EVOLUTIONARY BASES OF GAMIFICATION APPLICATION BY HIGHER EDUCATION INSTITUTIONS OF UKRAINE

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INTRODUCTION

Understanding of any bases of application of organizational, didactic, methodological components of education is dictated primarily by the general development of the education sector, which invariably acts as «a key subject of nation and state building, a leading social institution responsible for innovative human development, formation of competitive human capital»[1]. The study of the evolutionary foundations of the use of gamification in higher education is due to many factors: the reform of the entire education system of independent Ukraine; the general evolution of educational paradigms in modern scientific educational discourse; changing requirements of the new generation of higher education students for educational content and means of its effective learning; the need to develop and implement attractive educational methods by teachers of higher education institutions that future graduates of higher education institutions will be able to implement in their future professional life.

Gamification has its roots in the gaming experience of mankind. Games and game elements have been used in education since its inception. In 1938, the work of J. Geisinga «Homo Ludens. Experience in Defining the Game Element of Culture»[2], in which the author reflects on the comprehensive essence of the game phenomenon, its universal significance for human civilization, the signs, features, and functions of the game.

Gamification as a modern innovative tool began to emerge in the late twentieth century and early twenty-first century, primarily due to the accelerated pace of digitalization. Since the 2010s, it has been actively implemented in business and education, particularly in higher education. Today, gamification is undoubtedly one of the trends in the organization of the educational process in higher education institutions of Ukraine.

The purpose of the presented materials is to examine in more detail the evolutionary progress of gamification using the problem-chronological method. Thus, to record the chronological sequence of the development of

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[1] Леонтьєва І.В. Реформування освіти в Україні: еволюція наукових поглядів (2001–2021). *Педагогічна освіта: теорія і практика. Психологія. Педагогіка.* Збірник наукових праць. 2021. № 36 (2). С. 12–17. DOI: https://doi.org/10.28925/2311-2409.2021.361

[2] Гейзинга Й. Homo Ludens. Досвід визначення ігрового елемента культури. Пер. з англ. О.Мокровольського. Київ : «Основи», 1994. 250 с.

gamification in higher education in Ukraine, presented in the Ukrainian scientific and educational thesaurus.

1. Gamification in foreign studies: game philosophy, game elements and mechanics in business, application in education

An increasing number of foreign literary and scientific sources are devoted to the analysis of the concept of gamification, mechanisms of its implementation in business and education.

Gamification is based on well-known, philosophical and anthropological features, traits, and leading characteristics of the game, which permeates all spheres of human life – from art to sports, economics, and politics. The above-mentioned work by Johann Heisinga «Homo Ludens. The Experience of Defining the Playful Element of Culture»[3].

The author argues that «human culture emerges and unfolds in the game»[4], the game influences culture, language, justice, etc. «An age happier than ours once had the courage to call our species Homo Sapiens. When, over time, we came to the realization that, in the end, we are not as smart as the eighteenth century had made us believe in its adulation of reason and naive cheerfulness, then the new fashion chose the word Homo Faber, the creator of man, to describe our species. But the term faber, although not as dubious as sapiens, seems no less characteristic of a human being, since many animals are also creators. However, there is a third function that is inherent in both humans and animals, and is no less important than thinking and creating. This is the game. It seems to me that after Homo Faber, and almost on the same level as Homo Sapiens, Homo Ludens, the human who plays, deserves its place in our nomenclature»[5].

J. Geisinga identifies the following features of a game: access to the game is free, the game itself is a manifestation of freedom; a game is «not ordinary or real» life; a game differs from «ordinary» or «real» life in its location, duration, «its flow and meaning are contained in it»; «a game establishes order and is order itself, it requires absolute and complete order; it is in no way connected with material interest and cannot bring any profit». Repetitiveness, tension, rules of the game, mystery («secret») are the features of a game. A game is a competition for something or a representation of something. Both of these functions can be easily combined in such a way that the game represents a competition for something or becomes a competition for who can present something better than others[6].

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[3] Гейзинга Й. Homo Ludens. Досвід визначення ігрового елемента культури. Пер. з англ. О. Мокровольського. Київ : «Основи», 1994. 250 с.

[4] Ibid.

[5] Гейзинга Й. Homo Ludens. Досвід визначення ігрового елемента культури. Пер. з англ. О. Мокровольського. Київ : «Основи», 1994. 250 с.

[6] Ibid.

The application of these features is described in the famous book by Charles Coonradt «The Game of Work»[7], published in 1985. In the early 1970s, C. Coonradt, now called the «grandfather of gamification», was looking for ways to increase employee productivity through game elements. His ideas that work can be turned into a game to motivate employees were realized only in the era of accelerated development of digital technologies.

The origins of the modern understanding of «gamification» go back to the 80s thanks to the MUD (Multi-User Dungeon) game[8], which made it possible for several players to interact simultaneously in real time, while chatting. The history of MUDs is connected with tabletop role-playing games such as Dungeons & Dragons (D&D), which reached the peak of its popularity after the release of a new version of Advanced Dungeons & Dragons in 1977. The predecessor of MUDs is a single-player text game, an interactive story «Colossal Cave Adventure» created by caver Will Crowther in 1975 for the DEC PDP-10 computer. In 1976, the game was significantly expanded by Don Woods, who added many Dungeons & Dragons elements to it.

The first European MUD was written in 1978 by Richard Bartle and Roy Trabshaw at the University of Essex on the DEC PDP-10. The goal of the game was to collect a certain number of points, which allowed the player to receive the title of «wizard». On weekdays, other users could connect to the game at certain hours, and on weekends – around the clock. A modification of this game, «MIST», was in operation until 1991, when the computer on which it was written was written off.

The term «gamification» was first used in 2002 by Nicholas Pelling to refer to «the use of game-like accelerated interface design to make electronic transactions both enjoyable and fast»[9]. The idea behind gamification was that «the more an interface resembles an exciting game, the more likely users are to adopt it» to «make complex things simple, expressive, and practically easy to use». In 2003, N. Peeling opened a consulting company called Conundra Ltd. specifically to promote consumer goods using gamification, but his idea was not successful[10].

In 2003, Richard Bartle, the founder of the aforementioned European MUD game, classified players and proposed models for their use in the gamification process[11].

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[7] Coonradt C. The Game of Work: How to Enjoy Work as Much as Play. Deseret Book, 1985. 179 p.

[8] MUD (Multi User Dungeon / Multi-User Domain). URL: https://uk.wikipedia.org/wiki/MUD (дата звернення 24.09.2023).

[9] Pelling N. The Short Prehistory of «Gamification». Funding Startups (& Other Impossibilities). Nano Dome: website. URL: https://nanodome.wordpress.com/2011/08/09/the-short-prehistory-of-gamification/ (дата звернення 24.09.2023).

[10] Ibid.

[11] Bartle R. Designing virtual worlds. New Riders, 2004. 741 p.

Since 2009, gamification has really developed thanks to examples that clearly demonstrate the nature and effectiveness of this phenomenon in action, and has been integrated into many different business structures and presented to the general public.

A classic practical example of the effectiveness of gamification in 2009 is the popularity of Foursquare (founded by D. Crowley and N. Selvadurai)[12] due to the launch of the local mobile application of the same name for searching and discovering various establishments and new places, now known as Foursquare City Guide. The mechanism of the social application Foursquare evolved from the Dodgeball application created by Dennis Crowley in 2000 for a narrow circle of people. The application allowed users to register, or «check in», on a city map where they could see their friends' «check-ins» at the same time. Thus, the user had the opportunity to improve communication with their surroundings and discover new places to relax. After some time, the service ceased to be interesting for users, as the variety of actions in the system was limited to «checkins».

Since 2009, the social network Foursquare[13] has been a perfect example of gamification: users received points for visiting different places, and for visiting several specific attractions they were awarded a large number of points, badges, and sometimes a material prize. In this way, the app popularized the concept of gamified shared space, the use and registration of locations in real time.

In 2011, Gabe Zichermann and Christopher Cunningham published «Gamification by Design: Implementing Game mechanics in web and mobile apps»[14], which presents the strategy and tactics needed to integrate game mechanics into any consumer-oriented website or mobile application. The authors explain how to use basic game concepts, design templates, and meaningful code examples to create a fun and engaging social environment. They also answer the question of how companies can use gamification to provide their customers with an unforgettable, viral, and engaging experience.

K. Linehan et al. (C. Linehan, Kirman, Lawson, & Chan) in 2011[15] emphasized practical and empirically supported recommendations for the

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[12] Foursquare. Company. Who We Are. URL: https://location.foursquare.com/company/who-we-are/ (дата звернення 24.09.2023).

[13] Foursquare. Company. Who We Are. URL: https://location.foursquare.com/company/who-we-are/ (дата звернення 24.09.2023).

[14] Zichermann G., Cunningham C. Gamification by Design: Implementing Game mechanics in web and mobile apps. California: O'Reilly Media, 2011. 182 p. URL: https://www.scirp.org/(S(lz5mqp453edsnp55rrgjct55))/reference/referencespapers.aspx?referenceid=1808930 (дата звернення 24.09.2023).

[15] Practical, appropriate, empirically-validated guidelines for designing educational games. / Linehan C., Kirman B., Lawson S., Chan G. Proceedings of the International Conference on Human Factors in Computing Systems: Vancouver, May 7 – 12, 2011. URL: https://www.researchgate.net/publication/221515345_Practical_appropriate_empirically-validated_guidelines_for_designing_educational_games (дата звернення 24.09.2023).

development of educational games. The authors argue the relationship between the motivational potential of gamification, as one of its leading factors, and students' academic achievements through their efforts and time spent on learning.

The analysis of the concept, structure, internal and external processes of gamification in the general context, carried out by K. Werbach and D. Hunter in 2012, is presented in «For the win: How game thinking can revolutionize your business»[16]. The current widely used interpretation of gamification is based on the definition proposed by the authors as «the use of game elements and game mechanics in a non-game context».

«Game thinking can revolutionize your business» through the application of the following components of gamification concepts, which the authors point out: components, mechanics, dynamics[17]. The dynamics is the highest level, which includes constraints, progress, emotions, stories, and relationships. Mechanics is the order of rules that determine the outcome of interaction within the system, and dynamics is the reaction of users to the set of these mechanics. Game mechanics provide actions. They include expectations of reward, competition, cooperation, challenges, chances, feedback, and obtaining resources. Components are at the basic level of the gamification process and cover specific examples of mechanics and dynamics. They include: avatars, badges, collections, unlocking content, gifts, leaderboards, levels, points, virtual items, etc.

In 2014, H. Gerber emphasizes that gamification in its sectoral educational concept will work only when it is specifically reviewed and rethought, problems are identified and real prospects for its implementation in education are indicated[18].

In the same year 2014, I. Caponetto and a group of researchers (J. Earp, M. Ott) analyzed the literature on the theory and practice of gamification in education. In our study, the definition of gamification in education proposed by I. Caponetto et al. is basic – it is «the introduction of game design elements and game experience into the learning process»[19]. This understanding, in our opinion, provides a more reasonable basis for determining the components of gamification and the criteria for its implementation. The authors propose to gamify education to establish mutual relationships, actions and behavior, etc.

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[16] Werbach K., Hunter, D. Forthewin: how game thinking can revolutionize your business. Philadelphia: Wharton Digital Press, 2012. 148 p.

[17] Ibid.

[18] Gerber H. Problems and Possibilities of Gamifying Learning: A Conceptual Review. *Internet Learning Journal*. 2014. №3 (2). Article 5. URL: https://www.academia.edu/10301673/ Problems_and_Possibilities_in_Gamifying_Learning_A_Conceptual_Review (дата звернення 24.09.2023).

[19] Caponetto I., Earn J., Ott M. Gamification and education: a literature review. In 8th European Conference on Games Based Learning, Germany: ECGBL, 2014. P. 50–57.

In 2015, based on an interdisciplinary review of gamification[20], K. Seaborn and D. Fels explained the basic nature of gamification in education, paying special attention to empirical findings related to the purpose and content, design of systems, approaches and methods, as well as the specific impact on the participant. The authors point to the subjectivity of existing definitions of gamification, diverse or unclear theoretical foundations, inconsistencies between empirical findings and inadequate experimental design.

In 2015, a number of researchers presented independent articles on the use of gamification in a non-game context, in education in particular. For example, D. Codish and G. Ravid[21] justify the need to introduce game elements and mechanics into educational activities by attractiveness, playfulness and creation of a field for immersion of students in the learning process, similar to what happens in games. S. Nicholson[22] points out that the most commonly used combination of game components in the application of gamification is a combination of points, badges and leaderboards (abbreviated as points, badges and leaders – PBL). A. Liberot[23]investigated the possibility of assessing the individual psychological and functional impact of game elements in non-game contexts, and also distinguished between the concepts of «deep and superficial gamification» in terms of mechanics and framing and their psychological power.

In 2017, researchers C. Dichev and D. Dicheva presented systematic results on the problems of using gamification in education. It should be noted that C. Dichev and D. Dicheva use the term game elements to refer to game components and emphasize that «empirical research on understanding which game elements and under what circumstances can lead to the desired behavior is not fully systematized...»[24].

[20] Seaborn K., Fels D. I. Gamification in theory and action: review. *International Journal of Human Computer Research*. 2015. № 74. P. 14–31. URL: 10.1016/j.ijhcs.2014.09.006 (дата звернення 24.09.2023).

[21] Codish D., Ravid G. Detecting playfulness in educational gamification through behavior patterns. *IBM Journal of Research and Development*. 2015. № 59(6). P. 1–14. URL: https://dl.acm.org/doi/10.1147/JRD.2015.2459651 (дата звернення 24.09.2023).

[22] Nicholson S. A RECIPE for meaningful gamification. *Gamification in education and business*. New York: Springer, 2015. P. 1–20. URL: https://scottnicholson.com/pubs/recipepreprint.pdf (дата звернення 24.09.2023).

[23] Liberot A. Shallow gamification is the psychological effects of presenting an activity as a game. *Games and Culture*. 2015. № 10 (3), P. 249–268. DOI: https://doi.org/10.1177/1555412014559978

[24] Dichev C., Dicheva D. Gamifying education: what is known, what is believed and what remains uncertain: a critical review. *Int J Educ Technol High Educ,* 2017. № 14, 9. DOI: https://doi.org/10.1186/s41239-017-0042-5.

In 2021, F. A. Nieto-Escamez and M. D. Roldán-Tapia[25] based on the analysis of works on the use of gamification-based learning during pandemic isolation by searching the databases Scopus, PsycINFO, ERIC and Semantic Scholar concluded that gamification for students was an innovative, engaging, and effective strategy for providing learning materials, some of which pointed to the provision of effective social support during isolation from the COVID-19 pandemic.

Thus, the analysis of foreign literary and scientific sources on the subject of gamification and the basis of its implementation in business and education allowed us to trace the problem-chronological chain:

a) the middle of the twentieth century, when the well-known, philosophical and anthropological features, traits, leading characteristics of the game were substantiated, which permeates all spheres of human life – from art to sports, economics, politics;

b) the end of the twentieth century – gamification begins to emerge as an independent innovative tool, technology, which is a way to increase productivity and motivation of employees through game elements;

c) the beginning of the twenty-first century – in connection with the rapid development of digitalization, the concept of gamification is formalized, players are classified, and practical examples appear that clearly demonstrate the effectiveness of the use of game elements and mechanics on the promotion of goods and services, motivation of consumer decisions, etc;

d) since the 2010s, gamification has been actively implemented in business structures and in education, an interdisciplinary review of the use of gamification is carried out, the basic nature of gamification in education is explained, the content, mechanisms, components, methods of application in education, specific impacts on different types of participants in the educational process, etc. are substantiated.

2. The article studies the dynamics of gamification application by Ukrainian higher education institutions in the national scientific periodicals

Ukrainian scientists and practitioners have analyzed in detail the history of the emergence, spread and implementation of gamification as a general innovation process and one of the priority areas of education development, in particular, higher education. Systematic works on gamification of the educational process have been published in Ukrainian scientific periodicals since 2014–2015.

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[25] Nieto-Escamez F.A., Roldán-Tapia M. D. Gamification as Online Teaching Strategy During COVID-19: A Mini-Review. *Coronavirus Disease (COVID-19): Psychoeducational Variables Involved in the Health Emergency*, 2020. DOI: https://doi.org/ 10.3389/fpsyg.2021.648552.

O. Tkachenko[26] identified the main trends in the development of gamification of formal and non-formal education, systematized the categorical apparatus of gamification of education. The author introduced the understanding of the concept of gamification in the broad and narrow meanings: 1) in the broader sense – the use of both games and game techniques and game practices for educational purposes; 2) in the narrow sense – the use of exclusively game techniques and mechanics (game model, game code, game material).

The author[27] also identifies the priority trends in the gamification of the educational space – informal and formal. With regard to the formal educational space, the main trend of gamification provides for the parallel development and implementation of new didactic games in the electronic version and gamification in the narrow sense, that is, the introduction of game techniques and mechanics (game model, game code, game material) for educational purposes.

K. Bugaychuk[28] presents the results of a study of the essence of gamification in education, its features and differences from games and game based learning.

O. Makarevych[29] considers gamification as an integral factor in improving the effectiveness of distance learning elements. The latter are realized with the help of a learning management system (LMS), which is necessary for the development, distribution, and management of online learning materials. One of the most significant problems associated with electronic distance learning management systems is the complexity and length of time it takes to implement the system due to the human factor: not all users (both teachers and students) are «ready» to work in such systems. «That's where gamification mechanisms come in, enabling teachers not only to motivate students to learn but also to keep in touch with them,» – the author believes. «Gamification increases motivation for activity by using game elements in a non-game

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[26] Ткаченко О. Гейміфікація освіти: формальний і неформальний простір. *Актуальні питання гуманітарних наук*. 2015. Вип. 11. С. 303–310. Дрогобич : Посвіт. URL: http://dspu.edu.ua/hsci/archive/ (дата звернення 25.09.2023).

[27] Ткаченко О. Сучасні тенденції гейміфікації освітнього простору. *Розвиток сучасної освіти і науки: результати, проблеми, перспективи:* тези III-ї Міжнародної науково-практичної конференції молодих вчених (26-27 березня 2015 р., м. Дрогобич) / Дрогобицький державний педагогічний університет імені Івана Франка. Дрогобич: Посвіт, 2015. С. 272–274.

[28] Бугайчук, К. Л. Гейміфікація у навчанні: сутність, переваги, недоліки. *Дистанційна освіта України* : зб. матеріалів Міжнар. наук.-практ. конф. (м. Харків, 19–20 листопада 2015 р.). Харків: ХАДІ, 2015. С. 39–43.

[29] Макаревич О. О. Гейміфікація як невід'ємний чинник підвищення ефективності елементів дистанційного навчання. *Молодий вчений*. 2015. № 2 (6). С. 279–282. URL: http://nbuv.gov.ua/UJRN/molv_2015_2%286%29__73 (дата звернення 25.09.2023).

environment, namely: competition, prize incentives, logic of presentation, etc.»[30].

L. Sergeyeva[31] reveals the importance of gamification through the introduction of game mechanics in staff motivation, emphasizes that gamification increases motivation to work, improves the quality of communication in the team, identifies leaders, reduces conflicts, increases the overall level of productivity, stimulates students to learn, etc.

The next wave of analysis of the processes associated with the introduction of gamification in education in scientific periodicals is 2017–2019. Scientists L. Bondarenko[32], N. Figol[33], A. Gruzd[34], M.Hryshunina[35], O. Karabin[36] , T. Lyashchenko[37], S. Pereyaslavska[38], S. Petrenko[39], V. Pichkur[40],

[30] Макаревич О. О. Гейміфікація як невід'ємний чинник підвищення ефективності елементів дистанційного навчання. *Молодий вчений.* 2015. № 2 (6). С. 279–282. URL: http://nbuv.gov.ua/UJRN/molv_2015_2%286%29__73 (дата звернення 25.09.2023)

[31] Сергеєва Л. Гейміфікація: ігрові механіки у мотивації персоналу. *Теорія та методика управління освітою.* 2014. № 2 (14). URL: http://umo.edu.ua/images/content/nashi_vydanya/metod_upr_osvit/v_15/14.pdf. (дата звернення 25.09.2023).

[32] Бондаренко, Л. П. Гейміфікація в освітньому процесі. *Наука України – погляд молодих вчених крізь призму сучасності*: тези доповідей I Всеукраїнської науково-практичної конференції. Черкаси: ФОП Нечитайло О. Ф., 2017. С. 84–86.

[33] Тріщук, О., Фіголь, Н., Волик, Н. Гейміфікація в освітньому процесі. *Технологія і техніка друкарства*, 2019. № 3 (65), С. 72–79. URL: http://ttdruk.vpi.kpi.ua/issue/view/12217 (дата звернення 26.09.2023).

[34] Захарова О. В., Грузд А. В. Підвищення якості послуг вищої освіти за допомогою гейміфікації. *Наукові праці Кіровоградського національного технічного університету. Економічні науки.* Кропивницький, 2017. № 32. С. 113–122. URL: https://core.ac.uk/download/pdf/158807307.pdf (дата звернення 26.09.2023).

[35] Лященко Т.О., Гришуніна М.В., Пічкур В.Р. Гейміфікація як одна з інноваційних форм навчального процесу. *Управління розвитком складних систем*. 2018. № 35. С. 113–123. URL: https://urss.knuba.edu.ua/ua/zbirnyk-35/article-1189 (дата звернення 26.09.2023).

[36] Карабін О.Й. Гейміфікація в освітньому процесі як засіб розвитку молодших школярів. *Педагогіка формування творчої особистості у вищій і загальноосвітній школах.* 2019. № 67, Т. 1. С. 44–47. DOI: https://doi.org/10.32840/1992-5786.2019.67-1.9

[37] Лященко Т.О., Гришуніна М.В., Пічкур В.Р., op. cit.

[38] Переяславська С. О., Смагіна О. О. Гейміфікація як сучасний напрям вітчизняної освіти. *New Pedagogical Approaches in STEAM Education:* Electronic Scientific Professional Journal. Open Educational E-Environment of Modern University. 2019. Special Edition. Р. 250–260. DOI: https://doi.org/10.28925/2414-0325.2019s24

[39] Петренко С. В. Gamification як інноваційна освітня технологія. *Інноватика у вихованні*. 2018. Вип. 7, Том 2. С. 177–185.

[40] Лященко Т.О., Гришуніна М.В., Пічкур В.Р., op. cit.

N. Potapova[41], L. Sergeeva[42], O. Smagina[43], O. Trischuk[44], N. Volyk[45], O. Zakharova[46], and others emphasize that gamification is one of the innovative forms of the educational process, educational technology, a means of developing junior schoolchildren, a modern direction of national education, etc.

O. V. Zakharova, A. V. Gruzd[47] [27] draw the attention of research and teaching staff of higher education to the current opportunities to improve the quality of higher education services through gamification. Scientists have revealed the features of gamification in a broad sense – through the analysis of the experience of using game technologies in conducting classes in higher education institutions, comparing the traditional approach to learning and gamification. The paper substantiates the rules for creating a game mechanism, specifies ways to implement the principles of gamification, formulates the main requirements and tasks for the implementation of a gamified educational process, and identifies its advantages and disadvantages. Methodological recommendations are given on how to use the stages of the game, the bonus program, elements that reflect achievements and progress in learning, etc. The authors conclude that the technology of gamification of the educational process, which is the newest for Ukraine, is a promising and budgetary tool for improving the quality and competitiveness of higher education services.

O. Trishchuk, N. Figol, N. Volik[48] in their article note that gamification is distinguished from other game forms by «the focus of the participants of the process on a real goal related to their own activities, and not on the game for the sake of the game...»[49].

During this period, we can find scientific papers on the etymology of the concepts of gamification, igrofication and gaming. Thus, in the article by

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[41] Потапова Н. В. Особливості забезпечення геймізації в освітньому процесі закладів вищої педагогічної освіти *Науковий часопис НПУ імені М. П. Драгоманова.*Серія 5. Педагогічні науки: реалії та перспективи 2019. Вип. 70. С. 210–213. DOI: https://doi.org/10.31392/2311-5491/2019-70.50

[42] Сергеєва Л. Гейміфікація: ігрові механіки у мотивації персоналу. *Теорія та методика управління освітою.* 2014. № 2 (14). URL: http://umo.edu.ua/images/content/nashi_vydanya/metod_upr_osvit/v_15/14.pdf. (дата звернення 25.09.2023)

[43] Переяславська С. О., Смагіна О. О. Геймiфiкацiя як сучасний напрям вітчизняної освіти. *New Pedagogical Approaches in STEAM Education:* Electronic Scientific Professional Journal. Open Educational E-Environment of Modern University. 2019. Special Edition. P. 250–260. DOI: https://doi.org/10.28925/2414-0325.2019s24

[44] Тріщук, О., Фіголь, Н., Волик, Н., op. cit.

[45] Ibid.

[46] Захарова О. В., Грузд А. В., op. cit.

[47] Ibid.

[48] Тріщук, О., Фіголь, Н., Волик, Н., op. cit.

[49] Ibid. P. 74.

N. Potapova[50], gamification has synonymous other names – «igrofication», «gaming», the essence of which is the use of game elements and mechanisms in a non-game environment in order to achieve the set goals, which emphasizes the need for further discussion of the unification of the use of these concepts. At the same time, the gamified educational process is enriched with various techniques, tools, and methods. N. Potapova refers to such features of ensuring gamification in the educational process of higher pedagogical education institutions as «bricolage», which means «the use of various objects, tools and other equipment that are not specifically designed for the educational process for educational games»[51]. The author notes that the concept came to pedagogy from social philosophy and is associated with the name of Claude Lévi-Strauss. The use of the bricolage technique makes it possible to use ordinary objects in a completely different role and to create new tools or approaches from old material. All of this contributes to the development of critical thinking and creativity of participants in the educational process of higher education institutions.

In the current conditions of accelerating the development of information technology, gamification is undoubtedly one of the trends in the organization of the educational process in higher education institutions of Ukraine. This thesis is repeatedly emphasized in current articles of 2020–2023 by scientists O. Anichkina[52], I. Bykov[53], N. Efremova[54], G. Filon[55], A. Havrysiuk[56],

[50] Потапова Н. В. Особливості забезпечення геймізації в освітньому процесі закладів вищої педагогічної освіти *Науковий часопис НПУ імені М. П. Драгоманова.*Серія 5. Педагогічні науки: реалії та перспективи 2019. Вип. 70. С. 210–213. DOI: https://doi.org/10.31392/2311-5491/2019-70.50.

[51] Ibid. P. 211.

[52] Анічкіна О. В. Гейміфікація – сучасний виклик хімічної освіти. *Вісник Запорізького національного університету. Педагогічні науки. 2020. № 3 (36). Ч. I.* С. 74–80. DOI: https://doi.org/10.26661/2522-4360-2020-3-1-11

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[56] Єфремова Н. В., Гаврисюк А.А., op. cit.

M. Imeridze[57], G. Kobernyk[58], T. Lugova[59], K. Mekhed[60], V. Moroz[61], G. Mytsyk[62], M. Pryshlyak[63], O. Reshota[64], O. Sagan[65], O. Samodumska[66], A. Tereshchenko[67], S. Tolochko[68] [46], D. Velychko[69], V.Zarutska[70], and others.

O. Anichkina[71] notes that gamification is a modern challenge of chemical education, K. Mehed[72] and N. Filon[73] [38] prove by the results of a survey of

[57] Імерідзе М., Биков I., Величко Д., op. cit.

[58] Коберник Г. I. Технологія гейміфікації у професійно-педагогічній підготовці майбутнього вчителя. *Перспективи та інновації науки.* Київ. 2021. № 5 (5). С. 397–405. URL: https://dspace.udpu.edu.ua/handle/123456789/15192 (дата звернення 25.09.2023).

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[62] Мицик Г.М., Пришляк М. Про впровадження гейміфікації в процес навчання здобувачів спеціальності 016.01 спеціальна освіта (Логопедія). *Наукові записки Бердянського державного педагогічного університету. Серія : Педагогічні науки* : зб. наук. пр. Бердянськ : БДПУ, 2021. Вип.1. С. 284–293. DOI: 10.31494/2412-9208-2021-1-1-284-293.

[63] Ibid.

[64] Решота О. А. Гейміфікація як інноваційний інструмент підвищення ефективності дистанційного навчання. *Дистанційне навчання у ЗВО: моделі, технології, перспективи* (28 квітня 2021 р.). Львів : ФУФБ, 2021. С.77–81. URL: https://financial.lnu.edu.ua/wp-content/uploads/2021/08/KRUHLYY-STIL-RP-2021.pdf (дата звернення 27.09.2023).

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[67] Мороз В. М., Терещенко А. А., op. cit.

[68] Толочко С.В. Теоретико-методологічний аналіз гейміфікації як сучасного освітнього феномена. *Перспективи та інновації науки.* 2023. № 1(19). С. 369–383 DOI: https://doi.org/10.52058/2786-4952-2023-1(19)-369-383

[69] Імерідзе М., Биков I., Величко Д., op. cit.

[70] Заруцька В.О. Гейміфікація у освітньому процесі вищої школи: переваги та ризики. *Міжнародні наукові дослідження: інтеграція науки та практики як механізм ефективного розвитку*: Матеріали III Міжнародної науково-практичної конференції (м. Київ, 23–24 квітня 2021 р.). Київ : ГО «Інститут інноваційної освіти», 2021. С. 21–29.

[71] Анічкіна О. В., op. cit.

[72] Мехед К. М., Філон Н. Г., op. cit.

[73] Ibid.

future IT specialists that such a trend in modern education as gamification enables a teacher to move to a qualitatively new level of pedagogical skills in a space that is convenient and understandable for modern youth.

H. Mytsyk[74], M. Pryshliak[75] shared their own experience of implementing gamification in teaching certain disciplines («Speech Therapy» and «Special Preschool Pedagogy»). In the classroom, students majoring in 016.01 Special Education (Speech Therapy) were offered interactive games developed in the web applications LearningApps, Wordwall, Baamboozle, Quizlet, Kahoot. In order to change the types of activities during a lecture or seminar, the teacher demonstrated one of the games to the audience on a large screen using a computer projector, and in the case of ZOOM classes – in broadcast mode. Conditions were also organized for students to work in teams to create games in these applications at different stages of the class. The authors provide illustrated examples of various types of exercises that were offered, in particular, at the end of the content block to summarize the material covered and to promote the formation of students' skills to analyze, evaluate, compare, classify and justify their own decisions.

V. Moroz[76], O. Reshota[77], A. Tereshchenko[78] analyze distance learning as one that has provided and continues to provide a wide range of opportunities and prospects for changing and improving educational systems for which the critical situation creates forced conditions. Gamification as an innovative tool for the educational process of a modern university is designed to respond to the challenges of maintaining motivation, activity, and engagement in distance learning. Scientists have presented a table that details the content of the following components of the gamified learning process: points, badges, standings, progress charts, timelines, quests, levels, avatars, awards (previously identified by J. Francisco Figueroa)[79].

Scientists V. Moroz[80], S. Pereyaslavska[81], O. Reshota[82], O. Smagina[83], A. Tereshchenko[84] propose to implement these components with the help of educational services, the content and number of which are increasing every year: Alice (https://www.alice.org/), Scratch (https://scratch.mit.edu/) –

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[74] Мицик Г.М., Пришляк М., op. cit.

[75] Ibid.

[76] Мороз В. М., Терещенко А. А., op. cit.

[77] Решота О. А., op. cit.

[78] Мороз В. М., Терещенко А. А., op. cit.

[79] Ibid.

[80] Мороз В. М., Терещенко А. А., op. cit.

[81] Переяславська С. О., Смагіна О. О., op. cit.

[82] Решота О. А., op. cit.

[83] Переяславська С. О., Смагіна О. О., op. cit.

[84] Мороз В. М., Терещенко А. А., op. cit.

environments for learning the basics of algorithmization and programming in a game form; CodeSchool (http://codeschool.uzhnu.edu.ua/) – a programming learning service with elements of gamification; MotionMathGames (https://motionmathgames.com/) – mobile and desktop games in mathematics; Mathletics (http://uk.mathletics.com/) – an educational site for schoolchildren aimed at attracting children to mathematics through games and competitions; Spongelab (https://www.spongelab.com/landing/) – a platform for personalized science education; LinguaLeo. ru (https://lingualeo.com/ru) is an interesting and effective way to learn English; Kahoot! (https://kahoot.com/) is a free online service for creating interactive learning games; MinecraftEdu (https://www.minecraft.net/) is an online simulator in which players can create game worlds from blocks, as well as interact with other players, and is actively used in the bulk process; WorldofClasscraft (WoC) (https://www.classcraft.com/) is a free gaming platform related to learning design, etc.

Researchers H. Kozub and S. Pereiaslavska[85] are working on the development of a training course "Gamification in the educational process of the school" for the preparation of masters in the field of 014 Secondary Education, specializing in Computer Science, Physics, Mathematics. The course aims, on the one hand, to further develop the digital competencies of the future teacher, and on the other hand, to develop creative thinking skills for the further implementation of gamification in the school educational process.

A group of researchers led by O. Samodumska (Y. Budas, S. Buchatska, I. Zarishniak, H. Tarasenko, I. Tregubenko)[86] extrapolated the experience of using gamification in higher education to the context of informal adult educational practices, in particular, adult education centers in Ukraine.

Scientists O. Hrytsenko, M. Zagorulko, T. Pushkariova, I. Pshenychna, O. Samodumska[87] pay special attention to the peculiarities of professional and pedagogical training of future students of higher education institutions with

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[85] Переяславська С. О., Смагіна О. О., op. cit.

[86] Samodumska O., Zarishniak I., Tarasenko H., Buchatska S., Budas I., Tregubenko I. Gamification in Non-Formal Adult Educational Practices. *Revista Romaneasca pentru Educatie Multidimensionala,* 2022, № 14 (2), P. 156–176. DOI: https://doi.org/10.18662/rrem/14.2/573

[87] Samodumska O., Pushkarova T., Hrytsenko O., Zahorulko M., Pshenychna I. Professional and pedagogical training of future students of higher education with elements of gamification. *Revista Eduweb*. 2022. № 16(4). P. 52–64. DOI: https://doi.org/10.46502/issn.1856-7576/2022.16.04.5

elements of gamification, and developed an author's program of this training. The researchers clarify that in this context, gamification is an auxiliary resource that expands the capabilities of higher education teachers. In particular, gamification helps to create a unified system of methods that will meet the goals of university training and combine the content of the educational material provided to applicants – future students.

The scientific works of I. Bykov[88], M. Imeridze[89], O. Sagan[90], S. Tolochko[91], D. Velychko[92] on the peculiarities of the use of gamification by higher education institutions are generalized. Thus, S. Tolochko believes that the professionalism of teachers will be manifested in their ability to modify the conditions, tasks, stages, plots, roles in educational games, directing them to meet educational needs depending on the content of the educational material and the preferences of students. The author describes in detail the content of modern professionally oriented mobile services and applications that ensure the use of gamification for professional higher education[93].

Thus, our analysis of the dynamics of views on the use of gamification by Ukrainian higher education institutions in domestic scientific periodicals allowed us to make the following generalizations: a) systematic works on the gamification of the educational process have been appearing in Ukrainian scientific periodicals since 2014–2015; b) in the period 2017–2019 Ukrainian scientists substantiated in detail the essence, trends, priority areas of gamification in domestic education, in particular, higher education; c) in scientific articles of 2020–2023, scientists are united in understanding the importance of gamification as a trend in the organization of the educational process in higher education institutions of Ukraine; d) the process of creating methodological tools for the practical application of gamification in the educational process of higher education institutions is ongoing.

CONCLUSIONS

The introduction of gamification into the educational space of domestic higher education institutions is gaining momentum. The irreversibility of such changes, which are characteristic of evolutionary processes, is primarily due to the accelerated pace of global informatization of society. The education of the digital age has challenged higher education institutions to find new approaches to optimizing learning in accordance with the needs and characteristics of the future generation of students. Gamification is

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[88] Імерідзе М., Биков І., Величко Д., op. cit.
[89] Ibid.
[90] Саган О.В., op. cit.
[91] Толочко С.В., op. cit.
[92] Імерідзе М., Биков І., Величко Д., op. cit.
[93] Толочко С.В., op. cit.

undoubtedly one of the trends in the development of higher education and improvement of the quality of its services.

The analysis of gamification and the evolutionary foundations of its application by Ukrainian higher education institutions in foreign and domestic literary, scientific, and periodical sources allowed us to trace the problem-chronological chain:

– the middle of the twentieth century, when the well-known, philosophical and anthropological features and leading characteristics of the game were substantiated;

– the end of the twentieth century, when gamification began to emerge as an independent innovative tool, a way to increase productivity and motivate employees through game elements;

– the beginning of the twenty-first century, when, with the rapid development of digitalization, the modern concept of gamification is formalized, players are classified, practical examples of the effectiveness of using game elements and mechanics in promoting goods and services appear;

– 2010s, when gamification is actively implemented in business structures and education, an interdisciplinary review of the use of gamification is carried out, the basic nature of gamification in education is explained, substantiate the content, mechanisms, components, methods of application in education, specific effects on different types of participants in the educational process, etc.;

– 2015-the current time when Ukrainian scientists and practitioners have analyzed in detail the history of the emergence, spread and implementation of gamification as a general innovation process and one of the important areas of higher education development.

SUMMARY

The article presents the results of the analysis of gamification and the evolutionary foundations of its application by higher education institutions of Ukraine in foreign and domestic literary, scientific, and periodical sources.

The evolutionary progress of gamification implementation is considered using the problem-chronological method. Thus, an attempt is made to record the chronological sequence of the development of gamification by higher education institutions of Ukraine, which exists in the Ukrainian scientific and educational thesaurus.

The first paragraph analyzes the works of foreign authors who have studied the origins of gamification and the peculiarities of its development. In particular, the author traces the experience of substantiating the game philosophy, the emergence of gamification, the sequence of theoretical analysis of the concept, structure, internal and external processes of gamification in the general context, the peculiarities of applying game

elements and mechanics in business, as well as issues related to the problems of their practical implementation in education.

The second paragraph describes the dynamics of the use of gamification by Ukrainian higher education institutions in the national scientific periodicals. It is shown that Ukrainian scholars and practitioners have analyzed in detail the history of the emergence, spread and implementation of gamification as a general innovation process and one of the priority areas of higher education development.

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