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PROFESSIONAL MASTERY OF A TEACHER AT A PROFESSIONAL PRE-HIGHER EDUCATION INSTITUTION IN THE FIELD OF RAILWAY TRANSPORT

Анотація: У статті розглянуто сутність професійної майстерності викладача закладу фахової передвищої освіти, що готує фахівців для залізничного транспорту. Акцентовано увагу на основних компонентах педагогічної майстерності, специфіці викладацької діяльності в умовах змін транспортної галузі, цифровізації та впровадження дуальної освіти. Наголошено на практично-орієнтованості підготовки, обґрунтовано важливість виробничої практики, екскурсій та зустрічей з представниками галузі. Виокремлено сучасні підходи до формування професійної майстерності та охарактеризовано особистісні й професійні якості, необхідні для ефективного навчального процесу. Розкрито нормативне забезпечення практики та наведено емпіричні дані щодо її ефективності.

Ключові слова: професійна майстерність, педагогічна компетентність, залізничний транспорт, фахова передвища освіта, практика, екскурсії, дуальна освіта, інноваційні технології.

Abstract. The article explores the essence of the professional mastery of a teacher at a professional pre-higher education institution that trains specialists for the railway transport sector. Emphasis is placed on the key components of pedagogical excellence, the specifics of teaching in a changing transport industry, digitalization, and the implementation of dual education. The practice-oriented approach to training is highlighted, and the importance of industrial internships, excursions, and meetings



with industry representatives is justified. Modern approaches to the formation of professional mastery are highlighted, and the personal and professional qualities necessary for an effective educational process are described. Regulatory support for practice is disclosed, and empirical data on its effectiveness is provided.

Keywords: professional mastery, pedagogical competence, railway transport, professional pre-higher education, internship, excursions, dual education, innovative technologies.

Preface

Institutions of professional pre-higher education (IPHE) play a crucial role in training highly qualified personnel for the railway industry, which is strategic for Ukraine's economy. With the modernization of transport infrastructure, the implementation of digital technologies, and integration into the European educational space, the professional mastery of teachers has become particularly important. The quality of training future specialists depends on the level of their competence and pedagogical experience.

The requirements for modern specialists are determined by socio-economic changes in society and the formation of market relations. High-quality training in professional pre-higher education institutions is of particular significance, as it lays the foundation for the profession, shapes the specialist's mentality, and expands their professional profile. Current guidelines for professional pre-higher education include the development of a socially active individual with high competence, mobility, and professionalism; the cultivation of professional thinking and social responsibility; the formation of the potential for self-development and self-improvement; and the advancement of a balanced general cultural, specialized, and practical training for professionals.



Theoretical Foundations of Professional Mastery of a Teacher

Professional mastery is an integrated indicator of professional and pedagogical competence, encompassing knowledge, skills, abilities, personal qualities, and the capacity for creative activity. It includes:

- pedagogical competence – knowledge of teaching methods and forms;
- professional competence – deep expertise in the specialty;
- communication culture;
- innovativeness (willingness to implement new technologies);
- reflexivity (the ability for self-development and self-improvement).

The professional mastery of a teacher at a professional pre-higher education institution in the railway transport sector is a dynamic combination of pedagogical and professional competencies that ensure the effectiveness of the educational process and high-quality training of specialists. In the context of modern challenges in transport and education, a teacher must be not only a transmitter of knowledge but also a change agent, mentor, and role model for students.

Specifics of Teaching Activity in the Field of Railway Transport

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The railway transport sector is one of the key infrastructure industries that requires highly qualified personnel. Training such specialists is impossible without professional teaching activities, which have their own specifics determined by both the technical nature of the industry and the high safety requirements.

Combining Theoretical and Practical Training Teachers must not only deliver theoretical knowledge but also ensure a strong connection with practice. This involves:

- active use of laboratories, simulators, and training grounds;
- organizing field classes, excursions, and internships at railway enterprises;
- continuous updating of course content according to modern technologies (automatic control systems, signaling, new types of rolling stock, etc.).

High Qualification Requirements for Teachers



A teacher in the railway transport field must possess:

- specialized technical education;
- practical experience working on the railway (preferably in management, operation, or maintenance);
- knowledge of regulatory frameworks (instructions, rules, regulations, technical standards);
- the ability to work with modern equipment and software.

Fostering Professional Responsibility and a Culture of Safety

The teacher not only conveys knowledge but also instills in students:

- a clear understanding of the importance of following instructions;
- a culture of occupational safety;
- attentiveness, discipline, and stress resilience—qualities essential for working on the railway.

Interdisciplinary Approach

Many disciplines in the railway industry require knowledge across several areas:

- mechanics, electrical engineering, electronics, IT;
- logistics, economics, management;
- ecology, labor protection, law.

Teachers must be able to integrate this knowledge to form a comprehensive picture of the industry.

Continuous Professional Development

As the railway industry evolves dynamically, teachers must:

- participate in training sessions, seminars, and professional development courses;
- study new technologies, automated control systems, and digital innovations (e.g., e-tickets, diagnostic systems);
- maintain contact with enterprises to stay connected with real-world production.



Practical Training of Applicants at Professional Pre-Higher Education Institutions

Practical Training of Applicants at Professional Pre-Higher Education, which train personnel for the railway industry, is not only an important educational component, but also a factor in the formation of a competitive, mobile, capable of professional self-improvement specialist. It is within railway infrastructure enterprises that applicants integrate their knowledge, skills, and abilities with real production processes.

Practical Training of Future Railway Workers: The Experience of the Dnipro Professional College of Railway Transport and Transport Infrastructure
Practical training is a mandatory component of educational and professional programs in professional pre-higher education. It allows applicants to acquire practical skills and specific competencies needed for future professional activities. Thanks to the combination of theoretical training with real work experience, practical classes prepare young specialists to face the challenges of the railway industry, where readiness for quick action and ensuring transportation safety are crucial.

The purpose of this training is to complete the formation of acquired competencies and to gain experience in their application, to master modern forms of work organization, equipment, devices, and technologies in accordance with the specialty, to become familiar with the conditions of professional activity, and to consolidate the theoretical knowledge obtained during college studies.

The content and tasks of practical training are defined in practice programs based on the normative training content outlined in learning outcomes in state standards and educational-professional programs.

Purpose and Types of Practice

The main goal of practice is to develop professional skills and gain experience with relevant equipment and technologies. Depending on the specialty, educational plans include several types of practice, including:



- **Educational practice (in classrooms, laboratories, and workshops):** conducted using the college's training facilities. For instance, applicants develop skills in welding, mechanical and installation work. They can also officially qualify for working professions such as locksmith, ticket or baggage cashier, or signalman.

- **Educational practice in production:** conducted at railway enterprises (stations, depots). It involves applying learned skills in real production conditions - working with modern equipment and technologies in locomotive or car depots. The task of this stage is to consolidate skills and become familiar with the organization of labor in production.

- **Technological practice:** involves working with the latest technological processes within the specialty. For example, applicants may study dynamic systems of traction rolling stock or automated transport management systems.

- **Professional practice:** the final stage of education, serving as a "professional trial." It is intended to test and confirm knowledge acquisition. Applicants gather practical material for qualification work and apply theory to real-world problems.

According to methodological recommendations, all practice types are included in the curriculum with clearly defined timelines and objectives. At the college, there are four types of practice: workshop training (mechanical, welding), in production, industrial-technological, and professional. This structure ensures a gradual transition from formal education to practical work.

Regulatory Support

Practical training is governed by legislation on education and vocational education, as well as specific regulatory acts. In particular, the new Standard Regulation of the Ministry of Education and Science dated May 2, 2023, No. 510 approved the "Regulation on Practical Training for Applicants of Professional Pre-Higher Education," which outlines the principles of organization, assessment, and provision of practice. This document, along with institutional regulations, states that practical training is mandatory and based on national education standards.



The legal framework includes the Constitution of Ukraine, the Laws "On Education," "On Professional Pre-Higher Education," and others. Accordingly, the college operates within approved national standards: all types of practices are included in educational-professional programs, and their duration and expected outcomes are defined in the curricula. For example, according to the methodological recommendations of the Ministry of Education, the total volume of practical training should exceed 10% of the total educational workload.

In the Dnipro Professional College of Railway Transport and Transport Infrastructure, compliance with legal requirements is ensured, including through agreements with partner enterprises and adherence to internal regulations on the educational process.

According to Article 50, Clause 1 of the Law of Ukraine "On Professional Pre-Higher Education," practical training of applicants is conducted through internships at enterprises that meet the requirements of the educational-professional programs: production units of branches and regional branches of the Joint Stock Company Ukrainian Railways, transport enterprises in the city of Dnipro, the Dnipropetrovsk region, and other regions of Ukraine that provide practical training.

Practice Bases and the Role of Prydniprovsk Railway

Training and material bases play a key role in the practical preparation of applicants. According to the requirements, these bases must be modern and safe, equipped with the necessary tools and staffed with qualified personnel. The college has established its own educational base: five workshops (mechanical, electrical installation, electric welding, lathe-milling, and mechanical assembly) with specialized equipment, tools, and devices. These laboratories allow applicants to reinforce basic professional skills in environments close to real production. In addition to internal facilities, the college collaborates with production units of the branches and regional offices of the Joint Stock Company Ukrainian Railways, which cover Dnipropetrovsk and neighboring regions. These units (stations, depots, carriage facilities) enter into



agreements with the college to host interns. For instance, applicants undertake internships at locomotive depots (TCH-1 Nyzhnodniprovsk, TCH-2 Kryvyi Rih, TCH-8 Dnipro), motor-car depots, and passenger car depots (VChD-11 Dnipro Passenger Car Depot, VChD-4 Synelnykove Passenger Depot), as well as power supply divisions (EC-3 Verkhnivtseve, EC-2 Nyzhnodniprovsk Node).

Interns work under the guidance of experienced supervisors and perform real tasks such as fleet inspections, rolling stock repair, or servicing railway technologies. The selection of the practice base is made by the college administration, considering the partner institution's ability to meet training objectives. Agreements are usually signed for one year, allowing for practical training schedules to be planned and for cooperation continuity to be ensured.

Practical Training and Working Professions

A special feature of professional pre-higher education is that applicants often simultaneously receive both a junior bachelor's degree and qualifications in working professions. During training practices, they formally master the required industrial specialties. For example, applicants in the educational and professional program 'Organization of Transportation and Management in Railway Transport' can obtain working professions such as second-class cashier (baggage, ticket, or freight), signal operator, or train assembler. Applicants of the programs 'Maintenance and Repair of Traction Rolling Stock' and 'Maintenance and Repair of Railcars' train as rolling stock repair locksmiths. Those studying in the program 'Maintenance and Repair of Railway Power Supply Devices' receive initial qualifications as substation electricians or contact network electricians. This means that upon graduation, they not only receive a diploma of junior bachelor, but also become capable of performing real work in the railway sector.

Thanks to this approach, entry-level employees immediately meet industry standards. For example, a graduate of the 'Organization of Transportation and Management' program receives a diploma and can work as a cashier, train assembler,



or centralized traffic control operator. Likewise, electromechanical technicians reinforce their knowledge with depot experience and may work as locomotive drivers, rolling stock repairmen, or even team leaders. Thus, practical training directly shapes professional qualifications, enabling graduates to enter the workforce ready to perform specific tasks in the railway industry.

Inclusiveness of Practice for Applicants of Educational and Professional Programs

Special attention in organizing practice is given to applicants with special educational needs. It is normatively established that their internships must be conducted considering their individual capabilities and needs. For example, if an applicants has mobility impairments, they may be assigned to a barrier-free area or practice within the college facility. If there are hearing or vision issues, teachers and mentors take this into account when distributing tasks.

At the same time, it is prohibited to involve applicants with special educational needs in tasks unrelated to their field of study. This approach ensures that every applicant for education receives equal opportunities to master the profession even in a real production environment.

Practical Examples and Significance of Training

Practical training at a railway college is not merely a formality but a genuine contribution to the safety and efficiency of the industry. For example, during workshop-based educational practice, applicants repair locomotive engines and prepare power system components using modern benches and machines. During industrial practice, the same applicants install traction sections on real locomotives, putting theory into action. As a result, the management of Prydniprovskya Railway receives a specialist who has already mastered the fundamentals of the profession.

Thanks to a systematic approach to practical training, the college links education with the world of work: graduates confidently assume roles such as station duty officers, dispatchers, cashiers, and mechanics from their very first day on the job.



According to instructors, professional practice is the final stage of training—a creative combination of theory and practice that tests knowledge acquisition and the ability to operate in real industrial conditions. Real-life examples show that this approach improves the competitiveness of young specialists and promotes workforce renewal in the railway industry.

Statistical Evidence of Practice Effectiveness

According to a study conducted by the Ukrainian Institute for Education Development (2023), graduates who underwent dual training demonstrate a 30–35% higher level of adaptability to work conditions compared to those who did not have practical experience at enterprises.

According to the analytical report of the HR Department of JSC 'Ukrzaliznytsia' (2023), up to 40% of newly hired employees are graduates of professional pre-higher education institutions who completed their practice at the company's facilities.

Practical training in professional pre-higher railway education institutions is not merely a formal requirement but a real tool for preparing future professionals for independent work. Teachers, college administrations, and employers must unite efforts to expand partnership programs, modernize the forms and content of practice, and provide methodological support and evaluation of its outcomes.

The Importance of Excursions to Railway Enterprises and Meetings with Industry Representatives

One of the effective ways to enhance the quality of vocational training for applicants in the railway field is through excursions to railway enterprises and organizing meetings with industry specialists. These activities promote practice-oriented thinking, the development of professional motivation, and the establishment of a strong link between theory and practice.

The modern training system for future railway professionals requires not only a solid theoretical foundation but also close contact with practice. One of the most



effective methods of ensuring this connection is through excursions and meetings with representatives of the railway industry.

Functions of Excursions to Railway Enterprises:

- Educational: allow applicants to become familiar with actual working conditions, equipment, infrastructure, and technological processes in operation.
- Career guidance: help applicants better understand various professions within the industry and make conscious career choices.
- Motivational: direct contact with professionals and observing their work encourages applicants to study, develop professional skills, and aspire to success.
- Informational: participants receive up-to-date knowledge about modern technologies, industry changes, workforce requirements, and railway transport trends.

Excursions make it possible to observe in practice what is taught theoretically. Meetings with industry professionals may also result in valuable connections that help with internships or future employment. Visits to various elements of the railway infrastructure (depots, stations, dispatch centers, etc.) provide a broader understanding of the system's complexity and scope. They also promote respect for the profession and highlight its importance to the country's economy and transportation system.

Meetings with Professionals: The Role of Mentorship and Example

In the process of training future railway professionals, it is important not only to transfer knowledge and skills but also to instill correct values, motivation, and professional orientation. That is why meetings with practicing specialists play a significant role—they act as mentors and role models.

Practitioners share their experiences, talk about challenges and achievements in their work, providing a valuable source of knowledge. Industry representatives can outline real job requirements and market demand for specific roles, helping align educational programs with workforce needs. These meetings often become the first step toward a career, opening doors to internships, practical training, and employment.



Mentorship is the transfer of experience, knowledge, values, and professional culture from an experienced specialist to a young professional or applicant.

Functions of a Mentor:

- Introduce real working conditions;
- Transfer practical skills and job standards;
- Explain safety regulations and procedures;
- Shape responsible attitudes toward job duties;
- Provide psychological support at the beginning of a professional path.

Successful professionals who achieved results through dedication and discipline serve as real-life examples for applicants. Their authority is based on experience, not theory.

What such meetings provide:

- Real stories that inspire applicants;
- Demonstrations of high work standards;
- Understanding that success requires effort and discipline;
- Motivation for self-improvement.

Advantages of regular interaction with industry professionals:

- Up-to-date information about challenges and trends in the railway field;
- Career guidance and insights into specialization options;
- Formation of professional identity and sense of belonging to the industry;
- Internship and employment opportunities through professional networking.

The Role of Educational Institutions in Creating Conditions for Mentorship

Educational institutions should actively involve railway professionals in guest lectures, round tables, production practices, participation in professional competitions, forums, and projects.

It is also important to develop a mentorship system based on the triad: 'applicant for education — graduate — professional.



Personal example is the most effective method of influencing youth in their professional self-determination. That is why the administration and teachers of specialized disciplines at the college regularly organize meetings with industry representatives.

The Dnipro Professional College of Railway Transport and Transport Infrastructure annually conducts a cycle of industry excursions and holds regular career-oriented meetings with industry professionals.

For example, this academic year, applicants for education participated in:

- An exhibition of modernized traction rolling stock at Dnipro station, attended by the Chairman of the Board of Ukrainian Railways, Oleksandr Pertsovskiy. Applicants visited locomotive cabs (VL11m6, VL8, ChS7, and the ChME3 diesel locomotive), spoke with drivers and assistants, and asked questions about their future professions.

- A tour of the Prydniprovskaya Railway History Museum, where museum staff led engaging excursions. Unexpectedly, applicants were greeted by the director of the Prydniprovskaya regional branch, Oleksandr Momot, who invited them to undertake industrial practice at railway units.

- A patriotic excursion to the 'Food Train'—a unique humanitarian train with six wagons: a generator wagon (400 kW), fuel station, refrigerator, hot and cold kitchens, staff quarters, and a water wagon (27,000 liters) with filtration and pumping systems. Today, railway workers continue to rescue civilians and are among the first to come to the aid where it is needed most. Food Train can work autonomously for 5-7 days, and the train's equipment allows you to prepare complete meals: soups, porridges, salads, meat, and more. Special thermal boxes installed inside the train allow for easy transportation of ready-made lunch boxes with food from the kitchen train to the end consumer. This train has taken on permanent duty in the most difficult frontline areas of Ukraine, where warmth and food are critically important for life.



Such activities should be included in applicants' individual learning paths and supported as part of implementing dual education.

Conclusions

The professional skill of the teacher of the institution of professional pre-higher education is the basis of a high-quality educational process and one of the main factors in the formation of a competitive specialist. It provides not only the transfer of knowledge, skills and abilities, but also the creation of conditions for the comprehensive development of the personality of the applicant for education, his professional self-determination and socialization.

A modern teacher must have a high level of professional and pedagogical competence, possess the latest teaching methods, be able to adapt the educational material to the level of training of applicants, stimulate their cognitive activity and independence, critical thinking, ability to self-education. An important role is played by the digital literacy of the teacher, which allows you to effectively integrate electronic resources, distance learning platforms, multimedia tools into the educational process, as well as carry out training in mixed and distance formats in accordance with the needs of the time.

The pedagogical activity of a teacher of professional pre-higher education is not limited to training. It includes scientific and methodological work, education of applicants, organization of extracurricular activities, cooperation with employers and participation in the development of the educational environment of the institution. One of the most important signs of professional skill is the ability to constant self-improvement, critical understanding of one's own experience, openness to new approaches, participation in professional associations, competitions, conferences, advanced training and self-education.

Personal qualities of the teacher - tolerance, sociability, empathy, responsibility, pedagogical tact - largely determine the effectiveness of his interaction with applicants, affect the formation of young people's moral values, guidelines for work and



citizenship. In the context of modern challenges - digitalization, reforming education, the requirements of the labor market - the professional skill of the teacher should be considered as a dynamic process that requires flexibility, the ability to change, the integration of new knowledge and technologies, as well as a high level of professional reflection.

So, the professional skill of the teacher is not only an indicator of the level of his training, but also an indicator of the quality of education in the institution as a whole, his ability to respond to the needs of modern society, to form a generation of young specialists ready for practical activity and lifelong learning.

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