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TRADITIONS AND INNOVATIONS IN THE TRAINING OF ENGINEERING STAFF

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Abstract
The article is devoted to the problem of combining traditional and modern innovative pedagogical technologies (on the example of the training of geological engineers at the North-Eastern State University). It is shown that the success of the educational process depends on the correct combination of modern and traditional teaching methods.
Keywords: traditional teaching methods, innovative teaching methods, student-centered teaching, project method.

The combination of traditions and innovations in modern higher education is an important methodological and pedagogical problem. Russian engineering higher education has always been based on the principle of deep fundamental training and education based on science. However, at present, a university graduate should not only have a wide range of knowledge, but also have such personal qualities, as a desire for continuous development and self-improvement, the ability to work in a team, be a leader, be able to make informed decisions and be responsible for them.

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With the change in requirements for a university graduate, approaches to the organization of the educational process also change, new educational technologies are introduced. One of the most difficult and controversial issues in scientific publications is the issue of effective compatibility innovations and traditions in education. The educational result of both a separate academic discipline and the training of a future engineer as a whole depends on the right combination of traditional and innovative teaching methods.

The article summarizes the experience of using traditional and modern educational technologies in the training of mining geologists at the Polytechnic Institute of the North-Eastern State University (Magadan).

How known goal traditional methods learning is bulkmessage new knowledge and reporting the current information students on specific topic. The basic principle of traditional teaching methods are informational and explanatory activities of the teacher (transmission of knowledge) and reproductive (listen, remember and reproduce) - students.

The purpose of modern teaching methods is to encourage the student to actively participate in the learning process, to aspiration constantly update their knowledge, work with a lot of new information be able to solve non-standard, multidisciplinary problems.

In the preparation of geological engineers, there are a number of disciplines for which both lectures and practical classes are possible, mainly using traditional teaching methods (knowledge transfer).

First, there are disciplines. basic, " general special " training of future geologists (for example, "Crystallography and mineralogy", "Fundamentals of paleontology and general stratigraphy"). In the course of studying these disciplines, the professional foundations and practical skills of the future specialty are laid. The predominance of traditional teaching methods is explained by the following features of these disciplines:

- These disciplines lay fundamental professional knowledge and terminology base, which are subsequently used by students in the study of professional disciplines;
- They require work with a huge amount of factual material that must be constantly learned and memorized;

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- For these disciplines, it is obligatory to link lecture theoretical knowledge with the practical part, and this implies a large amount of practical classroom work (for example, with a collection of minerals and rocks, a collection of fossils, etc.), which has a weak alternative to traditional teaching methods with "transmission and transfer of knowledge" to students.

Secondly, these are disciplines that are oriented on the the study concrete methods, suggesting calculation big quantities most various indicators (for example, "Economics and organization of exploration work"). This type of discipline is focused on the use of economic, mathematical and statistical methods in calculations. This involves the gradual formation of practical experience in determining economic indicators in order to draw up estimates, projects, plans and other documentation that characterizes the activities of economic entities in geology.

Modern (active) teaching methods, to a greater extent, are used in the study of professional disciplines and in the organization of independent work of students. An example innovative learning is usage project method and case method. The project method is "a learning system in which students acquire knowledge and skills in the process of planning and performing gradually more complex practical tasks - projects" [3]. Case method - based on real facts (or close to reality) description of a problem situation related to a certain sector of the economy that needs to be addressed [9]. At the same time, the problem does not have an exact solution, and requires, under the prevailing conditions, to propose a certain course of action.

The main characteristics of the project method and the case method, which allow choosing these technologies for the training of engineers, are:

- Constant involvement of students in the educational process;
- Increasing motivation to master both fundamental and special disciplines;
- The need to work with a large amount of information in a limited time;
- Formation of the ability to analyze situations and independently make decisions in real life;
- Constant interaction of students with each other and teachers, as well as with production specialists in developing a solution to a case or working on a project.

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The project method is used in the formation of students' professional competencies. For example, as part of the study of the disciplines "Geology and exploration of placers" and "Ore deposits of the North-East of Russia" students are offered data obtained at the first stages of the implementation of specific projects for the search or exploration of mineral deposits of one of the real geological enterprises in the region. The task of the students is propose your own set of further actions, in terms of methodological and technological approaches. Project implementation time is 2-3 weeks. When carrying out such individual projects students, not only reinforce their knowledge gained in traditional lectures on discipline but also learn to apply them when working with real objects of mineral deposits.

The project method showed high efficiency when working in small groups of graduate students of the specialty "Applied Geology". Individual engineering projects, designed for the entire academic year, and related to the prospect's development and integrated development mineral resource bases Magadan areas, united all the academic disciplines of the graduate course into a single whole. The product result of the project is the preparation and defense of an analytical note characterizing the prospects of the object and containing the program his geological study.

The implementation of the project required the integration of all academic disciplines of the graduate course. To achieve the maximum educational result, within the framework of reducing the classroom load and the strict time frame of the project, teachers had to optimize the entire educational process, using both traditional and innovative teaching methods. Specific tasks assigned to graduates were gradually solved in the course of studying academic disciplines in accordance with the schedule of work on the project. For example, the analysis of the regional geological position of the object was carried out in the course of studying the disciplines "Regional Geology" and "Geotectonics and Geodynamics", the analysis of the quality of previously conducted geological exploration work - as the discipline was studied " Exploration and geological and economic evaluation of minerals", etc.

Case technologies at North-Eastern State University have been successfully implemented in the preparation of students of mining and geological specialties since 2014 as part of the International Engineering Championship "Case - in ".

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The championship consists of qualifying university stages, during which student teams solve an engineering case dedicated to real production problems and developed based on materials from industry enterprises. Semi-finals of the Championship are held in 8 Federal Districts of Russia, final in Moscow.

The decision of the participants is evaluated by an expert commission, consisting of leading employees of the largest mining and geological enterprises in the region, scientific and educational organizations. According to the members of the expert commission, the teams demonstrate completely different approaches to solving the case, applying in practice the theoretical knowledge gained during the study of disciplines.

From the above, we can conclude that innovative practice-oriented methods Education is playing an increasingly important role in the training of geotechnical engineers. However, the result of the educational process depends on the right combination traditional and innovative methods. The advantages of traditional teaching methods are their consistency, the fundamental nature of knowledge. Modern innovative pedagogical technologies make it possible to move from passive assimilation of knowledge by students to their active application in real situations of professional activity, which, of course, increases the quality of training of future specialists and stimulates the development of such personal qualities as independence, cognitive activity, the ability to work in a team, the ability to be responsible for decisions made, etc.

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