

Інноваційні засоби викладання 3D-моделювання включають використання технологій віртуальної та доповненої реальності, інтерактивних симуляторів, 3D-сканерів і систем швидкого прототипування. Завдяки VR/AR технологіям студенти можуть взаємодіяти з цифровими моделями у реальному масштабі.

Важливою тенденцією сучасної інженерної освіти є інтеграція 3D-моделювання з технологіями адитивного виробництва. Використання 3D-друку дозволяє швидко виготовляти фізичні прототипи деталей та оцінювати їх функціональність.

Таким чином, розвиток 3D-моделювання та впровадження інноваційних засобів його викладання є одним із ключових напрямів модернізації інженерної освіти.

Список використаних джерел

1. Tickoo S. Autodesk Inventor for Engineers and Designers. CADCIM Technologies, 2023.
2. Waguespack C. Mastering Autodesk Inventor. Wiley Publishing, 2021.
3. Autodesk Inc. AutoCAD Fundamentals. Autodesk Official Press, 2022.
4. Murdock K. Autodesk 3ds Max Complete Reference Guide. McGraw-Hill, 2020.
5. Zeid I. CAD/CAM Theory and Practice. McGraw-Hill, 2020.

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Potential for Attracting Foreign Students to Ukrainian Educational Institutions in the Conditions of Digitalization

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Abstract. *The theses explore the potential for attracting international students to Ukrainian higher education institutions in the context of the digitalization of the global educational space. The role of educational export as a tool for economic development, state soft power, and the formation of international partnership networks is analyzed. It is substantiated that modern digital technologies – online platforms, distance learning systems, XR technologies, and AI-adaptive solutions – create new opportunities for integrating Ukrainian higher education institutions into the global education market without the need for students' physical presence in Ukraine. Promising regions for Ukraine's educational export are identified, and the competitive advantages of Ukrainian education in the fields of medicine, engineering, agricultural sciences, and vocational education and training are outlined. Particular attention is paid to legislative barriers that hinder the development of remote enrollment of international students, as well as to the need for a comprehensive state strategy for educational export and strengthening Ukraine's international influence through the mechanisms of educational diplomacy and intercultural interaction.*

Keywords: *educational export, digitalization of education, international students, soft power, international education, educational diplomacy.*

The global market for educational services has confidently surpassed the USD 200 billion mark and continues to demonstrate steady growth even amid geopolitical turbulence. The attraction of international students has long been recognized as one of the most effective instruments of soft power: it simultaneously generates foreign currency revenues, expands cultural influence, and builds sustainable informal networks between countries [1]. Ukraine – with more than 130 higher education institutions (HEIs), an extensive vocational education system, and internationally recognized scientific schools in exact sciences, medicine, engineering, and agronomy – possesses substantial foundations for such development; however, it has not yet transformed this potential into a comprehensive state strategy [2].

Today, the national education system faces a dual challenge. From a geopolitical perspective, post-war reconstruction will require an extensive network of international allies – people who have personally experienced Ukraine and are therefore inclined to support its interests. From the standpoint of institutional development, the decline in the number of domestic students due to demographic losses and emigration directly threatens the financial sustainability of universities and the survival of scientific schools. International students are capable of mitigating both challenges simultaneously.

The decisive factor fundamentally changing the rules of the game is the digitalization of education. Massive Open Online Course (MOOC) platforms, XR simulators, and adaptive Learning Management Systems (LMS) have made high-quality education accessible via the Internet from virtually anywhere in the world. Generalized findings from 51 controlled pedagogical studies indicate that online learning is not inferior to classroom-based education and, in certain contexts, even surpasses it [3]. Consequently, Ukrainian universities are now capable of reaching students thousands of kilometers away without opening representative offices abroad.

The selection of priority markets is shaped by global industrial trends. The United States is undergoing large-scale reindustrialization: the IRA and CHIPS Acts direct more than USD 400 billion toward renewable energy, microelectronics, and green manufacturing sectors [4], creating a workforce deficit that local colleges are unable to satisfy. Latin American countries – Argentina, Ecuador, Colombia, and Peru – are accelerating industrial development and raw material extraction while lacking sufficient accredited technical education programs within the region. India and Bangladesh generate hundreds of thousands of applicants annually for medical, engineering, and IT specialties, while traditional destinations such as the United States, the United Kingdom, and Australia are becoming increasingly inaccessible for many of them [2]. Central Asian states – Kazakhstan, Uzbekistan, Tajikistan, and Kyrgyzstan – are reforming their agricultural and industrial sectors, where Ukraine's agrarian educational tradition possesses evident competitive advantages [1].

Ukraine's comparative advantages in these markets are tangible. First, tuition fees are significantly lower than in English-speaking countries. Second, Ukraine's relatively neutral geopolitical image does not provoke the biases often associated with major global powers. Third, the possibility of offering programs in English and Spanish

removes language barriers for large segments of target audiences. Fourth, Ukrainian universities have decades of experience training engineers, doctors, and agronomists – precisely the specialists required by industrializing economies.

The technological foundation for online education in technical specialties is formed by modern digital tools: simulation environments and industrial equipment digital twins; extended reality technologies (XR: AR – augmented reality, VR – virtual reality, MR – mixed reality); blended learning models that combine online theory with short-term practical training at partner enterprises; and AI-adaptive platforms [5]. For vocational education and training, these technologies are particularly significant: welding, electrical installation, and agricultural machinery simulators make it possible to develop practical skills without requiring access to a physical industrial site.

By considering international students solely as a source of tuition revenue, we underestimate their strategic importance. Upon returning home, they carry with them a living rather than media-generated image of Ukraine – its people, values, and professional standards. In this way, they become agents of people-to-people diplomacy, cultural ambassadors, and potential business partners for Ukrainian enterprises. Research demonstrates that countries with developed educational exchange systems experience growth in bilateral trade and foreign direct investment [6]. This effect underpins the educational diplomacy models of China (through the China Scholarship Council program and the Confucius Institutes network [7]) and Germany (through DAAD [8]).

The financial impact of educational export extends beyond tuition fees. According to OECD estimates, one full-time international student generates between USD 15,000 and 45,000 annually in domestic expenditures within the host country [1]. Moreover, a stable flow of international students helps universities retain academic staff and scientific schools, which is critically important amid the decline of the domestic student population. This, in turn, stimulates adjacent sectors such as EdTech, localization, and translation services, while the released resources can be directed toward fundamental and applied research.

The primary structural limitation lies in legislative gaps. The current Law of Ukraine “On Higher Education” [9] does not regulate remote admission without the applicant’s physical presence in the country, does not provide for the institution of an accredited educational representative (lawyer or agent) authorized to act on behalf of a foreign applicant, and does not ensure equal rights for public and private HEIs in attracting international students. Meanwhile, universities in the United Kingdom, Canada, and Australia have long accepted international applicants fully remotely through electronic signatures and video identity verification. Eliminating these gaps is not an optional reform but a mandatory prerequisite: as long as admission requires physical entry into Ukraine, no marketing campaign will generate a large-scale flow of students from distant markets.

The proposed educational export strategy is based on five levels of coordinated efforts between the state and universities. The diplomatic level involves concluding agreements on mutual recognition of qualifications with key partner countries. The regulatory level requires amendments to the Law “On Higher Education” and the introduction of online program accreditation according to international standards (ISO/IEC 40180, EFMD). The financial level includes launching a state scholarship program (300–500 places annually) as an initial driver for network-based recruitment. The infrastructural level focuses on the development of high-quality LMS content and modernization of the “Study in Ukraine” platform. The promotional level encompasses targeted marketing through embassies, diaspora communities, and digital channels. In this framework, the state acts as a catalyst and legal partner, while universities assume responsibility for building institutional brands and educational product offerings.

Therefore, educational export should be regarded not as a secondary direction, but as a strategic axis where Ukraine’s foreign policy, scientific capacity, and economic development intersect.

The combination of existing competencies within Ukraine’s educational system, modern digital instruments, and clearly identified external markets provides a realistic basis for building and competitive educational export industry – provided that legislative barriers are removed and the state and universities act in a coordinated manner.

References

1. OECD. Education at a Glance 2023: OECD Indicators. Paris: OECD Publishing, 2023. DOI: 10.1787/e13bef63-en.
2. UNESCO Institute for Statistics. Global Flow of Tertiary-Level Students. Montreal: UNESCO, 2024. URL: <http://uis.unesco.org/en/uis-student-flow>.
3. Means B., Toyama Y., Murphy R., Bakia M., Jones K. Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review. Washington DC: U.S. Department of Education, 2010. ERIC: ED505824.
4. U.S. Department of Energy. Inflation Reduction Act Guidebook. Washington, DC: DOE, 2023. URL: <https://www.energy.gov/lpo/inflation-reduction-act>.
5. European Commission. Digital Education Action Plan (2021–2027). Brussels: EC, 2021. URL: <https://education.ec.europa.eu/focus-topics/digital-education/action-plan>.
6. Wojciuk A., Michalek M., Stormowska M. Education as a source and tool of soft power in international relations. *European Political Science*. 2015. Vol. 14(3). P. 298–317. DOI: 10.1057/eps.2015.25.
7. Haugen H.O. China's recruitment of African university students: policy efficacy and unintended outcomes. *Globalisation, Societies and Education*. 2013. Vol. 11(3). P. 315–334. DOI: 10.1080/14767724.2012.750478.
8. Nye J.S. *The Future of Power*. New York: PublicAffairs, 2011. 320 p. ISBN: 978-1-58648-891-8.
9. Law of Ukraine "On Higher Education" dated 01.07.2014 No. 1556-VII / Verkhovna Rada of Ukraine. URL: <https://zakon.rada.gov.ua/laws/show/1556-18>.