

HIGHER EDUCATION INSTITUTIONS IN FUTURE ENGINEERS- MECHANICAL ANALYSIS OF THE STATUS AND PROBLEMS OF THE PREPARATION

*Siddiqov Bakhtiyor Makhammadjon ogli independent research is
Namangan state technical university*

Abstract: *This research analyzes the current state and challenges of training future mechanical engineers in higher education institutions and examines the demands of the modern labor market for engineering specialists. The study focuses on identifying key factors influencing the professional preparation of mechanical engineers in the context of technological modernization and industrial development. Special attention is given to the integration of education, science, and industry, as well as to the implementation of competency-based and practice-oriented approaches in engineering education. The paper also provides a comparative analysis of international experiences in mechanical engineering education, particularly in Germany, South Korea, and Turkey. These countries demonstrate effective models of engineering training based on dual education systems, industry–university cooperation, and cooperative education programs.*

Keywords: *mechanical engineering education, mechanical engineer training, labor market demand, higher education system, engineering competencies, industry–university cooperation, dual education system, practice-oriented education, engineering workforce development, comparative analysis.*

Today's day in the uzbekistan economy, industrial and agricultural sectors of the modernization to the process of engineering staff on the demand significantly in the level increases, in particular, the industry, mechanical engineering modern techniques and technologies introduction to, work production process automation , such as tasks, engineer-mechanical specialists activities with directly connected.

Uzbekistan Republic President in 2023-year 11-September “Uzbekistan – 2030” strategy on” UP–158-number in the order of the economy, industrial development, high - tech production, production expansion , and engineering personnel training quality to increase the priority of the tasks one as defined in [1]. This strategic document in industrial networks modernization to, innovative work to produce the current to and highly qualified engineering personnel for the need to meet state policy level is raised. Also, Uzbekistan Republic President 2024-year 25 -may “Higher education institutions admission parameters set and the state of order on the basis of personnel preparation

”on the decision in engineering, technology and technical directions on taken quotas gradually increasing the necessity noted was [2]. This condition labor market engineering professionals demand high that it shows. These tasks done increasing while modern technology with work who can engineers-mechanical personnel training require will. Labor market analysis that shows, the work directed engineer-mechanical from not only theoretical knowledge, but also following practical kompetensiyalarni also required are: – industrial equipment operation to; – technical diagnosis and repair; – work production process of the organization to; – automated management systems with work; – resource - saving technologies of the application.

In so doing, labour market engineers-mechanical for the demand of the economy sectors, modernization, use , production process, technical update and innovative technologies introduction of the process with directly related, that is determined. This condition higher education institutions, engineers-mechanical preparation , the process of labor market needs with to harmonize the need shows.

In recent years, higher education system, improving aimed at a number of new decisions are also taken were. In particular, 2024-year 16-October received has been the president's decree in professional education and higher education in the system of international educational programs of the introduction to, competitive personnel training and education with quality international standards on the basis of evaluation mechanisms for improving the task was set [7].

Also, 2024-year higher education institutions admission system improving and public order on the basis of personnel training mechanisms modernization to on also new is the decision to accept and, in which education quality and professionals in the preparation of the effectiveness of enhancing aimed at measures identified were [8].

This decree and decision analysis that shows, in the country in engineering education, especially in the agricultural sector engineers-mechanical personnel training system of the modernization to the great attention paid. This while higher education institutions in the educational content to modern requirements on the basis of again see the out, innovative pedagogical technologies of the introduction to the students of professional kompetensiyalarini development requires is.

Future engineers-mechanical training learn the importance of foreign improving the experience. Especially, Germany, South Korea and turkey are in the state of engineering education work production with an integral - integration on the basis of established was.

In germany, engineer personnel to prepare the main feature of the **dual education system** is. This system students education institution in theoretical knowledge to get with together work out in the enterprise practical training will pass. Germany

vocational education institute (IN) to the data according, dual education system students nearly 50 percent of enterprises with the collaboration of practical training will take [4]. Dual education model engineer-professional plays an important role in the formation of mechanical kompetensiyalarini because students participate in the real production process. South Korea engineering education , university and industry cooperation on the basis of established was. In korea follow who **LINC (the leader in industry-university Cooperation)** program, universities and industrial enterprises between cooperation and enhancing aimed at [5].

This system within the framework of: – the students of the industry in the enterprises of the practice was; the university of the laboratory work and the production of with integrasiyalashadi; – students startup and innovative projects involved is.

This model engineers innovation economy, the requirements of fit , without prepare to serve will.

Turkey's higher education system in engineering education work production with close cooperation on the basis of established was. Turkey's Higher education council (YÖK) to the data according, engineering in the faculty of students for the **COOP (Cooperative Education)** program to follow will [6].

This program: – students education for working out in shlydilar; – enterprises education program in the formation involved is; – final of the work, the real work out the problem on the basis is made.

Germany, shows that the analysis of the experience of korea and turkey, engineer-mechanical preparation of the following general principles:

- education and production integration;
- have a high share of practical training;
- university and industry cooperation;
- education programs based on the requirements of the labor market update.

Higher education institutions in the national education system to adapt to this experience engineers-mechanical preparation will serve to increase the quality of.

Germany, shows that the analysis of the experience of korea and turkey, engineer-mechanical preparation of the following general principles:

- education and production integration;
- have a high share of practical training;
- university and industry cooperation;
- education programs based on the requirements of the labor market update.

Higher education institutions in the national education system to adapt to this experience engineers-mechanical preparation will serve to increase the quality of.

Used literature

1. *Uzbekistan , republic of the president № 158-the number of served. “Uzbekistan – 2030” strategy on. 11.09.2023.*
2. *Uzbekistan , republic of the president 's decision. Higher education institutions admission parameters and the state of the order on. 25.05.2024.*
3. *Uzbekistan Republic president of the PP-431-number will decide. The rural economy modernization to measures on. 12.12.2024.*
4. *The federal institute for vocational education and training (IN). Dual vocational education and training in germany. Bonn, 2022.*
5. *Ministry of education of Korea. LINC – the leader in industry-university cooperation Program. Seo abides, 2021.*
6. *YÖK (Council high-rise, Turkey). In the model the engineering cooperative education program. Ankara, 2022.*
7. *OECD. Engineering skills and pay labour Market Needs. Paris, 2021.*
8. *World Bank. Skills development for the industrial growth is made possible. Washington, 2020*