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Future Competencies: Employers' Insights on Economics Graduates from the Lublin Voivodeship

Keywords: competencies of the future; future skills; education; job market; economics graduates

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Abstract

Theoretical background: Developing adequate skills is a key role that higher education institutions play for the benefit of their students/graduates, employers operating in the labour market, and society. However, their environment poses several challenges, and the pace of emerging changes makes planning the scope of competencies shaped in educational programs challenging. Moreover, they must take into account current trends and, given the duration of the educational period, anticipate what the competence needs of the labour market will be in the future. In response to emerging trends, expectations regarding the competencies that graduates possess are changing. Among these, it is worth mentioning the growing importance of technical skills related to Industry 4.0 and the growing importance of higher-level cognitive skills. However, the growing emphasis on developing social competencies is also worth noting. These seem universal, and even though the world changes, they still play a crucial role in building positive interpersonal relationships

despite the digitalisation and virtualisation of everyday life. However, it is also worth referring to local labour markets in research, which may have slightly different needs and expectations. In the context of environmental change, competencies related to sustainable development also seem to play an increasingly important role. As a result of these trends, higher education institutions are responsible for supplying graduates with job-related technical skills and a variety of soft skills, as well as for shaping attitudes that will ensure young people can become valuable members of society.
Purpose of the article: The primary purpose of the article is to identify the university graduates' competencies that employers believe are important currently and will be important in the future, based on the analysis of competencies of the graduates of data analysis, economics, finance and accounting, logistics, and management courses of studies at the Faculty of Economics of Maria Curie-Skłodowska University in Lublin.
Research methods: The survey used quantitative and qualitative research methods, including a CAWI (computer-assisted web interview) study of 155 employers and an IDI (individual in-depth interview) study of 16 employers in the Lublin region. Both studies were conducted in the first half of 2023.
Main findings: The results highlight the competencies currently in demand and those to be sought in the next five years. According to the research results, the ranking of competencies expected from economics graduates will not change significantly in the next few years. However, according to the surveyed employers, basic IT skills and knowledge of the latest technologies may become more significant. In contrast, the importance of skills such as analysis and synthesis or the ability to communicate verbally and in writing in Polish will decrease. These changes may result from globalisation processes and the development of modern technologies, especially those related to artificial intelligence, which are expected to lead to fundamental changes in the labour market in the near future. The conclusions drawn from this research facilitate a comparison with other studies on this crucial topic. It should be noted that the primary constraint of the study is its regional focus and the fact that it solely targets employers who hire economics graduates.

Introduction

Preparing university graduates for the demands of changing labour markets is challenging because it has to take into account the conditions of a highly volatile, uncertain, complex and ambiguous (VUCA) environment (Minciu et al., 2019) in which both higher education institutions (HEI) and organisations present in the labour market operate. Time has become critical in shaping the educational pathways of young people, as universities design their curricula not only based on currently existing competence requirements but also try to take into account the future needs of employers. It is essential as changing educational programmes is a long-term process, and the existing circumstances of HEIs mean limited flexibility and longer reaction times to emerging changes. Hence, there is a need to study the expectations reported by employers regarding not only the currently expected level of competencies of graduates but also to forecast the directions in which the labour market will develop and, consequently, the expectations regarding the desired future competencies. Such competencies of the future are those qualities of employees that affect their work efficiency, which are related to the projected civilizational changes and technological progress (Kurowicka-Roman & Kurowicki, 2021).

Phenomena changing the current labour market, such as new technologies and the resulting automation of processes, as well as their effects such as labour market

polarization, but also the growing emphasis on sustainability of company's operations, which leads to the emergence of "green jobs", will be described in more detail in the subsequent parts of the article. In the broadest sense, they include those competencies that are gaining importance, those that will be relevant in the future, those that are re-emerging and those that are timeless (Low et al., 2021).

This article attempts to identify the university graduates' competencies that employers believe are currently and will be important in the future in the next 5 years. At the same time, it is limited to competencies of the graduates of data analysis, economics, finance and accounting, logistics, and management courses of study, as the study included only the respondents employing graduates from selected courses at the Faculty of Economics of Maria Curie-Skłodowska University. The literature analysis has shown that there are studies on future competencies, a large number of which are conducted on the global level and by international institutions. In our opinion, however, it is also worthwhile to carry out studies of a more local nature to identify the potential existence of differences due to the specific characteristics of local labour markets. It is also important to include the local/regional level of analysis in the research of competencies for the future. Local labour markets exhibit significant diversity regarding available skills and skill deficiencies, which profoundly impacts regional employers' competency requirements and thus their development strategies. In regions with a shortage of skilled workers, firms tend to experience lower productivity, potentially leading to persistent regional disparities. Furthermore, regions with low demand for skills risk falling into low-skill traps, where the lack of incentives to upgrade qualifications results in enduring productivity gaps. Skills at the regional level influence the region's competitiveness, innovation, economic resilience, and income inequality (Clark & Bailey, 2018). Therefore, skills policy, not only of companies but also of local governments and higher education institutions, must consider the specific needs of local labour markets to counteract these traps and support regional development effectively (Suleman et al., 2023). By addressing these localised skill deficiencies, regions can enhance their growth potential and better prepare for future competency demands (Corradini et al., 2023).

The study presented in this article was conducted and describes the future competencies perceived by employers in Lublin Voivodeship. This area is in eastern Poland and represents one of the nation's most pivotal agricultural regions, encompassing extensive farmland. The region's industrial activities predominantly focus on food production, chemical manufacturing, and machinery. However, the service sector is experiencing dynamic growth, particularly in information technology, education, and tourism domains. In 2023, the service sector contributed 60% to the voivodeship's gross value added. By the end of 2024, the unemployment rate stood at 7.4%, surpassing the national average of 5.1%. The average gross salary in Lublin Voivodeship in 2023 was approximately PLN 4,500, compared to the national average of around PLN 5,500 (Statistical Office in Lublin, 2023).

The region is distinguished by its academic potential, which fosters innovation and competitiveness. Lublin hosts nine higher education institutions, offering over 200 academic programs, with a student population exceeding 60,000 (Student. Lublin, n.d.). The majority of graduates specialise in fields such as law, engineering, economics, and medicine.

The study described in this article allows us to address the existing knowledge gap, as it enables such a comparison in relation to time (current-future), geography, and the specifics of the studied fields of study.

Literature review

Environmental factors shaping the competencies' expectations in the labour market

Predicting future labour market conditions requires considering several key trends emerging in the environment. Notable among these is the technological revolution, which is sometimes referred to as the Fourth Industrial Revolution or Industry 4.0 (Kurt, 2019). The basis for the functioning of this new reality is the availability and dissemination of "the combination of numerous physical and digital technologies such as artificial intelligence, cloud computing, adaptive robotics, augmented reality, additive manufacturing and Internet of Things (IoT)" (Ustundag & Cevikcan, 2018, p. v). Industry 4.0 generates four main impacts: changing customer expectations, increased productivity, inter-organisational collaboration and the need to rethink and redesign companies' systems and operating models (Ada et al., 2021). A key impact area also relates to the labour market and the competencies required of job candidates looking for employment in the new environment. To a large extent, these competencies are shaped within HEI's curricula, which influence their graduates' employability (Low et al., 2021).

Industry 4.0 and the inherent automation of tasks and processes are causing several structural changes in the global labour market (Ada et al., 2021; Gleason, 2018). The elimination of routine and repetitive tasks that used to be performed by employees, resulting from the use of modern technologies, may lead to job reductions in some sectors of the economy (Chalutz & Cohen, 2022; Socha & Wojdyła, 2021; Śledziewska & Włoch, 2020). At the same time, the need to operate automation systems creates new employment opportunities in areas related to their design, programming, operation and maintenance (Gorustowicz, 2019). The relative growth of employment in the service versus industry sectors is also expected to lead to global changes in the perception of work, increasing the role of automation and interaction with machines (Socha & Wojdyła, 2021). Shortages of workers with technical skills, especially in the digital area, will increase with the digital transformation, requiring effective education and recruitment efforts, such trends are visible both in a local (country) or international context (EU) (Ada et al., 2021; Dervojeda et al., 2019; Socha & Wojdyła, 2021).

Requirements for a range of specialised technical skills are also globally increasing, creating a demand for workers with such competencies (Bughin et al., 2018), particularly evident in the desire for job candidates' science, technology, engineering and mathematics (STEM) skills.

However, there is also a shift in demand for cognitive skills from basic to higher-level skills. However, demand for some types of higher-level cognitive skills will decrease with automation (Bughin et al., 2018). Other categories of skills will be less in demand, such as basic cognitive skills and physical and manual skills (Verdin & O'Reilly, 2021). However, the extent of the impact of automation on individual competencies appears to be local and industry-specific. It varies according to the speed of technological adaptation (Shelest-Szumilas et al., 2023) and between sectors, with greater demand for physical skills in some of them (Bughin et al., 2018).

At the same time, there is a need to develop soft skills, such as interpersonal skills, planning, creativity or time management, which are essential both globally and locally in the context of teamwork and customer service, which are vital processes in modern businesses (Bughin et al., 2018; Gorustowicz, 2019; European Commission, 2019; Kurowicka-Roman & Kurowicki, 2021; Low et al., 2021). Employers face the challenge of attracting and retaining employees with the right competencies who can flexibly adapt to the new reality. Another point worth noticing is that changes due to technological progress mean that even competencies critical at a given time can become obsolete quickly, which increases the importance of candidates' competencies such as flexibility, adaptability and readiness for continuous learning (Chalutz & Cohen, 2022; Gleason, 2018; Kipper et al., 2021; Van Laar et al., 2017).

A phenomenon that is increasingly impacting the shape of markets and economies is the spread of circular economy and sustainability concepts in environmental, social and economic areas (Cabral & Dhar, 2021; Sern et al., 2018; Sulich & Sołoducho-Pelc, 2022). The environmental dimension is of particular importance here. The transition to a "green economy" can change the labour market, increasing the availability of jobs in industries related to renewable energy and green technologies (Bassi & Guidolin, 2021; Bozkurt & Stowell, 2016). There is an emergence of "green jobs" understood as "jobs that help to protect and restore ecosystems and biodiversity, reduce energy consumption, decarbonise the economy, and minimise or altogether avoid the generation of all forms of waste and pollution" (UNEP, 2008, p. 7) on the labour market. It implies new requirements for potential employees to have green competencies, including eco-environment-related knowledge, skills, abilities, awareness, attitude and behaviour (Cabral & Dhar, 2021). Since the growth of the green economy generates a demand for employees with green skills, as examples from some European countries show, educational institutions tend to pay more attention to developing green competencies among their graduates (Dlimbetova et al., 2016; Holm et al., 2017).

Industry 4.0 also introduces new requirements for traditional competencies that must be redefined to match the new technologies (Ada et al., 2021). Required skills

in the IT industry are changing, creating a mismatch between needs and available job candidates' profiles (Goulart et al., 2022). Companies must collaborate with various stakeholders, including educators, trade unions and governments, to effectively manage the challenges of the transforming labour market (Bughin et al., 2018).

Changes driven by technological progress are not the only phenomena in the environment shaping the evolving requirements for competencies needed in labour markets, both globally and locally. Among other phenomena, it is worth highlighting the significance of demographic, social, and globalisation changes. Although it is difficult to analyse them separately from technology, as they are directly linked to it, it is also essential to consider their impact on competency expectations.

Demographic changes are directly linked to the division of the world into developing and developed countries, and the phenomena characterising these societies are markedly different. In developed countries, the ageing population is a prominent issue, which necessitates changes in the labour market related to enhanced skills in managing age diversity, fostering intergenerational collaboration, and addressing the unique challenges older employees face (Börsch-Supan et al., 2021; Brečko, 2021; Ziółkowska, 2021). Additionally, the ageing population drives a growing demand for healthcare professionals, including nurses, caregivers, and health specialists (Greer, 2021; Ogugua et al., 2024). Conversely, emerging economies experience a rise in the number of young workers, which increases the demand for professions related to education and digital technologies. Young employees in lower-income countries are increasingly sought after for their skills in these areas, reflecting the global technological advancement and educational development trend (Hosan et al., 2022; Orkin et al., 2024).

Similar differences also appear in the context of urbanisation. Developed countries have higher urbanisation rates than developing countries; however, the urbanisation growth rate is significantly higher in the latter, driven by migration from rural areas to cities in search of better living and working conditions (Chen et al., 2023; UN DESA, 2019). Urbanisation, a global trend, imposes additional skill requirements on workers compared to similar jobs in less populated areas. Urban environments demand competencies in navigating complex infrastructures, managing higher population densities, and addressing urban-specific challenges (Rouwendal & Koster, 2025). Concurrently, changes in educational structures highlight the growing importance of lifelong learning and continuous skill enhancement. As market demands evolve, employees must engage in ongoing education to maintain relevance and competitiveness. This shift underscores the need for soft skills development, including motivation, mentoring, and talent management (Ramírez-Montoya et al., 2021).

A trend emerging from the development of technologies that, among other benefits, facilitate more effortless physical movement across the globe, as well as reduce the need for physical travel through electronic communication means, is globalisation. Globalisation brings about various changes in the competencies required in contemporary labour markets, while also leading to a certain similarity of require-

ments, and thus a set of universal, transnational competencies emerges (Boix Mansilla & Jackson, 2023; Majewska, 2023). On the one hand, local markets have specific characteristics that may impose different demands, but global trends are increasingly becoming evident locally. Globalisation has significantly impacted the competencies required in the labour market, emphasising the importance of intercultural communication and foreign language proficiency (Deardorff & Jones, 2023; Oberste-Berghaus, 2024). As international trade and collaboration expand, employees must be able to navigate diverse cultural contexts and effectively communicate across borders. This trend necessitates the development of skills that facilitate international cooperation and understanding. Furthermore, professional mobility has become a key aspect of the modern workforce, requiring employees to be adaptable and flexible in various locations and environments (Caligiuri, 2023).

The ability to quickly integrate into new settings and work effectively in multicultural teams becomes a key competency in a global labour market.

HEI and labour market competencies of the future

Implementing the competencies of the 4.0 industry also involves all stages of education and learning outside the education system, which requires the involvement of vocational teachers and the promotion of lifelong learning (Socha & Wojdyła, 2021). However, the sphere of higher education, which at least partly bears responsibility for shaping young people's competencies while entering the labour market, plays a unique role here (Rocki, 2020). HEIs face the challenge of appropriately modifying their study programmes to be tailored to the changing needs of the industry, which can be particularly difficult in the area of technology and information systems (Cummings & Janicki, 2020). The difficulty in forecasting the demand for competencies stems from the dynamic and often unpredictable changes in the labour market, affecting the ability to respond effectively (Jelonek et al., 2019). However, as projections of the future shape of the labour market indicate, higher education must focus not only on imparting technical knowledge but also on developing personal, cognitive, social and emotional skills (Goulart et al., 2022; Ilori & Ajagunna, 2020). The shaping of social competence, such as lifelong learning, plays a unique role here because, with such a changing environment, education cannot end when one leaves the university's walls (Gleason, 2018).

The education system ought to also take steps to reduce the adverse social effects of increasing automation (Socha & Wojdyła, 2021). One of these is the increasing polarisation of the labour market visible locally and globally (Arendt & Gajdos, 2022; Verdin & O'Reilly, 2021). As a result, it has led to the emergence of two extreme groups of workers: highly skilled professionals involved in designing and operating automation systems and workers performing simple, low-paid tasks amenable to automation (Bughin et al., 2018). Those with technical skills in STEM fields are in a more favourable position, which contributes to income inequality between them

and lower-skilled workers (World Economic Forum, 2020). Polarisation in the labour market can perpetuate social inequalities in the long run, as those in an advantageous position have more opportunities for career and financial advancement (European Commission, 2019). Measures to reduce polarisation in the labour market need to focus on providing equal access to education, vocational training, and support for those in at-risk groups, enabling them to participate actively in the labour market. Education is crucial in fostering the knowledge, competencies, mindsets, and principles necessary for individuals to actively participate in and thrive within an inclusive and sustainable future (Arendt & Gajdos, 2022; Grenčíková et al., 2021; Szabó & Boncz, 2023). Therefore, education must strive beyond merely readying young individuals for the workforce; it must empower students with the aptitudes essential to become proactive, accountable, and involved members of society (OECD, 2018).

A visible trend in contemporary education is the development of competency-based education (CBE). This approach to curriculum development is crucial in contemporary HEIs as it ensures that graduates possess the necessary skills and knowledge to meet the dynamic and evolving demands of the contemporary labour market. By focusing on attaining excellence rather than minimum standards, CBE fosters adaptive learning experiences that prepare students to address complex real-world challenges effectively. Furthermore, CBE promotes lifelong learning and continuous professional development, essential for keeping up with the changing environment and employers' evolving requirements and expectations regarding necessary competencies (Rhoney et al., 2024). Although this concept is becoming increasingly popular among HEIs worldwide, some definitional issues exist regarding understanding the terms "competence", "competency", and "competency-based learning".

Competence is a holistic concept that involves integrating and applying contextually-appropriate knowledge, skills, and psychosocial factors (e.g. beliefs, attitudes, values, and motivations) to consistently perform successfully within a specified domain (Belasen & Rufer, 2007; Moore et al., 2002). It is often associated with the ability to apply knowledge, understanding, and skills in performing up to the standards required in employment (Recommendation of the European Parliament and of the Council of 23 April 2008 on the Establishment of the European Qualifications Framework for Lifelong Learning, 2008). It is linked to a domain and dependent on context, emphasising the interaction between the individual and context conditions in demonstrating competent performance (Vitello et al., 2021). Competency is the concept that forms the basis of the research described in this article. In contrast to competence, competency emphasises the underlying characteristics of an individual, such as behaviours, traits, and skills that enable effective task and function performance (Hoffmann, 1999; Holmes et al., 2021; Salman et al., 2020; Škrinjarić, 2022; Woodruffe, 1993). It is more task-oriented and focuses on the action, behaviour, or outcome (Kurz & Bartram, 2002; McClelland, 1973; White, 1959). Competencies can be reliably measured or quantified and differentiate between superior and average performers (Dainty et al., 2004; Hoffmann, 1999; Holmes et al., 2021).

However, these concepts are not clearly delineated, sometimes addressed as "fuzzy", and occasionally used interchangeably in literature (Wong, 2020; Woodruffe, 1993). The reason is that there is a semantic area where these two concepts overlap, which has been presented in the form of a conceptual map by Vare et al. (2022).

Competency-based education represents a paradigm shift in educational focus from curriculum content to learning outcomes. This shift, known as the "Competence Turn", emphasises what learners acquire rather than what is taught (Vare, 2022). Competency-based learning emphasises mastery, measurable objectives, meaningful assessments, timely support, and flexible assessment processes to ensure students develop and demonstrate competencies effectively (Alt et al., 2023; Holmes et al., 2021). HEI curriculum development based on this model significantly differs from a traditional model (Gruppen et al., 2016). Developing competencies by HEIs significantly enhances their graduates' employability and market position. HEIS that align their curricula with competency-based learning help bridge the gap between academic learning and practical application, thereby improving graduates' readiness for professional environments. This alignment with labour market demands not only increases the employability of graduates but also provides them with a competitive advantage, enabling them to navigate and succeed in diverse and dynamic work settings (Belchior-Rocha et al., 2022).

Considering the circumstances described above, shaping the demand for competencies graduates acquire and the perceived role of HEI in developing the employability of its students entering the labour market, it is worth indicating which competencies are most frequently mentioned in terms of future usefulness.

An analysis and synthesis of the available research literature results concerning future competencies was conducted to prepare a framework for our study's analysis. Due to the various approaches and classifications used by various authors, the competencies they mentioned were categorised into the following classes: cognitive, functional and social. The listed competencies and their frequency of occurrence are presented as word clouds in Figure 1. The complete list of studies analysed and the competencies distinguished by their authors are presented in a table in Appendix 1.

(a) cognitive competencies

(b) functional competencies

(c) social competencies

Figure 1. Cognitive, functional and social competencies of the future

Source: Authors' own study.

Analysis of the selected reports on future competencies shows that the dominant category, with regard to the number of indications, concerns social competencies. It was possible to identify 42 different competencies, which received 132 indications. Dominant responses included communication skills, interpersonal skills, learning, creativity and self-control. Flexibility, leadership skills, negotiation skills, and teamwork also received a relatively high number of indications. The second most frequently mentioned competence category was cognitive skills, which included 15 competencies and received 56 responses. Here, complex problem-solving, data analysis, analytical thinking and skills, systems thinking and management dominated. Functional competencies were indicated relatively less frequently. Nine such competencies appeared in the prepared list and received 42 indications. The competencies with the highest number of indications were technical skills, digital skills, specific knowledge, and IT skills.

Research methods

The research described in this article was carried out as part of the project "Didactic Excellence of the University", specific action "Employer research", implemented at Maria Curie-Skłodowska University (UMCS) in Lublin in 2022–2023. The main goal of the research was to identify the most important competencies for employers while recruiting university graduates from the perspective of the current and future labour market, using the example of employers in the Lublin Voivodeship who hire economics graduates from the UMCS. In order to reach this goal, we posed the following research questions: In the adopted example:

What competencies (knowledge, skills and social competencies) do employers currently expect from graduates of economics courses?

What competencies do employers think will be particularly important for graduates of economics courses in the future (5-year horizon)?

In order to answer these questions, two research projects were carried out, as the use of mixed methods that complement each other has allowed for the creation of a more holistic picture of the phenomenon and a deeper understanding of it (Dawadi et al., 2021). The first was a quantitative study using an online survey technique, and the second was a qualitative study using individual in-depth interviews (IDI). The quantitative study using the web survey technique allowed for general data collection, while the qualitative study allowed for more in-depth answers to the research questions (Brannen, 2005). The quantitative study aimed to identify the competencies currently desired from economics graduates and learn about the competencies they believe may be particularly important in the next 5 years. The survey was carried out from February to May 2023 using the 1KA survey system installed on the server of the UMCS in Lublin. As a research tool, we used our design questionnaire based on the generic competencies list described in the EU TUNING Project aimed at implementing the Bologna Process in HEI (Lokhoff et al., 2010).

The selection of units for the study was non-random; purposeful and convenience sampling was used. The respondents were employers operating in the Lubelskie Voivodeship, Poland, who agreed to participate in the survey. The inclusion criterion for selection was employing at least one employee who graduated from the Faculty of Economics at the UMCS within the last five years from the survey date. In the end, 155 employers took part in the survey. Ninety-three respondents fully completed the questionnaire, while 107 completed it only partially. However, the questions that form the basis of the part of our study presented in this paper were fully completed by them, and their responses were included in the analysis. Table 1 shows the characteristics of the research sample.

Table 1. Characteristics of the research sample (quantitative survey)

Organisation size (number of employees)	1–9 employees	10–49 employees	50–249 employees	250–1,000 employees	above 1,000 employees		
	15%	42%	29%	12%	2%		
Date of establishment	1960–1969	1970–1979	1980–1989	1990–1999	2000–2009	2010–2019	2020–2022
	3%	1.5%	0%	19%	42%	30%	4.5%
Organisation type	Enterprise (commercial activities)		Non-profit organisation		Administration/public services		
	89%		1%		10%		
Activity sector	Services		Production		Trade		
	65%		16%		19%		
Course of studies of the employed graduates	Business Analytics	Economics	Finance and Accounting	Logistics	Management		
	19.5%	20.5%	20.5%	19%	20.5%		

Source: Authors' own study.

The data collected was analysed using the SPSS statistical package and the Excel spreadsheet package using basic analysis methods. The qualitative research used an individual IDI. This form of interview allows the research participant to speak freely, without the research tool suggesting answers, and to find out the individual opinions and experiences of the respondents on a given topic. The study was conducted from April to May 2023. The research tool used during the interviews was a scenario specially developed for the survey. The interview took a semi-structured form, meaning that despite having a set of specific questions, the conversation often took the form of free speech by the respondent. The selection of the sample was purposive. An attempt was made to contact dozens of potential respondents who met the recruitment criteria. A minimum number of 15 interviews was assumed. In the end, 16 respondents representing Lublin's business and institutional environment participated in the study. The study participants were recruited according to the adopted criteria, such as belonging to a group of employers operating in the Lubelskie Voivodeship and having experience in employing EC UMCS graduates. Details are presented in Table 2, which contains the profiles of the respondents. The interviews were recorded, and transcriptions were made. Only in the case of two respondents was permission for recording not given, which resulted in the need to take notes during the meeting.

Table 2. Respondent demographic profiles (qualitative survey)

Participants	Respondent's code	Gender	Industry sector	Job position
Participant 1	F1	female	logistics	Full-time employee
Participant 2	F2	female	communication	Full-time employee
Participant 3	F3	female	communication	Full-time employee
Participant 4	F4	female	industrial automation	Full-time employee
Participant 5	M5	male	data analysis	Managerial position
Participant 6	M6	male	sales, energy	Full-time employee
Participant 7	F7	female	administration	Deputy manager
Participant 8	F8	female	a public institution, communication	Managerial position
Participant 9	F9	female	banking	Managerial position
Participant 10	F10	female	customer service	Head of HR
Participant 11	M11	male	audit	Managerial position
Participant 12	M12	male	insurance	Spokesperson
Participant 13	M13	male	research and development	Full-time employee
Participant 14	F14	female	human resources	Manager
Participant 15	F15	female	competence development, human resources	CEO
Participant 16	M16	male	human resources, competence development	CEO

Source: Authors' own study.

A total of 10 women (F) and six men (M) took part in the survey, representing the type of industries in which graduates of the Faculty of Economics may seek

employment in the future after studying subjects such as logistics, finance and accounting, economic analysis, economics and management. Hiring decision-makers – managers, CEOs, executives and HR staff – were surveyed.

The following analysis will present quotations from the transcriptions of the respondents' recordings, representing an accurate transcript of the respondents' statements. The quotations are a verbatim transcript of the spoken language. Each quotation is accompanied by the Respondent's code (as shown in Table 2).

Results

Competencies of the future from the perspective of quantitative research findings

In the quantitative survey, employers surveyed rated the competencies presented to them on a scale from 0 (*lowest importance*) to 5 (*highest importance*). The results obtained in the study were subjected to statistical analysis, which included the calculation of basic descriptive statistics. Additionally, considering the results of the Kolmogorov–Smirnov and Shapiro–Wilk tests for normality, the significance of differences between the current and future importance ratings of competencies was examined using the non-parametric Wilcoxon test. Table 3 compares the mean values obtained for each surveyed competence desired currently and for the competencies that respondents believe will be important in the next 5 years, with competencies that were found to be not statistically significantly different marked in bold.

Table 3. Average ratings of competencies desired now and in the future by employers hiring economics graduates

Competencies	Competencies desired now		Competencies desired in the future		Difference of means
	Mean	Standard deviation	Mean	Standard deviation	
conduct following professional ethics	4.82	0.409	4.86	0.379	0.04
taking care of the quality of the tasks performed	4.87	0.342	4.84	0.425	**-0.03**
basic professional knowledge of the work performed	4.73	0.49	4.74	0.55	0.01
ability to apply knowledge in practice	4.69	0.465	4.74	0.44	0.05
ability to work independently	4.68	0.469	4.73	0.534	0.05
communication in oral and written form in Polish	4.72	0.515	4.67	0.577	**-0.05**
ability to adapt to new situations	4.62	0.549	4.65	0.545	0.03
basic IT skills	4.56	0.692	4.62	0.658	0.06
interpersonal skills (stress management, relationship building, etc.)	4.56	0.595	4.62	0.569	0.06
learning to learn	4.56	0.52	4.61	0.532	0.05
problem-solving skills	4.57	0.644	4.59	0.594	0.02
ability to search for and analyse information from a variety of sources	4.56	0.692	4.58	0.596	0.02

Competencies	Competencies desired now		Competencies desired in the future		Difference of means
	Mean	Standard deviation	Mean	Standard deviation	
ability to work as part of a team	4.52	0.631	4.56	0.58	0.04
ability to analyse and synthesise	4.57	0.592	4.55	0.617	**-0.02**
decision-making skills	4.43	0.802	4.52	0.669	0.09
professional experience	4.13	0.812	4.49	0.619	0.36
organisational and planning skills	4.4	0.768	4.45	0.634	0.05
success orientation	4.4	0.731	4.44	0.634	0.04
ability to work in a multidisciplinary team	4.31	0.782	4.38	0.706	0.07
initiative and entrepreneurship	4.14	0.854	4.3	0.672	0.16
basic general knowledge	4.21	0.749	4.27	0.739	0.06
knowledge of at least one foreign language	4.07	0.992	4.26	0.883	0.19
ability to communicate with experts in other fields	4.19	0.87	4.25	0.761	0.06
criticism and self-criticism	4.08	0.932	4.25	0.855	0.17
ability to develop new concepts (creativity)	3.94	0.852	4.04	0.69	0.1
preparation and management of projects	3.53	1.091	3.82	0.932	0.29
ability to work in an international environment	3.4	1.504	3.77	1.054	0.37
understanding the cultures and customs of other countries	3.47	1.11	3.67	0.993	0.2
appreciation of diversity and multiculturalism	3.52	1.174	3.63	0.964	0.11
leadership qualities	3.18	1.01	3.37	0.918	0.19
ability to carry out research (e.g. market, R&D) and analysis	3.07	1.26	3.33	0.971	0.26

Source: Authors' own study.

Out of the 31 competencies evaluated by respondents, 10 were found to have no statistically significant difference between the level expected currently and in 5 years. Based on the participants' indications, most of the competencies will become more important in the future. Only 2 out of 21 significantly differing competencies have negative values of the means differences between the future and present level of competencies. In the opinion of the employers, the following competencies will be less important in the future than at present: taking care of the quality of tasks performed (-0.03) and the ability to analyse and synthesise (-0.02). In our opinion, the decrease in the importance of these competencies may be related to the development of modern technologies, especially artificial intelligence. Modern technological solutions are pretty effective in performing simple analytical functions, so in these aspects, they might gradually replace some activities previously performed by humans. The decreasing importance of Polish language skills also does not seem surprising in the face of globalisation processes, as the importance of English as an international language of communication increases.

Competencies that employers believe will gain the most importance are: the ability to work in an international environment (0.37), professional experience (0.36), preparing and conducting projects (0.29), and the ability to conduct research and analysis (0.26). The increase in the importance of these competencies may be due to increasing globalisation and the conviction that planning and conducting projects or

carrying out research may again be a consequence of the development of technology, which, however, does not perform well in areas related to the so-called human factor, such as leadership, planning or carrying out research, where the human being still plays a key role and is difficult to replace. Table 4 compares the ranking of the Top 10 competencies currently desired and those that will be desired in the future.

Table 4. Top 10 competencies desired now and desired in the future

Competencies in demand now				Future competencies		
No.	Competencies	Mean desired now		No.	Competencies	Mean desired for the future
1	taking care of the quality of the tasks performed	4.87		1	conduct following professional ethics	4.86
2	conduct following professional ethics	4.82		2	taking care of the quality of the tasks performed	4.84
3	basic professional knowledge of the work performed	4.73		3	basic professional knowledge of the work performed	4.74
4	communication in oral and written form in Polish	4.72		4	ability to apply knowledge in practice	4.74
5	ability to apply knowledge in practice	4.69		5	ability to work independently	4.73
6	ability to work independently	4.68		6	communication in oral and written form in Polish	4.67
7	ability to adapt to new situations	4.62		7	ability to adapt to new situations	4.65
8	ability to analyse and synthesise	4.57		8	basic IT skills	4.62
9	problem-solving skills	4.57		9	interpersonal skills (stress management, relationship building, etc.)*	4.62
10	basic IT skills	4.56		10	learning to learn*	4.61

Source: Authors' own study.

The ranking of the top ten highest-rated competencies of the present does not differ significantly from the analogous ranking for future competencies. The first three places are held by the same competencies, with professional ethics being the most important in the future, according to the employers, while the quality of the tasks performed is the most important for current competencies. Basic general knowledge closes the top three in both lists. Only two competencies, the ability to analyse and synthesise and the ability to solve problems, dropped out of the top ten in the future and were replaced by interpersonal skills and learning skills, which do not appear in the top ten currently desired competencies. In the other aspects, a slight shift of one position or no change is recorded. In contrast, the ability to communicate in Polish dropped by two positions, and IT skills gained two positions.

After the preliminary assessment of the importance of the studied competencies currently and in the future, based on their mean evaluation, we followed with an

analysis of the statistical significance of differences between them. The Kolmogorov–Smirnov and Shapiro–Wilk tests that were conducted allowed us to reject the hypothesis of normal distribution of variables, which determined the use of the non-parametric Wilcoxon test based on medians. The obtained results indicate that statistically significant differences appear only in the case of two competencies: professional experience (Z = -3.501) and preparation and management of projects (Z = -2.255). The level of difference measured by the Z statistic indicates that there is a strong difference in the first case, and a moderate one in the second case. Detailed results of these tests are shown in Appendix 2.

Competencies of the future as perceived by in-depth entrepreneurs employing economics graduates – results of a qualitative study

As mentioned, the qualitative study aimed to gain more in-depth knowledge regarding the competencies that will be important for economics graduates in the next five years. This method also allowed the respondents more freedom of expression and the inclusion of competencies that may not have appeared or were worded differently in the TUNING classification. To better represent their views, the lists have retained the original forms of the respondents' statements concerning names of competencies, even though they were not always precise and disjointed.

To begin with, it is worth pointing out that the respondents stressed high variability in the aspect of competencies desired in the labour market in the future, which is indicated, for example, by respondent M12: "These criteria are evolving, as many things are changing and, well, they will probably continue to change in some way, while I am presenting the state as of today" and M13: "So, well, this is the problem we will have to face in the next 5 years, i.e. the development of these technologies will lead to the fact that the scope of competencies will change dynamically from year to year". Some respondents even indicated that in the face of high variability, predicting the competencies of the future seems to be too difficult an undertaking. F8's words indicate it: "I think that at this stage we have entered a moment when it is difficult to predict", and F9's: "It is difficult for me to answer what will happen in 5 years [laughs], what we will be doing at all, what we will be replaced in, what we will be replaced in by artificial intelligence, while maybe we should also remember one thing, that it is not that it will take jobs away from us because these jobs will simply change".

Despite the lack of certainty about their predictions, respondents indicated that some specific competencies will become increasingly important over the next few years. The list of these is presented in Table 5.

Table 5. Competencies of the future identified by surveyed employers

Competencies of the future		No. of indications	Examples of respondents' statements
1	Digital and technological competence	15	M12: "So my vision for the future is, well, digital competence and solely digital competence" F3: "I think that if we are talking about these competencies of the future, there are definitely digital competencies and some knowledge of programming languages"
2	Soft skills	12	F4: "It seems, if we look at it in such a long time horizon, that these soft competencies, as we started with hard ones at the moment, I think that this table will turn and that these soft competencies will be kind of needed, will be a priority" M11: "It is also worth remembering this emotional intelligence, which will allow us to keep that human touch"
3	Resilience (adaptability to change)	6	F10: "The ability to learn, but also the ability to change, the ability to adapt to change" M11: "Such competencies of the future cannot be ignored, also such flexibility, readiness to learn"
4	Analytical skills	4	M5: "The ability to analyse large Big Data data sets is, in my opinion, going to be a very important competence in the near future"
5	Creativity	4	M11: "Over the next 5 years, creativity is projected to see the greatest growth in importance of competencies"
6	Language competencies	3	F2: "Language skills – more and more companies are going global"
7	Inclusiveness, international openness	3	M16: "In Poland, it seems to me that it will be very important to be able to work in a multicultural environment because this is still, after all, a margin"
8	Other: Cognitive competence, Organisational competence, Negotiation, Results orientation, Crisis management, Hard skills (expert)	1	F10: "Experts will be sought after in the market because all these basic things, such easy things, which are now also done by a human being, they will be done, they will simply be automated, and an expert will still be very much in demand"
Total		53	

Source: Authors' own study.

The respondents indicated the high importance of digital and technological competencies often related to artificial intelligence or machine learning in the future. This set of competencies was emphasised by almost all respondents (only 1 person did not highlight this aspect). For example, M12 indicates: "So what my vision for the future is, digital competencies only", or F3: "I think that if we are talking about these competencies of the future, there are definitely digital competencies and here some knowledge of programming languages".

In the second place, based on the number of indications in the respondents' statements, soft competencies were ranked as important future competencies. Soft competencies, in various forms, were highlighted by 12 out of 16 respondents. For example, respondent F4 described it as follows in his statement: "It seems, if we look at it in such a long time horizon, that these soft competencies, just as we started with hard ones at the moment, I think that this table will turn and that these soft

competencies will be kind of needed, needed, will be a priority" and F9: "So here, too, such social communication skills will be at the top all the time", and F10: "If I had to say one word or one competence that will be sought in the future, I would definitely bet on empathy", as well as M11: "It is also worth remembering about emotional intelligence, which will allow us to maintain that human touch".

An important aspect that appeared in many respondents' statements was the combination of competencies related to handling modern technologies and soft skills. This set of skills seems to be seen as particularly desirable for the labour market in the coming years. For example, F15 indicates: "On the other hand, this contact between modern technologies and man will become more and more important", or M16: "Above all, the ability of man with a machine in the broad sense of the term, both in such industrial and office use". The surveyed employers indicated a possible appearance of new professions on the labour market related to the combination of these two categories of competencies, e.g. F4: "I think that soon there will be a need for the so-called technology translators, for example, I imagine that this may be a new profession", or F9: "Such a profession does not exist yet, but it will be a person (a bit of a prompter) who will be able to ask questions well and skilfully, e.g. to a GPT chat, in order to give such commands that will actually extract the information we need".

In addition, respondents also pointed to the high need to develop a whole range of skills, which can be generally described as resilience, i.e. the ability to adapt to changing conditions and the environment. Respondents pointed to the increasing importance of the ability to learn, flexibility or resistance to change. Notably, this category was highlighted by almost half (7 out of 16) respondents. The respondents formulated their views as follows: "The ability to learn, but also the ability to change, the ability to adapt to change" (F10), "such competencies of the future cannot be omitted also such flexibility, readiness to learn, so these are somewhere expected from the candidates of the future" (M11).

Respondents also highlighted creativity and the ability to think analytically as key future competencies. These were indicated by 4 interviewees for each category. For example, the high importance of creativity is highlighted by M13, who says: "People will focus on these things related to problem-solving with approaches to problem-solving. And, in fact, with creative approaches to solving a problem, so all these things, let's say mechanical things like algorithm implementation, we will leave to machines, it will be up to man to do this creative work", or M11: "In the next 5 years, it is forecast that somewhere in there, creativity will see the biggest growth in terms of the importance of competencies, analytical thinking will remain very important", M5 also draws attention to advanced analytical skills: "The ability to analyse large sets of Big Data is, in my opinion, going to be a very important competence in the near future".

Moreover, the surveyed employers' perspective indicated the importance of language competencies and competencies related to openness to work in an international environment. As indicated by M16: "In Poland, it seems to me that the ability to work

in a multicultural environment will be very important because it is still marginal", or M11: "This sphere of inclusiveness, i.e. openness to other cultures, cannot be replaced by anything, so it is also a competence, which will be very desirable in the future".

In their statements, employers also indicated cognitive competencies such as logical thinking, results orientation, organisational skills, negotiation skills, coping with crises, and hard competencies, interpreted as expert knowledge. However, these were isolated cases.

Discussions

The main goal of our research was to identify the competencies expected by employers from graduates of the Economics Faculty at the UMCS relevant now and in the next 5 years perspective. The results confirm the global nature of the requirements placed on young people. In the area of currently expected competencies, according to the results of the literature analysis, the dominant competencies are those which are a response to existing trends in the labour market and its environment, such as technological changes related to the development of Industry 4.0 and globalisation.

The results obtained in this study allowed us to answer the research questions regarding the competencies expected by employers from graduates of economic studies now and in the future. In addition, the results allowed for comparisons with the current state of knowledge regarding future competencies, which might help increase the employability of young people entering the labour market shaped in HEIs.

Similarly to the findings in the literature, the respondents' quantitative and qualitative survey answers focused mainly on competencies related to new technologies, which enable the performance of simple tasks or those requiring the processing of large amounts of information (Big Data) (Bughin et al., 2018; Dervojeda et al., 2019; Grodek-Szostak et al., 2020; World Economic Forum, 2020, 2023). However, as indicated in the literature, when routine, repetitive tasks can be carried out with the support of technology, those competencies that cannot be replaced by technology take on particular importance. Hence, the relevance of cognitive and soft skills, which employers frequently present as particularly important for the employability and effectiveness of graduates as future employees (Bughin et al., 2018; Dervojeda et al., 2019; Dondi et al., 2021; Grodek-Szostak et al., 2020; Jelonek et al., 2019; Socha & Wojdyła, 2021). Comparing the results of our study (Tables 3 and 5) and studies analysed in the literature (Figure 1), we conclude there is a high degree of consistency in employers' preferences for cognitive, functional and social skills.

It is worth noting the global dimension of these competencies. Communication was the dominant competence in the studies analysed in the literature (Ada et al., 2021; Bughin et al., 2018; Chalutz & Cohen, 2022; Cummings & Janicki, 2020; Dervojeda et al., 2019), but it was also indicated by respondents in the qualitative study. In the quantitative study, communication in Polish was indicated as one of the few competencies

whose relevance will decrease in the future, while at the same time, according to the respondents, knowledge of foreign languages is increasing. It may indicate a global approach by employers to the competencies possessed by graduates, which is also confirmed by the respondents' answers stating the importance of the ability to work in the context of international and multicultural teams. This trend was also evident in the literature analysis (Dervojeda et al., 2019; Gorustowicz, 2019; Goulart et al., 2022).

A high degree of consistency between our research results and those found in the literature also emerges from the perspective of changes in the relevance of individual competencies over time. In the quantitative study, which made it possible to draw such conclusions, the group of competencies of graduates that are relevant in the short term and potentially relevant in a 5-year perspective was quite similar. Rankings changed, but few competencies were found in only one of the two groups, which may indicate that, as in the studies available in the literature, there are groups of competencies whose significance varies only slightly over time. Thus, we might distinguish specific universal competencies with stable high significance in time.

This article provides a comprehensive analysis of the competencies employers in the Lublin Voivodeship expect from economics graduates, both currently and in the future. By combining quantitative and qualitative research methods, the study offers a nuanced understanding of the evolving demands of the labour market. The findings highlight the increasing importance of digital and technological skills, alongside soft skills such as adaptability, creativity, and emotional intelligence. The regional focus of the study adds a unique dimension, addressing the specific needs and expectations of local employers, which may differ from global trends. This localised insight is crucial for higher education institutions aiming to tailor their curricula to better prepare graduates for the job market. The article also underscores the significance of sustainable development competencies, reflecting broader environmental and societal changes. Overall, the research contributes valuable knowledge that can inform educational strategies and policy-making to enhance the employability of future graduates.

The primary limitation of the conducted survey is its geographic scope. By assumption, it was conducted on a relatively narrow group of purposively selected respondents who operate in the Lubelskie Voivodeship in Poland and, at the same time, employ graduates of the Faculty of Economics at the UMCS. It is, therefore, a relatively narrow scope of the study. Despite this limitation, the results indicate that the effects of globalisation can also be seen in the local dimension, as there was a high degree of consistency with the studies conducted from a global perspective.

Conclusions

Determining what competencies will be important in the future labour market is challenging. Rapid technological, social and environmental changes make it difficult to make predictions. However, planning the range of competencies shaped by the

HEI requires certain assumptions to be made, as considering contemporary trends in curricula takes time and leads to modifications that are a long-term process.

In conclusion, several points are worth noting. Firstly, modern technologies supporting the implementation of simple, basic tasks influence growing expectations for more advanced cognitive and social competencies. Often, these expectations also relate to attitudes, which should increasingly be based on coping in a changing, diverse, and international environment. These competencies might be shaped as part of the HEI learning process. Moreover, their importance is relatively constant over time. The study also did not reveal any significant differences that could indicate the specificity of economics faculties, which may indicate a certain uniformity in the requirements of general competencies for job candidates.

The study extends the research area related to future competencies and contributes to creating new knowledge. Despite its local nature, its results are consistent with global trends in this area. Due to the use of the TUNING classification of competencies, the study is replicable, so it would be interesting to see whether such consistency of local/global research is also characteristic of local populations in other geographical areas, for example, from outside the developed world or from other cultural areas whose values are not as consistent with Anglo-Saxon culture.

The study results are also essential to the practice of HEI such as universities. Conclusions from the research could be used to shape educational programmes to consider not only current but also future expectations of employers. In addition to developing specialised technological competence, it is worthwhile to ensure that the curriculum includes subjects that enable students to acquire soft skills, which seem increasingly in demand in the labour market. It is also worth considering the area of green competencies, which is only marginally present in curricula and which, given current environmental trends, may become increasingly important as companies become more aware of and involved in sustainability.

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Appendix 1. Reports concerning future competencies reviewed for the paper

Source	Skills category	Skills	Context
(Bughin et al., 2018)	higher cognitive skills	critical thinking and decision making, project management, complex information processing and interpretation, creativity	global
	social and emotional skills	advanced communication and negotiation skills, interpersonal skills and empathy, leadership and managing others, entrepreneurship and initiative-taking, adaptability and continuous learning, teaching and training others	
	technological skills	basic digital skills, advanced IT skills and programming, advanced data analysis and mathematical skills, technology design, engineering, and maintenance, scientific research and development	
(Dervojeda et al., 2019)	technical competencies	characterisation and analysis, systems integration, specific lab skills, modelling and simulation, equipment running, troubleshooting	international – EU
	quality, risk and safety competencies	quality management, emergency management and response, industrial hygiene, risk assessment	
	management and entrepreneurship competencies	strategic analysis, marketing, project management, IP management, and deal negotiation skills	
	communication competencies	verbal communication, written communication, presentation skills, public communication, virtual collaboration	
	innovation competencies	integration skills, complex problem solving, creativity, systems thinking, continuous experimentation, design mindset	
	emotional and social intelligence	leadership, cooperation, multicultural orientation, integrity, stress tolerance, self-control	
(Jelonek et al., 2019)	**General competencies gaining importance**		national – Poland
	transferable to other roles	digital, transdisciplinary, learning ability	
	ability to collaborate on the human-machine/computer interface		
	general competencies complementary to machine capabilities	high level of cognitive competencies enabling dealing with unpredictable and non-codified tasks (comprehensive problem-solving, critical thinking, deductive thinking, cognitive load management), cognitive and creative skills related to generating and understanding new ideas and concepts, unconventional and adaptive thinking, competencies related to written expression (constructing meaningful sentences)	
	ability to use technology [in traditionally unrelated professions], computational thinking		
	data utilization (in design and decision-making)		
	Vocational competencies gaining importance		
	high/expert-level specialist competencies in middle and high-level professions		

Source	Skills category	Skills	Context
	highly specialised competencies at the intersection of two or more fields		
	Relatively stable competencies		
	competencies adequate to those possessed in the replaced group		
	supplemented by general competencies related to technological development processes (ability to operate increasingly advanced machines, computers)		
(Cummings & Janicki, 2020)	IT knowledge	database skills, systems administration, business/systems analysis	national – USA
	business knowledge	general communication skills, general writing skills, data analytics	
(Grodek-Szostak et al., 2020)	technical competencies	computing mastery, statistical knowledge, key performance indicators' proficiency	national – Poland
	managerial competencies	general problem-solving and decision-making, conflict-solving, and negotiation ability	
	social competencies	individual's social values, ability to transfer knowledge, leadership skills, ability to work in a team, interpersonal communication	
(World Economic Forum, 2020)	top 15 skills for 2025	analytical thinking and innovation, active learning and learning strategies, complex problem-solving, critical thinking and analysis, creativity, originality and initiative, leadership and social influence, technology use, monitoring and control of technology design and programming, resilience, stress tolerance and flexibility, reasoning, problem-solving and ideation, emotional intelligence, troubleshooting and user experience, service orientation, systems analysis and evaluation, persuasion and negotiation	global
(Socha & Wojdyła, 2021)	**Competencies gaining importance**		national – Poland
	cognitive competencies	lifelong learning readiness, generating new ideas (creativity), searching, analysing, and verifying information from dispersed sources	
	functional competencies	assembling technical devices, writing computer programs, knowledge of industry software	
	social competencies	leadership entrepreneurship (showing initiative), time management, stress resilience, collaboration in dispersed teams	
	Future competencies		
	cognitive competencies	cognitive flexibility, design thinking, rapid information summarisation, designing integrative solutions in a robotic environment	
	functional competencies	designing digital-technical solutions, resource optimisation in the context of environmental challenges	
	social competencies	willingness to take risks, ability to work without fixed hours, self-development (learning planning)	
	Returning competencies		
	cognitive competencies	holistic perspective (interdisciplinary)	
	functional competencies	using technical documentation, repairing technical devices	
	social competencies	emotional intelligence	

Source	Skills category	Skills	Context
	Timeless competencies		
	cognitive competencies	logical thinking, analytical thinking, critical thinking, problem-solving	
	functional competencies	basic mechanical tools and machinery operation, functional digital skills (computer operation, internet usage), website creation	
	social competencies	independence and responsibility, punctuality, communicativeness, group collaboration, perseverance people, management (work planning, controlling and motivating others, conflict resolution)	
(Dondi et al., 2021)	**Cognitive**		global
	critical thinking	structured problem solving, logical reasoning, understanding biases, seeking relevant information	
	planning and ways of working	work-plan development, time management and prioritisation, agile thinking	
	communication	storytelling and public speaking, asking the right questions, synthesising messages, active listening	
	mental flexibility	creativity and imagination, translating knowledge to different contexts, adopting a different perspective, adaptability, ability to learn	
	Interpersonal		
	mobilising systems	role modelling, win-win negotiations, crafting an inspiring vision, organisational awareness	
	developing relationships	empathy, inspiring trust, humility, sociability	
	teamwork effectiveness	fostering inclusiveness, motivating different personalities, resolving conflicts, collaboration, coaching, empowering	
	Self-leadership		
	self-awareness and self-management	understanding own emotions and triggers, self-control and regulation, understanding own strengths, integrity, self-motivation and wellness, self-confidence	
	entrepreneurship	courage and risk-taking, driving change and innovation, energy, passion, and optimism, breaking orthodoxies	
	goals achievement	ownership and decisiveness, achievement orientation, grit and persistence, coping with uncertainty, self-development	
	Digital		
	digital fluency and citizenship	digital literacy, digital learning, digital collaboration, digital ethics	
	software use and development	programming literacy, data analysis and statistics, computational and algorithmic thinking	
	understanding digital systems	data literacy, smart systems, cybersecurity literacy, tech translation and enablement	

Source	Skills category	Skills	Context
(Górniak et al., 2022)	self-organizational	time management and punctuality willingness to take on responsibility, independent work organization and coping with stressful situations	national – Poland
	interpersonal	communication skills, ease of establishing contacts with people, ability to work in a team	
	cognitive	learning new things, ingenuity and creativity, information analysis and drawing conclusions	
	more important in the future	collaboration with people from different nationalities, assembly and repair of technical devices, willingness to travel frequently and change workplace, operation of machines, tools, and technical devices, use of specialised computer programs, proficiency in using a computer, tablet, and smartphone, administrative work and documentation management, conflict resolution between people	
(Chalutz & Cohen, 2022)	adjustment skills	fast learners, innovators, adjust quickly to changes, and have high social skills	global
	accumulated mobile skills	flexible and dynamic mind, rapid learning ability, creativity, and changes the focus of the required type of communication skills, computer literacy and teamwork skills	
	specialisation skills	backbone specialty skills, cutting-edge technology	
(World Economic Forum, 2023)	cognitive competence, including the ability to solve complex problems, creative thinking, ability to think analytically, knowledge of technology, self-management skills, social-emotional skills such as curiosity, lifelong learning, resilience, flexibility, agility, motivation and self-awareness, systems thinking, skills related to artificial intelligence and big data analysis, talent management, customer service and customer service orientation		global

Source: Authors' own study.

Appendix 2. Statistical analysis of variables, their distribution, and significance of relationships

Competence	Current competencies										Future competencies										Wilcoxon signed-rank test results		
					Normality tests									Normality tests									
					Kolmogorov–Smirnov			Shapiro–Wilk						Kolmogorov–Smirnov			Shapiro–Wilk						
	Code	Mean	sd*	Median	Statistic	df	Sign.**	Statistic	df	Sign.**	Code	Mean	sd*	Median	Statistic	df	Sign.**	Statistic	df	Sign.**	Variables	Z	Asympt. Sign.***
Analytical and synthetic skills	Q5at_2	4.58	0.59	5.00	0.382	93	0.000	0.685	93	0.000	Q7aa	4.55	0.62	5.00	0.381	93	0.000	0.688	93	0.000	Q5aa_2–Q7aa	-.130[b]	0.896
Organizational and planning skills	Q5ce_2	4.40	0.79	5.00	0.343	93	0.000	0.740	93	0.000	Q7ab	4.45	0.63	5.00	0.333	93	0.000	0.732	93	0.000	Q5ab_2–Q7ab	-.874[c]	0.382
Basic general knowledge	Q5ap_2	4.21	0.75	4.00	0.243	93	0.000	0.798	93	0.000	Q7ac	4.27	0.74	4.00	0.269	93	0.000	0.795	93	0.000	Q5ac_2–Q7ac	-1.091[c]	0.275
Basic professional knowledge related to the job	Q5ax_2	4.73	0.49	5.00	0.455	93	0.000	0.576	93	0.000	Q7ad	4.74	0.55	5.00	0.476	93	0.000	0.517	93	0.000	Q5ad_2–Q7ad	-.285[c]	0.776
Communication skills in Polish (spoken and written)	Q5ag_2	4.72	0.52	5.00	0.453	93	0.000	0.579	93	0.000	Q7ae	4.67	0.58	5.00	0.439	93	0.000	0.603	93	0.000	Q5ae_2–Q7ae	-.618[b]	0.537
Knowledge of at least one foreign language	Q5ay_2	4.07	0.99	4.00	0.243	93	0.000	0.832	93	0.000	Q7af	4.26	0.88	4.00	0.273	93	0.000	0.768	93	0.000	Q5af_2–Q7af	-1.822[c]	0.068
Basic IT skills	Q5al_2	4.56	0.69	5.00	0.391	93	0.000	0.676	93	0.000	Q7ag	4.62	0.66	5.00	0.405	93	0.000	0.592	93	0.000	Q5ag_2–Q7ag	-1.129[c]	0.259
Ability to search and analyze information from various sources	Q5au_2	4.56	0.69	5.00	0.391	93	0.000	0.676	93	0.000	Q7ah	4.58	0.60	5.00	0.394	93	0.000	0.672	93	0.000	Q5ah_2–Q7ah	-.522[c]	0.601
Problem-solving skills	Q5ba_2	4.57	0.64	5.00	0.390	93	0.000	0.677	93	0.000	Q7ai	4.59	0.59	5.00	0.399	93	0.000	0.664	93	0.000	Q5ai_2–Q7ai	-.559[c]	0.576
Decision-making skills	Q5aq_2	4.43	0.80	5.00	0.369	93	0.000	0.710	93	0.000	Q7aj	4.52	0.67	5.00	0.378	93	0.000	0.693	93	0.000	Q5aj_2–Q7aj	-1.215[c]	0.224
Critical thinking and self-criticism	Q5af_2	4.08	0.93	4.00	0.246	93	0.000	0.824	93	0.000	Q7ak	4.25	0.86	4.00	0.305	93	0.000	0.780	93	0.000	Q5ak_2–Q7ak	-1.596[c]	0.110
Teamwork skills	Q5ar_2	4.52	0.63	5.00	0.346	93	0.000	0.710	93	0.000	Q7al	4.56	0.58	5.00	0.368	93	0.000	0.663	93	0.000	Q5al_2–Q7al	-.807[c]	0.420

Competence	Current competencies										Future competencies										Wilcoxon signed-rank test results		
					Normality tests									Normality tests									
					Kolmogorov–Smirnov			Shapiro–Wilk						Kolmogorov–Smirnov			Shapiro–Wilk						
	Code	Mean	sd*	Median	Statistic	df	Sign.**	Statistic	df	Sign.**	Code	Mean	sd*	Median	Statistic	df	Sign.**	Statistic	df	Sign.**	Variables	Z	Asympt. Sign.***
Interpersonal skills (stress management, relationship building, etc.)	Q5ak_2	4.56	0.59	5.00	0.371	93	0.000	0.696	93	0.000	Q7am	4.62	0.57	5.00	0.402	93	0.000	0.629	93	0.000	Q5am_2–Q7am	-1.161[c]	0.246
Interdisciplinary teamwork skills	Q5bd_2	4.31	0.78	4.00	0.294	93	0.000	0.785	93	0.000	Q7an	4.38	0.71	4.00	0.306	93	0.000	0.762	93	0.000	Q5an_2–Q7an	-.922[c]	0.357
Communication skills with experts from other fields	Q5bb_2	4.19	0.87	4.00	0.259	93	0.000	0.802	93	0.000	Q7ao	4.25	0.76	4.00	0.247	93	0.000	0.787	93	0.000	Q5ao_2–Q7ao	-.889[c]	0.374
Appreciation of diversity and multiculturalism	Q5am_2	3.52	1.17	4.00	0.207	93	0.000	0.897	93	0.000	Q7ap	3.63	0.96	4.00	0.261	93	0.000	0.881	93	0.000	Q5ap_2–Q7ap	-.922[c]	0.357
Ability to work in an international environment	Q5aw_2	3.71	1.14	4.00	0.190	93	0.000	0.880	93	0.000	Q7aq	3.77	1.05	4.00	0.189	93	0.000	0.871	93	0.000	Q5aq_2–Q7aq	-.811[c]	0.417
Adherence to professional ethics	Q5ao_2	4.82	0.41	5.00	0.498	93	0.000	0.472	93	0.000	Q7ar	4.86	0.38	5.00	0.515	93	0.000	0.405	93	0.000	Q5ar_2–Q7ar	-.778[c]	0.437
Ability to apply knowledge in practice	Q5ah_2	4.69	0.46	5.00	0.431	93	0.000	0.589	93	0.000	Q7as	4.74	0.44	5.00	0.463	93	0.000	0.545	93	0.000	Q5as_2–Q7as	-1.000[c]	0.317
Ability to conduct research (e.g., market, R&D) and analysis	Q5ai_2	3.07	1.26	3.00	0.161	93	0.000	0.909	93	0.000	Q7at	3.33	0.97	3.00	0.215	93	0.000	0.887	93	0.000	Q5at_2–Q7at	-1.811[c]	0.070
Learning ability	Q5an_2	4.56	0.52	5.00	0.360	93	0.000	0.669	93	0.000	Q7au	4.61	0.53	5.00	0.401	93	0.000	0.654	93	0.000	Q5au_2–Q7au	-.967[c]	0.333
Ability to adapt to new situations	Q5av_2	4.62	0.55	5.00	0.398	93	0.000	0.662	93	0.000	Q7av	4.65	0.54	5.00	0.420	93	0.000	0.634	93	0.000	Q5av_2–Q7av	-.617[c]	0.537
Ability to create new concepts (creativity)	Q5ac_2	3.94	0.85	4.00	0.234	93	0.000	0.852	93	0.000	Q7aw	4.04	0.69	4.00	0.282	93	0.000	0.814	93	0.000	Q5aw_2–Q7aw	-1.299[c]	0.194

Competence	Current competencies										Future competencies										Wilcoxon signed-rank test results		
					Normality tests									Normality tests									
					Kolmogorov–Smirnov			Shapiro–Wilk						Kolmogorov–Smirnov			Shapiro–Wilk						
	Code	Mean	sd*	Median	Statistic	df	Sign.**	Statistic	df	Sign.**	Code	Mean	sd*	Median	Statistic	df	Sign.**	Statistic	df	Sign.**	Variables	Z	Asympt. Sign.***
Leadership skills	Q5ab_2	3.18	1.01	3.00	0.212	93	0.000	0.905	93	0.000	Q7ax	3.37	0.92	3.00	0.214	93	0.000	0.894	93	0.000	Q5ax_2– Q7ax	-1.873[c]	0.061
Understanding cultures and customs of other countries	Q5bc_2	3.47	1.11	4.00	0.186	93	0.000	0.898	93	0.000	Q7ay	3.67	0.99	4.00	0.201	93	0.000	0.888	93	0.000	Q5ay_2– Q7ay	-1.636[c]	0.102
Ability to work independently	Q5az_2	4.68	0.47	5.00	0.426	93	0.000	0.595	93	0.000	Q7az	4.73	0.53	5.00	0.456	93	0.000	0.537	93	0.000	Q5az_2– Q7az	-.936[c]	0.349
Project preparation and management	Q5aa_2	3.53	1.09	4.00	0.227	93	0.000	0.896	93	0.000	Q7ba	3.82	0.93	4.00	0.277	93	0.000	0.857	93	0.000	Q5ba_2– Q7ba	-2.255[c]	0.024
Initiative and entrepreneurship	Q5aj_2	4.14	0.85	4.00	0.239	93	0.000	0.811	93	0.000	Q7bb	4.30	0.67	4.00	0.270	93	0.000	0.775	93	0.000	Q5bb_2– Q7bb	-1.818[c]	0.069
Attention to the quality of performed tasks	Q5as_2	4.87	0.34	5.00	0.516	93	0.000	0.411	93	0.000	Q7bc	4.84	0.42	5.00	0.508	93	0.000	0.423	93	0.000	Q5bc_2– Q7bc	-.410[b]	0.682
Success orientation	Q5be_2	4.40	0.73	5.00	0.329	93	0.000	0.745	93	0.000	Q7bd	4.44	0.63	5.00	0.327	93	0.000	0.736	93	0.000	Q5bd_2– Q7bd	-.739[c]	0.460
Professional experience	Q5ad_2	4.13	0.81	4.00	0.234	93	0.000	0.820	93	0.000	Q7be	4.49	0.62	5.00	0.352	93	0.000	0.716	93	0.000	Q5be_2– Q7be	-3.501[c]	0.000

*standard deviation

**significance

***asymptotic significance (two-sided)

a. With Lilliefors significance correction

a. Wilcoxon signed-rank test

b. Based on positive ranks

c. Based on negative ranks

green font – statistically significant

Source: Authors' own study.