educational process, presents theoretical material, provides service functions in the context of exercise activity, mathematical and simulation modeling through computer visualization, and interactive feedback [4].

Our study, we used the schematic model of an electronic textbook based on digital technologies proposed by NA Muslimov (Figure 1).

“According to NA Muslimov, an electronic textbook and each of its sections must have an introductory section before the main material is presented. It must fully reflect the general structure of the subject, its parts and the relationship between them.” An electronic textbook serves as the basis for E-learning. Because an electronic textbook is considered a component of E-learning. The technology of designing and implementing E-learning is considered in detail in the third chapter of the research work.

Each of these classifications solves separate problems, but none of them can completely cover knowledge, skills and personal qualities. The basis of the second level of classification is considered to be the inclusion of the first level, that is, the system of knowledge. Because knowledge and skills, which have independent significance, are inextricably linked. In other words, knowledge cannot exist outside of skills, and skills cannot be mastered or applied without relying on knowledge.

It is possible to create a classification of issues that provide the interrelationship of knowledge related to digital technologies, the skills to apply them in professional activities, and the personal qualities appropriate to this activity. The current digitalized educational environment, the main goal is to organize the knowledge, skills, and competencies that learners need to acquire, as well as their effective use to achieve the desired results. Implementation of this goal, the organizers of the educational process are required to have deep knowledge, high moral competence, as well as the ability to analyze and use digital technologies.

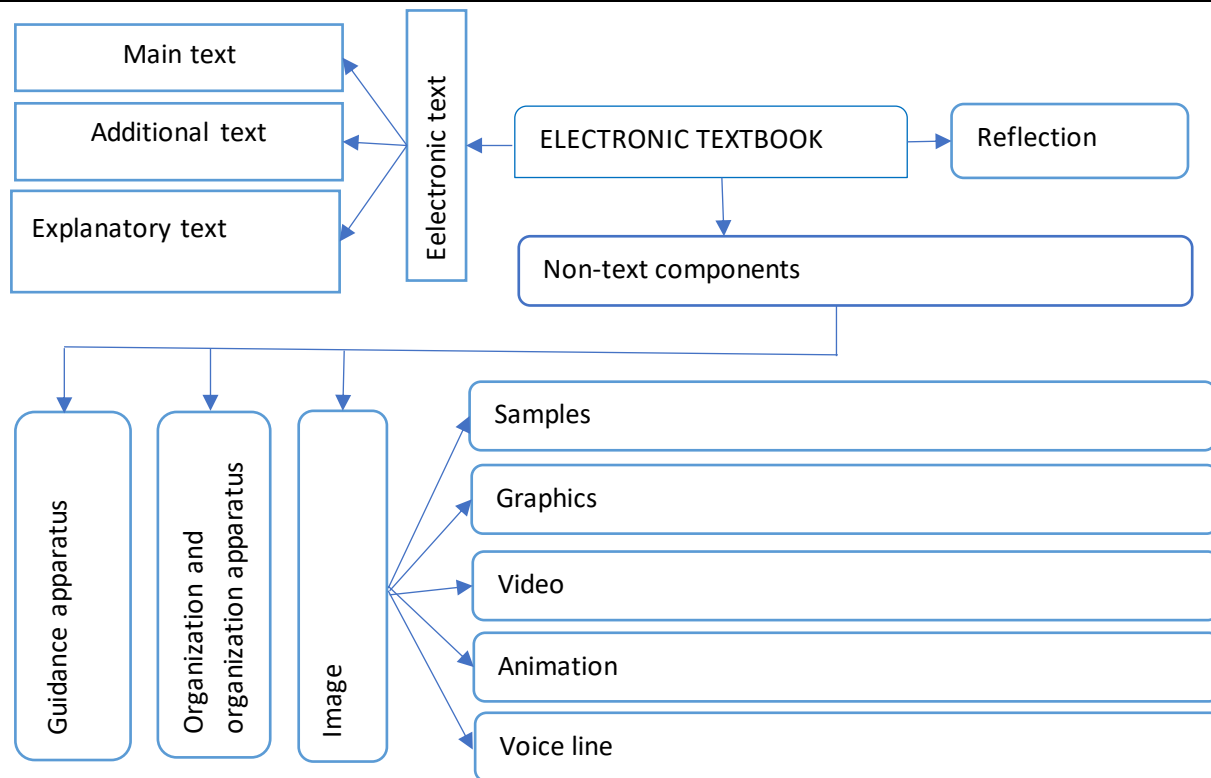


Figure 1. Schematic model of an electronic textbook

The following models of describing didactic tools in a simple, concise, convenient and, most importantly, object-oriented form are of particular importance in the qualitative delivery of new information planned for students to learn. The organizational structural model is presented in Figure 2.

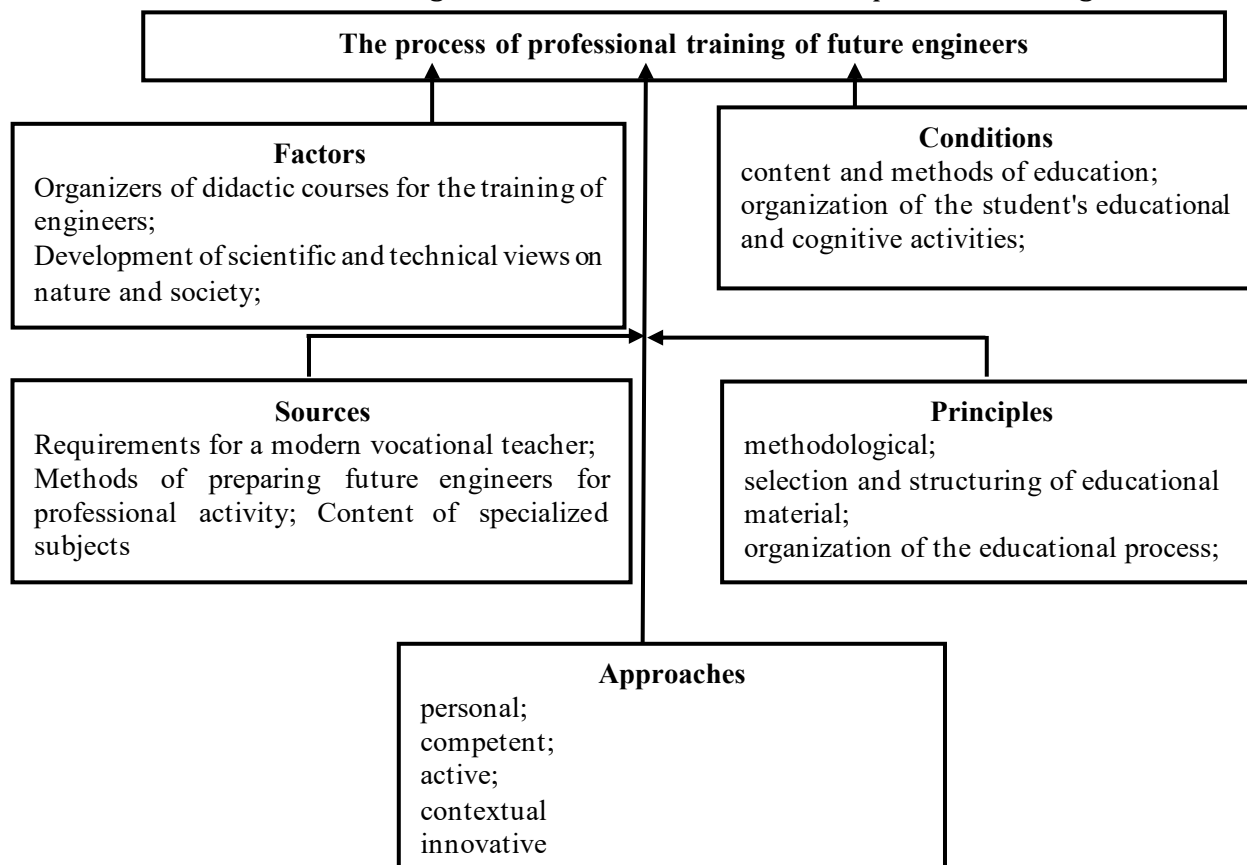


Figure 2. Fundamentals of developing professional competence of future engineers

The fact that higher educational institutions find the necessary organizations for the personnel they train and work closely with them indicates a high demand for graduates. Thus, the level of knowledge of future specialists in the field of electrical engineering, electrical mechanics and electrical technologies (electrical engineering), their competitiveness in the labor market are the products of a quality educational process. In this regard, in order to ensure the growth of the quality of education, it is important to control, manage and gradually eliminate its shortcomings. Testing the experiences of foreign countries in certain higher educational institutions of the republic, and in case of positive results, their widespread implementation and popularization in practice are reflected in the training of competitive highly qualified personnel by increasing the quality of education [5].

In a number of resolutions and decrees of the President of the Republic of Uzbekistan Shavkat Mirziyoyev, special importance is attached to the organization of the educational process at a high level based on improving the relevant basic training, pedagogical and practical work experience of students and professors of higher educational institutions, the use of modern advanced pedagogical, information and communication technologies, including the Internet educational process, in the implementation of lessons, the training of highly qualified specialists with experience, etc [6]. Of course, in this, first of all, the preparation of future specialists in the field of electrical engineering, electrical mechanics and electrical technologies (electrical engineering) studying in higher educational institutions for professional activity, which will be effective in the widespread use and provision of services of energy-saving technologies as a priority area in the socio-economic development of society. In this regard, in order to raise the quality of education in higher educational institutions to a higher level, it is necessary to activate the process of teaching specialized subjects in the energy sector, such as reforming education in developed foreign countries, studying the activities of leading scientists and specialists in the energy sector, analyzing the work of leading

scientists and specialists in the energy sector, and popularizing advanced positive experiences. Because the features of teaching specialized subjects are that, based on a systematic approach, it designs an educational process that describes the activities of preparing specialists for the profession of Electrical Engineering, Electrical Mechanics and Electrical Technologies (Electrical Engineering) in order to achieve the intended goals. It forms skills and qualifications for their implementation in practice.

References

1. Uktamov D.O. Regulatory and legal framework for the use of digital technologies in the educational process. Collection of materials of the "International Scientific and Technical" conference on computer science and engineering technologies No. 2 October 13, 2023, 339-342.
2. Uktamov D.O. The role and importance of digital technologies in preparing future engineers for professional activity . Scientific Methodological Journal 2024 No. 2/2 131-136.
3. Uktamov D.O. Methodological system for using digital technologies in training future engineers. Professional education in Uzbekistan 2024 No. 1, 52-58.
4. Akhmedov J.R, Nurov U.X, Uktamov D.O. Technological map of the methodology for preparing engineering and pedagogues for innovative activities in an informational educational environment . International scientific and practical online conference "Computer linguistics: problems and solutions" . - Tashkent. 19.04.2021. Pages 29-36.
5. Uktamov D.O. Digital educational technologies as a means of preparing future engineers for professional activity. Innovative technologies in the environment of digitalization of higher education: Problems and solutions International scientific and practical conference March 14-15, 2024 105-109 .
6. Hamidov J.A, Murodova A.Y. (2023) Technology for development of

professional and technical component of future engineers through virtual educational technology Atamuratov RK The educational advantages of virtual reality technologies. The Competing Science and Technology International Journal, 4 May 2023, pp. 87-90.