SCIENTIFIC CULTURE
www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 12, No. 4, (2026), pp. 3234-3243
Open Access. Online & Print

DOI: 10.5281/zenodo.12426386

ENHANCING FUTURE-ORIENTED COMPETENCES OF LOGISTICS STUDENTS: A FRAMEWORK FOR EDUCATIONAL INNOVATION

Joanna Łabędzka[1]*, Beata Poteralska[2]

[1,2] *Institute of Management, Jan Kochanowski University of Kielce, Kielce, Poland*

Received: 03/06/2025
Accepted: 23/02/2026

Corresponding author: Joanna Łabędzka (joanna.labedzka@ujk.edu.pl)

ABSTRACT

In the VUCA (Volatility, Uncertainty, Complexity, Ambiguity) world, the logistics sector is undergoing rapid transformation driven by deregulation, globalization, digitalization, and evolving consumer behavior. As a result new competence requirements are emerging for employees in this sector: both hard and soft competences, including future-oriented competences to better deal with uncertainty. The aspect of changing skill requirements is particularly important in relation to the role of higher education. It is therefore necessary to adapt new methods to better shape graduates' competences. The paper identifies key changes that influence logistics and proposes a framework for educational innovation within higher education using future studies approaches. It highlights a gap in higher education curricula in developing such competences and presents a foresight-based workshop model for logistics students that helps to acquire future-oriented competences to meet labour market demands and support the professional development of logistics specialists in uncertain environments.

KEYWORDS: Foresight, Future-Oriented Competences, Higher Education, Logistics..

1. INTRODUCTION

Technological development, globalization and evolving social and economic needs are causing the modern labor market to change rapidly. This means that the competences employees require are also changing and they should be adjusted to the needs of the future. The paper is focused on future-oriented competences that are closely related with the aspect of dealing with uncertainty, unpredictability, and quick adaptation to the changing environment.

According to [1], education plays a critical role in the development of competences needed in the future. Universities are under pressure to produce highly employable graduates. However, current education systems often fail to respond appropriately to the need to develop such competences. The current concepts of higher education do not offer convincing solutions to the challenges facing society today. There is a general deficit in university curricula in terms of aligning them with the development of future-oriented competences [2]. To develop such competences future studies methods, including foresight are adequate and successfully used [3, 4]. However, at present these approaches are rarely used in the formal education system. Moreover, a lack of the awareness of the philosophical approaches to foresight and future studies is observed among education practitioners [5].

Future-oriented competences are relevant to all fields of human activity. This paper focuses on competences in the field of logistics. Logistics is one of the areas undergoing significant change nowadays due to deregulation, globalization, digitalization, changes in consumer behavior, and technological development. Moreover, the application of foresight in the area of logistics, which is a focal point of this paper, is very limited.

Thus, the paper raises the research questions formulated as follows:

- Research question 1: What changes in the logistics sector drive the need to integrate future-oriented competences into the competence portfolios of logistics professionals?
- Research question 2: How can future-oriented competences in the field of logistics be developed using future studies approaches?

The paper aims to identify the main areas of transformation in logistics that necessitate the continuous evolution of competency requirements for both managerial and operational personnel. Furthermore, it seeks to develop a framework proposal within higher education with the use of future studies approaches.

The paper is structured as follows. First, it draws on a literature review of the competences that will be needed in the future. This is followed by a presentation of ongoing transformations in logistics. These changes have a significant impact on the skills required of a logistics professional, whose profile is then described based on existing formal competency frameworks and models. The next section is devoted to a framework for educational innovation. First, the results of an analysis of the scale and forms of applying foresight in the formal education system are presented. Against this background, the paper presents an original proposal for a foresight workshop program for bachelor's studies aimed at developing the future-oriented competences of logistics students. The paper concludes with a summary and indications of future research directions.

2. FUTURE-ORIENTED COMPETENCES

Employees' competences are widely regarded as one of the most important resources for any organization. Developing competences is critical to the success of both organizations and individuals, particularly when faced with an unpredictable future. Competence is understood as a set of knowledge, skills, and attitudes [6]. It is "the ability to integrate and apply contextually-appropriate knowledge, skills and psychosocial factors (e.g., beliefs, attitudes, values and motivations) to consistently perform successfully within a specified domain" [7].

The term "competence" is often used interchangeably with "skill" [7]. This approach is also applied by the authors in this paper.

The paper is focused on competences needed in the future. These competences are referred to in the literature as 21st century skills, future skills or future-oriented competences [1, 8–10]. These terms are considered synonyms by some researchers [11]. Finding a generally accepted definition of 21st century competences is challenging [12]. This is why this term is sometimes regarded as an umbrella term for various skills, thinking patterns, and characteristics that are central to the 21st century [1]. 21st century competences are also called future skills. According to [13] they are specific skills enabling tasks to be undertaken and implemented in a fundamentally flexible, geographically dispersed work environment that is susceptible to frequent and rapid changes and requires the use of digital technologies and cooperation with automated systems and artificial intelligence-powered machines. [2] defines future skills as "competences that allow individuals to solve complex prob-lems in contexts characterized through a high degree of emergence in a self-organized way and enable them to act (successfully)."

Competences needed in the future comprise two categories: STEM (Science, Technology, Engineering, and Maths) and "soft skills" (amongst others: creativity, problem-solving skills, critical thinking, collaboration, communication, dealing with uncertainty, unpredictability, and quick adaptation to the changing environment) [14–18]. According to [13], there are three groups of future competences: cognitive (thinking competences, including creativity, logical reasoning, and complex problem-solving); social (teamwork, leadership, entrepreneurship, and emotional intelligence); and digital and technical (hard skills). The first two groups can be considered soft competences. [19] lists 5 broad categories of competences: analytic skills, interpersonal skills, ability to execute, information processing, and capacity for change/learning. The majority of them are soft skills, though some hard skills are mentioned as well. Furthermore, they emphasize that "general competences should not be studied in isolation from occupation-specific contexts," as different skills may be required depending on the type of work. For example, the skills required for engineering differ from those required for social work.

In the current literature competences are commonly divided into "soft" skills, which are related to interpersonal communication, creativity, problem solving etc. and "hard" skills, which are related to technical abilities [20]. Although traditional technical skills ("hard skills") remain important, it is recognized that soft skills, also known as social or interpersonal skills, are becoming increasingly significant [21]. Reference [22] shows that "soft skills will play a critical role for the future generations in many industries." [23] adds that a lack of soft skills is one of the factors of dismissing younger workers from work.

Some researchers, such as [9], understand that future-oriented competences are not synonymous with 21st-century competences, but rather, are part of them. These skills focus directly on "working with the future." [9] defines future-oriented competences as "skills that are necessary to navigate the imagined futures." They are related to the ability to create future scenarios, anticipate potential problems, and critically engage with problem-solving strategies. This paper focuses on this specific type of soft competences in the area of logistics.

3. LOGISTICS TRANSFORMATION

Logistics refers to the management of material flow between locations and encompasses the coordination of information, transportation, inventory, warehousing, material handling, and packaging [24]. Moreover, logistics operates within the larger framework of supply chain management, which implies a much more complex and holistic approach to this domain.

Logistics is undergoing significant transformation as a result of various factors in the surrounding environment. Recent geopolitical developments, including US-China tensions, the Russia-Ukraine war, Brexit, and the COVID-19 pandemic, have disrupted global supply chains, led to shortages of critical goods, and reshaped distribution networks [25]. For example, in the aftermath of the military conflict between Iran and Israel due to rerouting and higher fuel expenses shipping costs surged and transit times for ships avoiding the Red Sea and Suez Canal increased significantly. Such events have demonstrated the urgent need for more resilient and innovative logistics systems that can perform effectively in a progressively uncertain and complex business landscape.

Furthermore, the rapid pace of technological development is transforming logistics processes, making them more automated, self-adaptive, and intelligent. Artificial intelligence, cloud computing, blockchain, Big Data analysis, and Internet of Things enhance operational efficiency, visibility, transparency, security, enable data-driven decision-making, and drive the digitalization of logistics as in [26–28]. Information regarding the logistics process must be delivered in real time to the supervising freight forwarder, cooperating companies, and clients to help them make well-informed decisions. For example, data on traffic and transport parameters such as speed, location, and fuel consumption is used to reroute if necessary and to keep the client informed about the delivery status.

Ecological demands are also influencing logistics. Aligning economic growth—including logistics—with environmental principles calls for thoughtful planning, design, operation, and management of supply chains, all of which are essential to the long-term viability of today's businesses [29]. For instance, the introduction of Euro 6 standards forces transport companies to invest in more environmentally friendly vehicles, plan greener routes, and monitor exhaust emissions.

It should not be overlooked that growing customer expectations for increased personalization, omnichannel distribution, informed purchasing decisions, and time-versus-cost balanced deliveries are also impacting the logistics sector [30]. For example, the growing demand for same-day or next-day delivery in e-commerce has pushed companies to develop dense networks of urban warehouses and parcel lockers.

The abovementioned changes occurring in logistics are reflected in the continuously evolving

competency requirements for both managerial and operational staff. The necessary competences, including skills, knowledge, and capabilities, need to be clearly understood to ensure that logistics professionals can continue to add value to the processes they plan, execute, monitor, and manage. The ongoing transformation of logistics extends beyond the short and medium term, reaching into a future that cannot be effectively addressed by traditional forecasting methods alone. It is a long-term shift that requires strategic foresight; consequently, logistics professionals must be equipped with the competences necessary to navigate future uncertainty with agility and resilience.

4. PROFILE OF THE LOGISTICS PROFESSIONAL

In terms of hard skills, the responsibilities of the logistician over time have become part of the broader role of the supply chain manager, who oversees not only the movement of goods but also the selection and planning of materials needed for production. Within this broader process, the logistics professional focuses on the timing and efficiency of transporting materials to the manufacturer [31]. Time management, inventory management, and supply chain design were indicated in [32] as the essential hard skills for the performance of almost all required logistics tasks. However, the majority of the identified top skills (7 out of 10) were soft skills, such as communication (verbal and written), ability to plan and prioritize, customer focus, decision-making, negotiation, and business process improvement. The research also revealed that entry-level professionals should possess basic skills in demand forecasting and in anticipating future market challenges, aligning with future-oriented competences. The critical soft abilities involved in performing the tasks in the fields of operations management and supply chain management listed in [33] include: active listening, critical thinking, deductive reasoning, oral comprehension, oral expression, problem sensitivity, reading comprehension, speaking, and written comprehension. There was no explicit mention of future-oriented competences identified in the analysis. Also in [34] is stated that effective performance in logistics requires a diverse set of competences, including not only operational and technical skills related to transportation, warehousing, and inventory management, but also analytical thinking, digital literacy, and the ability to coordinate within the broader context of supply chain management.

Much of the existing literature on logistics competences models does not explicitly differentiate between hard and soft competences. In [35] three crucial competence groups were distinguished, although without reference to future orientation: special competences (crucial for engaging in work focused on people), analytical competences (for effective job performance), and personal competences (for self-management). With regard to future orientation, a compelling competency set is presented in [36] that divides logistics competences into four groups:

- business competences (soft and hard skills), including business continuity planning and e-business—core factors for adapting to ever-changing environments;
- logistics competences (hard skills) such as warehouse control, inventory management, transportation decisions, and green logistics;
- digital competences (hard skills), including data analytics, cyber-security, simulations, automation technologies; and,
- personal competences (soft skills), such as leadership, cross-functional teamwork, readiness for change management, virtual communication, adaptability, ability to work remotely.

This strongly future-oriented competency framework prepares professionals for the growing complexity, volatility, and technological advancement of supply chains by emphasizing not only technical logistics skills but also digital and personal competences, as it takes into account changing trends in logistics driven by digitalization, resilience measures, and e-business models, and aligns with the need for agility in uncertain and dynamic environments.

As for existing competency frameworks for logistics, there is no single universally accepted one. In Europe, one of the most important allusions is the European Qualification Standards for Logistics Professionals (ELAQF) [37], which serve as a European reference point for the development of educational programs, professional qualifications, and recruitment in logistics, place strong emphasis on hard skills (technical, operational, and functional). These include, for example, supply chain planning and control, transport mode selection and routing, data analysis and KPI tracking, inventory optimization techniques, the use of logistics IT systems, risk management in logistics operations, Lean and Six Sigma tools, as well as cost control and budgeting. Soft skills are included within the Core Management Skills module and recognized as crucial across all levels of certification. Soft interpersonal competences are planning professional development, change management understanding, strong oral and written communication, strategic thinking and

decision-making, excellent communication and coaching, situational leadership. This framework is focused more on current practical skills rather than explicitly addressing future-oriented competences. Nevertheless, some elements, like the use of logistics IT systems and risk management, could indirectly relate to future-oriented skills, especially as they evolve with technology and market changes.

The Polish Qualifications Framework is a national system that defines competency requirements across eight levels and is used in education and the validation of qualifications. In the field of logistics, competences may be included within qualifications such as Logistics Technician (Level 4 PRK), Logistics Engineer (Level 6–7 PRK), and Market Qualifications (e.g., "Warehouse Management" or "Organization of Road Freight Transport"). It includes hard skills such as inventory and warehouse management, transport planning and organization, route and mode selection, and the use of logistics IT systems. Soft skills encompass problem-solving, adaptability and flexibility, self-management and responsibility, and decision-making. Future-oriented skills are implicitly included, such as digital literacy, the ability to adapt to changing environments, critical thinking, and innovation.

Existing models, especially formal competency frameworks for logistics such as ELAQF, need revision—primarily due to the digitalization and automation of logistics processes—and require the explicit inclusion of future-oriented competences. This would enable students and trainees to learn these competences early on, which would subsequently translate into logistics professionals who can respond effectively to uncertainty, volatility, and the need for swift adaptation in dynamic environments.

5. FRAMEWORK FOR EDUCATIONAL INNOVATION

The formal education system is supposed to allow the acquisition of competences. Traditionally it focuses more on hard skills and knowledge. Thanks to new technologies, universities can fulfil their role in innovative ways by incorporating future-oriented competences into the foundation of their operations. Unfortunately, they are not yet able to do so [13]. The formal education system is not able to prepare today's students for the fast-changing world [9]. The main challenge for universities is to change the way students are educated so that they acquire the key competences necessary for the labor market and also prepare them to function in a world where constant change is the norm. Modern education should build a bridge between competency models and frameworks and the logistics sector, preparing it for ongoing change.

Currently, foresight approaches are rarely used in the formal education system. However, there are some examples of organizing workshops that use these anticipatory approaches to develop the ability to cope with uncertainty [38]. These examples include: The ACTVOD workshop [39]; a workshop based on scenario intervention methodology [40]; and foresight sessions for students at professional educational institutions [41]. Additionally, a training course has been developed to support university students in career planning and personal development [42]. This course uses a foresight approach to support professional and personal development and a Futures Literacy approach to allow students to experience various ways of "using the future" in the context of their future profession. The authors did not find any examples in the literature of using foresight approaches to educate logistics students. [43] emphasized that logistics professionals need to adopt a Design-for-Resilience approach, demonstrating strategic foresight by maintaining safety stock, securing subcontracting capacities, and establishing supply backups to accommodate excessive and unexpected demand. Therefore, integrating foresight into logistics course curricula would help upskill aspiring logistics professionals and reduce the soft competency gap. Ultimately, this would enable them to better prepare for possible futures and adapt more seamlessly to dynamic and uncertain work environments.

6. FORESIGHT WORKSHOP PROGRAM

Investigations clearly show that people do not learn well as "spectators," or passive recipients of knowledge delivered by experts [44, 45]. Students prefer teaching methods that enable active learning [46]. Thus, there is a need to equip students with future-oriented competences in an active way. The use of a future studies approach allows us to meet both of these objectives. The authors of the paper propose to include a set of foresight workshops each year within bachelor's studies (Fig. 1).

A set of practical foresight workshops can be implemented within the existing portfolio of subjects or offered as a standalone course. The workshops are integrated in each year of the bachelor's program, and each year focusing on an important aspect of logistics transformation that shapes the future of the field and influences the competence requirements of logistics professionals. As a result of an analysis regarding the main aspects of logistics transformation, the following topics were selected as exemplary workshop themes: Technological Transformation & Digitalization, Ecological Transformation, and Client Value Transformation.

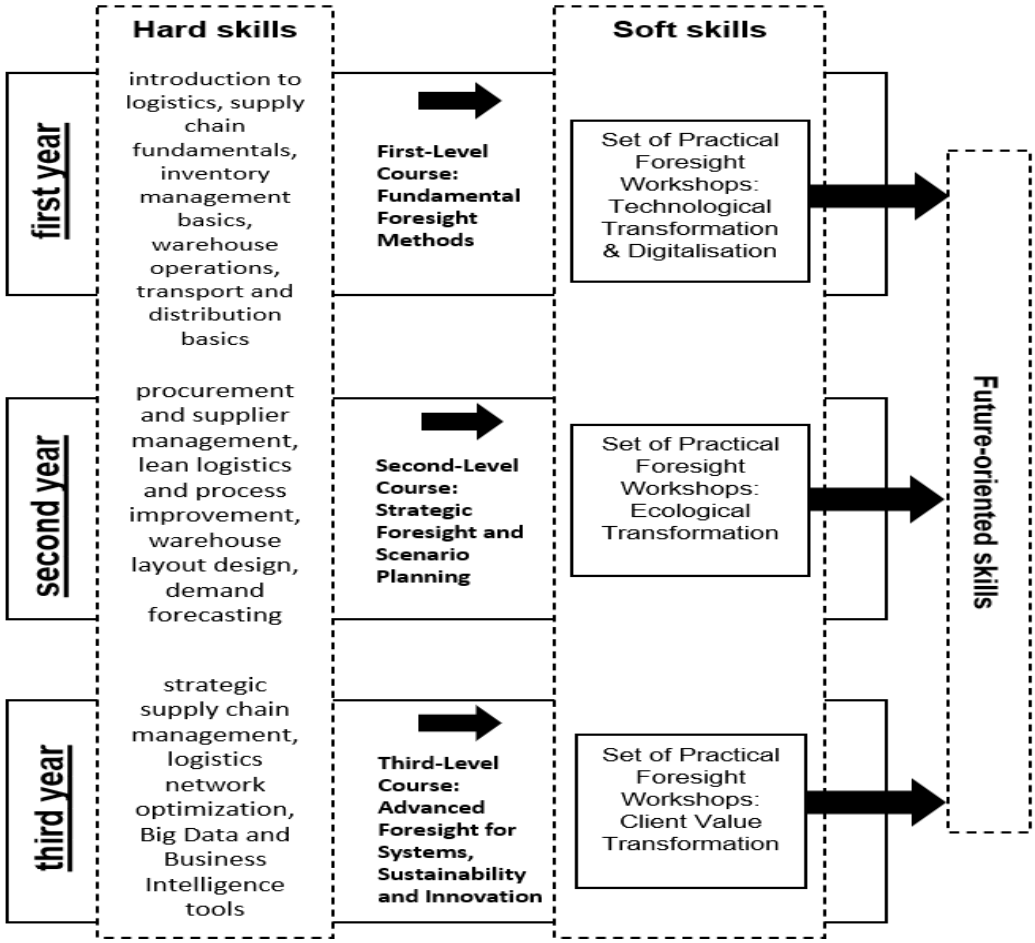

Figure 1: Future-oriented competences development path in logistics: Foresight workshop program for bachelor's studies
Source: Own elaboration by Joanna Łabędzka

The overall objective of the workshop is to prepare students for an uncertain and unpredictable future, both professionally and personally. To achieve this, increasingly advanced future studies methods are applied each year. First year's workshops are focused on an introduction of future thinking, main tools and foresight role in logistics and management. Fundamental foresight methods are such as PESTLE analysis, identification of weak signals and wild cards, and cross-impact analysis. In the second year, more advanced foresight tools and techniques are introduced in the workshops, including bibliometrics, scenario building, the Delphi method, and trend analysis. The final year of the bachelor's program, focused on developing future-oriented competences, is dedicated to the most advanced topics, such as digital tools for foresight simulations, backcasting, resilience and adaptation futures, and Futures Literacy Labs (UNESCO Method) [47]. By building students' advancement year by year, future-oriented competences will have the opportunity to be gradually strengthened and developed throughout the program.

The set of thematically oriented workshops for each academic year may include around 10 separate sessions divided into 4 modules, each focused on developing hard and soft skills, including future-oriented competences, through various foresight methods.

Fig. 2 shows a sample workshop structure for the First-Level Course: Fundamental Foresight Methods on the theme of Technological Transformation & Digitalization.

In the introductory part of the practical workshops, students are taught the importance of long-term planning and the role of foresight in anticipating the distant future. The concept of foresight and its potential for logistics is highlighted. In this section, future-oriented skills such as anticipatory thinking and long-term strategic planning are particularly emphasized and developed.

Moving to the practical part, the first step is to identify the drivers, i.e. "influential forces of changes that are currently shaping or have the capacity to shape or transform a system" [48]. This can be accomplished by using the STEEPL or PESTLE

framework, which takes into account social, technological, ecological, economic, political, and legal drivers [49]. PESTLE analysis enables the development of environmental scanning and resilience-building skills with a future-oriented focus.

The next module is devoted to the identification and analysis of weak signals in the technological and digital landscape. Reference [50] describes weak signals as "the early signs of possible but not confirmed changes that may later become more significant indicators of critical forces for development, threats, business and technical innovation. They represent the first signs of paradigm shifts, or future trends, drivers or discontinuities." Weak signals are "events which characterize a high degree of uncertainty and lag time, there is at the start no complete and relevant information about their consequences, but they indicate future changes and can lead to serious transformations in the current social and economic situation" [51]. Key characteristics of weak signals are: "the uncertainty of the consequences, incomplete information and complexity of interpretation, lag time, the ability to become a new trend or to lead to significant changes in the future" [51]. The weak signals exercises shape awareness of future symptoms in the present, helping to "read the future" and develop a futures literacy mindset. An important qualitative method, often used in foresight methodologies, is brainstorming. Brainstorming is a creative and interactive method used in expert panels to stimulate idea generation through free associations and open discussion in a non-critical environment, aiming to quickly gather a large number of ideas that are later assessed, prioritized, and refined in three key phases: preparation, idea generation, and evaluation [52].

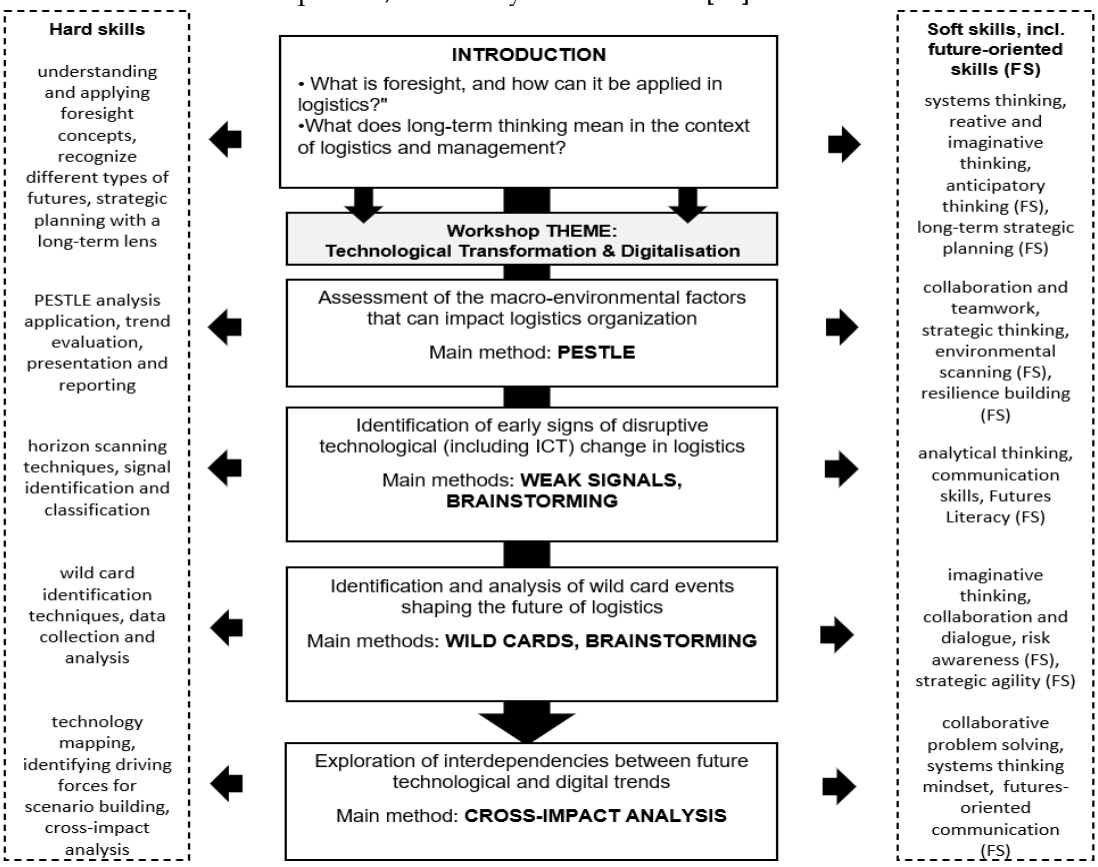

Figure 2: A sample structure of the First-Level Course
Source: Own elaboration by Joanna Łabędzka

According to [53] "brainstorming is a key component of foresight research, while its application is very flexible and can take the form of an unoriented discussion, as well as carefully prepared surveys." Brainstorming was selected as an effective method to support the development of hard, soft (including future-oriented) competences by fostering creativity, collaboration, and future-oriented communication.

The following part in the proposed program for bachelor's studies is focused on wild card events that could significantly impact the logistics industry, simultaneously altering the portfolio of required staff competences. Wild cards are "sudden and unique incidents that can constitute turning points in the evolution of a certain trend." They are "phenomena that will have large and immediate consequences for

organizational stakeholders if they take place" [54]. E.g., earthquakes, cyclones, tsunami, meteorite falls. Wild card analysis would help to raise risk awareness among students and sensitize them to the impact of unexpected events on the development paths of logistics as well as on their own careers.

The last module is intended for exploration of independences between technological and digital trends with the use of a cross-impact method. It "provides a structured approach to choosing those outcome combinations for which scenarios are built, based on statements concerning the logical relationships between the factors and their outcomes" [55]. The application of this method enables one to assess and interpret complex interdependencies between different factors or events influencing the future of logistics. Students are equipped with a semi-quantitative approach that is highly useful for presenting long-term future visions and assumptions to decision-makers.

The first-level course and its learning outcomes are then used in the second-level course, which is more advanced in applying practical foresight methods (e.g., scenario building) and developing strategic decision-making skills.

7. CONCLUSIONS

The presented framework demonstrates significant practical potential for bridging the gap between logistics under strong transformation forces, evolving labor market demands, and higher education in logistics. By integrating a foresight workshop program into bachelor's studies in logistics, it offers an innovative and original approach to developing future-oriented competences, distinct from traditional educational models.

This approach equips students with the skills to navigate uncertainty, prepare for and adapt quickly to ongoing change, and anticipate future developments in the logistics sector, addressing critical deficits in current curricula. Its application not only enhances the educational offering but also fosters professional growth in a rapidly transforming logistics sector, making it a valuable tool for educational innovation. Thanks to its foresight-based nature, the proposed set of workshops is suitable for students who already have some knowledge of future studies or have taken part in a similar workshop, as well as novices in this area.

The next stage of the planned work will involve running pilot workshops for logistics students. Observations from these workshops will inform any necessary modifications to the scope and methods used.

As previously mentioned, research conducted to date indicates that students expect their studies to equip them with the key competences required in the future [13]. It would therefore be appropriate to conduct a survey with participants of the pilot foresight-based workshop to assess the effectiveness and appeal of using foresight methods to acquire future-oriented competences.

REFERENCES

J. Voogt, O. Erstad, C. Dede, P. Mishra, "Challenges to Learning and Schooling in the Digital Networked World of the 21st Century," J. Comput. Assist. Learn, vol. 29, pp. 403–413, 2013.

U.-D. Ehlers, "Future Skills: The Future of Learning and Higher Education," 2020.

J. Keller, C. Markmann, H. A. von der Gracht, "Foresight support systems to facilitate regional innovations: A conceptualization case for a German logistics cluster," Technological Forecasting and Social Change, vol. 98, pp. 15–28, 2015.

C. C. Millar, O. Groth, J. F. Mahon, "Management innovation in a VUCA world: Challenges and recommendations," California Management Review, vol. 61, issue 1, pp. 5–14, 2018.

N. N. Beni, "Presenting a framework for foresight in education," In F. Uslu. Proceedings of 5th International Conference on Education and Social Sciences (INTCESS 2018), pp. 1072–1078, Istanbul, Turkey, 2018.

M. Bacigalupo, P. Kampylis, Y. Punie, G. van den Brande, "EntreComp: The entrepreneurship competence framework," Publication Office of the European Union. EUR 27939 EN. https://doi.org/10.2791/593884, 2016.

S. Vitello, J. Greatorex, S. Shaw, "What is competence? A shared interpretation of competence to support teaching, learning and assessment," Cambridge University Press & Assessment, 2021.

U.-D. Ehlers, "Future Skills: A Framework for Higher Education," Karlsruhe, Germany, 2022.

O. Ioannidou, S. Erduran, "Policymakers' Views of Future-Oriented Skills in Science Education," Frontiers in Education, vol. 7, article 910128, 2022.

B. Poteralska, J. Łabędzka, K. Brożek, "Identification and Development of Future-Oriented Competences," Proceedings of the 12th International Scientific Conference "Business and Management 2022," Vilnius, Lithuania, pp. 852–858, 2022.

R. Aurava, K. Sormunen "Future-oriented skills and knowledge in game jams, a systematic literature review," Computers and Education Open, vol. 4, 100129, 2023.
C. Kain, C. Koschmieder, M. Matischek-Jauk, S. Bergner, "Mapping the landscape: A scoping review of 21st century skills literature in secondary education," Teaching and Teacher Education, vol. 151, 104739, 2024.
R. Włoch, K. Śledziewska, "Kompetencje przyszłości. Jak je kształtować w elastycznym ekosystemie edukacyjnym?," DELab UW, Warszawa, 2019.
K. Klowden, Q. Lim, "Future of work: Insights for 2021 and Beyond," Milken Institute, 2021.
A. Sala, Y. Punie, V. Garkov, M. Cabrera Giraldez, "LifeComp: The European Framework for Personal, Social and Learning to Learn Key Competence," Publications Office of the European Union, Portugal: Lisbon, 2020.
O. Habets, J. Stoffers, B. Van der Heijden, P. Peters, "Am I Fit for Tomorrow's Labor Market? The Effect of Graduates' Skills Development during Higher Education for the 21st Century's Labor Market," Sustainability, vol. 12, issue 18, 7746, 2020.
Q. Wang, J. J. Liu, "Teaching for the future: a transnational university practice," On the Horizon, vol. 28, issue 2, pp. 85–92, 2020.
N. Petru, M. Marejka, "Determinants of Management of the 21st Century, their Impact on Communication and the University Education," Ad Alta-Journal of Interdisciplinary Research, vol. 4, issue 2, pp. 30–34, 2014.
D. Finegold, A. S. Notabartolo, "21st century competencies and their impact: An interdisciplinary literature review. Transforming the US workforce development system," 19, 56, 2010.
W. Lyu, J. Liu, "Soft skills, hard skills: What matters most? Evidence from job postings," Applied Energy, vol. 300, 117307, 2021.
J. Ejdys, K. Halicka, M. Kosior-Kazberuk, D.Szpilko, E. Krawczyk-Dembicka, M. Czerniawska, "Kompetencje teraźniejszości i przyszłości – oczekiwania pracodawców reprezentujących mikro, małe oraz średnie przedsiębiorstwa w województwie podlaskim," Politechnika Białostocka, 2024.
G. Silva, A. I. Correia, M. Oliveira, "The Role of Soft Skills in the Tourism Industry and the Challenges for HEI's: The Case of Portugal," Proceedings of the 9th International Conference on Future of Education, Florence, Italy, pp. 436–440, 2019.
W. Mainga, M. B. Murphy-Braynen, R. Moxey, S. A. Quddus, "Graduate Employability of Business Students, Administrative Sciences," vol. 12, issue 3, pp. 1–35, 2022.
S. Makris, K. Alexopoulos, G. Chryssolouris, "Logistics," In: Laperrière, L., Reinhart, G. (eds) CIRP Encyclopedia of Production Engineering. Springer, Berlin, Heidelberg, 2014.
I. Ali, D. Gligor, M. Balta, S. Bozkurt, T. Papadopoulos, "From disruption to innovation: The importance of the supply chain leadership style for driving logistics innovation in the face of geopolitical disruptions," Transportation Research Part E: Logistics and Transportation Review, vol. 187, 103583, 2024.
P. Helo, V. V. Thai, "Logistics 4.0 – digital transformation with smart connected tracking and tracing devices," International Journal of Production Economics, vol. 275, 109336, 2024.
R. Stasiak-Betlejewska, K. Czarczyk, "Digital Transformation of Logistics: How Modern Technologies Increase Supply Chain Safety," System Safety: Human - Technical Facility - Environment, vol. 6(1), pp. 410–420, 2024.
H. Yalcin, T. U. Daim, "Logistics, supply chain management and technology research: An analysis on the axis of technology mining," Transportation Research Part E: Logistics and Transportation Review, vol. 168, 102943, 2022.
S. Roy, R. Mohanty, "Green logistics operations and its impact on supply chain sustainability: An empirical study," Business Strategy and the Environment, vol. 33, pp. 1447–1476, 2023.
T. Le Minh, V. M. Ngo, N. T. H. Nguyen, M. N. N. Thai, N. T. Truong, "Logistics Service Quality, Customer Satisfaction and Retention: Moderating Effects of Technological Capability," Academic Journal of Interdisciplinary Studies, vol. 13(5), pp. 164–182, 2024.
E. Dadzie, A. Richard, "Evaluating the Role of Logistics in Supply Chain Management," Dama Academic Scholarly Journal of Researchers, vol. 10, pp. 112–133, 2025.
M. A. Iqbal, J. Su, S. Hasan, "Skill and knowledge requirements of entry-level logistics professionals in the apparel industry of Bangladesh: an importance-expertise matrix analysis," International Journal of Fashion Design Technology and Education, vol. 15, pp. 45–56, 2021.
I. C. Fantozzi, S. D. Luozzo, M. M. Schiraldi, "On tasks and soft skills in operations and supply chain

management: analysis and evidence from the O*NET database," The TQM Journal, vol. 36(9), pp. 53–74, 2023.
F. Cantoni, A. Ricciardi, P. G. Bisogni, H. Zsifkovits, "The unravelled role of soft skills in the logistics and supply chain management field," Journal of Innovation & Knowledge, vol. 9(4), 100615, 2024.
A. Katinienė, Ž. Jezerskė, K. Vaičiūtė, "Research on competencies of logistics specialists in transport organisations," Journal of Business Economics and Management, vol. 22, pp. 1308–1322, 2021.
L. Y. Koh, K. F. Yuen, "Emerging competencies for logistics professionals in the digital era: A literature review," Frontiers in Psychology, vol. 13, 2022.
European Logistics Association, "European Qualification Standards for Logistics Professionals," Brussels: ELA, 2014.
P. Forte, R. Miller, T. Bowen, J. Vissers, R. Faubel, E. Pavi, T. Malmstrom, "A Futures Literacy Application in Health Care: The Managed Outcomes Project Case Study," Journal of Futures Studies, vol. 24, issue 3, pp. 51–61, 2020.
V. Lauttamaki, "ACTVOD-futures workshop – a generic structure for a one-day workshop," Foresight, vol. 18, issue 2, pp. 156–171, 2016.
A. Bourmistrov, B. W. Amo, "Creativity, proactivity and foresight," Technological Forecasting and Social Change, vol. 174, Article Number 121215, 2022.
N. P. Dedov, E. B. Fantalova, O. I. Vaganova, A. V. Lapshova, V. A. Kuznetsov, "Role of foresight sessions in professional self-development of students," Revista de la Universidad del Zulia. 3ª época, vol. 12, issue extra 35, pp. 504–515, 2021.
A. Kononiuk, E. Rollnik-Sadowska (Eds.) "Replay your futures – labs for exploring undiscovered pathways," Lukasiewicz Research Network – Institute for Sustainable Technologies, Poland, 2022.
D. Ivanov, "Lean resilience: AURA (Active Usage of Resilience Assets) framework for post-COVID-19 supply chain management, "International Journal of Logistics Management, vol. 33, no. 4, pp. 1196–1217, 2021.
D. R. Serrano, M. A. Dea-Ayuela, E. Gonzalez-Burgos, A. Serrano-Gil, A. Lalatsa, "Technology-enhanced learning in higher education: How to enhance student engagement through blended learning," European Journal of Education. Research, Development and Policy, vol. 54, issue 2, pp. 273–286, 2019.
R. Bolstad, J. Gilbert, S. McDowall, A. Bull, S. Boyd, R. Hipkins, "Supporting future-oriented learning & teaching — a New Zealand perspective Report to the Ministry of Education," New Zealand Council for Educational Research, Ministry of Education, New Zealand, 2012.
M. Vaclavik, M. Tomasek, I. Cervenkova, B. Baarova, "Analysis of Quality Teaching and Learning from Perspective of University Students," Education Sciences, vol. 12, issue 11, 2022.
R. Miller, R. Sandford, "Futures Literacy: The Capacity to Diversify Conscious Human Anticipation," In: Poli R. (ed.) Handbook of Anticipation, Springer Nature Switzerland, 2019.
A. Krishnan, S. Robele, B. Kistemaker, S. Happ, O. Ajilore, S. Sarva, Z. Kakal, "Foresight Playbook. Overview of Foresight Tools," United Nations Development Programme Regional Bureau for Asia and the Pacific, New York, 2022.
The Futures Toolkit, Government Office for Science, London, UK, 2024.
O. Saritas, J. E. Smith, "The Big Picture – trends, drivers, wild cards, discontinuities and weak signals," Futures, vol. 43, pp. 292–312, 2011.
J. Ponimareva, A. Sokolova, "The Identification of Weak Signals and Wild Cards in Foresight Methodology: Stages and Methods,". Working Papers Series: Science, Technology and Innovation, WP BRP 46/STI/2015. The National Research University Higher School of Economics, Russia, 2015.
M. Romanowski, K. Nadolny, "Technological foresight: characterisation of research methods used in prospective analysis," Journal of Mechanical and Energy Engineering, vol. 2(42), no. 2, pp. 101–108, 2018.
R. Popper., M. Keenan, I. Miles, M. Butter, G. S. Fuenta, "Global Foresight Outlook 2007," The European Foresight Monitoring Network, 2007.
J. Kaivo-oja, S. Mendonca, M. Pina e Cunha, F. Ruff, "Wild cards, weak signals and organizational improvisation," Futures, vol. 36(2), pp. 201–218, 2004.
A. Salo, E. Tosoni, J. Roponen, D. W. Bunn, "Using cross-impact analysis for probabilistic risk assessment. Futures & Foresight Science, vol. 4, issue 2, DOI: 10.1002/ffo2.103, 2022.