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INTERNATIONAL COOPERATION AND VIRTUAL MOBILITY AS FACTORS OF THE DEVELOPMENT OF THE INNOVATIVE ECOSYSTEM OF HIGHER EDUCATION INSTITUTIONS

In today's conditions of globalization and digital transformation, higher education institutions (HEIs) are increasingly viewed not only as educational institutions, but also as active participants in the innovation ecosystem, capable of creating and transferring knowledge, attracting international resources and forming new socio-economic models of development. The innovative ecosystem of a university involves the interaction of various participants – students, scientists, business, state and international organizations - under the conditions of a sustainable exchange of knowledge and resources. In this context, international cooperation and virtual mobility are key factors in the dynamic development of such ecosystems.

International cooperation of universities provides access to the latest scientific and educational practices, creates conditions for the development of innovative activities and strengthens the positions of institutions in the global scientific and educational network. Cooperation includes concluding agreements with higher education institutions of other countries, participation in international projects and programs, organization of joint conferences, internships and research, etc. This contributes to increasing scientific potential through the exchange of knowledge, technologies and scientific personnel [1, 2, 4].

The priority areas of international cooperation of higher education institutions are [1, 3, 4, 7, 12]:

– **expanding the network of partnership agreements with foreign universities, research institutions, international organizations and representatives of innovative businesses.** Such agreements create an institutional framework for implementing joint educational programs, conducting collective scientific research, exchanging experience, and implementing innovative educational and management practices.

– **increasing opportunities for academic mobility of students, lecturers and researchers,** which involves participation in international exchange programs, joint training courses, internships and research projects. Academic mobility contributes to improving the quality of education and scientific research, developing intercultural and professional competencies, as well as integrating universities into the global educational and scientific space.

– **developing cooperation with international educational and scientific networks, digital platforms and consortia,** which act as powerful resources for the innovative activities of universities. Participation in such networks provides access to joint research infrastructures, open scientific data, international grant programs and knowledge exchange platforms. This, in turn, creates conditions for the commercialization of scientific research results, the development of startup initiatives and the formation of a sustainable innovative ecosystem of the university.

Taken together, these areas of international cooperation contribute to increasing the competitiveness of higher education institutions through joint scientific publications, participation in international grant programs and implementation of long-term projects, activation of innovative activities and strengthening the role of universities as key players in the global knowledge economy. This contributes not only to the development of scientific and educational achievements, but also to the formation of a positive image of the university at the global level [2, 3, 7, 8].

Virtual mobility is becoming increasingly important in the higher education environment, especially after the COVID-19 pandemic, which significantly accelerated the digital transformation of educational processes, as well as a result of the full-scale war of the Russian Federation against Ukraine. In conditions of physical restrictions on movement, security threats and forced displacement of students and lecturers, it is digital formats of international

cooperation that have become a key tool for ensuring the continuity of educational and scientific processes [6, 7, 9].

Virtual mobility, implemented through joint online courses, international digital projects, Collaborative Online International Learning (COIL) programs, virtual research laboratories, and online internships, allows higher education institutions to maintain and expand international academic ties without the need for physical presence of participants. In the context of war, this is of particular importance for Ukrainian universities, which were able to maintain integration into the European and global educational and scientific space, despite the restrictions caused by military actions [2, 3, 8, 10].

In addition, virtual mobility helps to increase the accessibility of international experience to a wide range of learners and researchers, including those who are unable to participate in traditional physical mobility programs. It ensures the development of digital, intercultural and communicative competencies that are necessary for functioning in the knowledge economy and the formation of an innovative ecosystem of universities [6, 7, 9, 11, 12].

Thus, in the face of pandemic and military challenges, virtual mobility is transformed from an additional tool for internationalization into a strategic mechanism for supporting the sustainability, international cooperation, and innovative development of higher education institutions in Ukraine.

The synergy of international cooperation and virtual mobility contributes to the creation of a comprehensive innovative ecosystem of the university, where knowledge, technologies and competences circulate through various channels of interaction:

First, the internationalization of the educational process expands access to international practices and expertise, allowing universities to adapt leading management models and pedagogical approaches [11, 12].

Second, virtual academic programs strengthen ties between universities through joint courses, online seminars, and research initiatives, which creates the prerequisites for joint scientific and innovative projects [5, 9].

Third, the participation in international research networks and digital initiatives opens up new opportunities for attracting grant resources and integrating universities into global value chains (GVCs), which is an important aspect of the innovative ecosystem [9, 11, 12].

International cooperation and virtual mobility are important elements of the innovative ecosystem of modern universities, contributing to internationalization, improving the quality of education and developing scientific potential. They not only broaden educational and scientific horizons, but also create mechanisms for effective interaction with global partners. Integrated into the university development strategies, these factors contribute to the formation of competitive educational models, capable of responding to the challenges of the 21st century.

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