THE ROLE OF DIGITAL TECHNOLOGIES IN BLENDED LEARNING: FOREIGN EXPERIENCE AND CHALLENGES FOR UKRAINIAN HIGHER EDUCATION INSTITUTIONS

Tetiana Pryhalinska
Candidate of Pedagogical Sciences, Senior Lecturer at the Department of Mathematical Analysis and Probability Theory, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Ukraine
e-mail: tania.krivorot@gmail.com, orcid.org/0000-0002-4267-077X

Summary

In the article, the author analyzes the definitions of "blended learning" and the role of digital technologies in its implementation. The author analyzes the experience of using blended learning in countries such as Canada, the Czech Republic and the Federal Republic of Germany, which demonstrate the effective implementation of digital platforms and technologies to improve the quality of the educational process. In particular, it focuses on the use of learning management systems (Moodle, MS Teams, Google Classroom), recording and distribution of video lectures, interactive simulations and forums to maintain communication between teachers and students.

The study identifies key aspects that Ukrainian higher education institutions can adapt from international experience: a flexible combination of synchronous and asynchronous activities, providing technical support for teachers, creating centers of pedagogical excellence, as well as state support for the digitalization of education. The main challenges, such as the lack of a unified digitalization strategy, the need to develop infrastructure and prepare teachers for the effective use of digital technologies and innovations, are outlined.

It has been determined that the application of innovative approaches to blended learning in Ukraine will improve the quality of educational services, ensure the flexibility of the educational process and promote the integration of national education into the world educational space.

Key words: innovation, educational process, higher education institutions, digitalization, blended learning, technology.

DOI https://doi.org/10.23856/6718

1. Introduction

The diversity of learning methods and strategies has always been a challenge due to the diversity of human personalities, their needs, abilities, preferences and interests. Today, the search for effective and convenient learning strategies in higher education institutions is becoming even more urgent due to the impact of local and global crises, as well as significant transformations in the world. Also, the Covid-19 pandemic has given a powerful impetus to the development of blended and distance learning technologies, contributing to the adaptation of educational processes to new conditions.

As noted in the study by Chykurova O., Boiaryshcheva T., Herych M., Kviatkovska A., Tymoshchuk O., the growing digitalization of society and the need for flexible approaches to learning encourage educational institutions to seek innovative solutions that take into account the diverse needs of students and the modern world *(Chykurova, 2022)*. Modern education is

constantly evolving under the influence of digitalization, which is changing traditional teaching methods. Blended learning, which combines face-to-face learning with the use of digital technologies, has become an important trend in many countries around the world. This model promotes individualization of the educational process, provides flexibility in the acquisition of knowledge and meets the challenges of modern society. Blended learning is an innovative approach that offers new opportunities to optimize the educational process. By combining the advantages of traditional learning, such as direct interaction with students, with the potential of modern technology, the blended model allows for flexible and interactive learning environments. The results of numerous studies confirm that this approach contributes to the development of critical thinking, creativity and other key competencies of the 21st century.

2. The essence of the main definitions of "blended learning"

An analytical review of scientific research to substantiate blended learning in higher education institutions allows us to conclude that the works of V. Bykov, K. Reychuk and M. Kandemirova, Y. Kandemirova, and M. Kandemirova have had a significant impact on this aspect. Bykov, K. Buhaichuk, R. Gurevych and M. Kandemia, H. Tkachuk, L. Kartashova, Y. Trius, V. Kukharenko, N. Morse, V. Oliynyk, O. Spirin, K. Osadcha, A. Kviatkovska, A. Gruber, H. Stucker, B. Khan, etc. The concept of "blended learning" has undergone significant transformations due to scientific research. Scientists have not only clarified its definition, but also expanded the understanding of its capabilities and limitations, creating a solid theoretical foundation for its application in education.

Different authors use different terms to describe the same phenomenon. For example, J. Trius believes that the terms "blended learning", "blended learning" and "hybrid learning" are synonymous and mean the integration of traditional and online forms of learning *(Trius, 2012)*.

In her study, A. Kviatkovska notes that "Blended learning is the systematic use of methods and techniques of traditional and distance learning, in which educational material in any electronic form (audio, text, video, presentations, animations, webinars, etc.) is transmitted to students through digital technologies to achieve educational goals" *(Kviatkovska, 2023)*.

The study by I. Shevtsova and V. Bondarenko notes that "Blended learning is a systematic process of acquiring knowledge, skills and abilities organized by educational institutions of various types within formal education. Part of this process involves the remote use of information and communication technologies and technical means that ensure the storage and delivery of educational materials, control measures, as well as interaction between participants in the educational process (consultations, discussions, etc.)."

The term "blended learning" can be found in a press release from EPIC in 1999: "...To date, the company has developed 220 e-courses covering a wide range of topics. These courses are available online and can be taken anytime, anywhere" *(Collis, 2001)*.

3. Experience of foreign countries in blended learning and the use of digital technologies

The experience of foreign countries in blended learning and the use of digital technologies is an important benchmark for the development of the modern educational system. Many educational institutions around the world are actively implementing blended learning as an effective approach that combines traditional classroom instruction with online components. Let's look at the key aspects of this experience in different countries.

In the academic years 2003–2004, 2004–2005, and 2005–2006, the University of Konstanz (Germany) offered information literacy courses based on the blended learning model. This was made possible through the preliminary preparation of materials for face-to-face training and the creation of e-learning resources. Students were able to work with learning units, download all lesson materials (presentations, work instructions, etc.), and send their own work to teachers. A forum played a significant role in the learning process, as it was used to exchange questions between participants and teachers. This organization of training ensured the transparency of the course, so that participants had access to all materials at any time convenient for them.

Scientists T. Girmer and A. Heinrich conducted an empirical study at the University of Bamberg (Germany), which assessed the key requirements for using lecture recording solutions in the context of blended learning at the Faculty of Information Systems and Applied Computer Science. The study also analyzed possible ways to record and expand lectures, and based on the results, a conclusion was made about the relevance and prospects of digital technologies for blended learning.

It is worth noting that the COVID-19 pandemic has become a catalyst for the development of innovative approaches in higher education. The forced transition to distance learning at universities in Germany and other countries has stimulated the active use of new technologies, such as online platforms, video conferencing, and interactive learning materials. This has opened up new opportunities for personalizing learning, increasing its accessibility, and engaging students in active educational activities.

Analyzing the experience of Canada, it is worth noting Delhousie University, which offers innovative blended courses that combine the best practices of classroom and online learning. Thanks to a carefully thought-out combination of synchronous and asynchronous activities, students have the opportunity to learn at their own pace, choosing the optimal balance between interactive interaction with the teacher and classmates and independent work with educational materials. This approach provides a high degree of flexibility and personalization of learning, allowing each student to achieve the best results. Delhousie University, located in Nova Scotia, one of the provinces of Atlantic Canada, is a leading research institution in the region; it is ranked 10th among national higher education institutions in the ranking list of the British publication The Times Higher Education. This prestigious university is renowned for its innovative research, which has a significant impact on the development of various fields of knowledge, from medicine and natural sciences to the humanities and social sciences. Delhousie is a recognized leader in education and research, attracting talented students and faculty from around the world.

The experience of blended learning at the University of Waterloo, one of the top ten higher education institutions in Canada, ranked 12th in The Times Higher Education, will help to detail the vision of the blended learning concept, as it has its own individual features *(Lastochkina, 2022)*. The organization of blended learning at the university is ensured by the Center for Pedagogical Excellence (CPE), which plays a key role in the development and implementation of relevant methods. On their website, they position blended learning as a thoughtful integration and alignment of classroom and distance interaction components. These components include lectures, seminars, labs, excursions, group work, and other types of classes. The Center for Pedagogical Excellence offers instructional materials, recommendations, and technical support for teachers, helping them to effectively combine different forms of learning. Particular attention is paid to adapting blended learning to the needs of different disciplines and student groups, as well as ensuring the flexibility of the educational process through digital technologies.

Thus, the experience of the University of Waterloo not only demonstrates the successful implementation of the blended learning concept, but also provides practical approaches that can be used by other educational institutions to improve their educational strategy.

A study conducted at the Higher School for Medical Staff in Olomouc, Czech Republic, makes it possible to note that the following digital platforms were used in the process of blended learning: Moodle, Google Classroom, Microsoft Teams, Zoom, as well as specialized medical simulators such as SimLife, iSimulate, Anatomage. For many universities in the Czech Republic, the blended learning tool is part of general education and represents a kind of continuum between traditional and pure online courses *(Pavlisová, 2022)*. It is worth noting that the MS Teams platform has been recommended by the Czech Ministry of Education as a common tool for Czech educational institutions of all levels.

4. Challenges for Ukrainian higher education institutions and recommendations for overcoming them

Based on the analysis of scientific sources and pedagogical observations, we have stated that, despite the advantages, Ukrainian higher education institutions face the following problems in the implementation of blended learning:

1. Technical infrastructure. Many HEIs are not sufficiently equipped with modern technology and high-speed Internet.
2. Digital competence of teachers. Teachers often lack the necessary digital skills to effectively use innovative platforms.
3. Low student motivation. Lack of discipline and self-control in distance learning can reduce the effectiveness of the blended model.
4. Financial constraints. Insufficient funding for educational institutions makes it difficult to introduce the latest technologies.
5. Legal barriers. Unclear regulations on blended learning prevent its widespread use.

Pedagogical observations and own experience allow us to provide recommendations for overcoming the above challenges:

1. *Infrastructure development.* It is important to provide higher education institutions with modern technologies, high-speed Internet and access to licensed platforms.
2. *Professional development of teachers.* Organization of trainings, seminars on digital literacy, consultations, and attendance at modern professional development events will help to increase the level of digital literacy of teachers and research and teaching staff.
3. *Student motivation.* The introduction of interactive teaching methods that encourage active participation of students, such as interactive whiteboards, simulation programs, digital platforms, will help students increase their motivation to learn.
4. *Attracting additional resources.* Cooperation with business, government, and international organizations to finance digitalization in Ukrainian higher education institutions is important.
5. Improving the regulatory framework. The adoption of laws that clearly regulate the use of blended learning in higher education is necessary and important in today's conditions in Ukraine.

5. Conclusions

Ukrainian higher education institutions should focus on integrating modern digital platforms, introducing technical support for teachers, and using interactive tools in the educational process. This will improve the quality of education, provide flexibility in learning, and adapt to global educational challenges. It is important to consider the individual needs of students through personalized approaches, as Delhousie University does. The use of digital technologies allows flexible adaptation of the educational process to the characteristics of different groups of students. Ukrainian HEIs can apply the Canadian experience of combining synchronous and asynchronous activities: online lectures and seminars with students' independent work on materials, which will help ensure flexibility and personalization of learning.

References

1. Chykurova, O., Boiaryshcheva, T., Herych, M., Kviatkovska, A., Tymoshchuk, O. (2022). Aplicación de las tecnologías de la información en el proceso educativo bajo la ley marcial. Apuntes Universitarios, Vol 13(1). DOI: 10.17162/au.v13i1.1325.
2. Clayton, M. Christensen, Michael, B. Horn, Heather Staker. (2013). Is K–12 blended learning disruptive? An introduction to the theory of hybrids. 2013 URL: https://www.christenseninstitute.org/publications/hybrids/ (last accessed: 17.12.2024).
3. Collis, B. (2001). Flexible learning in a digital world: experiences and expectations. London, GB: Kogan Page Limited.
4. Kviatkovska, A. (2023). Osoblyvosti vykorystannia elementiv zmishanoho navchannia v protsesi vykladannia tekhnichnykh dystsyplin v zakladakh fakhovoi peredvyshchoi osvity [Features of the use of elements of blended learning in the process of teaching technical disciplines in institutions of professional higher education. Science and Education]: Proceedings of the XVII International. Scientific. Conf, Hajdúszoboszló, Hungary. Khmelnytskyi: KHNU. p. 53.[in Ukrainian]
5. Kviatkovska, A., Kartashova, L. (2024). Zmishane navchannia: metodyka pidhotovky maibutnikh fakhivtsiv z telekomunikatsii. [Blended learning: a methodology for training future telecommunications specialists]. Collection of scientific papers "Bulletin of Postgraduate Education". Iss. 27(56). p. 55–69. DOI:10.58442/2218-7650-2024-27(56)-55-69.[in Ukrainian]
a. Lastochkina, O.(2022). Zmishane navchannia V OSVITNOMU seredovyshchi universytetiv Kanady [Blended learning in the educational environment of Canadian universities]. Perspectives and innovations of science. 6(11). doi:10.52058/2786-4952-2022-6(11)-227-240. [in Ukrainian]
6. Osadcha, K., Osadchyi, V., Spirin, O., Kruglik, V.(2022). Analiz dosvidu zmishanoho navchannia: ohliad suchasnoi praktyky profesiinoi pidhotovky maibutnikh fakhivtsiv v Ukraini [Analysis of the experience of blended learning: a review of the current practice of professional training of future specialists in Ukraine.]. Topical Issues of the Humanities. Issue 49, Vol. 2. DOI: 10.24919/2308-4863/49-2-19.[in Ukrainian]
7. Pavlisová, Hana.(2022). Blended learning ve vysokoškolském vzdělávání v české republice – vize do budoucna". Sborník příspěvků z konference ICERI. IATED [in Czech]
8. Shevchuk, L., Yashanov, S. (2022). Orhanizatsiino-pedahohichni umovy efektyvnosti zmishanoho navchannia informatychnykh dystsyplin fakhivtsiv profesiinoi osvity.[Organizational and pedagogical conditions for the effectiveness of blended learning of informatics

disciplines for specialists in vocational education.]. Scientific Bulletin of Izmail State University of the Humanities. Issue 60. p. 176–185. [in Ukrainian]
9. Shvetsova, I. V., Bondarenko, V. V.(2019). Uprovadzhennia zmishanoho navchannia (blended learning) u protsesi vykladannia anhliiskoi movy za profesiinym spriamuvanniam.[Implementation of blended learning in the process of teaching ESP]. Young scientist. № 7.2 (71.2). p. 78–82. [in Ukrainian]
10. Trius, Y. V., Gerasymenko, I. V.(2012). Combined learning as an innovative educational technology in higher education. Theory and methods of e-learning: a collection of scientific papers. Issue III. Kryvyi Rih. p. 299–308 [in Ukrainian]