

Dorota Czyżewska-Misztal

Poznań University of Economics and Business

dorota.czyzewska-msztal@ue.poznan.pl

ORCID: 0000-0001-6989-4143

Judyta Cabańska

Poznań University of Economics and Business

judyta.cabanska@ue.poznan.pl

ORCID: 0000-0001-7947-3713

AI Skills in the EU vs. the US: A Comparative Analysis and Europe's Strategic Initiatives¹

Abstract: Artificial intelligence (AI) has become a critical determinant of economic competitiveness, shaping innovation capacity, productivity, and long-term growth. Central to this transformation are AI-related skills, which not only drive technological adoption but also influence the ability of economies to capture value in rapidly evolving global markets. The aim of this chapter is to provide a brief analysis of AI skills in the European Union (EU) and the United States (US), examining differences in workforce readiness, digital literacy, and advanced AI competencies. While the US demonstrates relative strengths in cultivating high-level AI expertise and attracting global talent, the EU faces structural challenges related to skill gaps, fragmentation, and uneven distribution across member states. In response, Europe has launched a series of strategic initiatives, with the *Coordinated Plan on AI* at the core, the EU AI Act and the *Apply AI Strategy* aimed at accelerating the adoption and integration of artificial intelligence in strategic sectors across the Union. By highlighting both comparative weaknesses and emerging strengths, the chapter underscores the pivotal role of skill development in Europe's ambition to establish digital sovereignty and maintain global competitiveness in the AI era. The text analysis is used as research method in the chapter.

Keywords: AI skills, EU, USA, artificial intelligence, EU AI Act, Apply AI Strategy.

¹ This chapter was prepared as part of the Jean Monnet Centre of Excellence project “Resilient and Transforming Europe”, funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

1. Introduction

Artificial intelligence (AI) has become a critical determinant of economic competitiveness, shaping innovation capacity, productivity, and long-term growth (Marino, Lafuente & Tebala, 2023; Makridakis, 2017; Jeon, 2025). As stated in the *AI Index Annual Report 2025*, early productivity gains from generative AI are becoming measurable in selected tasks while questions raise about the AI long-term impact on the whole economy. The labour market has started to be impacted by the AI-driven transformation as certain knowledge-worker roles decrease due to the emergence of new AI-related positions. Moreover, companies across diverse regions and sectors are going beyond AI experimentation towards AI systemic adoption. Investment patterns show increasingly sophisticated ways of funding in specialized applications and sector-specific technological solutions (Maslej et al., 2025).

Central to the AI-driven transformation are AI-related skills, which not only drive technological adoption but also shape economies' ability to capture value in rapidly evolving global markets. The development and adoption of AI will thus likely have a profound impact on labour markets, not only from the point of view of employment levels and job quality, but also on how work is organised, the type of tasks workers are to perform, and therefore on the skills that will be needed (Lassébie, 2023). As stated by Maslej et al. (2025), a consistent pattern across studies has been emerging so far: AI help narrow the gap between low- and high-skilled workers, increasing much more productivity of junior workers in comparison with senior workers.

Artificial intelligence is increasingly used across various aspects of social and economic life. Hence, the global competition for AI talent is intensifying. Both companies and countries are taking steps to attract employees with AI skills. Countries are striving to enhance their AI talent pool by easing immigration rules to allow more AI experts to study and work in the country. In December 2025 A bill to establish Federal agency technology and artificial intelligence talent teams to improve competitive service hiring practices, and for other purposes (S.3410) was introduced to the American Congress with the aim to attract AI talent (<https://www.congress.gov/bill/119th-congress/senate-bill/3410/text>). Similar activities are also being undertaken in other countries to attract talent in the AI field (for example by the *Coordinated Plan on AI* of the EU). According to the LinkedIn AI Talent Index (Hood, 2025), countries like Singapore, Israel, and Luxembourg are leading the charge for AI talent concentration in 2024 (for more details see the report).

The aim of this chapter is to provide a brief analysis of AI skills in the European Union (EU) and the United States (US) and to review several strategic initiatives that the EU has taken recently as a response to this AI talent race internationally. We use text analysis as research method in this chapter.

2. AI skills in the European Union vs. in the USA

Artificial intelligence has rapidly advanced in recent years, driven mainly by exponential data growth, investments and innovations in infrastructure and algorithms (Singla et al., 2025). The adoption of artificial intelligence (AI) technologies is one of the most significant drivers of labour market transformation in advanced economies. AI affects not only the demand for highly specialised technical roles, but also the skills required for a wide range of occupations, including those in professional services, manufacturing, healthcare and public administration (Green, Salvi del Pero & Verhagen, 2023; OECD, 2024; Mäkelä & Stephany, 2024).

AI skills have not been widely researched in the literature to date. This is due to the novelty of this research area, and therefore only a few recent studies present metrics that allow for comparisons of the AI skills situation in different countries. From the EU perspective Cedefop's project "AI futures of work" analyses how AI and other digital technologies are impacting skill demands and fostering skill mismatches in the EU labour market. It also analyses what are the implications of digitalization on new forms of work and learning (gig, platform, remote work etc.). Furthermore, the OECD has published several reports that make limited reference to AI skills. AI skills are also mentioned in The AI Index 2024 Annual Report published by Stanford University.

This section is an attempt to provide a comparative analysis of AI-related skills in the European Union (EU) and the United States (US), focusing on workforce readiness, skill penetration, labour demand, training intensity, wage effects and structural labour market characteristics based on the small amount of quantitative data available.

Although AI is being developed rapidly, only a small share of this development is occurring in both the EU and the US. According to OECD, the AI workforce is concentrated in a few high-skilled occupations: mathematicians, actuaries and statisticians, software and application developers, ICT managers, database and network professionals, and electro-technology engineers. They are disproportionately highly-educated and male (Green & Lamby, 2023).

According to LinkedIn data published by the European Commission, AI accounted for 0.41% of jobs in the EU in 2023. The European Commission (2024) reports that the number of AI workers has doubled since 2016 nevertheless its share is very low. This growth in AI skills reflects their accelerated adoption and their limited spread in the general population. According to the OECD.AI (2025), approximately 0.35–0.40% of the US workforce has AI skills. These professionals are predominantly found in high-value industries and technology-based enterprises. The US labour market is more deeply integrated with AI capabilities across industries than the EU, where AI expertise is mainly concentrated in ICT, research and data-related roles. This distinction has a significant impact on labour market operations. While the EU has significant potential for skill development, the low level of AI skill adoption prevents the kind of widespread productivity gains that would accelerate the implementation of AI-enabled work practices across the entire economy. Labour demand indicators show that the two regions have different underlying structures (Table 1).

Table 1. Comparison of AI skills and labour market indicators – EU vs US

Indicator	European Union (EU)	United States (US)
Share of workforce with AI skills	~0.41% (2023)	~0.35–0.40%
Growth of AI-skilled workforce	>2× growth since 2016	Strong growth, high concentration
Workers expecting need for AI upskilling	61%	High implicit demand via adoption
Employer-provided AI training	~15% of workers	Higher employer-led training
Wage premium for AI skills	Present, uneven	Strong and consistent
Female share of AI workforce	<25%	~30–40%

Source: own elaboration based on: (European Commission, 2024; OECD.AI, 2025; Green, Salvi del Pero & Verhagen, 2023; Cedefop, 2025; Maslej et al., 2024; Lassébie, 2023).

Green, Salvi del Pero & Verhagen (2023) found that AI job postings accounted for less than 1% of total online job postings across 14 developed labour markets in 2021, including technologically advanced ones. This finding applies to both the EU and the US, confirming that AI-specific occupations remain niche rather than mainstream. In 2023, AI-related jobs accounted for 1.4% of all American job postings. In 2024, that number increased to 1.8%. The same increasing trend applies to the EU (in the *The AI Index 2025 Annual Report* there are no precise data on the EU in total but only on some EU countries: in 2024 AI-related jobs accounted for 1.99% of job postings for Luxembourg, 1.31% for Belgium and Sweden, 1.25% for the Netherlands, 1.15% for Germany, only 0.13% for

Croatia) (Maslej et al., 2025). However, the composition of AI-related labour demand differs substantially. In the EU, AI job advertisements are concentrated in a few metropolitan areas and innovation hubs, predominantly linked to ICT and research-oriented roles. In contrast, the US labour market exhibits broader diffusion of AI skills into non-technical roles, such as business analytics, marketing, human resources, and healthcare support functions (Maslej et al., 2024). This broader sectoral spread in the US suggests that AI competencies are increasingly viewed as complementary skills rather than standalone technical specialisations. From a labour market perspective, this enables quicker adaptation, as a greater proportion of workers are exposed to AI-related tasks, even if they are not formally employed in AI-specific roles.

A key difference between the EU and US labour markets is the extent to which employers support training and upskilling. Survey evidence from Cedefop and the Job Market Monitor indicates that 61% of workers in the European Union expect to need new AI-related skills in the near future. However, only around 15% of these workers participated in employer-provided AI training during the previous year (Cedefop & Job Market Monitor, 2025). This mismatch highlights structural weaknesses in continuous training systems and contributes to persistent skill shortages.

In contrast, in the United States, while no single harmonised survey exists, multiple labour market studies report higher rates of AI tool usage at work and more widespread integration of AI literacy into job requirements (OECD.AI, 2025; Maslej et al., 2024). US firms tend to rely more heavily on on-the-job learning, private training providers, and internal reskilling programmes. This enables them to adapt skills more quickly in response to technological change.

From a labour economics perspective, these differences suggest that the EU is at greater risk of skill mismatch and job polarisation, whereas the US labour market is better equipped to absorb AI-driven changes through flexible training and reskilling mechanisms.

Although the EU produces a large number of high-quality STEM graduates and AI researchers, it struggles to retain advanced AI talent in its labour market. Analyses by the OECD and the European Commission indicate that a significant proportion of highly skilled AI professionals trained in Europe eventually migrate to the United States, where they are attracted by higher wages, stronger research ecosystems, and clearer career progression opportunities (European Commission, 2024).

This inflow of global talent benefits the US labour market, enabling the accumulation of a critical mass of AI expertise and reinforcing its position in high-value segments of the AI labour market. In contrast, the EU faces challenges related to internal mobility, linguis-

tic barriers, and diverse labour-market institutions, which hinder the efficient allocation of talent across member states.

Wage outcomes provide further evidence of divergent labour market dynamics. The OECD Employment Outlook (Green, Salvi del Pero & Verhagen, 2023) shows that AI-related skills are associated with higher wages in both regions. Workers in AI-intensive occupations are disproportionately found in the upper deciles of the earnings distribution, reflecting strong labour demand and limited supply. However, the magnitude and consistency of these premiums vary. In the United States, job advertisements requiring AI competencies often offer salaries well above those for similar roles without AI requirements, indicating intense competition among employers for scarce talent (Green, Salvi del Pero & Verhagen, 2023). In the EU, while wage premiums are present, they are more unevenly distributed across countries, reflecting labour market fragmentation and differences in collective bargaining systems.

These disparities affect talent allocation and mobility, making the US labour market more attractive for highly skilled AI professionals and contributing to persistent talent outflows from Europe.

The demographic composition of a region can further shape its AI labour market outcomes. Gender disparities are a persistent issue in both regions, but they are more pronounced in the EU. According to estimates by the European Commission, women account for less than 25% of AI specialists in the EU, compared to 30–40% in OECD countries, including the United States (European Commission, 2024; Lassébie, 2023). Such imbalances reduce the effective labour supply and exacerbate skill shortages. Additionally, the EU labour market is characterised by greater institutional fragmentation, resulting in uneven access to AI-related employment opportunities across regions and socioeconomic groups. While the US labour market is also unequal, it benefits from higher geographical and occupational mobility, which facilitates the faster concentration of AI talent in innovation hubs.

In summary, although the European Union and the United States face similar technological pressures from AI adoption, their labour markets respond in markedly different ways. The United States has stronger integration of AI skills into employment structures, higher training intensity, and greater labour-market rewards for AI competencies. Despite rapid growth in AI talent and a strong educational base, the European Union continues to face challenges related to limited skill diffusion, training gaps, labour market fragmentation and talent retention. These differences highlight the pivotal role of labour market insti-

tutions, employer practices, and workforce development mechanisms in determining the economic impact of AI.

3. Strategic initiatives of the EU as a response to the AI talent race

Taking into account the strategic importance of AI in the process of green and digital transformation, as well as the growing competition in this area from the USA and China, the European Union has undertaken several strategic initiatives in the last few years aimed outlining a program for developing AI skills among Europeans. AI cost and lack of skills are reported by companies as major barrier to AI adoption. Businesses often possess rich data but that they lack the capacity to process, clean, analyse, and ensure the quality of the vast amount of information included inside the company. This problem is of larger importance for small and medium-sized firms that appear to be lagging behind in that respect (Lassébie, 2023; Huňady, Lacová & Vallušová, 2025).

The first strategic document to be mentioned in this context is the EU Coordinated Plan on Artificial Intelligence (AI) which is an overall initiative by the European Commission and EU Member States to promote AI development, investment and co-operation, launched in 2018 and revised in 2021 (OECD, 2025). The plan is organised around four pillars, each addressing key aspects of AI development and implementation across the EU. The third pillar refers to ensuring that AI works for people and brings benefits to the society. This pillar encompasses initiatives to nurture AI talent and develop relevant AI skills across the workforce. One of the elements of this plan is to attract AI talent into the EU through diverse incentives like scholarships or grants. In this pillar several key actions for Member States were outlined aiming at addressing skill gaps and preparing their workforces for AI-driven transformation:

- refine and implement the skills dimension in their national AI strategies,
- exchange best practices on how to integrate AI into general education and other specialised programmes (in healthcare, social sciences, law, business) and on promoting broad and specialised knowledge on AI in the lifelong learning programmes;
- take measures and exchange best practices on AI inclusion and diversity (how to attract talent in AI education and build balanced AI teams);
- make the best of the NextGenerationEU recovery funds to finance upskilling and re-skilling initiatives across the EU Member States (European Commission, 2021).

The next strategic document that should be mentioned in this context is the EU AI Act – the world's first comprehensive AI law, that officially entered into force on August

1, 2024 (European Parliament & Council, 2024). On February 2, 2025 the AI Literacy requirements came into force. According to the definition of the term given in article 3(56) of the AI Act, ‘Ai Literacy’ is defined as “skills, knowledge and understanding that allow providers, deployers and affected persons, taking into account their respective rights and obligations in the context of this Regulation, to make an informed deployment of AI systems, as well as to gain awareness about the opportunities and risks of AI and possible harm it can cause”. According to Article 4 of the AI Act providers and deployers of AI systems should take measures to ensure a sufficient level of AI literacy of their staff and other persons dealing with the operation and use of AI systems on their behalf. Assessing the usefulness of this rule, AI literacy aim to optimize the use of AI systems in the EU while protecting the health and safety of users and providing democratic control to all EU countries. As the requirement of AI literacy under the EU AI Act is not described in details, the European Commission published brochures helping the firms to implement this principle. Moreover, the EU AI Office has also started a living repository² to provide businesses with good examples of AI literacy practices.

The next step towards making the EU an AI continent is the Apply AI Strategy launched in October 2025 to boost sectoral AI adoption across the EU, enhance competitiveness and strengthen the EU’s technological sovereignty (European Commission, 2025). The Strategy is built around three core pillars: (1) eleven sectoral flagships aimed at increasing AI adoption in key industrial sectors and the public sector; (2) tackling horizontal, cross-cutting challenges; and (3) creating a unified governance framework that enables sector stakeholders to engage in AI policy development. AI skills appear in the section ‘Enabling an AI-ready workforce across sectors’ of this strategy. According to this section, adequate skills are a prerequisite for a responsible and beneficial use of AI among all workers. The Commission proposed several initiatives to build solid AI literacy among Europeans: 1. practical AI literacy trainings tailored to sectors and job profiles leading to micro-credentials, 2. involvement of industry in AI upskilling and reskilling, 3. practical use of the Digital Competence Framework for Citizens and the AI Literacy Framework for Primary and Secondary Education, 4. Funding ‘AI for business’ master programmes and ‘AI entrepreneurs lab’. All these initiatives need to be implemented now to see their measurable impacts on the education sector, labour market and the whole economy in the EU.

² The living repository with the examples of AI literacy practices is available under the link: <https://digital-strategy.ec.europa.eu/en/library/living-repository-foster-learning-and-exchange-ai-literacy> (accessed: 3.02.2026).

In 2025 the *Progress in Implementing the European Union Coordinated Plan on Artificial Intelligence* was issued by OECD (2025). The EU Member States have implemented several steps to nurture talent and improve the supply of AI skills so far:

- In AI-related skills in primary and secondary education – most EU countries have digital literacy programmes that may include AI, AI-focused teaching training;
- In structured AI programmes in higher education – several initiatives to create or expand graduate and doctoral-level AI programmes;
- In interdisciplinary AI education – 14 interdisciplinary initiatives across 12 EU countries;
- In inclusion and diversity in AI – few AI-specific inclusion initiatives;
- In workforce upskilling and reskilling – More than half of EU countries have national digital upskilling strategies, dedicated AI workforce trainings,
- In AI talent attraction and retention – initiatives attracting mainly researchers and doctoral candidates (OECD, 2025:85).

Overall, the efforts to attract AI talents to the EU have remained limited so far (one-fourth of EU countries reported programs aiming at attraction of AI talents) and are mainly focused on academia (attracting researchers and Ph.D candidates). Only one EU country supported an initiative of non-academic institutions recruiting AI professionals: only Finland has reported a structured initiative to attract AI professionals outside academia (Talent Boost Programme) which shows a clear gap in addressing workforce needs.

4. Conclusions

Recent developments of AI and other digital technologies are expected to markedly transform labour markets. AI is already increasingly embedded in everyday life and its influence on the labour market as well as on the whole economy is more and more visible. AI skills are the core of the AI-driven transformation as without them, the systematic integration of artificial intelligence and other digital technologies into business operations will not be possible. The comparison of AI skills potential in the EU and the US reveals that Europe faces greater challenges in developing AI skills due to limited skill diffusion, training gaps, labor market fragmentation, and talent retention. For this reason, numerous strategic initiatives on the EU side aim to attract more AI talent to Europe, develop AI competencies in the education sector from primary school to doctoral studies, and upskill and reskill employees in various industries: Coordinated Plan on AI, the EU AI Act and the

Apply AI Strategy. Assessment of the implementation of these initiatives shows limited results so far, while such actions require a much longer timeframe to assess changes, so it is necessary to wait for the measurable effects of these actions in the area of AI skills.

References

- Cedefop & Job Market Monitor. (2025). *AI skills and training needs in Europe*.
- European Commission (2025). Communication from the Commission to the European Parliament and the Council. Apply AI Strategy, COM(2025) 723 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52025DC0723> (accessed on 3 February 2026).
- European Commission. (2024). *Shaping and strengthening European AI talent*. <https://digital-strategy.ec.europa.eu/en/library/shaping-and-strengthening-european-ai-talent>
- European Commission (2021). Coordinated Plan on Artificial Intelligence 2021 Review, European Commission, Brussels, <https://digital-strategy.ec.europa.eu/en/library/coordinated-plan-artificial-intelligence-2021-review> (accessed on 3 February 2026).
- European Parliament & Council (2024). Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act), https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202401689 (accessed on 3 February 2026).
- Green, A. and L. Lamby (2023). *The supply, demand and characteristics of the AI workforce across OECD countries* In OECD Social, Employment and Migration Working Papers, No. 287, OECD Publishing, Paris, <https://doi.org/10.1787/bb17314a-en>.
- Green, A., Salvi del Pero, A. & Verhagen A. (2023). *Artificial intelligence, job quality and inclusiveness* In *OECD Employment Outlook 2023: Artificial Intelligence and the Labour Market*, OECD Publishing, Paris, <https://doi.org/10.1787/08785bba-en>.
- Hood, R. (2025). The LinkedIn AI Talent Index. Tracking the global talent AI ecosystem, March 2025, <https://economicgraph.linkedin.com/content/dam/me/economicgraph/en-us/PDF/li-ai-talent-index.pdf> (accessed on 3 February 2026).
- Huňady, J., Lacová, Ž., Vallušová, A. (2025). AI Adoption by the European Companies: Drivers and Barriers in the EU. In: Pellat, G., Lacová, Ž., Šuplata, M. (eds) *Data-Centric Business and Applications. Lecture Notes on Data Engineering and Communications Technologies*, vol 258. Springer, Cham. https://doi.org/10.1007/978-3-031-95068-1_17
- Jeon, G. (2025). Rethinking Competitiveness in the Age of AI: A Comparative Index-Based Approach. *Journal of International Development*, 37(7), 1525-1542. <https://doi.org/10.1002/jid.70018>
- Lassébie, J. (2023). *Skill needs and policies in the age of artificial intelligence*. In *OECD Employment Outlook 2023: Artificial Intelligence and the Labour Market*, OECD Publishing, Paris, <https://doi.org/10.1787/08785bba-en>.
- Mäkelä, F., & Stephany, F. (2024). *Complement or substitute? How artificial intelligence increases the demand for human skills*. <https://doi.org/10.48550/arXiv.2412.19754>

- Makridakis, S. (2017). The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms. *Futures*, 90, 46-60. <https://doi.org/10.1016/j.futures.2017.03.006>
- Marino, D., Gil Lafuente, J., & Tebala, D. (2023). Innovations and development of artificial intelligence in Europe: some empirical evidence. *European Journal of Management and Business Economics*, 32(5), 620-636. <https://doi.org/10.1108/EJMBE-03-2023-0085>
- Maslej, N. et al. (2025). *The AI Index 2025 Annual Report*, AI Index Steering Committee, Institute for Human-Centered AI, Stanford University, Stanford, CA, April 2025. <https://doi.org/10.48550/arXiv.2504.07139>
- Maslej, N. et al. (2024). *The AI Index 2024 Annual Report*, AI Index Steering Committee, Institute for Human-Centered AI, Stanford University, Stanford, CA, April 2024.
- OECD (2024). *The impact of artificial intelligence on productivity, distribution and growth*. OECD Publishing. <https://doi.org/10.1787/8d900037-en>
- OECD (2025), Progress in Implementing the European Union Coordinated Plan on Artificial Intelligence (Volume 1): Member States' Actions, OECD Publishing, Paris, <https://doi.org/10.1787/533c355d-en>.
- OECD.AI. (2025). *The AI workforce: Evidence from LinkedIn data*.
- Singla, A., Sukharevsky, A., Yee, L., Chui, M., Hall, B., & Balakrishnan, T. (2025). *The state of AI in 2025: Agents, innovation, and transformation*, McKinsey & Company. <https://www.congress.gov/bill/119th-congress/senate-bill/3410/text> (accessed: 30.01.2026).