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PEDAGOGICAL BASIS OF DIRECTING YOUNG STUDENTS TOWARDS ENGINEERING PROFESSIONS

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Abstract: This article examines the pedagogical foundations of orienting school students toward engineering professions. In the context of rapid technological development and increasing demand for engineering specialists, the issue of early and purposeful career guidance becomes particularly relevant. The study analyzes theoretical approaches to career guidance, pedagogical conditions for developing students' interest in engineering fields, and effective educational strategies such as STEAM education and project-based learning. The findings highlight the importance of integrating innovative pedagogical methods into the educational process to foster students' technical thinking, creativity, and professional motivation.

Keywords: career guidance, engineering professions, pedagogical foundations, school students, STEAM education, professional orientation.

Introduction. The rapid development of science, technology, and industry in the modern world has significantly increased the demand for highly qualified engineering specialists. Engineering professions play a crucial role in economic growth, industrial innovation, and technological sustainability. Therefore, preparing future engineers should begin not only at the higher education level but also during secondary education.

One of the most important tasks of the education system is to guide students toward conscious career choices based on their interests, abilities, and labor market needs. In this regard, orienting students toward engineering professions requires a scientifically grounded pedagogical approach. This article aims to analyze the pedagogical foundations of directing students toward engineering careers and to identify effective educational strategies that support this process.

Ma'lumki, zamonaviy ta'lim tizimi, an'anaviy ta'limdan farqli o'laroq, amaliyotda o'rganilayotgan ilmiy-nazariy va metodik uslubni kundalik hayotda qanday qo'llash mumkinligini ko'rsatishga imkon beradigan aralash muhit hisoblanadi. Matematika va fizika bilan bir qatorda o'quvchilar robototexnika va dasturlashni o'rganadilar. Bu jarayonda o'quvchilar aniq va tabiiy fanlardan olgan bilimlarini amaliyotdagi natijasini shaxsan ko'rib turadilar.

Literature Review. Research in the field of career guidance emphasizes that early professional orientation significantly influences students' future educational and career trajectories. Scholars note that engineering orientation is most effective when technical subjects are taught through practical, problem-based, and interdisciplinary approaches.

Studies on STEAM education demonstrate that integrating science, technology, engineering, arts, and mathematics enhances students' interest in technical professions and develops critical thinking skills. Additionally, pedagogical research highlights the key role of teachers as facilitators and mentors in shaping students' professional motivation.

Methodology. The research is based on theoretical and analytical methods. The following methodological approaches were used:

❖ ***Systemic approach*** – to examine career guidance as an integral part of the educational process;

❖ ***Student-centered approach*** – to consider students' individual interests and abilities;

❖ ***Activity-based approach*** – to emphasize learning through practical and project-oriented activities.

Methods of analysis included a review of scientific literature, comparative analysis of pedagogical approaches, and generalization of best practices in engineering-oriented education.

Results and Discussion

1. Pedagogical essence of orienting students toward engineering professions:

Career orientation toward engineering professions is a purposeful pedagogical process aimed at developing students' technical thinking, problem-solving skills, and professional awareness. Effective orientation requires creating educational conditions that encourage curiosity, experimentation, and independent learning.

Engineering-oriented education should focus on:

❖ developing logical and analytical thinking;

❖ fostering creativity and innovation;

❖ forming practical skills through hands-on activities;

❖ strengthening motivation for technical and engineering careers.

Increasing students' interest in engineering professions creates a strong foundation for training many highly qualified and high-potential young specialists in our country. Today, the New Uzbekistan needs engineers with great professional capacity. Only if we further strengthen students' interest in engineering careers and provide them with broad opportunities will they be able to demonstrate their engineering potential in the future.

2. Role of STEAM and project-based learning:

STEAM education plays a significant role in preparing students for engineering professions. By integrating different disciplines, STEAM allows students to see real-world applications of theoretical knowledge. Project-based learning, in particular, enables students to work on real or simulated engineering problems, promoting teamwork, responsibility, and critical thinking.

Such approaches transform students from passive learners into active participants in the learning process, thereby increasing their interest in engineering fields.

The importance of STEAM education lies in the fact that the low quality of education in the real sciences, the insufficient material and technical base, and the weak motivation of teachers and students are among the biggest problems of the education system. At the same time, our state, which is developing step by step, requires the training of highly qualified specialists in various educational fields of high-technology sciences.

In this regard, today STEAM education helps to develop technological processes in the future and to meet the demand for scientific and engineering personnel in our country.

3. Teacher's role in engineering career guidance:

Teachers play a central role in guiding students toward engineering professions. In modern education, the teacher acts not only as a source of knowledge but also as:

➢ a mentor and advisor;

➢ a motivator;

➢ an organizer of creative and technical activities.

Teachers' professional competence, awareness of modern engineering trends, and ability to apply innovative pedagogical technologies are crucial factors in successful career guidance.

Conclusion: In conclusion, orienting students toward engineering professions is a complex and continuous pedagogical process that requires a systematic and innovative approach. The

integration of STEAM education, project-based learning, and student-centered pedagogical strategies significantly enhances students' motivation and readiness for engineering careers.

Effective career guidance contributes to the development of a new generation of technically competent, creative, and competitive specialists, which is essential for the sustainable development of society and the economy.

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