DOI: https://doi.org/10.30970/fp.3(57).2025.677677

Код JEL Classification O15, O33, J24

HUMAN CAPITAL TRANSFORMATION UNDER CONDITIONS OF LABOR DIGITALIZATION AND DEVELOPMENT OF INTELLECTUAL TECHNOLOGIES

KOMARNYTSKA Hanna
Doctor of Economics, Professor,
Head of the Department of Public Administration and Business Management
Ivan Franko National University of Lviv
ORCID ID: https://orcid.org/0000-0002-5533-6439

KOMARNYTSKYY Ihor
Student of Master's degree
Lviv Polytechnic National University

Abstract. *The article investigates the transformation of human capital in Ukraine under the influence of labor digitalization and the development of intellectual technologies against the backdrop of military crisis and global changes. Empirical analysis covers the period 2020–2025 using official statistics from Ukraine, the European Union, and data from international organizations (WEF, OECD, ILO, European Commission).*

Three hypotheses are proven: digitalization expands demand for highly skilled professions while simultaneously creating risks of digital inequality; continuous learning systems are critical for ensuring worker competitiveness; meta-competencies (adaptability, creativity, communication) determine adaptation success more than narrow technical skills.

A twelve-point implementation roadmap for Ukraine has been developed with clear division into three phases (2025–2030) and a budget estimate of EUR 500 million in investments. Research results can be used by public administration bodies, educational institutions, and employers to develop human capital development strategies.

Keywords *human capital, digitalization, artificial intelligence, competencies, continuous learning, public administration, educational policy, labor market.*

This article investigates the transformation of human capital under the intensifying impact of labor digitalization and the expansion of intellectual technologies, emphasizing their role in reshaping economic structures and workforce dynamics. The study aims to determine how digital transformation influences the quality, structure, and competitiveness of human capital, as well as to identify the institutional conditions required for ensuring sustainable workforce development in rapidly changing technological environments. The research employs comparative analysis, synthesis of statistical indicators, and evaluation of international benchmarks to reveal key tendencies that define human capital evolution in the digital age.

The results demonstrate that digitalization generates growing demand for highly skilled specialists while simultaneously deepening disparities in access to educational and technological resources. The study highlights that continuous learning becomes a critical factor for maintaining labor market relevance, particularly in light of projections indicating

that up to 65 percent of current skills will transform by 2030. Special attention is given to the role of meta-competencies—such as adaptability, creativity, communication, problem-solving, and cognitive flexibility—which underpin long-term employability and enable workers to navigate complex technological transitions. Empirical evidence also shows that despite external shocks and structural disruptions, Ukraine is progressing toward higher digital literacy and increasing integration into global technological ecosystems.

The article concludes that effective human capital transformation requires comprehensive public policies focused on digital infrastructure expansion, inclusive access to education, modernization of qualification frameworks, and the development of public-private partnerships. These measures are essential for enhancing national competitiveness, strengthening economic resilience, and advancing Ukraine's integration into the European educational and economic landscape.

References

1. State Statistics Service of Ukraine. (2024). Statistical Data on Employment in Ukraine (2021–2024). Kyiv. Available at: https://ukrstat.gov.ua

2. Ptukha Institute for Demography and Social Studies of the National Academy of Sciences of Ukraine. (2025). Human Capital of Ukraine: War Losses and Prospects for Post-War Recovery. *Visnyk of the National Academy of Sciences of Ukraine*, No. 4, 38–45. Available at: https://nasu-periodicals.org.ua/index.php/visnyk/article/view/39-46

3. Ministry of Digital Transformation of Ukraine. (2024). Digital Transformation Index of Ukrainian Regions. Kyiv. Available at: https://thedigital.gov.ua/news/regions/rezultati-tsifrovoi-transformatsii-v-regionakh-ukraini-za-2024-rik

4. Ministry of Education and Science of Ukraine. (2024). Diia.Osvita Platform: User Statistics and Development Recommendations. Kyiv. Available at: https://osvita.diia.gov.ua

5. National Bank of Ukraine. (2024). Export of IT Services of Ukraine (2021–2024). Kyiv. Available at: https://bank.gov.ua

6. Roosh, AI HOUSE, Ministry of Digital Transformation of Ukraine. (2024). AI Ecosystem of Ukraine: Talent, Companies, Education. Kyiv. Available at: https://thedigital.gov.ua/news/ukraina-posidae-druge-mistse-za-kilkistyu-shi-kompaniy-u-tsentralniy-ta-skhidniy-evropi-rezultati-doslidzhennya-pro-shtuchniy-intelekt

7. Ministry of Digital Transformation of Ukraine. (2023). Digital Literacy of Ukrainians: Study Results (2019–2023). Kyiv. Available at: https://www.kmu.gov.ua/news/mincifri-prezentuvala-diyacifrova-osvita-20-ta-doslidzhennya-cifrovoyi-gramotnosti-ukrayinciv

8. World Economic Forum. (2025). *The Future of Jobs Report 2025*. Geneva: WEF Publishing. Available at: https://www.weforum.org/publications/the-future-of-jobs-report-2025/

9. OECD. (2023). *OECD Skills Outlook 2023: Skills for a Resilient Green and Digital Transition*. Paris: OECD Publishing. Available at: https://doi.org/10.1787/27452f29-en

10. Charles, L., Xia, S., & Coutts, A. P. (2022). *Digitalization and Employment: A Review*. International Labour Organization. Geneva. Available at: https://www.ilo.org/publications/digitalization-and-employment-review

11. European Commission. (2020). *Digital Education Action Plan 2021–2027: Resetting Education and Training for the Digital Age* [COM(2020) 624 final]. Brussels. Available at: https://education.ec.europa.eu/focus-topics/digital-education/plan

12. LinkedIn. (2024). *The Most In-Demand Skills of 2024*. LinkedIn Talent Solutions. Available at: https://www.linkedin.com/business/learning/blog/top-skills-and-courses/most-in-demand-skills

13. Burning Glass Institute & Coursera. (2023). *2023 Skills Compass Report*. Boston. Available at: https://www.burningglassinstitute.org/research/2023-skills-compass-report