

Gamification in the Informal Learning Space of Higher Education (in the Context of the Digital Transformation of Education)

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Abstract: *The article explores the way gamification transforms the informal learning space of the higher education institutions inspired by information technologies and the all-consuming digitalization of human society. An overview is presented of the existing ideas about gamification in the context of the digital transformation of higher education. It is established that the effective use of gamification as a learning technique in the context of digital transformation of higher education contributes to the implementation of its core principles.*

We have attempted to analyze the factors that gave rise to gamification as well as to examine the ways to introduce gamification to the informal learning experience. The components of this technology are singled out along with the principles of its functioning. In the process, we reveal the role of gamification and opportunities that open up for the organization of educational activities in the informal space of higher education.

The given work identifies peculiarities and advantages of this digital form of education as well as risks associated with its introduction in the informal learning space of higher education.

The authors elaborate on the specifics of the development of informal learning space in the context of global gamification, as well as the technological and semantic modernization of higher education. It is established that the main purpose of gamification is to boost the internal motivation of higher education students to study and to reveal their creative and professional abilities.

Keywords: *Information space, digital transformation, gamification, higher education institutions, informal education, informal education, motivation, learning results.*

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Introduction

To reach an adequate level of achievement and to meet the objectives set for the higher education system while incorporating informal learning, it is necessary to not only refer to its development level in various countries but also to the educational trends in the world. This allows ramping up on the efficiency of the educational process while significantly improving the level of adaptation of students to practical activities in the specialty.

In the recent decade, there has been a rapid transformation of the informal education paradigm from the translation of ready-made knowledge to the joint discovery of this new knowledge and the togetherness of the experience of the educational events. This has led to the new practice where teachers and coaches involved in informal education deploy active teaching methods that imply a creative approach to the learning process itself, motivating students to continue their education, encouraging lifelong learning. The set of these active methods is a unique educational tool that stimulates students' thinking, engagement and motivation when they join an interactive-educational educational space. This technique is known as gamification.

Back in 1912, the American Cracker Jack popcorn brand began to put a free prize in every bag, and the other companies soon picked up on the idea. While this isn't the gamification we know today, the use of fun and a prize that could be collected may have inadvertently been the beginning of gamification.

The term "gamification" appeared in 2003 after the Woodrow Wilson International Center for Scientists created the Serious Games Initiative to study the application of gaming principles in public policy. This initiative gave rise to the gamification of education, which gradually became a field of research. It is believed that the research founder was N. Pelling (Reiners, 2015). Although, according to other sources, it could have been G. Zickerman, chairman of the Gamification Summit (Canada), editor of the Sweet Way that Gamification Helps M&M Boost Consumer Engagement Blog. The term "gamification" first gained widespread usage in 2010, in a more specific sense referring to the incorporation of social/reward aspects of games into the software. A number of business structures began creating gamification platforms, and marketers started employing game elements in their marketing initiatives.

Gabe Zichermann and Joselin Linder were the first well-documented researchers of gamification. They described gamification as an art of eliciting all the fun and engaging elements of games and applying them in real-life or production activities. This is what can be called human-oriented design as opposed to function-oriented design. It is a design process that optimizes the system for a person as opposed to the pure efficiency of the system (Mazelis, 2013, p. 139-142.).

Today, we can find different interpretations of the gamification concept but they all come down to the use of game technology in non-game situations (Samchuk & Moiseyuk, 2019, pp. 46-61).

K. Werbach's scientific works give the following definition: "Gamification is the use of game elements and game mechanics in a non-game context" (Werbach, 2012). Gabe Zichermann had his own thoughts on the matter: "Gamification is a process of using the game's strategy and dynamics to engage audiences and solve problems in business. With its help, you can gain experience that will create the necessary meaning and increase the motivation of employees and customers" (Zichermann, 2013).

However, in our opinion, it was K. Kapp who proposed the most elaborate and felicitous definitions for gamification: it is projecting the principles of game mechanics, aesthetics and aiming in order to get students to start the process, to develop motivation, to activate knowledge and solve problems (Kapp, 2012).

Advancement in the field of game physics and the use of gameplay elements in classes of basic disciplines in higher education institutions is the topic of professional interest with many scholars such as Brull, (2016), Deterding (2011), and Marczewski (2013).

We can find elaborate information about the main tendencies of the development of gamification within the informal educational space in the works by prominent authors such as Zayarna (2015, p. 39), Romi (2009, p. 257) Tang (2017), Pavlik (2016, pp. 27–36), Sergejeva (2017), Tkachenko (2015).

Following the latest philosophical trends, the educational process is increasingly viewed through the prism of a post-modernistic idea of the social construct where the emphasis is made on the fact that full-scale innovation in all spheres of human life forms fundamentally new people. It can be attributed to one of the basic concepts of postmodernism, which predicts that modern society is entering its new stage of development, casting away all previously required elements of existence (Nerubasska & Maksymchuk, 2020; Nerubasska, Palshkov, & Maksymchuk, 2020; Sheremet, 2019).

In such a society, the game is seen as a creative method that can be applied in teaching and students' successful socialization, but also as a way to improve the professional competencies of teachers themselves. This is why, perhaps for the first time in history, education in the era of Postmodernism becomes an exciting experience, evokes positive emotions whilst students are gaining actual knowledge. Gamification allows students to feel satisfaction with the practical skills they acquire and the ability to actualize their skills. Besides, gamification of the educational process allows less effort during the mastering of the educational material, learning becomes less tedious, thus, corresponding to one of the principles of postmodernism.

Gamification of the educational process empowers the ideas of postmodernism philosophy which state that each individual is unique, so they need a customized approach: the student needs individual forms of learning, while the teacher deserves individual working conditions that would help reveal their talents.

Moreover, the postmodernism of the educational process involves the freedom to choose and combine "serious" and "non-serious" (playful) in the educational process. Therefore, gamification is the form of learning that allows merging the features, characteristics and techniques of even essentially different teaching methods.

Postmodernism calls on the contemporary school to dispose of conventional teaching methods that have been in use for decades and to move to the introduction of such forms of learning that, instead of filling students' heads with specific knowledge, would show them the path of knowledge and form an interdisciplinary worldview (Ivanova, Yolkina, 2016). Gamification is an innovative learning model that is fully harmonized with the basic concept of postmodernism.

More detail on the role of gamification in the education environment in Postmodernism can be found in the scientific pursuits by Varenina (2014), Ivanova & Yolkina (2016), and Slattery, (2013).

We believe that gamification is an innovative digital tool of information and communication mechanism that can be successfully utilized in the learning space to convey educational content. Its main objective is to boost students' motivation as well as to maintain continuous feedback between students and teachers. It is of crucial importance since it is a proven fact that continuous feedback increases the students' performance efficiency.

At the same time, it should be recognized that the painstaking joint effort of the scientific and pedagogical community and public administration specialists in the field of harmonization of teaching methods and technologies in the informal educational environment in the context of

global gamification is currently in its infancy. Therefore, this innovative process requires incessant attention and continuous research by scientists.

The purpose of this article is to examine the way how gamification tools can transform the informal learning space within the higher education environment when preconditioned by the ubiquitous digitalization of all the spheres of human life. During the study, we analyzed the causes and ways of introducing gamification, as an innovation process, in the informal educational space. The key features, opportunities and challenges of this digital form of training in the informal learning space of higher education are defined.

The role of gamification in the process of digital transformation of higher education

The international community is confidently harnessing information and communication technologies, which have already penetrated all domains of human life. Enormous changes associated with the digital transformation in science and technologies require an adequate response from the Ukrainian higher education system. The education system in Ukraine is still rather conservative and fails to catch up with the demands of the progressive, digitalized Ukrainian society and business. Therefore, the contemporary higher education system is brought to the test of selecting the teaching methods and tools at the minimum cost of resources, in the shortest time possible, and integrating them into the educational process with the view of generating the maximum effective result. Thus, the digital transformation of the educational environment is a topical issue, given its unique opportunities in revolutionizing education and increasing its quality (Ryazantseva, 2019).

Electronic gadgets and technologies are gaining popularity as in-class tools, facilitating progressive teaching methods, new ways to organize the learning and scientific space, the approaches that did not use to find application due to the complexity of their use inside the conventional education environment. Gamification of the learning process of higher education is one of the current aspects of digital transformation of the education space.

Today, the gamification potential is discussed not only in the education sphere but also in business, management and marketing communities. It is explained by the fact that the current labor market demands to the quality of education imply a large-scale quantitative increase in the training of specialists with up-to-date competencies. To address the growing expectations, we need to resort to the digital sphere. In other words, we should make sure students are given the possibility to master

digital technologies in various fields of training (Ivanova & Ivanov, 2020, p. 7). All this gives grounds to talk about gamification not only within the "new concept in education" (Alomari, Al-Samarraie, & Yousef, 2019, pp. 395-417), but also about a new trend in the learning process of higher education (Bogomolov & Nevezhin, 2019, Klopfer, Haas, & Osterweil, 2018, pp. 129–131), and the development of the global digital society as a whole.

Due to the global digital transformation of higher education, the possibilities of gaming learning technologies are bound to keep expanding. Teachers of higher education institutions use the gamified approach to diversify the in-class activities and increase the students' learning capacity. Gamification can be used at any stage of the learning process and at any level of professional training. Besides, gamification can be successfully deployed for the close control and monitoring of students' retention of the learning content (Goltsova & Protsenko, 2019, pp. 65–77).

The introduction of gamification with the purpose of boosting the efficiency of the educational process requires a comprehensive model that would take into account not only well-known didactic but also some specific principles. These include interactivity, which ensures the involvement of all participants in the learning process, the modeling reality, which is the development of the game based on a certain model of real life, socially or professionally significant situation, and, finally, the principle of forecasting, which promotes understanding of the common purpose of the game and action plan, skills in sorting out the rules of the game and script preparation, etc. (Goltsova & Protsenko, 2019, p. 73).

Due to global digitalization, the possibilities of gaming educational technologies are limitless. The gamified approach allows diversifying the learning activities and promotes better academic performance.

A significant contribution to the digital transformation of higher education through gamification is encouraged by the world's leading high-tech companies. In the last few years, digital transformation pioneers such as Microsoft and its founder Bill Gates, Facebook and its founder Mark Zuckerberg, and Netflix with its CEO Reed Hastings have repeatedly called for new approaches to learning. These companies and their frontmen also serve as powerful facilitators to the world-renowned funds that have provided significant funding to support the revolutionary projects. The Summit Learning project, supported by Facebook, serves as a great example (The Summit Learning, 2017). As part of this project, several hundred U.S. schools are now joining the trend of the personalized learning experience previously accumulated in California.

Over the recent years, the developed economies report the increased demand for the digital transformation of the education system due to their desire to follow the digital model of economic development. This urge is stimulated by public education authorities, which demonstrate a willingness to change, the ability to recognize the new, to support and popularize the effective organizational forms and methods of teaching and research.

Gamification as a powerful driving force for the higher education system

The unique political, socio-economic and humanitarian trends that have emerged since the beginning of the 21st century constitute the current international status quo. This state of affairs, along with the search for new, non-standard approaches to improving the educational systems management, has brought the issue of higher education quality to the spotlight. In the context of the informatization of the global community, gamification offers a transparent, powerful solution.

Despite being a relatively new technique, gamification bears a wide educational potential. Gamification can be used in various spheres of human life, and, in the last decade, is seen as one of the most promising innovative approaches to conducting classes in the informal learning space of higher education (Stieglitz, 2017).

Gamification is a way to consciously update and upgrade the educational techniques and technologies that, for various reasons, have lost their effectiveness. The main concern lies with the field of higher education, and especially its informal environment. Games and all their subsequent forms have a purpose to give pleasure from the mere process of learning, without the impersonal aim at test results only. Therefore, the gamification of the informal learning environment in the context of higher education is set to boost students' internal motivation for learning, as opposed to the motivation through external factors such as grades or ranking.

Many scientists (Zolkina, 2020; Werquin, 2012; Deterding, 2011) assent to the idea that it is impossible to master something if one does not have motivation. Inside the virtual reality, a student's motivation is built upon the awoken interest towards a set task or a problem they need to tackle. The path towards the solution is gamified and the reward for the correctly resolved task is represented by scores and bonuses that later define the tops students in a group.

As was determined above, effective learning is impossible without motivation, while motivation arises from the focus on solving practical problems and being rewarded with great results. When we speak about

informal education, as opposed to formal, we need to bear in mind that learning has to be enjoyable, as the formal educational process is often viewed as monotonous and routine. Gamification is about joy through personalized learning (Zolkina, Lomonosova, Petrusevitch, 2020).

Such a massive surge in the development of gamification in the field of higher education was preconditioned by three main trends: the global market influence, the link between the game and the learning process, and a significant interest in games among young people (Des, Shepherd, & Skrabut, 2016).

The gamified, informal learning environment is so successful because it is an artificially created, scaled-down, perhaps even customized model that reduces student's stress levels, makes them feel safe and allows room for mistakes. Students' emotions are engaged, and they basically can experience the same actions that they would experience in a real-life professional workspace, with the same emotions, yet without losses and risks (Connolly, MacArthur, Hainey, & Boyle, 2012).

Therefore, the key objective of the gamification of the higher education informal learning environment is to bring about a change in the behavior of a student, increase their involvement in the educational process, and activate the competitive spirit. A student will want to pay attention to the material taught, and the interest in solving educational problems and further application of knowledge in professional activities will grow (National Doctrine of Education, 2013).

The main arguments in favor of the introduction of gamification in the higher education learning space are the following:

1. The need to make the educational process more motivating through the competition mode inside the study process and the personal interest of a student.

2. The need to make the educational process as innovative as possible. The contemporary students view the institution of higher education as a rigid system with outdated teaching methods. The modern world trends and approaches will, on the other hand, form a positive attitude of students to it.

3. The need to strengthen the functional component of the educational process (Moore-Russo, Wiss, & Grabowski, 2018).

4. Gamification makes meeting educational objectives easier: it makes learning more interesting and meaningful; it provokes students to take active action; it allows them to consolidate practical skills (Hamari, Koivisto, & Sarsa, 2014).

Simulation of practical situations and competitive mode of tasks are the most important and optimal methodologies in the educational process. Therefore, gamification serves as a system of indicators for students' academic performance and achievements. It is necessary to keep in mind that students' commitment, focus on specific learning objectives and fulfilment are of crucial importance when we speak about a perfect learning system. Students are conscious of the learning path and the reward they are set to earn on their way towards the objectives they set for themselves. The competencies that are acquired by the participants are valuable skills and experience individual and unique to every participant of a gamified learning space. Feedback in gamification is an instant and important step (Connolly, Boyle, MacArthur, & Hainey, (2012).

Gamification has the capacity to reflect the unique capabilities, type of thinking, logical abilities of each student. Based on this, a professional coach or teacher will be able to accurately determine the student's propensity for a particular activity and navigate them in the right direction. (Idrisova, 2017).

If the gamification system in the higher education environment is tuned perfectly it provides benefits for both the authors of the course and the students:

1. Students are engaged in the learning process and actively participate.

2. Gamification makes learning interesting for students since along with theoretical knowledge they also gain emotional experience and practical skills. This allows staying motivated moving from topic to topic, which increases the percentage of students who successfully complete the course (Erhel & Jamet, 2013).

3. Difficult material can be simplified. Game mechanics simplifies complex and abstract concepts by putting them into perspective, linking them to something a student is familiar with. This improves the quality of training, makes it easier and more accessible, and reduces the resistance to the effort required for training.

4. It helps motivation. An informal learning system that operates in the context of higher education requires a high level of self-discipline from the student. Therefore, regular motivation significantly contributes to the material retention facilitating the acquisition of practical skills while at the same time increasing students' chances for decent employment (Domínguez, Saenz-De-Navarrete, De-Marcos, Fernández-Sanz, Pagés, & Martínez-Herráiz, 2013).

5. Immediate application of the acquired knowledge and skills in the team projects practical assignments. Gamification can allow students to go through game tasks together, which not only provides practical experience and accelerates material retention but also promotes soft skills.

6. Emotional invigoration for knowledge. If the theory is on a certain level related to emotions, it is assimilated by consciousness much faster and turns into a skill faster.

7. Competition aspect. If a student sees the results of their classmates and can compare them with theirs, it makes them want to invest more effort in learning. This generates new results and speeds up the progress (Gamification).

Successful implementation of gamification technologies allows individualizing and personalizing the learning process, as students have the opportunity to close some knowledge gaps in extracurricular time by using some game simulators, for instance. They also can experiment with different variables and test theories (Bonini, 2020).

The role and significance of gamification in the informal educational space of higher education

Since the aim of the article is to study the implementation of gaming technologies within the higher education learning environment as well as to identify the main trends in the development of gamification in the informal educational space, there is a need to foreground the nature of informal education.

Informal education is a type of education that doesn't follow a rigid structure and doesn't always happen on the school or university premises. This term encompasses individual classes under the guidance of coaches or tutors and short-term courses that pursue practical short-term goals. Such training or lectures are often conducted by public organizations, volunteers and universities, and they are free for students (Tkachenko, 2015, p. 304).

The Law of Ukraine "On Education" has a special provision for this format of education defining it as education obtained, as a rule, through educational programs. The informal learning format does not imply state-recognized educational qualifications but may be sufficient for obtaining professional or partial educational qualifications. (Legka, 2019).

The informal learning space does not categorize students by age, professional or intellectual abilities, and sometimes has no actual time limitations. Institutions or organizations that provide informal education

usually do not award qualifications and do not conduct a formal assessment of participants' academic achievements (Tkachenko 2015, p. 304).

Today, informal education is on the rise as the entire world has recognized its benefits. Ukraine is no exception. While 7-10 years ago there were a handful of specialists involved in this field, today, we recognize a powerful, comprehensive infrastructure. The introduction of quarantine restrictions related to the response to the COVID-19 pandemic has become a catalyst to this incredible change. The second most important reason is that technological progress and competition urges businesses to increase the entry professional requirements for potential employees.

Moreover, we are witnessing more and more informal education projects in Ukraine that fill in the gaps in formal higher education. This is quite logical, as higher education reform is a long-term project with a delayed effect, while informal education is a more flexible process that is easier to adapt to changes in higher education, and in some cases, it causes those changes.

Today, informal projects in Ukraine for students and graduates are filling the existing vacuum launching certain recovery processes in the higher education system. At the same time, in other European countries, where informal education dates back in history for more than a century, attention to it continues to grow (Platonova, 2016).

Informal learning environment forms a synergy with higher education and promotes three basic principles: "learn through doing" whereby students gain knowledge during practical tasks; "learn to interact", which encourages teamwork; and, "learn to learn", which means students get used to analyzing their experience and form new knowledge from it. The successful implementation of these basic principles of informal education is directly proportional to the efficiency of the most effective technologies, one of which is gamification. (Tang, Wong, Li, & Cheng, 2017, p. 554).

Gamification in the informal learning space of higher education is focused on utilizing students' main wishes, promoting students' involvement in the learning process, encouraging achievement and significant results. Such efficiency is explained by two factors:

- Immediate feedback. Passing levels and some "assessment" mechanics allow the student to immediately get an analysis of their results. In this case, the gamified system responds to the target actions of the player, gives room for maneuvers and this is how a student consciously approaches the learning strategy. (Werquin, 2012);

- The versatility of mechanics and forms. Each student can have their prototype of a player, an appropriate character and strengths, which

means that to achieve the best results, each student must be motivated and participate voluntarily. The variety of mechanics that gamification provides help find an individual approach to different students of higher education (Romi & Schmida, 2009).

Speaking of the natural ways of gaining knowledge and practical skills, college undergraduates prefer the excitement, a story with a plot, a game. These elements facilitate the consolidation of the information received during lectures. What is especially valuable is that a gamified system generates or simulates stressful or ambiguous situations encouraging a student to reveal their inner intellectual and psycho-emotional reserves. This is a recent practice of selecting specialists used by potential employers, which is not based on the student's grades or the diploma. (Lepper, 1998).

The use of gamification in the informal educational space of higher education can create a game environment that stimulates the internal motivational process through a situation of choice, steering the student towards exploration and independent action. The possibility to make a choice and implement it while solving a problem, allows a student to grasp the meaning of the action "from within". A personal choice leads to meaningful action, and this sequence turns the learning process into a vital goal, which is a condition for effective learning. The student is not alienated from the educational process, as sometimes happens in the case of formal learning, but, on the contrary, they become involved in it. Now a student is motivated to resolve a task and this motivation is related to the internal content of the discipline. (Malone & Lepper, 1987, pp. 23–27).

The formation of a student's conscious attitude to learning involves independent and responsible action, which means a student accepts the educational goals and objectives inside the informal learning space. The difference between the communication component of the informal educational environment (game platform) and the formal educational communication lies in the principle where the educational information is not only transmitted in the virtual reality but, first of all, it offers actions to solve educational tasks with regard to the goal. Knowledge is not transmitted but created, while the student does not prepare for practical professional activity, but instead, joins it (Bessmertny & Gaenkova, 2016).

Since gamification is often preferred over other technologies ever deployed in the informal learning environment, it is necessary to identify and systematize the advantages of gamification and the ways to include the game in the system of informal learning:

1. Creating game moments that support learning objectives. This allows students to develop thinking and agility.

2. Reward system in the educational process:

- a) system of points and scores.
- b) score table and rankings.
- c) internal prize store.

Through obtaining incentives for completing the task students naturally reveal their best skills.

3. Materialization of ideas. By making the ideas tangible and understandable, the teacher simplifies the assimilation of the material.

4. The course is divided by levels of difficulty. One way to keep a student motivated is to make their progress visible. Each level involves overcoming obstacles and tackling the ever-increasing complexity of the content.

5. Practice dominates over the theory. In gamified informal learning space, students are supposed not only to have knowledge but also to apply it in practical tasks. (Nicholson, 2012, p. 28).

6. Encouraging independence. Gamification enables higher education students to demonstrate initiative and learn from their experience. To succeed in studying, one needs to carefully consider the lesson plan so that it is simple, short, and as clear as possible.

7. Role-playing games in the learning process. In the role-playing game, the student acts on behalf of their character, uses the acquired knowledge and skills to solve problems in a non-typical situation. This visualization makes the learning process more emotional, improving its quality and motivating the student to follow through the topics one by one.

8. Competition spirit. Gamification of learning in the informal educational space of higher education involves students/players' rivalry and confrontation where everybody tries to reach their goal.

9. Case-based approach in the educational process. Situational learning is used in learning simulations, where higher education students explore the system, playing with its model (Nikitin, 2016).

10. Interactivity. Different types of tests and materials, simulators and practical classes more actively involve the student in learning, making it interesting and more effective.

11. Teamwork. Learning objectives, which require cooperation between groups of students, are a good example of practice and an element of gamification. Such tasks have to be interesting to perform, and they are all about creativity and collaboration between students.

12. Room for risk. It gives a possibility to encourage a student to gamble inside a task and not be afraid of being punished for a wrong answer.

13. Deadline system. A student is stressed by the time constraints, which increases their ability to retain information and makes intuitive learning possible. (Gamification).

Today, coaches and teachers working in the informal learning space of higher education, in collaboration with computer game designers, are actively developing visualized models of informal learning and modular training programs based on virtual games. Game modules represent a systematic way of mastering learning material, which allows students to obtain practical knowledge in various subject areas (Sylvia, Tang, Wong, Li, & Cheng, 2021).

The efficiency of gamification within the informal learning space of higher education is explained by its ability to fill in those gaps of formal education that are typically overlooked in conventional learning, namely, effective interaction and communication in the educational community. However, it should be borne in mind that there is a risk that new useful skills acquired by higher education students through informal education will not be in demand in formal education system. Therefore, we believe that the progressive forms of informal education should be gradually injected into the tissue of formal education while also consolidated at the legislative level (Tsay, Kofinas, & Luo, 2018).

It should be noted that the informal learning space in higher education is pivotal for the introduction of gaming techniques and practices in a non-gaming context with the educational purpose. This is reinforced by the rapid pace with which the innovative approaches and teaching methods are implemented and tested, including the widespread use of role-playing, situational and other types of games.

Conclusion

The quality and affordable higher education is the solid foundation for the development of a forward-looking, progressive digital society. The countries that understood this at the right time have successfully built an effective system of both formal and informal education, navigating their economies through the sweeping waves of the new technological world and embracing the digital transformation. Today, these are two parts of one whole, informal education is no longer perceived as the opposite of formal or its substitute. Information and communication technologies are an integral part of full-fledged professional training in the higher education establishment. Now, students have the realistic possibility to confidently join

the workforce and feel comfortable in the conditions of the full-scale digitalization of society.

There are various interaction modes inside the learning space: informal education can be "embedded" in the formal system, complement it or be a driver of change for it. Any changes are possible if they reflect the systemic national educational policy of their countries, and are also the result of joint efforts of the non-governmental, public and private sectors (Platonova, 2016).

Our study of how gamification, supplemented by the massive digitalization of the human world, transforms the informal learning environment of higher education enabled us to argue that gamification is defined as a new technological resource for engaging students in cognitive activities. This, in its turn, contributes to the formation of their individual ways of accumulating knowledge and develops practical skills for future professional activities.

This contemporary technological resource not only enables effectively deploying all known methods of teaching but it also streamlines the process of cognitive activity in a way that is efficient and attractive for the learning process and convenient for implementation in a wide range of professional activities. This is of special value, taking into account the common application of information and communication technologies in business (Nicol, 2017, p. 40).

During the study, we uncovered the underlying factors and ways of introducing gamification as a modern innovation process in the informal educational space. We have also analyzed the advantages and disadvantages of implementing this digital form of education in the informal educational environment of higher education.

We believe that learning in the gamified informal educational space of higher education, within the framework of the ubiquitous digitalization and the massive embracement of information and communication technologies will help students to preserve their unique personalities (unity of the rational and the emotional). What is no less critical is that such a learning experience will promote the growth of a new generation of independent and motivated specialists. A specialist of this kind is a team player who is never complacent and keeps developing, and, thus, is a competitive professional on the job market.

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