

HIGHER EDUCATION IN TECHNICAL UNIVERSITIES OF RUSSIA

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Abstract

The article discusses the teaching algorithms of natural disciplines in technical universities of Russia. It is shown that the main goal of teachers of natural sciences is the formation of students' professional thinking (analytical, practical, creative, spatial, etc.) and the ability to integrate knowledge at various functional levels. Particular attention is paid to training programs that are aimed at forming the required competencies of future bachelors and masters of engineering.

However, in modern pedagogical science, the potential of natural disciplines in the formation of professional competencies among students of technical universities is not sufficiently defined. This article can fill this gap to some extent.

Keywords: education, upbringing, state, science, university.

I. INTRODUCTION

Traditionally, in higher education institutions, the study of natural disciplines is carried out without due support for fundamental sciences and in insignificant connection with production enterprises (in the form of episodic excursions, practices that are often formal in nature). Therefore, having come to production, the young specialist is not able to put into practice the knowledge gained at the university. Attempts by individual teachers and pedagogical teams of departments, faculties (and sometimes universities) to solve the problems of optimizing the teaching of professional disciplines in order to form key competencies of an engineer do not give sustainable results. Successful experience does not become mass practice, as To technologize this activity, it is necessary to standardize it, which is achieved using a system of principles that are not substantiated in the didactics of higher professional education.

The modern system of general and vocational education, as well as industrial production, seeks to technologize the training of engineering personnel, to the planned result at the optimal cost of effort, money and time. It is innovative systems, models and technologies of engineer training aimed at the formation and development of the necessary competencies in him that may prove to be ineffective if the necessary conditions for optimizing the engineer's training in natural disciplines in the system of his multilevel education. This is a special area of modern research in the theory and methodology of higher professional education.

II. METHODOLOGY

The methodology of finding ways to optimize modern engineering education is based on the provisions of a holistic, competent and personal-activity approaches, which should be considered through the prism of the humanitarian paradigm of engineering education, which allows us to develop a competency model for a graduate of an engineering university to train an engineer at each educational level.

The criterion for optimizing the training of professional disciplines in engineering universities should be to increase the effectiveness of preparing students for the acquisition and development of relevant professional competencies, taking into account not only the requirements of modern educational standards, but also the order of professional qualifications, the possibility of creating a comfortable educational environment for the formation and development of necessary competencies among students.

III. DISCUSSION

It can be argued that certain theoretical prerequisites for solving the problem of optimizing the teaching of natural disciplines in a multilevel training system have developed in science.

This group of studies includes the work on the humanization of vocational education (T.V. Andryushina, O.B. Bolbat, N.M. Borytko, V.I. Danilchuk, V.P. Zinchenko, V.P. Lezhnikov, E. B. Morgunov, PM Petruneva, G.I. Sorokin, V.I. Simonov, S.D. Smirnov, I.A. Solovtsova, etc.), a competency-based approach to education in general and to training engineering personnel in particular (Yu. M. Avramov, F. Baron, BC Bezrukova, V.A. Bolotov, Yu.V. Vardanyan, AB Vishnyakova, N.M. Grishanov, V. Grishing, D. Ziegler, E.Ya. Kogan, V.A. Prikhodko, Z.A. Sazonova, N.V. Tarasova, Yu.G. Tatur, AB Khutorsko g), a holistic approach in pedagogical research (N.M. Borytko, A.K. Gurakov, J. Delor, B.C. Ilyin, A.B. Lazichev, V.V. Mironov, N.K. Sergeev, D. Khaimes).

In our study, we relied on the methodological ideas of IB Fedorova, N.I. Bulaeva, T.V. Andryushina, O.B. Bolbat, A.B. Chashchova and other authors, consistent with the trends in the humanization of teaching various professional disciplines (N.M. Borytko, A.B. Molozhavenko, P.M. Petruneva, I.A. Solovtsova, etc.). In the works on methods and forms of training in professional disciplines (O.B. Bolbat, V.P. Zinchenko, G.I. Sorokin) it was shown that the modern training system in engineering universities requires fundamental improvement, and also needs to develop optimal technologies and forms of training personnel.

IV. RESULTS

The study convincingly showed that the training of modern engineers of different levels and areas is associated not only with the achievements of students in mastering the profession in accordance with the requirements of state educational standards, but also with the individual / special requirements of various industries and vehicles. The idea of optimizing training in professional / general professional disciplines, based on the specifics of training in modern engineering and technical universities and the relationship with the real sectors of the relevant industries and transport, is based on the idea of such a combination, which is justified in our study.

The aim of the study was to specify the research methodology for optimizing vocational training in a multi-level education system. At the same time, the optimization of training in professional disciplines was considered as a unit of didactics of a higher engineering school, taking into account the details of various levels of professional disciplines and the methods of their teaching.

An analysis of the existing pedagogical literature on this issue led to the conclusion that the optimization of education is a category of didactics, showing the possibility of improving the quality of training of graduates of engineering universities by improving the content, forms, methods and conditions of training in the rational training of engineering personnel. In addition, during the study it was found that optimization allows you to implement the coordination functions of interactions of subjects interested in quality, dynamic transformations of the subjects themselves, through the unity of technological, dialogical and motivational structural components.

V. CONCLUSION

Thus, it was revealed that in the modern conditions of training engineering personnel, it is possible to optimize the process of training in professional disciplines using a competent approach, because in this case, it becomes possible to obtain the required holistic competence of the future engineer. In addition, the competency-based approach allows the formation of an educational process, including goal-setting, the selection of available resources, a way to monitor and control the effectiveness of the study of specific

disciplines.

Optimization of a person's professional activity in the system of managerial relations requires the identification of factors affecting the dynamics of the level of its claims within the framework of relevant social roles. Correction of internal factors is possible using various forms and methods of training, depending on the initial intellectual, social and age characteristics of students, as well as their real / virtual relationship with production. At the same time, the synthesized use of various teaching aids, taking into account the modern tasks of engineering education, causes corresponding difficulties for teachers who are used to working on one specific system / algorithm.

By optimizing the learning process in line with the competency-based approach, the leading subject, the teacher, must make a rational choice of training and educational tools to achieve the required (and sometimes provided) competencies by employers of a qualifying and professional-personal.

REFERENCE LIST

- Agafonova M.S. (2007) Economic relations of a firm with various entities. *Journal of Economic Theory*. Number 4.
- Agafonova M.S. (2008) Formation of a firm's external economic relations. *Bulletin of the Russian State Pedagogical University. A.I. Herzen. № 49*.
- Agafonova M.S. (2008) Formation of external economic relations of a company. *Bulletin of the Russian State Pedagogical University named after A.I. Herzen. №. 49*.
- Demyanov A.A. (2010) Justification of the appropriateness of multi-step exposure to destabilizing factors and risks. *National interests: priorities and security*. Number 10.
- Dengov, V.V. *Microeconomics in 2 vols. T. 1. (2018) Theory of consumer behavior. Theory of the company. Theory of markets: a textbook for undergraduate, speciality and master's degrees*. 410 p.
- Efimiev A.S., Lavrinenko Y.B. (2019) Global companies in the digital economy. *FES: Finance. Economy*. T. 16. No. 6. P. 39-42.
- Efimiev A.S., Provotorov I.A., Vorotyntseva A.V., Elshammari H.F.M. (2019) Systematization of barriers and limitations for innovation. *Financial economics*. №. 8. Pp. 353-355.
- Ershov B.A. (2010) The Russian Orthodox Church and secular power in the Voronezh province in the XIX - early XX centuries. *GOU VPO "Voronezh State Technical University". Voronezh*. 167 p.
- Ershov B.A. (2010) The system of spiritual education in Voronezh province in the 19th century. *Education and Society*. №. 5 (64). Pp. 105-108.
- Ershov B.A., Fursov V.N. (2018) The Russian Church in the State Mechanism of Russia. *Bulletin Social-Economic and Humanitarian Research*. № 1. Pp. 32-37.
- Ershov B.A., Perevozchikova L.S., Romanova E.V. (2019) Globalization and Intensification of Spiritual Values in Russia in the Philosophical Aspect. *6th International Conference on Education and Social Sciences Abstracts & Proceedings*. Pp. 208-212.
- Ershov B.A., Perevozchikova L.S., Romanova E.V., Ashmarov I.A. (2019) The Concept of Spirituality in Social Philosophy. *Smart Innovation, Systems and Technologies. T. 139*. Pp. 688-694.
- Gumba H.M., Efimiev A.S., Uvarova S.S., Vorotyntseva A.V. (2019) Methodological approach to the analysis of the factor space of the innovative development of construction enterprises by modeling ranking distribution. *Economics and Entrepreneurship*. No. 5 (106). Pp. 1225-1231.
- Okolelova E.Yu. (2006) Sustainability of economic processes and assessment of their predictability. *Bulletin of Tula State University. Series: Construction, architecture and restoration*. Pp. 146-151.
- Okolelova E.Yu., Ryabinina V.S. (2017) Planning and forecasting as part of an enterprise financial strategy. *Innovative economy: prospects for development and improvement*. №. 5 (23). Pp. 109-114.
- Romanova E.V., Perevozchikova L.S., Ershov B.A. (2017) The Lifestyle of the Human Being in the

Information Society. *3rd International Conference on Advances in Education and Social Sciences
Proceedings of ADVED* Pp. 950-954.

Tkachenko M.F. (2011) Global challenges for the global labor market. *World economy and international relations*. 2011. № 9.