

FEATURES OF PEDAGOGICAL TECHNOLOGY IN TEACHING THE FUNDAMENTALS OF OIL AND GAS TECHNOLOGY

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Аннотация

Данная статья описывает анализ педагогических технологий обучения студентов технических вузов. Эффективность приведенных технологий увеличивается с помощью метода имитации. Также показана оптимальность внедрения педагогических методов и комплекса в учебный процесс нефтегазового технического вуза.

Abstract

This article describes the analysis of pedagogical technologies for teaching students of technical universities. The effectiveness of the above technologies is increased using the simulation method. The importance of introducing pedagogical methods and complexes into the educational process of an oil and gas technical university is also shown.

Annotatsiya

Ushbu maqolada texnika oliy o'quv yurtlari talabalarini o'qitishning pedagogik texnologiyalari tahlili yoritilgan. Yuqoridagi texnologiyalarning samaradorligi imitatsiya usuli yordamida oshiriladi. Neft va gaz texnika universitetining o'quv jarayoniga pedagogik usullar va komplekslarni joriy etishning maqbulligi ham ko'rsatilgan.

Ключевые слова: технология обучения, педагогическая технология, процесс, метод, объект, модель, моделирование, AnyLogic.

Key words: teaching technology, pedagogical technology, process, method, object, model, modeling, AnyLogic.

Kalit so'zlar: o'qitish texnologiyasi, pedagogik texnologiya, jarayon, usul, ob'ekt, model, modellashtirish, AnyLogic.

Modernization in the field of higher education is determined by the introduction of innovations and significant reforms in the well-known traditional forms and methods of teaching. The introduction of new innovative technologies must comply with standard methodological requirements. A characteristic feature of the process of introducing the latest advanced technologies is the constant technological intensification of methods for presenting pedagogical and educational materials, which requires improvement of teaching methods and teacher competence.

The intensive development of scientific and technological reforms in various fields of theory and practice, as well as the desire of teachers to achieve maximum results in their professional work, led to the introduction of the term "teaching technology" into pedagogical practice. The concept of "learning technology" was first introduced at a UNESCO conference back in 1970[1]. Today it is difficult to imagine this term as a link in traditional pedagogy. In UNESCO documents, this concept was first defined as a key factor in optimizing educational activities. Educational technology is analyzed as an integrated approach to the formation, use and

management of the entire process of learning and knowledge acquisition, taking into account mechanical means and human resources, aimed at improving the educational process.

From the above definition, it follows that:

- firstly, educational technology is a set of methods and tools for preparing, amending, transforming and presenting educational materials;
- Secondly, educational technology is a scientific field that studies methods of interaction between teachers and students in the educational process using relevant knowledge systems;
- thirdly, training technology can be understood as a set of methods and processes performed sequentially to achieve a product with certain characteristics [2].

Educational technology, as one of the most important elements of educational technology, is a system of pedagogical methods that controls the educational process, which includes two important aspects: the formation of student activity and monitoring of actions. Thus, pedagogical technology describes the real process of education.

It is important to note that teaching technology can be considered as sequentially performed pedagogical methods, actions and approaches, which together form a single didactic system. Its implementation in teaching activities allows students to achieve certain goals and contributes to the full development of staff.

As confirmed by M. V. Klarin, the concept of “pedagogical technology” is a complex organization and structure of the use of all personal, technical and systematic means aimed at implementing pedagogical tasks[3].

F. Coombs defined educational technologies as “a variety of methods, materials, equipment and support systems - in other words, all elements participating in the educational process and contributing to the functioning of the educational system” [4].

In pedagogical activity, it is necessary to focus modern teaching methods on the formation of a unique personality capable of effective qualification orientation. The implementation of this goal is possible by applying a competency-based approach to education in the educational process, which fully contributes to solving the problems of an individual’s qualification growth, his professional self-actualization and career development.

In modern pedagogy, modeling, in other words, design, is considered one of the most important methods of research activity. The model forms the basis of this process, thanks to which it is possible to obtain an illustrative overview of objects and processes that are incomprehensible to direct interpretation.

Modeling has been one of the most relevant research methods for decades and is widely used in educational research. The use of modeling methods makes it possible to combine empirical and theoretical approaches in research, as well as to combine experimental data, logical constructs and scientific abstractions in the process of studying pedagogical objects. In lesson planning, teachers often encounter the concept of pedagogical modeling.

In this study, we propose a three-level simulation for petroleum engineer training:

1. Conceptual level.

At this level, a multidisciplinary approach is required, including the use of methods, empirical data, theories and practices from various scientific fields. Undoubtedly, in-depth study of a subject from different scientific perspectives contributes to obtaining complex perceptions and fundamental knowledge about it.

2. Technological level.

At the technological design level, action procedures, guidelines for functional responsibilities, a training program, technologies and methods are developed.

3. Procedural level.

The procedural level translates educational activities into practical actions, while creating an end result that is ready for practical use. For example, presentations, educational materials, methodological recommendations for classes or extracurricular activities, preparation of educational programs, etc.

The level in this case means the degree of generalization of the methods and results of the project used within the framework of the teacher's activities. In accordance with the requirements for the final result and the form of its presentation, pedagogical design is carried out at various levels: conceptual, content, technological and procedural.

Modeling methods play a significantly important role in "innovative" pedagogy, which is confirmed not only by research by theoretical teachers, but also by practical teachers. In modern pedagogy, it is necessary to model educational processes, educational activities and their functioning. Research models are designed as tools for teaching specific subject areas.

From the point of view of educational goals in pedagogy, there are the following types of models:

- Educational models, including visual materials, various lesson plans and exercises;
- Scientific and technical models are necessary to study processes and phenomena.
- Experimental models are scaled or compact copies of the designed object. This type of model is known as full-scale, used to study an object and predict its future parameters.
- Game models include various types of games, such as economic, sports or business, which recreate the behavior of an object in various situations.
- Simulation models are used to simulate objects or processes with a certain accuracy. The study can be carried out many times to study and evaluate the consequences of certain actions in the current situation, or it can be carried out once with several similar objects, but under different criteria[5].

Modeling is a research method, an integral part of the cognition process. The creation of a methodology for simulation modeling of a university pedagogical system using the latest technologies will allow us to establish a scientifically based platform for comprehensive research in technical disciplines. This methodology, of course, helps improve the quality of training of specialists in the oil and gas industry.

In our case, the term "simulation modeling" has a broader meaning, not limiting it to technical products based on virtual reality. In our opinion, simulation modeling is immersion in a situation as close as possible to a professional environment in order to analyze a situation unfolding over time or solve a real professional problem. Thus, the simulation method is integrated into all the main didactic concepts, such as the competency-based approach, practice-oriented learning, contextual approach to learning, interactive learning and case method. To create an accurate computer model, we will use the AnyLogic program, which does not require any costs and is available to all users.

Anylogic is an excellent example of a unique simulation modeling tool - a software product that allows you to develop models based on all currently known approaches, including process (discrete-event), system dynamic and agent-based modeling.

In addition to the ability to create models of varying complexity and level of abstraction, Anylogic has extensive animation capabilities that do not require programming knowledge. This allows users to build visual models to analyze various processes and objects. In this case, the method of teaching the basics of oil and gas technology is enhanced by using 2D and 3D models, as well as built-in graphs created in the above-mentioned program.



In this teaching method, as in the traditional one, educational materials are, firstly, presented in the form of educational texts, educational video and audio materials, which provide a theoretical basis for assimilation. Secondly, the theoretical knowledge base is implemented using new forms and methods of simulation modeling the subject, technical and social content of future professional activities. Thus, there is a transition from the student's basic knowledge to more realistic models that reproduce fragments of real professional situations and activities.

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