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PROFESSIONAL TRAINING OF FUTURE LOGISTICS SPECIALISTS IN UKRAINE: INSIGHTS ON THE LOGISTICS COURSE EDUCATION

Abstract. Strategically located at the crossroads of Europe and Asia, Ukraine plays a key role in regional and global trade. As the importance of the logistics industry grows, so does the demand for skilled experts who can manage increasingly complex supply chains, transport systems, and customs processes. The aim of the article is to analyze the training of future logistics specialists in Ukraine, its main institutions, course structure, and training methods, as well as the challenges it faces in meeting the needs of the modern logistics industry. Methods of research applied: case analysis, and comparative analysis. We use the professional logistics courses of the National Transport University of Kyiv, the National Aviation University of Ukraine, and the Lviv Polytechnic University as examples. Analyzing their logistics training system, to gain a broader understanding of how to train the next generation of logistics experts and to provide insights into how emerging economies respond to the changing needs of the logistics industry. The partnerships between higher education institutions and well-known logistics companies (such as Nova Poshta, Ukrposhta, DHL Ukraine) plays a vital role in strengthening these educational programs. The educational institutions cooperate with a range of logistics companies to provide students with practical experience in logistics systems, transport management, and supply chain optimization operations. The Ukrainian government, universities, and the logistics industry all recognize that there are still some gaps in the internationalization of logistics in ukrainian, including the following: industry-university cooperation needs to be deepened horizontally across industries, the use of digital tools in training needs to be strengthened, and investment in logistics education infrastructure projects needs to be increased to make graduates more competitive and consistent with global logistics education practices.

Keywords: courses, curriculum, logistics specialists, training system.

Statement of the problem. Due to factors such as emigration and internal displacement resulting from the war, Ukraine faces a shortage of personnel and structural unemployment. In 2021, the official labor market had 11.5 million workers, which decreased to 9 million by 2023. To ensure annual GDP growth of 7% by 2030, an additional 4.5 million workers are needed. This rising need for professionals has prompted efforts to enhance the quality and accessibility of logistics training in Ukraine [2]. With Ukraine strategic position at the crossroads of Europe and Asia, Ukraine plays a key role in regional and global trade. As the logistics industry grows in importance, the demand for skilled specialists to manage increasingly complex supply chains, transportation systems, and customs processes has also increased.

Analysis of recent research and publications. L. Lebedeva, and D. Shkuropadska [5] mentioned that Ukrainian universities have adjusted their logistics programs to follow the European Credit Transfer and Accumulation System (ECTS), enabling greater academic mobility and recognition of qualifications within the European Union (EU). Additionally, Ukrainian logistics education has seen the introduction of international certification programs, often in partnership

with professional bodies such as the European Logistics Association (ELA) and the Chartered Institute of Logistics and Transport (CILT). These certifications equip graduates with globally recognized credentials.

T. Garmash [1] mentioned that professional training in logistics in Ukraine is primarily provided by higher education institutions, vocational schools, and industry-led training programs. However, including outdated educational curricula, limited access to modern logistics technologies, and a lack of industry-academia collaboration. In Ukraine, logistics education is governed by national standards established by the Ministry of Education and Science of Ukraine. The Ministry plays a pivotal role in accrediting academic institutions that offer logistics courses, ensuring the quality and consistency of education across the sector.

The official content of the NTU's logistics programs project describes that they offering specialized logistics programs aimed at preparing students for careers in the transport and logistics sectors. The university with a focus on aligning its curriculum with the evolving demands of the global logistics industry. NTU has consistently seen a robust enrollment of students in its logistics programs. According to the latest statistics, approximately 1,000 to 1,500 students are enrolled annually in various

logistics-related courses at the university. These figures demonstrate the growing interest in logistics as a field of study and reflect the increasing importance of logistics professionals in Ukraine's economy [7]. NTU offers Supply Chain Management (SCM) focuses on the strategic coordination of the flow of goods and services, including procurement, production, and distribution. Students in this specialization gain expertise in optimizing supply chains, managing inventory, and ensuring the smooth movement of goods across national and international borders. Transport Logistics is another key specialization offered by NTU, which focuses on the management and optimization of transportation systems, including road, rail, air, and sea transport. This program equips students with the skills needed to design, implement, and manage transportation networks effectively. Customs Regulation addresses the complex field of customs processes and compliance, an essential area for professionals involved in cross-border logistics and international trade [8].

The official content of the NAU's faculty of Transport, Management and Logistics shows that NAU's logistics programs are designed to address this demand by providing a comprehensive education that combines traditional logistics principles with a specific focus on aviation logistics, air transport systems, and supply chain management within the aviation sector. According to the latest data, NAU enrolls approximately 500 to 800 students each year in its logistics programs, including specializations related to transportation, supply chain management, and aviation logistics. NAU's logistics programs are distinctive in that they combine general logistics training with a focus on the aviation industry, making them particularly valuable for students interested in pursuing careers in air transport logistics. The university offers several specializations, Logistics Technologies introduced to the latest digital tools and technologies used in modern logistics operations, including GPS tracking systems, transportation management software, and supply chain management platforms. By offering specialized subjects, a tailored curriculum, and a strong focus on aviation logistics, NAU is preparing future logistics professionals to contribute to the growth and modernization of Ukraine's logistics and aviation sectors [6].

The official content of the LPNU Department of Marketing and Logistics shows that it is well-known for providing specialized training that prepares students for various roles in the logistics and supply chain sectors. The university offers a wide selection of specializations and core subjects that address both general logistics and specific subfields of the industry [3]. LPNU offers a broad range of specializations within the logistics field. These specializations include Customs Regulation and E-commerce Logistics. Customs Regulation provides students with knowledge on customs policies, procedures, and laws governing the import and export of goods. Students in this track learn about the documentation and compliance processes needed to move goods across borders. This specialization is particularly relevant given Ukraine's position as a key transit hub between Europe and Asia, where understanding customs regulations is crucial for ensuring efficient cross-border logistics operations. With the global rise in e-commerce, LPNU has tailored part of its logistics curriculum to focus on the logistics needs of online retail [4].

N.Sytnyk et al. [9] analyze educational internship and practical training requirements in Ukraine's logistics programs in partnerships with logistics firms. Internships and practical training are fundamental components of logistics education in Ukraine. Partnerships between

higher educational establishments and prominent logistics firms (e.g., Nova Poshta, Ukrposhta, DHL Ukraine), play a critical role in strengthening these educational programs. Nova Poshta provide valuable exposure to global logistics practices, offers internships that provide students with practical experience in areas such as last-mile delivery, supply chain management, warehousing, and logistics technology, students often benefit from exposure to high-scale logistics systems. Ukrposhta, the national postal service, also collaborates with Ukrainian universities to offer internship programs focused on postal logistics and large-scale distribution networks. For students specializing in transportation logistics and supply chain management, internships at Ukrposhta provide insight into the challenges and solutions involved in managing a nationwide delivery network. Through these partnerships, students learn about postal operations, customs clearance, international logistics, and managing high-volume shipments. Internships with DHL Ukraine offer students exposure to international logistics networks, freight forwarding, and the use of cutting-edge technology in logistics management. Additionally, DHL provides students with insights into the integration of digital technologies, such as artificial intelligence (AI) and Internet of Things (IoT) in the logistics sector, preparing them for the technological demands of the modern logistics industry, including NTU and NAU. Sytnyk mentioned that Ukrainian universities also collaborate with logistics firms to tailor their programs to meet the evolving demands of the industry. So, the partnerships between Ukrainian universities and leading logistics firms like Nova Poshta, Ukrposhta, and DHL Ukraine are essential in enhancing the practical training and internship opportunities available to logistics students. These collaborations bridge the gap between theoretical education and practical experience, equipping students with the skills and knowledge needed to thrive in the logistics industry. As the logistics sector continues to evolve, these partnerships will remain a key component of the educational framework, helping to ensure that students are prepared to meet the demands of the ever-changing global logistics landscape.

Highlighting unresolved aspects of the general problem. By studying Ukraine's approach, we can gain insights into how emerging economies are addressing the evolving demands of the logistics sector, providing a useful basis for comparison with China's rapidly developing logistics education system under the BRI framework. Analyzing Ukraine's experience with logistics education is highly relevant for comparison with China for several reasons. Both countries are situated along major global trade routes and are involved in large-scale infrastructure projects, such as the Belt and Road Initiative (BRI), which influence the demand for logistics professionals. Additionally, both nations are navigating similar challenges in modernizing their logistics industries, aligning with international standards, and integrating advanced technologies into education and training.

The aim of the study. The article aims to analyze the training of future logistics specialists in Ukraine, its main institutions, course structure, and training methods, as well as the challenges it faces in meeting the needs of the modern logistics industry. To obtain more general research conclusions, we chose three specific universities (NTU, NAU, and LPNU), they were selected as research subjects for the following reasons: to ensure the feasibility and accuracy of the research, choose universities that can obtain enough relevant data and information; to correspond to the research scope of logistics engineering (involving railway traffic,

aerospace, logistics technology).

Methods applied. We conducted the comparative analysis of the logistics programs at three major Ukrainian universities. Each institution offers unique strengths in logistics education, yet they share a commitment to providing students with the knowledge and skills necessary to succeed in the rapidly evolving logistics and supply chain sectors.

Results and Discussion. National Transport University stands as one of Ukraine's premier institutions for logistics education, offering a comprehensive range of programs that cover essential logistics domains such as transportation systems, supply chain management, and international logistics. NTU places strong emphasis on transportation logistics and the integration of modern technologies in logistics operations. The university is well-regarded for its industry partnerships, including collaborations with major logistics firms such as Ukrposhta and DHL Ukraine, providing students with practical training opportunities in areas like freight forwarding, supply chain coordination, and transportation systems.

National Aviation University, on the other hand, has a more specialized focus, offering logistics programs tailored to aviation and aerospace logistics. With specializations like Airport Logistics and Aviation Supply Chain Management, NAU prepares students to meet the unique demands of logistics in the aviation industry. Core subjects at NAU include aviation transport systems, airport operations, and the management of aviation supply chains. NAU's close ties with the aviation sector, including partnerships with companies like Ukrposhta and DHL Ukraine, allow students to gain hands-on experience in aviation-related logistics, making them highly specialized for careers in this niche area.

Lviv Polytechnic National University offers a diverse and innovative approach to logistics education, with a range of specializations that address emerging trends in the field. LPNU places significant emphasis on integrating digital tools, AI-driven technologies, and sustainability practices into its logistics curriculum. We consider it logical to reveal the content of these courses. One of the standout courses at LPNU is Customs and International Trade Logistics, which provides students with an understanding of the logistics processes that occur when goods cross international borders. This course is particularly valuable as Ukraine's position as a transit country and its growing role in global supply chains make this area of study crucial for logistics professionals in the country.

As to Digital Logistics and E-commerce Technologies we can summarize, that in alignment with the growing importance of digital technologies in logistics, LPNU offers courses that cover the digitalization of logistics and the application of e-commerce technologies in supply chains. These courses introduce students to emerging technologies such as blockchain, AI, and cloud-based systems for managing logistics processes. They also explore the impact of digital tools on inventory management, order fulfillment, and customer service in e-commerce logistics. We also consider it appropriate to analyze logistics programs at LPNU as it is a leading institution in Ukraine that offers a comprehensive range of logistics education programs. This analysis focus on the specializations, subjects, and trends unique to LPNU, providing insights into how the university's logistics program differs from other leading institutions like National Transport University and National Aviation University. Lviv Polytechnic National University has become an attractive destination for students interested in logistics education. Lviv State University of Technology is ranked 1001-1200 according to the

Quacquarelli Symonds (QS) University Rankings 2025), bringing a unique perspective to the field. NTU excels in transportation and supply chain management, NAU focuses on aviation logistics, and LPNU leads in areas like e-commerce logistics, customs regulation, and digitalization. Each institution's curriculum is closely aligned with the specific needs of the logistics industry, ensuring that graduates are well-equipped to meet the demands of both domestic and global supply chains.

Ukraine's logistics education system faces significant challenges, including technological gaps, insufficient industry-academia collaboration, funding constraints, slow alignment with EU standards, and workforce shortages. Addressing these challenges will require concerted efforts from the government, educational institutions, and the private sector to ensure that logistics training programs are adequately equipped to meet the demands of the modern logistics industry.

The analysis of logistics education in Ukraine reveals both notable achievements and critical areas for improvement. Ukraine has made significant strides in expanding its logistics education programs, with a growing number of universities and institutions offering specialized courses in supply chain management, transport logistics, and customs regulation. These programs provide students with a solid foundation in both theoretical knowledge and practical skills, and there are efforts to align them with EU standards, reflecting Ukraine's goal of integration into the European market.

However, several challenges remain. Despite advancements in curriculum and training programs, Ukraine still faces limitations in modernizing educational infrastructure. The slow integration of cutting-edge technologies such as AI, IoT, and automation in training programs hampers the country's ability to produce logistics specialists who are fully equipped to meet the needs of a digitalized and globalized logistics industry. Moreover, there is a significant gap between academic training and the practical skills required by the logistics industry, underscoring the need for stronger collaboration between educational institutions and the private sector.

The government and industry have recognized these gaps and have begun taking steps toward addressing them, including initiatives to improve industry-academia collaboration, enhance the use of digital tools in training, and invest in infrastructure projects. Furthermore, Ukraine's adoption of European logistics standards offers an opportunity to modernize and harmonize logistics education, making it more competitive and aligned with global best practices.

Conclusions. Due to the impact of the war, Ukraine's logistics market has received widespread global attention in recent years. Especially with the deepening of regional economic cooperation in the European Union, the potential of Ukraine's logistics market has become increasingly apparent. The following are suggestions for the establishment of logistics majors in Ukrainian universities: Firstly, universities can strengthen cooperation with logistics companies to jointly research and develop new logistics technologies and solutions to improve logistics efficiency and service quality. Secondly, universities can offer courses related to logistics information technology and supply chain management, train students to master advanced technologies such as big data and cloud computing, optimize supply chain management processes, and focus on technological innovation and application to adapt to the trend of digital transformation and development in the logistics industry. Thirdly, universities continue to strengthen cooperation with logistics companies, establish internship bases, provide students with more

opportunities for practical operations, and ensure the strong practical operation capabilities required by logistics students. Fourthly, universities can increase investment in cross-border e-commerce logistics, international logistics and other related courses to train students to master emerging business models and operational management capabilities. Keep up with the development pace of emerging formats to adapt to diversified business models. Fifthly, the logistics major of universities can focus on international education, offer bilingual courses and international certificate certification, and enhance students' international vision and cross-cultural communication capabilities. Through

the above suggestions, the logistics major of Ukrainian universities can better adapt to the future international market needs and improve the quality of vocational education in the logistics major and the employment competitiveness of students.

Prospects for further research include cross-disciplinary horizontal research, for example, combining the characteristics of biology, chemistry, physics and other disciplines to reconstruct the logistics engineering system and conduct more in-depth research. In addition, the long-term impact of emerging technologies such as drones and unmanned driving on the future development of logistics can be studied.

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ПРОФЕСІЙНА ПІДГОТОВКА МАЙБУТНІХ ФАХІВЦІВ З ЛОГІСТИКИ В УКРАЇНІ: ОКРЕМІ АСПЕКТИ ТЕОРЕТИЧНОГО НАВЧАННЯ

Анотація. Стратегічно розташована на перехресті Європи та Азії, Україна відіграє ключову роль у регіональній та світовій торгівлі. Оскільки важливість логістичної галузі зростає, зростає і попит на кваліфікованих фахівців, які можуть керувати дедалі складнішими ланцюжками поставок, транспортними системами та митними процесами. Мета статті – проаналізувати окремі аспекти теоретичної підготовки майбутніх фахівців з логістики в Україні. Методи дослідження: кейс-аналіз, порівняльний аналіз. Ми використовуємо для прикладу професійні логістичні освітні компоненти Київського національного транспортного університету, Національного авіаційного університету України, Львівської політехніки. Аналізуючи їх систему навчання з логістики, отримуємо ширше розуміння того, як навчити наступне покоління фахівців з логістики, як країни з економікою, що розвивається, реагує на мінливі потреби логістичної галузі. Партнерство між закладами вищої освіти та відомими логістичними компаніями (такими як Нова Пошта, Укрпошта, DHL Україна) відіграє важливу роль у посиленні освітніх програм. Заклади вищої освіти співпрацюють з рядом логістичних компаній, щоб надати студентам практичний досвід роботи з логістичними системами, управлінням транспортом та оптимізацією ланцюгів поставок. Український уряд, університети та логістична галузь визнають, що в інтернаціоналізації логістики все ще існують певні прогалини, зокрема такі: як необхідність поглибити співпрацю між галузями та університетами, посилити використання цифрових інструментів у навчанні та збільшити інвестиції в проекти інфраструктури логістичної освіти, щоб зробити випускників більш конкурентоспроможними та відповідати світовій освітній практиці з логістики.

Ключові слова: освітня компонента, навчальний план, фахівець з логістики, професійна підготовка.