education-challenges-and-opportunities

8. Laak, K.-J., & Aru, J. (2025, March 21). AI and personalized learning: Bridging the gap with modern educational goals. *arXiv*. https://arxiv.org/html/2404.02798v2

PROSPECTS FOR TRAINING ICT SPECIALISTS IN THE CONTEXT OF ANTI-CRISIS IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE TOOLS

Svergun Iryna,
Postgraduate student of the Department of Smart Economics
Kyiv National University of Technologies and Design (Kyiv, Ukraine)
chernova.irena78@gmail.com

Khaustova Yevheniia,
Doctor of Economic Sciences, Professor of the Department of Smart Economics
Kyiv National University of Technologies and Design (Kyiv, Ukraine)
g.haystova@gmail.com

In the modern world, information and communication technologies (ICT) and artificial intelligence (AI) tools have become key drivers of adaptation to crises such as the COVID-19 pandemic, the full-scale war in Ukraine, and global economic transformations. In Ukraine, the war that began in 2022 has significantly impacted the ICT sector and education: according to the Ministry of Education and Science of Ukraine, the number of students who switched to distance learning increased by 35% in 2023 due to military actions and power outages [1]. This underscores the need for rapid implementation of innovative approaches in training ICT specialists capable of working in uncertain conditions, adapting quickly to changes, and applying intelligent tools for risk forecasting, process optimization, and decision-making. The purpose of this paper is to analyze the prospects for training ICT specialists in the context of anti-crisis implementation of AI tools, considering global trends and national challenges.

The war in Ukraine has become a catalyst for changes in the ICT sector, simultaneously creating challenges and opportunities. On the one hand, physical infrastructure has been destroyed: as of 2023, over 20% of technical centers and laboratories in the eastern regions of the country are unusable. On the other hand, the demand for cybersecurity specialists and AI system developers has increased due to a surge in cyberattacks. According to CyberTech, the number of attacks on Ukrainian resources rose by 150% in 2022, prompting the development of remote platforms and cybersecurity programs [2, p. 83]. Educational institutions have been forced to adapt: for instance, Kharkiv National University of Radio Electronics shifted 90% of its courses to online formats, using AI for personalized learning. This demonstrates how crises accelerate digitalization but also create new challenges, such as a lack of equipment and access to high-speed internet in regions where only 40% of the population has stable connectivity [1].

Anti-crisis implementation of AI involves leveraging its capabilities for rapid transformation: automation of processes, risk forecasting, logistics optimization, and cybersecurity enhancement. In medicine, Ukrainian developers during the COVID-19 pandemic created an AI-based platform that predicted the spread of the virus, helping hospitals optimize resources and reduce bed shortages by 25% [4, p. 45]. In business, AI

facilitated adaptation to wartime conditions: in 2022, when Ukraine's ports were blocked, logistics companies like Nova Poshta used algorithms to reroute deliveries, reducing delays by 30%. Globally, the Google AI for Social Good project applies AI to predict natural disasters, which could be adapted for Ukraine's needs, such as post-shelling recovery. In education, AI platforms like Coursera and Ukraine's Prometheus offer adaptive courses, enabling students to learn ICT at their own pace, increasing learning efficiency by 15% [3, p. 32].

Education in the ICT field must align with contemporary challenges, shifting from a traditional academic model to a practice-oriented one. A global trend is the emphasis on interdisciplinarity, project-based learning, and collaboration with businesses. Training should encompass AI at all levels: from basic understanding to the development and implementation of solutions. Critical thinking, data analysis, cybersecurity, and teamwork skills are essential. Universities should create adaptive learning pathways using gamification, personalized routes, simulations, and virtual and augmented reality supported by AI algorithms. For example, in 2023, Kyiv National University of Technologies and Design introduced a cybersecurity course where students use AI to simulate attacks, improving their readiness for real threats by 20% [2, p. 85].

International cooperation plays a crucial role in training. Programs like Erasmus+ and Horizon Europe provide grants and opportunities for knowledge exchange. In 2023, Taras Shevchenko National University of Kyiv, in collaboration with universities in France and Germany, developed an AI platform for climate change analysis, funded by Horizon Europe [3, p. 34]. UNESCO also supports initiatives to integrate AI into education, emphasizing ethical approaches and accessibility.

Key challenges in training ICT specialists in Ukraine include a lack of modern equipment, insufficient funding, and a shortage of instructors experienced in AI. In regional universities, the situation is exacerbated by the war: for instance, key technical laboratories in Mariupol have been destroyed. Solutions include establishing digital education hubs, involving IT practitioners in teaching, and investing in instructor training. In 2024, the Ministry of Digital Transformation launched the "Digital Ambassadors" program, engaging specialists from companies like EPAM and SoftServe to teach at universities [5, p. 62]. Dual education, where students combine studies with practical experience in IT companies, is also gaining momentum: according to the Ministry of Education, 15% of ICT students studied under this system in 2023.

The use of AI raises ethical concerns, such as algorithmic bias and privacy violations. For example, in recruitment, AI can discriminate against candidates due to poorly configured algorithms, as seen with Amazon's system in 2018 [6, p. 18]. In education, it is crucial to teach students the principles of responsible AI design to avoid such issues. UNESCO recommends incorporating ethical modules into ICT programs, focusing on data protection and decision transparency.

The integration of AI tools into the training of ICT specialists is essential for overcoming crises and fostering an innovative economy. Ukraine has significant potential due to active government support, international partnerships, and its own IT resources. According to OECD forecasts, global demand for ICT specialists will rise by 25% by 2030, while in Ukraine, this figure may reach 40% due to post-war recovery needs [3, p. 35]. Educational programs must adapt to global trends, ensuring practical skills, ethical responsibility, and digital literacy. Strategic reforms, including the creation of hubs, dual

education, and international collaboration, will enable Ukraine not only to recover but also to become competitive in the global ICT landscape.

References:

1. Honcharuk I. M. Strategies for the internationalization of education in the digital age. *Economy and Society*. 2021. № 32. P. 115-120. URL: https://economyandsociety.in.ua/index.php/journal/article/view/1223
2. Liashenko O. I. International trends in the development of the digital economy. *Global and National Economic Problems*. 2022. № 40. P. 83-89.
3. OECD. *AI and the future of skills. Volume 1: Capabilities and assessments.* OECD Publishing, 2021. URL: https://www.oecd.org/publications/ai-and-the-future-of-skills-volume-1-5ee71f34-en.htm
4. Schwab K. *The fourth industrial revolution.* Geneva: World Economic Forum, 2016.
5. Sokoliuk I. O. The impact of digitalization on small and medium-sized businesses in Ukraine. *Business Inform.* 2023. № 2. P. 60-65.
6. UNESCO. *AI and the future of education.* Paris: UNESCO Publishing, 2022.

ІНСТРУМЕНТИ ШІ: НАВЧАННЯ БІЗНЕС-НАВИКАМ СТУДЕНТІВ-ЕКОНОМІСТІВ

Бойко Ярослав Миколайович,
доцент кафедри економіки, підприємництва і торгівлі, к.е.н., доцент,
ДВНЗ «Ужгородський національний університет»
yaroslav.boiko@uzhnu.edu.ua

Гапак Наталія Мирославівна,
доцент кафедри економіки, підприємництва і торгівлі, к.е.н., доцент,
ДВНЗ «Ужгородський національний університет»
natalia.hapak@uzhnu.edu.ua

Штучний інтелект (ШІ) здійснює важливу роль у підготовці студентів економічних спеціальностей, сприяючи розвитку їх професійних навичок та адаптації до сучасного ринку праці.

Інтеграція ШІ у навчальні дисципліни допоможе розкрити практичні аспекти застосування технологій для оптимізації економічних процесів. Він може допомогти студентам розвивати здатність аналізувати дані, вирішувати проблеми та приймати обґрунтовані рішення в економічній сфері. Це особливо важливо для прогнозування ринкових трендів і оптимізації ресурсів, для проведення конкурентного аналізу, SWOT / TOWS-аналізу, PESTEL-аналізу тощо. Актуальним також є напрацювання навичок щодо написання якісних промптів (точних запитів) для досягнення найякіснішої відповіді від системи та отпимізації робочого часу в управлінні бізнесом. Важливо показати студентам-економістам різні інструменти ШІ під ті чи інші задачі бізнесу, знати їх переваги/недоліки та спрямувати навчання так, аби вони власноруч напрацювали навички роботи з ШІ та впевнено могли використовувати їх для виконання бізнес-завдань.

Як зазначає І.Стефанська, «важливо навчити якісно взаємодіяти зі штучним інтелектом…більше звертати увагу на розвиток метанавичок (надуміння), зокрема усвідомленості, емпатії, неупередженості, гнучкості, креативності, інтегрального та критичного мислення та ін.» [1].