

## **FUTURE CHANGES IN LOGISTICS & SUPPLY CHAINS: A COMPETENCE DIMENSION**

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**The article notes that the integration of the Ukrainian economy into the EU is partially hampered by purely logistical factors. The positions of Ukraine in the world ranking of the Logistics Performance Index are analyzed. Attention is focused on the component of «logistics competence», which is significantly behind the average European level. The authors suggested that the existing backlog could offset the new generation of potential managers who were the target audience of this study. With the help of the survey, a worldview picture of future changes in the logistics industry in Ukraine, Poland, and Germany was obtained. Thanks to identifying the personal characteristics of the target audience, common features are highlighted. It has been proven that they will help reduce gaps in logistics competence, which will help bring the country's logistics to a qualitatively new level of stable, sustainable development and contribute to Ukraine's integration with the European Union.**

***Key words:* Logistics&Supply Chain, Logistic Performance Index (LPI), logistics competencies, EU integration, economic development, logistics potential, comparative analysis, survey.**

### **Introduction**

The economic development of Ukraine, as well as the integration of the Ukrainian economy into the EU (into global supply chains), is partially hampered by purely logistical factors: as of 2020, the Logistics Efficiency Index in Ukraine is 2.83, while the average European level is 3.52. Indirectly, the logistical efficiency of the country also depends on the level of competence, and an additional indicator of the Human Development Index, according to the latest data, positions Ukraine only in 88th place (Fig. 1). To increase the Logistics Efficiency Index in the «competence» component, it is necessary to: 1) eliminate the gaps in the professional training of the existing human capital (primarily due to hard skills because, as studies have shown, people without basic professional education mainly work in the field of logistics) and 2) work for the future – to form potential human capital (the future generation of managers) in accordance with European standards, values, principles.

### **General problem statement and its relevance**

The contribution of «competencies» to the development of the country's logistics potential is manifested in the following aspects: performance improvements – the development and proposal of optimal logistics solutions for logistics systems of different hierarchical levels; the effect of synergy, which allows to unite the enterprises of the industry, infrastructure facilities and develop the country's logistics system on the basis of holisticity, compatibility, complementarity, stability, sustainability, etc.; network effect, which allows attracting more talent to develop the logistics of the future: smart, digital, green, secure. Therefore, the question arises about the significance of «competence» in the logistic performance index.

### **The purpose of the article**

The purpose of the article is to present the results of the authors' empirical research on the formation of professional competencies in logistics and supply chain management among potential managers of a new generation in 3 countries: Germany (LPI leader), Poland, and Ukraine. The objectives are (1) to carry out a comparative analysis of the level of understanding/vision/awareness in the Logistics and Supply Chain Industry and (2) to identify factors contributing to the increase in the level of logistics competence up to the average European level.

### **Literature review**

Among the latest studies and publications, the most interesting is the empirical study of Polish colleagues [1]. The authors conduct a comparative analysis of the students' awareness of Polish and Ukrainian universities in the future profession of a logistician, the motives for choosing a profession, and the importance of acquired professional competencies when hiring. The study affects the problem of human capital migration from Poland – the outflow of qualified young people to Western Europe in search of higher earnings. And although the goals of this study are different, it still attracts our interest through a similar target audience and its characteristics.

Other empirical studies on this topic [2] raise the importance of functional, social, and cognitive competencies in the training of logistics specialists. The authors identify over 280 competencies that describe the required set of skills for logistics and supply chain managers. Attention is focused on the readiness of continuous and constant learning at the workplace.

The problem of professional competencies in logistics and supply chain management has been deeply studied and covered in numerous works of foreign scientists, in particular [3, 4, 5]. In their research, the authors substantiate certain competency models and offer the necessary set of professional competencies. Attention is focused on the importance and dominance of hard skills for managers of lower levels of management and the importance of developing soft skills for managers.

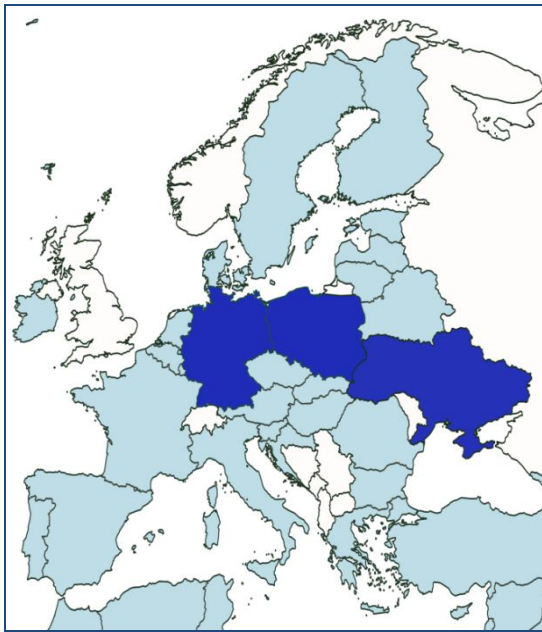
A significant contribution to the dissemination and development of a competency-based approach to training logistics specialists in Ukraine was made by Ukrainian scientists, particularly Hryhorak M., Krykavskyy Ye., Smerichevska S., and others. By joining efforts, an appropriate national standard is being developed, which must be consistent with the European qualification standards for logistics professionals of the European Logistics Association.

Modern challenges (particularly the consequences of Covid-19, the war in Ukraine) form the need to revise the established approaches prescribed in the standards and change priorities, which actualize the conduct of empirical research.

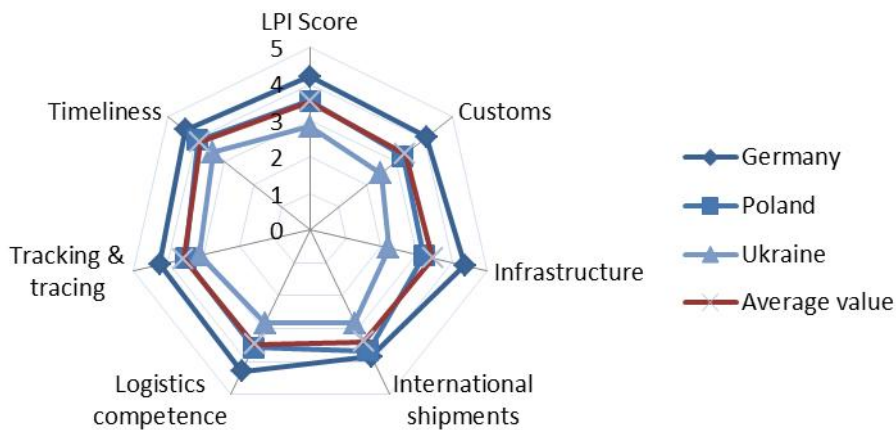
### **Data, research methodology, and findings**

Competence is a key driver for developing the Logistics and Supply Chain Industry. A qualitative breakthrough in this component can accelerate qualitative changes in other interrelated areas. Currently, there is a significant gap in the level of logistics competence of Ukraine (2.84) compared with Poland (3.58) and Germany (4.31) (Fig. 1). This is partly due to historical circumstances. The training of logistics specialists for the needs of the national economy in Ukraine began in the late 90s and then only in 2 universities (the first graduation – 2003); this process became more active even later. When the first admission of students to the specialty «Logistics» took place in Ukraine, young logistics specialists were already graduating in Poland, who, against the backdrop of the development of the Eastern European logistics services market, and were ready to take on new challenges and develop the logistics of their country. The timely response of the educational environment allowed Poland to rise to the average European level of «competence» and even higher (Fig. 1).

Future changes in logistics & supply chains: a competence dimension



	Germany	Poland	Ukraine
<b>Logistics market size 2018 (in bn.€)</b>	280	62.3	11.3
<b>Logistics performance index</b>	4.2 (1)	3.54 (28)	2.83 (66)
<b>Global Competitiveness Index</b>	81.8 (7)	68.9 (37)	57 (85)
<b>Human Development Index</b>	0.939 (4)	0.872 (32)	0.75 (88)



Country	LPI Rank	LPI Score	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
Germany	1	4,2	4,09	4,37	3,86	4,31	4,24	4,39
Poland	28	3,54	3,25	3,21	3,68	3,58	3,51	3,95
Ukraine	66	2,83	2,49	2,22	2,83	2,84	3,11	3,42
<b>Average in EU</b>		3,52	3,34	3,46	3,41	3,49	3,56	3,86

Fig. 1. Metadata of research

\* Source: calculated and built by the authors in accordance with [6, 7, 8, 9, 10]

The signing of the Association Agreement with the EU raised the issue of integration into the common space of the European Union before Ukraine. The integration process is uneven: in the field of education – at a faster pace, in the industry, for example, transportation – much slower and even protracted and rather politicized. The academic community of leading Ukrainian universities is increasingly working on the unification of educational and professional programs in logistics and focuses on the ELA Standard. This will help reduce the gaps in the logistics competence of the new generation of managers, which will

help bring the country's logistics to a qualitatively new level of sustainable development and contribute to Ukraine's integration into the EU.

The study, which took place in 2020–2021, involved students from the Ukrainian, Polish and German universities. Students who study Logistics or studied this discipline for at least one semester were involved in the nonprobability judgmental sampling survey (using an online questionnaire). The method used to select respondents made it possible to survey those students (and, in the nearest future – logistics professionals, mid-level managers) who are familiar with the peculiarities of the development of logistics and SCM. Although the sample obtained by this method does not guarantee sufficient representativity, it still made it possible to identify the main features and differences in the vision of the trends in the development of logistics among university students from the selected European countries.

By identifying students' characteristics (socio-demographic, behavioral, value orientations), it is possible to identify common and distinctive features of the target audience. One of the study's main assumptions is that representatives of German, Polish and Ukrainian universities – potential managers of the new generation – have more in common than different. They are equally concerned about environmental issues. They have approximately the same level of digital literacy, and thanks to the unification of university programs, they have the same set of hard and soft skills. They will «blur the gaps» in competencies.

A feature of the target audience is that a priori, they acquired professional competencies provided for by university programs, so the questionnaire questions were not affirmative but rather problematic and formulated in such a way that the respondents applied critical thinking, creativity, and knowledge derived from their observations. According to the degree of freedom of the respondent, semi-closed and open questions were used. For example, 'Do you know successful examples of domestic enterprises that rather benefited from the integration into the global supply chains?', 'What economic effect has been achieved?', 'Give examples of domestic enterprises that have rather lost out with the emergence of global companies', 'What is the segment of the logistics services market developing most dynamically in your country at present?' etc. The survey questions also foresaw finding out the respondents' level of perception/non-perception of logistics as an important factor in integrating the national economy into the global economic space, identifying factors that, according to the future professionals, stimulate or hinder the development of logistics in their country and those that are central to the successful functioning of SCs, etc. Such questions led the respondents to express their own position – 'Imagine that the country's logistics industry prospects depend on your decisions. Indicate 3 priority areas that you would develop in the first place'. The survey results are shown in Fig. 2–6.

Statistical and graphical analyses of the survey findings were conducted using IBM SPSS Statistics 22. An overwhelming majority of respondents from both Ukraine and Poland agreed that the integration of the national economy into the global economy depends on the efficiency of logistics, though only a small number of them could give examples of successful enterprises that benefited from the integration into the global SCs (Fig. 2). However, we can state that there is an intuitive understanding of the logistics role as an important accelerator and leader of modern processes in the age of globalization. At the same time, public opinion lacks knowledge, logical evidence, convincing facts, and, therefore, conscious logistical thinking.

Respondents from Ukraine and Poland chose a digital vector (47.1 % and 30.6 %, respectively) as the determining vector for the future development of the logistics services market, followed by green (28.8 % and 22.2 %) and integrated (21.2 % and 36.1 %) ones (Fig. 3). It seems interesting to cross-compare respondents' answers regarding their attitude to green logistics in SCs: about half of those Ukrainian respondents who chose green as a perspective vector for logistics development believe that green logistics is a tribute to fashion, an effective marketing ploy, and not the necessity due to the state of the environment (Fig. 4). In general, more than a third (35.6 %) of respondents in Ukraine support this opinion, and in Poland 22,2 %, while in Germany this percentage is insignificant.

*Future changes in logistics & supply chains: a competence dimension*

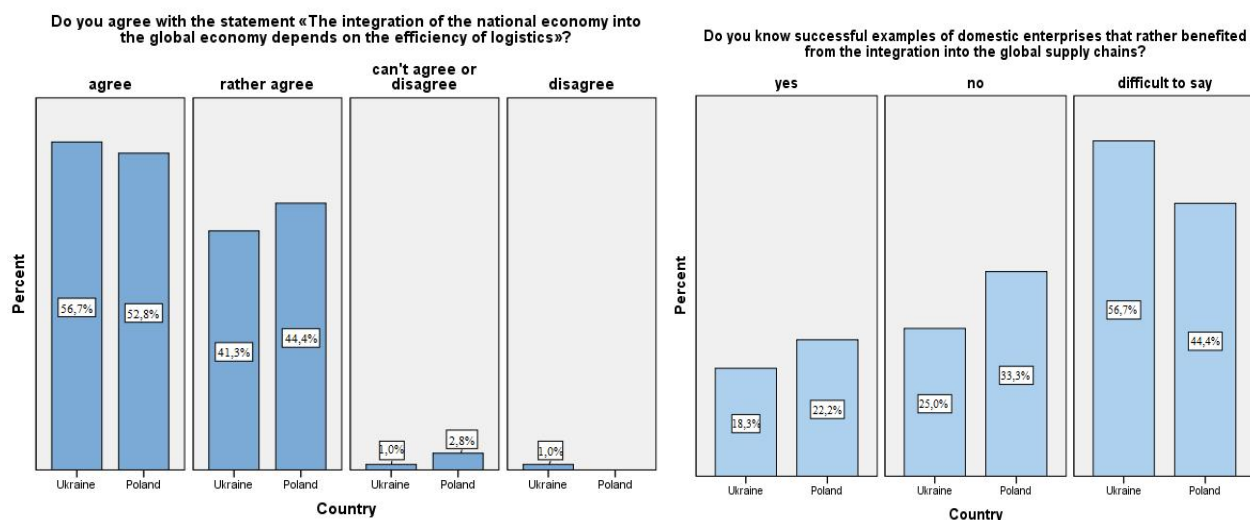


Fig. 2. Structure of answers to questions: ‘Do you agree with the statement that «The integration of the national economy into the global economy depends on the efficiency of logistics?»’ and ‘Do you know successful examples of domestic enterprises that rather benefited from the integration into the global supply chains?’

\* Source: own research

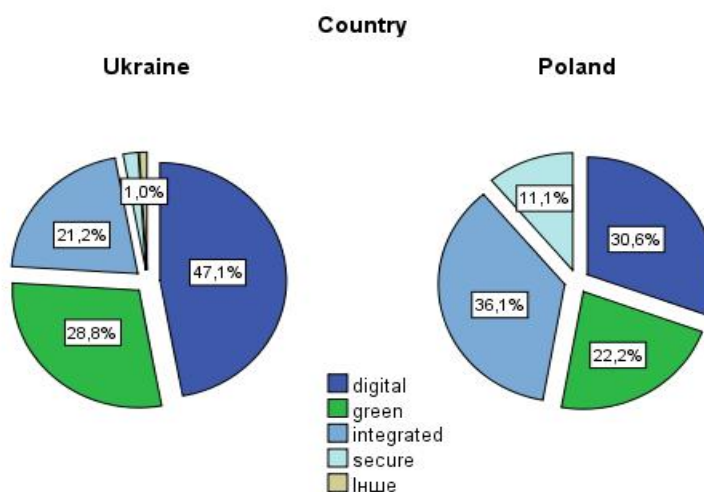


Fig. 3. Structure of answers to the question ‘What do you think is the defining vector for the future development of the logistics services market in your country?’

\* Source: own research

When asked ‘Which factors do you think are central to the successful functioning of the SC?’, the majority of respondents from Ukraine, Poland, and Germany indicated the establishment of close partnership relations between SC participants (24,9 %, 26,8 %, and 22 % respectively). In addition, they considered the ability to adapt to change (16,9 %, 21,1 %, and 32 %) and the availability of highly qualified personnel (17 %, 15,5 %, and 15 %, respectively) to be the factors of great significance.

The analysis of the results of the study of the degree of influence of different institutions on the development of logistics and SCs by country made it possible to find out the following (Fig. 5): in Ukraine, respondents believe that international organizations and government institutions have the greatest influence on logistics; in Poland, the influence of the institutions mentioned above is regarded as medium, while Logistics companies are given more preference; according to German respondents, the most influential are logistics associations, business associations and logistics companies themselves. These differences may be

due to the level of economic development and the level of development of logistics infrastructure in the countries, which affects the degree of respondents' awareness of the need to rely less on regulators and put more responsibility and authority on direct participants of the logistics market, acknowledging the importance of professionalism and competence of the staff.

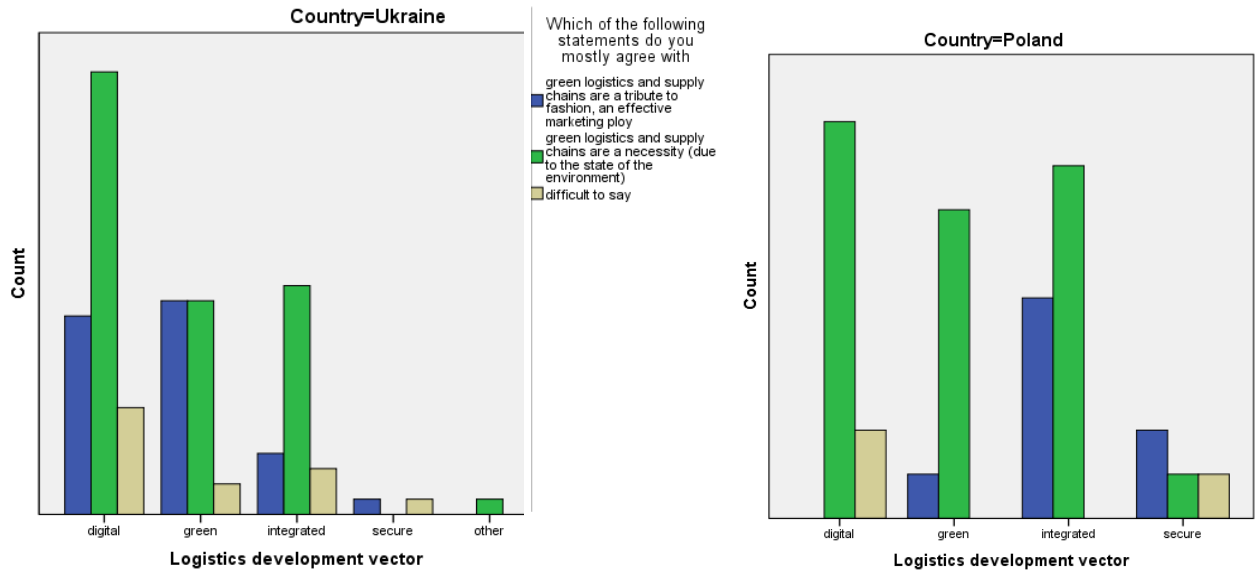


Fig. 4. Respondents' attitude to green logistics in terms of the selected vectors of future development of the logistics market in Ukraine and Poland

\* Source: own research

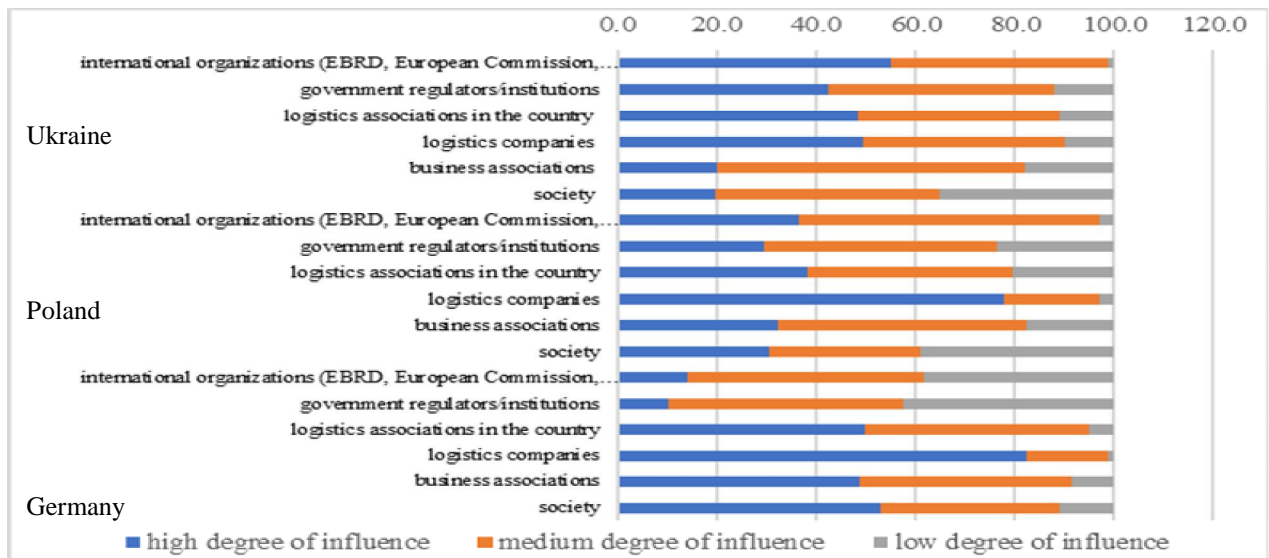


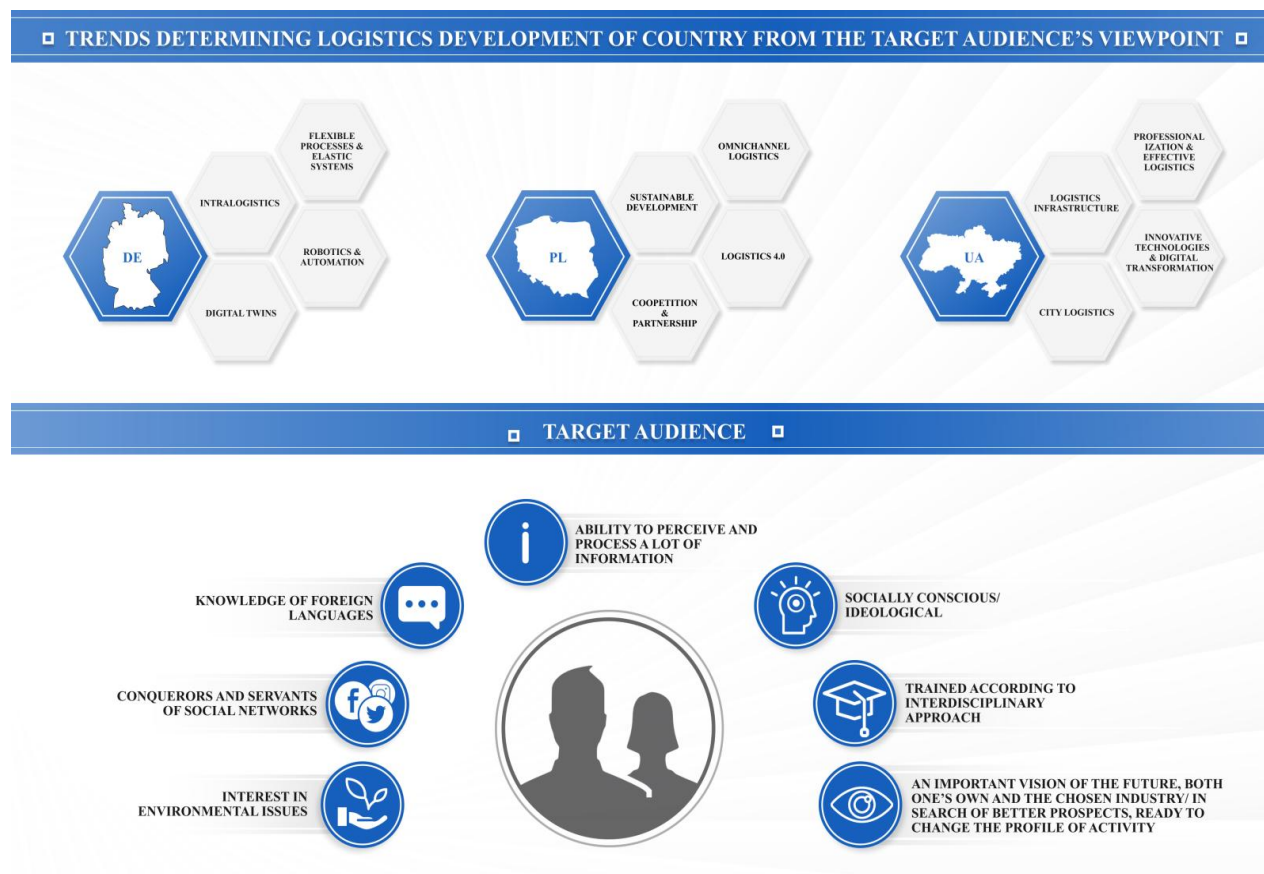
Fig. 5. Structure of answers to the question 'In your opinion, what is the degree of influence of such aspects on the development of logistics and supply chains?'

\* Source: own research

Through the survey, a worldview picture of future changes in the logistics industry in Ukraine, Poland, and Germany was obtained. The vision of the prospects for the development of logistics in 3 countries is different. And it is determined by the level of development and achievements of a particular

country in Logistics and Supply Chain Industry. In particular, according to respondents' viewpoint, in Germany, digital trends will dominate, in Poland – environmental, and in Ukraine – related to human capital and infrastructure modernization.

The assumption underlying the study was also confirmed – the representatives of the German, Polish and Ukrainian universities – potential managers of the new generation – have more in common than different. They typically: Interest in environmental issues; Conquerors and servants of social networks; Knowledge of foreign languages; Ability to perceive and process a lot of information; Socially conscious/ideological; Trained according to interdisciplinary approach; An important vision of the future, both one's own and the chosen industry in search of better prospects, ready to change the profile of activity. This gives grounds to say that they can «blur the gaps» in competencies.



*Fig. 6. Research infographic*

Source: own research

### **Conclusions and future research**

Logistics is the engine of the economic growth of the country's economy. World experience shows that countries with a high level of LPI can provide enterprises with access to international markets through reliable supply chains, and countries with a low level of LPI have high logistics costs, which negatively affects the competitiveness of the national economy. The logistical potential of Ukraine is partially constrained by professional competencies. And although there are qualitative shifts in this indicator (according to the latest LPI rating, Ukraine has risen to 61 place from the previous 95 place), however, this remains a weakness of Ukrainian logistics, especially compared to the average European indicators.



The authors are convinced that a qualitative breakthrough in the «competence» component can accelerate qualitative changes in the logistics industry as a whole. And a new generation of potential managers will blur this gap in the common European market in the near future, as the survey confirmed.

Prospects for further research are the formation of a dynamic competence model for logistics and supply chain management that meets the challenges of the time.

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### МАЙБУТНІ ЗМІНИ В ЛОГІСТИЦІ & ЛАНЦЮГАХ ПОСТАЧАННЯ: КОМПЕТЕНТІСНИЙ ВИМІР

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У статті наголошено, що інтеграція української економіки в ЄС частково гальмується суто логістичними чинниками. Проаналізовано позиції України у світовому рейтингу Індексу логістичної ефективності. Проведено порівняльний аналіз України з Німеччиною та Польщею в розрізі 6 субіндексів. Акцентовано увагу на складовій «логістична компетентність», за яким спостерігається значне відставання від середньоєвропейського рівня. Обґрунтовано внесок «компетентностей» у розвиток логістичного потенціалу країни з позицій: покращення результатів; ефекту синергії; ефекту мережі. Авторами висунуто припущення, що існуюче відставання знівелює нова генерація потенційних менеджерів, які були цільовою аудиторією даного дослідження. За допомогою опитування отримано світоглядну картину майбутніх змін логістичної галузі в Україні, Польщі та Німеччині. Розглянуто відмінності, які є більшою мірою відображенням рівня досягнень конкретної країни в галузі логістики. Завдяки ідентифікації особистісних характеристик цільової аудиторії (соціально-демографічних, пове-



дінкових, ціннісних орієнтацій), виділено спільні та відмінні риси. Доведено, що спільних рис у представників трьох країн є більше, вони включають: інтерес до екологічних проблем, прив'язаність до соціальних мереж, володіння іноземними мовами, здатність сприймати і обробляти багато інформації, навчання за міждисциплінарним підходом, важливе бачення перспективи, як власної, так і галузі, а завдяки уніфікації університетських програм – однаковий набір *hard skills* та *soft skills*. Це сприятиме зменшенню «розривів» у логістичній компетентності нової генерації менеджерів, що допоможе вивести логістику країни на якісно новий рівень сталого, стійкого розвитку та сприятиме інтеграції України з ЄС.

**Ключові слова:** логістика, ланцюги постачання, Індекс логістичної ефективності (LPI), фахові компетентності з логістики, інтеграція в ЄС, економічний розвиток, логістичний потенціал, порівняльний аналіз, опитування.