

## IMPROVING THE SOFTWARE AND METHODOLOGICAL SUPPORT OF PREPARING FUTURE ENERGY ENGINEERS FOR PROFESSIONAL ACTIVITY

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### ABSTRACT

In this article, the problem of improving the software-methodological support of preparing future power engineers for professional activities based on digital technologies is solved. This article can be used by those who deal with the problem of digitalization of training future specialists for professional activities.

### KEYWORDS

Power engineers; future; software-methodical; supply; didactic; generalization; adaptation; introduction; results; data; modern computer; teacher; student; monitoring; criterion; summary; recommendation; control algorithm; strategy; purpose; task; professional; knowledge.

### INTRODUCTION

Nowadays, information technology has become a useful tool for any professional or any researcher or representative of a voluntary field, and their possibilities in this regard are very wide. That is, with

the help of information and communication technologies, it is possible to collect, systematize and present information in a large volume and wide range of data, as well as operationalize (quickly solve) their



transfer to the necessary sources (places). Such opportunities can be a reliable fundamental didactic basis for the development of any system or process transition and optimal options for solving problems related to them. When solving the problem of the research work under consideration, it is necessary to process the data collected from the research object and make them into information form, and make scientific developments related to the solution of the research. It can be seen from the methodology of developing the software-methodical support for training future power engineers on the basis of digital technologies that it consists of a creative process from researching a complex dynamic system with interrelated laws and organizational structure to its practical use.

The results of our research in this area showed that in solving the problem of improving the training of future power engineers for professional activity, first of all, attention should be paid to improving the software and methodological support of their professional activity training based on digital technologies, and through this, it is possible to train a modern, competitive, innovative and advanced mature staff [2-6].

Scientific-methodical justification of improvement of the software-methodological support of training future power engineers for professional activities based on digital technologies. It mainly provides information on scientific-methodical substantiation of the didactic, generalization, adaptation and implementation stages of improving the software-methodological support of preparing future energy engineers for professional activities based on digital technologies and establishing pedagogical activities on them. We will briefly touch on them below:

The didactic stage corresponds to the first year of training future power engineers for professional activity. At this stage, the didactic foundations of the software necessary to inform the preparation of future specialists for professional activities are prepared. They will consist of: a computer set; methodical recommendations on algorithmic languages and their programming; standard programs; application package; pedagogical software tools; digital learning technologies; set of interactive working programs; intelligent systems; intellectualized teaching systems; intellectualized technological maps; expert systems and so on. Using these, work on the organization of software-methodological support for the preparation of future energy engineers for professional activity is designed;

The generalization stage corresponds to the second year of professional training of future power engineers. At this stage, the development of pedagogical software tools and intellectualized teaching systems and their generalization depending on the setting of the research problem is carried out. Based on them, creative work on the organization of the innovative-integrative educational process, intended for use in improving the preparation of future energy engineers for professional activities, is also carried out. In this case, the main focus is on the developed interactive training complexes related to the improvement of the software-methodological support of the preparation of future power engineers for professional activity. The issue of putting generalized digital educational technologies into practice will be addressed;

Adaptation stage corresponds to the third course of professional training of future power engineers. At this stage, fully generalized digital educational technologies will be used in the training of general professional and specialty (specialty) subjects in the



preparation of future power engineers for professional activity. The monitoring of the results achieved on them is determined, and based on them, the ones suitable for the improvement of the software-methodological support for the preparation of future power engineers for professional activity are selected. The practical value of the selected digital educational technologies is studied, and if there are some deviations in the research strategy, they are adapted taking into account the objectives of the problem;

The induction stage corresponds to the fourth year of professional training of future power engineers. In the pedagogical activity at this stage, more attention is paid to the software-methodical support intended for mass use, and the information technology of improving the software-methodical support for preparing the future energy engineers for professional activity is fully operational. Through the control algorithm in this technology, an intelligent interface between the teacher and the learner is established, and they form a unique active learning technology. Also, in this technology, scientific-practical developments and intellectualized training systems developed on the basis of them will be placed in modern computer memory to improve the preparation of future energy engineers for professional activities.

At the same time, the prepared digital educational technology will include scientific-practical developments obtained on the basis of innovative-integrative education and algorithmic systems for their implementation. The functional tasks of these digital educational technologies include determining and evaluating the professional readiness of future power engineers. It is necessary to check the achievement of the goal of improving the software-methodological support for the preparation of future power engineers for professional activity and the formation of professional knowledge of the future power engineer, and conclusions and recommendations will be prepared based on them. Therefore, the dynamic system of improving the software-methodological support of training future energy engineers for professional activities based on digital technologies and the interactive training complexes and intellectualized training systems corresponding to it can be the fundamental didactic basis for the optimization of information processing in the preparation of future specialists for professional activities according to the planned option. Based on these, we found it appropriate to develop a computerized system for improving the software-methodological support of training future power engineers for professional activity (see Figure 1).

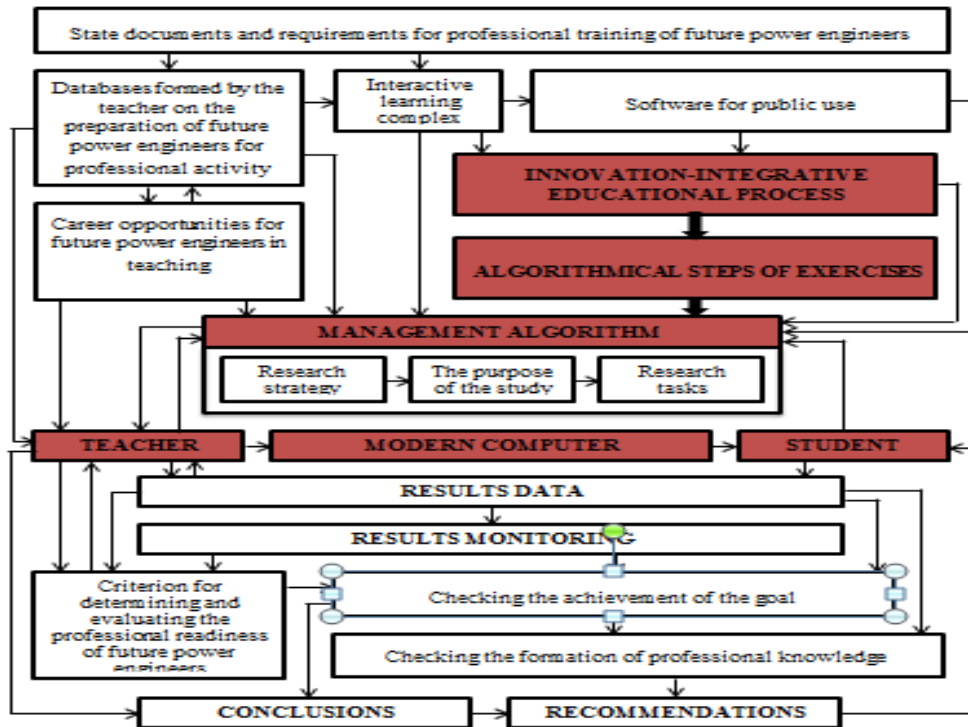


Figure 1. Digital technology of improving the software-methodological support of training future power engineers for professional activity.

As can be seen from the digital educational technology, i.e. the computer system for improving the software-methodological support of training future power engineers for professional activity, it is necessary to work with a large volume and wide-ranging data to solve the given problem. Based on them, databases are formed for use in problem solving, and they are presented in the form of information for consumer use. Of course, not every researcher or teacher will be able to fully remember the information related to conducting such voluminous research. The results of our research in this regard have shown that the development and introduction of information and

communication technologies to solving problems related to the improvement of professional training of future specialists can provide one of the optimal options for finding a solution to the problem under consideration. For this reason, we began to develop information and communication technology for improving the software-methodological support of training future power engineers for professional activity and called it "Multi-solution single system" digital educational technology. The reason why we call this digital education technology as such is that it is possible to obtain separate solutions for each stage of improving the software-methodological support of



future energy engineers for professional activity related to each stage of preparing future energy engineers for professional activity. At the same time, on the basis of interactive teaching complexes in this technology, information about the results of the working activities of innovative-integrative education and their monitoring is obtained regularly. The important point of this digital educational technology called "Multi-solution unified system" is that with this technology, it is possible to check the achievement of the goal of conducting research and the formation of professional knowledge in future energy engineers for each stage (they are four). Therefore, it is better to use the research method called "Systematic approach" when working with these digital educational technologies. In this, the digital educational technology of improving the software-methodological support of training future energy engineers for professional activities is considered as a whole dynamic system, and related subsystems and system elements are taken as a basis, as well as the relationships between them are researched. Based on them, an intellectual interface between the teacher and the learner will be established, and they will be used to improve the professional training of future power engineers.

As can be seen from the above, this "Uniform Multi-Solution System" provides ample opportunities to obtain one of the optimal options for solving the problem of improving the professional training of future power engineers.

It is clear from the above that this mentioned digital technology and its use in practice requires an integrated approach. Therefore, when using the digital technologies in question, the teacher (researcher) is required to be able to perform mental and logical operations, starting from preparing the organizational structure of the planned subject (subject), determining

the learning results and finding the optimal option for the evaluation process.

## CONCLUSION

In conclusion of this part of our study, it can be noted that the developed digital technology (see Figure 1), firstly, can be downloaded by future power engineers to their media and can be used to conduct professional training at home, secondly, with its help, the educational content can be updated at any time in the desired direction, thirdly, with the help of this technology, it is possible to work with a large amount and extensive information at the same time, fourthly, the criterion for determining and evaluating the results of the studied subject can be used to check whether all subjects in the study of a specific subject have been mastered, fifth, this digital technology of studying the subject has a universal and methodological character, and by making some adjustments, it can be used to solve the problem of improving the preparation of future specialists for professional activities, and so on.

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