

DOI 10.36074/logos-13.12.2024.067

GAMIFICATION AS A COMPONENT OF THE DIGITAL EDUCATIONAL ENVIRONMENT

Natalia Bobro¹

1. Ph.D, Doctor of Philosophy,
Director of the digital department of the European University,
director of the “NooLab & AI” scientific laboratory of the European University
European University, UKRAINE, SWITZERLAND

ORCID ID: 0009-0003-5316-0809

Summary The article examines the reform of the higher education model in the context of digitalization and modern social development. The key aspects of the educational sphere transformation, such as the introduction of a digital educational environment and its evolution into a digital university format, are identified. Particular attention is paid to the use of digital technologies, including artificial intelligence, blockchain, and cloud computing, to optimize the learning process. The cognitive characteristics of modern students, which lead to a change in approaches to the organization of education, are analyzed. Special emphasis is placed on the introduction of gamification as a tool to increase learning motivation. The structure of gamification, its elements, and its impact on the formation of a link between theoretical knowledge and practical skills are considered. Examples of the implementation of gamified programs, in particular through mobile applications and learning management systems (LMS), are provided. The advantages and challenges associated with the introduction of gamification in the educational process are identified. The conclusion about the expediency of systematic implementation of gamification to improve the efficiency and innovation of higher education is made.

The reform of the higher education model observed in the context of modern social development is characterized by systemic changes in the legal regulation of the educational sphere, introduction of a level system of specialist training, implementation of educational standards, provision of variability of educational programs, and harmonization of educational areas with the needs of the labor market. Approaches to the management of educational institutions are changing significantly [1; 2]. At the center of the transformation of higher education is the formation of a digital educational environment, which, as it develops, evolves into

a digital university format. The effectiveness of this process is determined by the quality of the software and the adaptation of digital tools to the characteristics of modern students who organically interact in the virtual space.

Relationships between participants in the educational process involve the use of social media, messengers, video services, and the introduction of end-to-end digital technologies (artificial intelligence, chatbots, blockchain, machine learning and neural networks, cloud technologies, etc.) The formation of personality, development, and socialization (communication, leisure, study, work) of modern students takes place with the direct and active participation of the Internet, and their identity is represented both in real and digital space. Constant interaction with online content develops such characteristics as clip thinking, multitasking, quick attention span, and mosaic perception of information.

Clip thinking is characterized by the fragmented perception of the information flow, the inability to process information and think systematically. In the educational aspect, this is manifested in rapid fatigue from traditional lectures and classes, as well as in difficulties with learning long texts. Therefore, teachers, depending on the circumstances, need to find ways to either use these cognitive features competently in the educational process or to correct them [3, p. 21].

The ability to multitask is a characteristic of modern students and consists of performing several tasks simultaneously or switching between them quickly. The main characteristics of multitasking are working memory (the ability to retain the information necessary to perform current tasks), fluid intelligence (the speed and accuracy of information processing), and voluntary attention. The flip side of this is a decrease in the depth of information processing, rapid forgetting of the content of completed tasks, which makes it impossible for students to form reproductive-algorithmic and rational-empirical thinking in the learning process [4, p. 721].

For successful interaction with the new generation, which has grown up in a digital information environment and has little tolerance for the monotony of the educational process, it is becoming an objective necessity to transform the roles of teachers and students, as well as to restructure the essence of contact work. Opportunities for such changes are provided by the digitalization of the educational environment of a higher education institution.

One of the modern educational technologies aimed at motivating students to study is gamification. This technology involves the use of computer game elements in non-game situations. In other words, actions typical of young people's daily lives, including computer games, become a way to engage them in studying educational material. Structurally, gamification includes components, mechanics, and dynamics. In the computer design of gamified educational courses, these elements are manifested in the form of points, levels (stages), icons, tables of results (leaders), prizes, awards, progress bars, storylines, and feedback [5].

ABSCHNITT 23.
PÄDAGOGIK UND BILDUNG

It is important to note that in practical terms, many educational institutions have already introduced this educational technology, which has shown practical results. In particular, this technology was implemented in 2024, based on the European University, using the EUni application [6].

The peculiarity of this application is that it uses many elements of gamification: points for activity, achievement levels, badges for success, leaderboards, etc. (Figure 1).

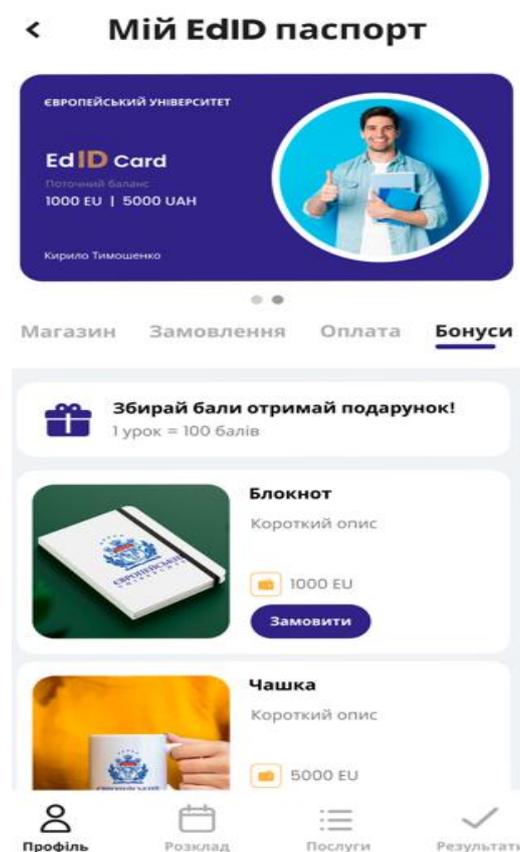


Fig. 1. **Gamification elements in the EUni application**

These gamification elements stimulate interest in learning, creating an environment of healthy competition and motivating students to actively participate in the learning process. The application also integrates innovative gamification elements such as digital avatars that individualize the learning experience of each user.

It should be noted that the use of game elements has a long tradition in educational methods and practice. At the same time, it is the emergence of the generation of “digital aborigines” that has forced a new look at the role of games in

the educational process. Gamification in higher education differs from other game formats in that its participants are focused on achieving professional goals, not just game effects [7, p. 69]. Digital game elements are a supplement to, not an alternative to, learning. The game uses elements aimed at teaching students to solve relevant production situations. During the mastering of a gamified educational course, the student performs both educational and game tasks, with educational goals remaining the priority, and game tasks only support the internal motivation to achieve them.

Gamification has both supporters and opponents in the academic community. Some researchers believe that the educational process and professional training of students will be most effective only with the active use of simulation technologies, including gaming practices. This is because such technologies allow students to realize a clear connection between the knowledge they acquire and their future professional activities through game formats that are familiar to their generation [5; 7]. In addition, gamification helps to overcome the monotony of the educational process and to increase its fascination, positivity, and emotionality.

Other researchers have expressed reservations about the effectiveness of gamification in education, especially in the context of students focused on traditional learning methods. Opponents of this technology, who usually have a negative attitude to any use of information and communication technologies in the educational process, often consider gamification superficial and even harmful to achieving educational goals. In our opinion, such reservations are not justified, as gamification, if implemented rationally, is a powerful tool for increasing student motivation, engaging them in the learning process, and improving the mastering of material. It allows us to adapt the educational process to the needs and characteristics of modern students, who are representatives of the digital generation, naturally oriented towards interactive and dynamic learning formats.

The experience of numerous studies confirms that gamification elements not only diversify the learning process but also stimulate cognitive activity, the development of problem-solving and teamwork skills [1; 3; 8]. In particular, according to a study by the International Journal of Human-Computer Studies, gamification in education increases student performance by 34.75% [9].

In addition, gamification helps to form a link between theoretical knowledge and its practical application, which is especially important for professional education.

At the same time, the cost of implementing gamification can vary significantly depending on the country and the specific educational system [5]. It is important to note that gamification costs are not limited to technology and software.

ABSCHNITT 23.
PÄDAGOGIK UND BILDUNG

Academic staff must also be trained in the effective use of gamification, which may require additional resources and funding. In addition, maintenance and upgrades to game systems require ongoing costs. Eventually, the total cost of gamification in education will depend on many factors, including the level of technology required, the size and complexity of the educational system, and the resources available in a particular country or region.

It is important to note that games will not be a complete replacement for traditional university education, but they can be a valuable addition that supports the learning process and helps to master the material. In addition, educational technologies can serve as a source of income on specialized platforms and resources. For example, by introducing special tariffs (including discounts), subscriptions for a fee, advertising, or developing training programs not only for students but also for employees of companies and government institutions.

Considering the scale of the educational market, before developing a game product, it is necessary to carefully determine its target audience. This includes establishing the level of education (preschool, school, higher, or additional professional education) and the targeted learning objectives, such as learning foreign languages, developing personal interests, acquiring applied skills, or consolidating and expanding knowledge. A clear understanding of these parameters will help to create a product that best meets the educational needs of users and effectively integrates into the learning process.

Among the challenges associated with the introduction of gamification are the lack of digital skills among teachers, limited time to master innovative technologies, and insufficient preparation for the use of digital tools in the educational process. These factors greatly complicate the process of adapting gamification as an effective tool for the professional training of students.

It should be noted that the student community has a positive attitude towards gamification. The majority of students believe that this technology makes the learning process more interesting, dynamic, and more adapted to their needs. Gamification helps to increase motivation to learn, activates cognitive processes, and helps to develop important skills such as time management, teamwork, and decision-making in non-standard situations. Thanks to the game elements, students better understand the connection between theoretical knowledge and its practical application in their future professional activities.

At the present stage, one of the most effective solutions for integrating gamification into the educational process is to implement its elements within learning management systems (LMS). This allows for the organic integration of game mechanics into training courses using the existing infrastructure of

educational institutions. In addition, ample opportunities for gamification are provided by mobile applications, which, thanks to the widespread availability of mobile devices, make learning more interactive and personalized. As a result, such tools help to increase student engagement, the efficiency of the educational process, and its adaptability to modern challenges.

Conclusions. Reforming the higher education model reflects current trends in harmonizing educational processes with social demands, legal changes, and digitalization challenges. Creating a digital learning environment that evolves into a digital university format is becoming a central element of transformation. This environment allows for the integration of innovative technologies such as artificial intelligence, blockchain, and cloud computing, which optimize learning processes, expand access to resources, and form new approaches to interaction between participants in the educational process.

Gamification is one of the most important tools to increase motivation and learning efficiency. The use of game elements such as levels, rewards, leaderboards, and digital avatars helps to activate cognitive processes, develop critical thinking, and teamwork. Practice shows that the integration of such technologies into educational processes, for example, through mobile applications or learning management systems, increases student interest and ensures that learning is adapted to the characteristics of the generation of digital aborigines.

Along with the benefits of gamification, such as increased motivation to learn and the formation of a link between theory and practice, there are challenges. These include the lack of training for teachers in the use of digital tools and the high costs of implementing and maintaining technology. To successfully integrate gamification into educational processes, it is necessary to provide systemic support, including teacher training, cost optimization, and consideration of the specifics of educational systems. As a result, gamification can become an effective tool for the development of education in the context of digitalization.

REFERENCES:

- [1] Krap, A., Bataiev, S., Bobro, N., Kozub, V., & Hlevatska, N. (2024). Examination of digital advancements: Their influence on contemporary corporate management methods and approaches. *Multidisciplinary Reviews*, 7. DOI: <https://doi.org/10.31893/multirev.2024spe026>.
- [2] Bobro, N. (2024). The concept of a digital university. *Scientific innovations and advanced technologies*, № 9(37). pp. 804-811. DOI: [https://doi.org/10.52058/2786-5274-2024-9\(37\)-804-811](https://doi.org/10.52058/2786-5274-2024-9(37)-804-811).
- [3] Wambsganss, T., Janson, A., Söllner, M., Koedinger, K., Leimeister, J. M. (2024). Improving Students' Argumentation Skills Using Dynamic Machine-Learning-Based Modeling. *Information Systems Research*, 1-34. DOI: <https://doi.org/10.1287/isre.2021.0615>.

ABSCHNITT 23.

PÄDAGOGIK UND BILDUNG

- [4] Verina, N., & Titko, J. (2019). Digital transformation: conceptual framework. In Contemporary Issues in Business, *Management and Economics Engineering*. 719–727. DOI: <https://doi.org/10.3846/cibmee.2019.073>
- [5] Bobro, N. Innovative model of a Digital University. The Teaching, Learning, Medical and Psychological Support as Challenges of 21st Century: Preschool, Secondary, Extracurricular, *Vocational, Higher and Postgraduate Education*. DOI: <https://doi.org/10.5281/zenodo.13585316>
- [6] EU CRM. Mode of access: https://play.google.com/store/apps/details?id=ua.ETM.european_university_app&hl=uk&pli=1.
- [7] Safarli C., Kolach S., Zhyvko M., Volskyi O., & Bobro N. (2024). The Impact of Globalization on the Formation and Implementation of International Investment Strategies, *Economic affairs*, 69 (3), 64-70. DOI:10.46852/0424-2513.4.2024.25.
- [8] Lysenko S., Bobro N., Korsunova K., Vasylychshyn O., & Tatarchenko E. (2024). The Role of Artificial Intelligence in Cybersecurity: Automation of Protection and Detection of Threats. *Economic Affairs*, 69, 43-51, DOI: 10.46852/0424-2513.1.2024.6.
- [9] The effect of challenge-based gamification on learning: An experiment in the context of statistics education. *International Journal of Human-Computer Studies*, 2020. Mode of access: <https://www.sciencedirect.com/science/article/pii/S1071581920300987>.