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### Gamification Technology in the Higher School Educational Process as a Way of Improving of Professional Training for the Modern Economy

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#### ABSTRACT

The paper deals with the problem of improvement of the professional training of specialists for the modern economy by means of introducing gamification technology in the educational process of the Russian higher schools. The authors have made an overview of a number of existing ideas and research about gamification to determine the key aspects in the understanding of this technology. Different approaches to defining the concept of gamification have been analyzed, as well as the concept of gamification technology, its components, and principles of functioning, role and opportunities for the organization of learning activities in high school. The main functions and components of gamification as an effective tool in the higher education system have been analyzed, as well as its ability to enhance the creative and transformative element in the educational process in the modern university. It has been shown that gamification is introduced into our lives through the various access channels, including the Internet and mobile communication systems, thus gradually becoming an integral part of the global information space and the acquiring round-the-clock access at any point. The paper presents examples of successful implementation of gamification technology in higher education and business. The characteristic of the exclusive educational project from the Students' Internet Festival "Pokolenie. RU Bryansk" ("Generation.RU in Bryansk") has been given as an example of successful use of gamification technology in a university practice.

**JEL Classification:** A10, A14, I20, I29.

**Keywords:** Gamification, higher education, gaming technology, educational projects, student Internet Festival.

## 1. INTRODUCTION

Formation of present and future generations of specialists for the economy in the information-based society is associated with the constant development of vocational education system, the successful update of which involves the intensive introduction of new educational technologies.

The conception of gamification of vocational education is objectively determined by the tendency of transition to a new “professional era”, where every employee becomes a “homo gamer”, functioning within the system of certain gaming strategies (companies’ virtual maps, role-plays, quests, points, game symbols of a personal profile, levels). Within this system, a “homo gamer” reaches various professional summits, status positions, promotions, bonuses, etc. (Kokarev & Meshkov, 2013).

Along with the general technological changes, psychological portrait of future professionals is also changing: from an early age young people become involved in the digital world, which shapes their educational demands, making game training more and more needed, and this factor must be considered when developing new educational strategies in the higher school.

The system of modern higher education challenges high school teachers, forcing them to look for ways of training qualified personnel in a short time. At the same time, the teaching staff must not only pass over some educational content but also involve students, stimulate their interest in the acquisition of new knowledge in a particular area.

Modern educational systems are aimed at creating a flexible model of feedback between teacher and student, as well as at increasing the group activity and interaction among students.

## 2. LITERATURE REVIEW

Let us review a number of existing ideas about gamification, which would allow identifying the key aspects in the understanding of this technology.

The history of gamification sends us back to the 80s of the 20th century, the time of coinage of the term “gamification” that arose due to online-prg MUD (Multi-User Dungeon), the first test analog of MMORPG-games. However, gamification in the modern sense of the word appeared only in 2003 (K. Verbah), after the creation of Conundra companies with a class of consultants who offered to use gaming technology in production.

Gamification saw its true birth and recognition only in 2010, and “it happened because the community had grown and gained critical mass, “gamification” had become a buzzword, and a number of experts were able to crystallize and define it clearly” (Werbach, K. “Gamification: a short course”).

From the standpoint of general scientific interest and educational practice there is a number of gamification definitions given in the works by K. Verbah, A. Kokarev, A. Mazelis, A. Meshkov and other authors (Eliseeva, E., 2015; Nica, A. “Gamification in education: 10 game HTML Academy techniques you can successfully use”; Tomilova, O.V. Experience of using gamification concepts to improve the effectiveness of training sessions”):

- the use of game elements and game design techniques in non-game situations;
- the use of game design techniques for non-gaming areas - business processes, social projects, training;

- the application of the concept of game principles and techniques in non-gaming activities (recruitment, training, promotion of healthy lifestyles);
- the application of approaches specific to computer games in software tools for non-gaming processes in order to attract users and consumers to increase their involvement in the solution of applied problems, and the use of products and services;
- the use of video game technology in the implementation of non-gaming applications.

Below we consider the main components of gamification in the views of some researchers, namely I. Varenina, K. Verbah, A. Salin, A. Mosin, A. Mazelis and others.

I. Varenina sees the game as a process that involves two or more parties competing with each other and pursuing a specific goal. The use of a strategy by the parties can lead to victory or defeat (Varenina, L., 2014).

The other side of the game is also important: it is an activity in which the social relations between people are recreated. There are the following structural elements in the game: plot, roles, rules. Subject to certain rules, players assign roles and implement them according to the plot.

A. Mazelis highlights the basic principle of gamification, that is, achieving a constant, measurable feedback from the user, providing the ability to adjust the dynamic behavior of the user and, as a consequence, the rapid development of all of the functionality (Tomilova, O.V. Experience of using gamification concepts to improve the effectiveness of training sessions”).

Currently, there is a growing interest in gamification all over the world: China, India, Canada, Mexico, South Africa. M2 Group studies show that gamification market will reach \$ 2.8 billion by 2016. (“Gamification: three ways to use games by HR-service”).

It is important to note the fact that gamification is introduced into our lives through the various access channels, including the Internet and mobile communication systems, thus gradually becoming an integral part of the global information space and the acquiring round-the-clock access at any point.

Today elements of gamification are actively used in personnel management, innovation management, marketing, sales behavior, healthy lifestyles promotion, personal finance, etc.

The growing interest in gamification is explained by the desire to find a means of increasing employee engagement and bring more transparency to the system of incentives and rewards for companies.

Gamification uses such game elements as setting goals, feedback, levels, creativity. Players gain points that, in turn, are an incentive for the further mastery of the subject and material.

Gartner agency research has identified 5 main sectors that are potential targets for the implementation of gamification for the period up to 2020: the development and innovation management, performance management, employees, the globalization of advanced education, self-development, the creation of platforms for engaging and building relationships with consumers (Werbach, K. “Gamification: a short course”), (Mosin, A. “Plus gamification across the country?”).

The process of involvement and motivation has been called “gamification of education” (Varenina, L., 2014). Experience has shown that the use of this approach can significantly increase the efficiency of the educational process.

Gamification of higher education is an advantage in the motivational attraction of this “game” generation to the realities of their future profession; via familiar to them gaming technologies they plunge into the educational system of objectives, tasks, issues, projects. The formation of professional development values and the development of professional identity go through a specially built gaming reality.

The value of the gaming technology cannot be exhausted and appreciated through the prism of entertainment and recreational opportunities. Its phenomenon consists in the fact that, being a relaxation, a discharge, it can also develop into training, work, and in the modeling of human relations. In today’s high school, which lays stress on revitalization and intensification of the educational process, we strongly recommend the use of gaming technology.

### **3. METHODS AND MATERIALS**

The concept of “game technology” includes a fairly large group of methods of organization of the learning process. This educational game has a significant feature: clear goal and the corresponding result to her, which is characterized by cognitive orientation.

A game form of training sessions serves as a means of motivation, stimulus for training activities. The learning process takes place as the activities of the trainee, and, as we know, “Practice makes perfect”.

According to the psychological research, what we hear is actively digested by 40%, what we see - by 50%, if we see and hear at the same time, it is saved by 70-75%, and if we do it ourselves, we remember 92%. That’s why playing techniques are so important in the learning process at any level.

A game form of studies is created with the help of the gaming techniques that are motivation means stimulating learning activities. In the game, there is no teacher and student. There are roles and actions, and all participants teach each other and learn from each other. Game training is unobtrusive. Typically, all are open in the game.

A. Carr-Chellmen highlights inherent gamification properties as a technology that encourages learning: the attitude to errors (the student has the right to mistake): a student is not scored down for a wrong answer, he does not get a bad grade, motivation is as sort of award, teamwork, and involvement in learning with exciting games (Bindyukova, T., 2014).

Gamification of education contributes to a better perception and digestion of educational material, helps to overcome inertia, conservatism of modern education, turns the study into an interesting, fascinating and even exciting activity, constantly engaging students into the learning process, creating the necessary emotional background, filled with joy, happiness, positive attitude, striving to stress-free overcome the problems, to achieve the objectives and to obtain the results (“Goali, Sh. Can gamification save education? Website “Education Today””).

Practice shows that gamification provides full, detailed and three-dimensional study of the subject in the virtual space through the possibility of victories and defeats, bonuses and transitions, working out the knowledge and skills that are fixed by the game experience, and can be optimally and quickly used outside of the educational process.

It is important to note that gamification in education is focused on the creation of such a system, in which the success of a game provides a certain knowledge, skills, competencies, transferred into the professional world.

K. Werbach very clearly reveals the essence of this aspect of gamification, noting that gamification "... is not the transformation of everything into a game. On the contrary, the game says: "you are in the real world, but let us make your experience better." The game singles out some key points of your experience, making them richer, adds some motivation, but does not detract from the real world " (Werbach, K. "Gamification: a short course").

Gamification is based on the creation of a legend, a story with dramatic techniques accompanying the gaming application. Involvement of the student into the history of the game creates a sense of active involvement in the events of the game, gives personal meaning to his/her actions and deeds, creates a sense of contribution to the common cause, creates the motivation to achieve the set goals in the game, interest in the success, to stimulate the desire for further development and education.

In addition, the gamification uses gradual change and increasing the complexity of the goals and objectives as users acquire new skills and competences, which ensures the development of performance while retaining the user's involvement.

D. Dzhi notes the role of the phenomenon of awards for teaching: "You will not learn if you do not have motivation. And motivation always takes the form of some kind of reward. You can have fun, earn game points, but at the same time, the game will help you to better understand such abstract things such as algebra".

S. Goli, recalling the period of study at the University of Washington described the role of gamification in his own life: "We played special electronic games that imitated real business building - from the birth of the idea to turning it into a huge group. It was a rewarding experience, developing communication skills within a business environment. The fact is that, after many years, as head of a large company I still recall those lessons, which makes me ask why such a training format has not yet been universally accepted? " (Eliseeva, E., Zlobina, S., Zyateva, L., & Szczerba, I., 2015).

S. Goli is doubtlessly right saying that the use of gaming techniques is not sufficiently common to all levels of education, but nevertheless, gamification is making confident steps forward and conquering various markets. Since 2002, there has been a movement of "Serious Games" (Serious games initiative), which has united the community in the private sector, education and the army that used gaming technology for training and simulations with the aim of non-fiction. "Games for change" project, using games to run large-scale social change is also functioning successfully (Werbach, K. "Gamification: a short course").

#### **4. RESULTS AND DISCUSSION**

The best-known educational projects that actively use gamification elements are:

- an online resource for the study of the English (lingualeo.ru), which has in a short time gained immense popularity and has become a significant phenomenon in the educational sector;
- speed printing training site "Klavogonki" (Keyboard Races), which name was chosen not by chance, as very high-speed printing process of learning is built by analogy with the usual races. By the way, students can learn the material on their own or in competition "races" with other "drivers". Socialization elements distinguish this approach to learning fast and error-free printing (Tomilova, O.V. Experience of using gamification concepts to improve the effectiveness of training sessions").



A Russian project which leverages game mechanics to motivate their users is an HTML Academy project is an interactive HTML and CSS training service focused on trying to make learning interesting and fun. Game project mechanics consists in the gradual flow of information, the gradual complication of principle, puzzle, instant feedback, “perfectionism”, minigames, “storytelling”, achievements and points, ratings, open profiles (Yeliseyeva E., 2015).

World of Warcraft projects, World of Classcraft (WoC), Minecraft belong to a modern system of gaming technology education with the multi-function user interface; they have been successfully implemented (Mosin, A. “Plus gamification across the country?”).

Features of software and technical support offer to teachers multiple platforms, allowing realizing their ideas based on gamification of learning. In this regard, the high quality and functionality of gaming platforms such as SAP Stream Work may be noted. Gamified version of this platform enables implementation of gaming dynamics into decision-making tools (“brainstorming techniques” and “quick focus”); into the method of “brainstorming” there were added such game elements as a list of leaderboards, achievements, progress bar, the “quick focus” tool that was supplemented with game elements “points”, “leaderboards”, “achieve” (Nica, A. “Gamification in education: 10 game HTML Academy techniques you can successfully use”).

A well-known project is an online platform for the training of employees - Deloitte Leadership Academy. It is an innovative training program for more than 10,000 executives in 150 countries.

A. Mazelis distinguishes Encounter gaming platform, “as it reflects the main trends in the development of gamification systems, including the possibility to “gamify” taking of theory and even practice exams by students “ (Tomilova, O.V. Experience of using gamification concepts to improve the effectiveness of training sessions”).

The described gaming platform is a web-based application that allows you to have the game in a variety of formats. An important feature of this platform is the availability of rating points and other stimulating elements for the maintenance of interest in work in the system. The platform makes it possible to create virtual games according to the pre-set author’s rules. For example, in the academic sphere, traditional theoretical test papers may be replaced by electronic games in the Encounter environment. Thus the common form of questions is replaced by the game. One of the principles of such games is competition with other players for a place in the game. There is also an opportunity for the promotion of the most successful students. In addition, the system features elements of socialization: a forum, private messages, as well as a special window for the messaging to author (moderator) of the game.

There may be many options, and one of them is the creation of special gamified courses using the well-known MS PowerPoint. This tool, familiar to many teachers and students, offers ample opportunities for learning. When creating a specialized electronic content, in addition to images and text MS PowerPoint allows the creator of the course to use the built-in library of figures, animation, spectacular transitions; they may insert function in the video presentation and audio materials, not to mention hyperlinks and triggers. This powerful arsenal allows the teacher to interact with the trainees (players), in other words, to create a gamified course without any help from programmers.

An exclusive game project (authors and developers: E.V. Eliseeva, S.N. Zlobina I.I. Scherba et. al.) can serve as an example of a large-scale comprehensive educational role-playing game. It is Interuniversity,

a students' Internet-festival "Pokolenie. RU Bryansk" ("Generation. RU in Bryansk") that has been implemented by us on the basis of academician Petrovskii Bryansk state University since 2000. (Eliseeva, E., Zlobina, S., & Erokhin, V., 2015; Kokarev, A., & Meshkov, A., 2013; Mazelis, A., 2013; Nica, A. "Gamification in education: 10 game HTML Academy techniques you can successfully use").

The Internet Festival is a comprehensive innovation, an educational technology, with a full-scale game nature, special holiday spirit, though subordinate to unified concepts and themes, rules and regulations of the game user behavior, competition, multiplicity of demo form used, the network nature of the interaction, the presence of a specialized information platform - the Internet Website of "Planet Creativity" ([www.planetakreativa.ru](http://www.planetakreativa.ru)), multi-functionality as a communication, teaching and research center (Eliseeva, E., Zlobina, S., & Erokhin, V., 2015; Kokarev, A., & Meshkov, A., 2013; Mazelis, A., 2013).

The game context of the Internet Festival is represented by real and virtual student "team laboratories", "innovative enterprises", "science centers", with a system of social and professional leaders in roles of captains, scientists, design specialists, creative professionals, experts in advertising and promotion, web designers, psychologists, sociologists, etc.

Passion, competitiveness, involvement into the game, interest, positive emotional background in the Internet-festival "Pokolenie. RU Bryansk" is created through different gaming events: web-quests, the "Extreme Internet" program, educational games, role-playing business games, economic games, cyber games, facilitation, express- psychological games, pr-meetings, chants, slogans, flashmobs, parades, cultural programs, command attributes and symbols, electronic business cards, and representations (Kokarev, A., & Meshkov, A., 2013).

Ideas of teams and participants are promoted into projects with major funding, and the participants themselves have the opportunity to be included in project teams with a high index of implementation through cooperation with innovation centers and foundations. The non-game context of the Internet Festival is aimed at achieving educational and scientific purposes.

The main result of the festival is the creation of the implementable and acute projects by the participants. To this end, a whole team of consultants works for the socio-economic planning, research conducting, pr-promotion and protection of the organization and creation of a presentation, team management and leadership, web-design, network journalism.

Over the long history of the Internet-festival it has been attended by more than 1700 participants from 10 universities of Russia, Ukraine, and Belarus; about 150 projects of social, socio-economic, innovational, scientific, educational, patriotic content have been created, a vast empirical database of sociological, psychological, and pedagogical research process and the results of the Internet-festival has been accumulated, research papers of students and teachers have been published, as well as books, monographs and methodological works.

The Internet-festival "Pokolenie. RU Bryansk" allowed to create a complete game concept with a high modular unit, organizational structure, business processes, complex game, educational activities, game roles and procedures, diagnostic tools, performance measurement monitoring, participants' encouragement system, method of preparation and consultation of the organizers, experts and participants of the festival.

As you can see, games of such scale perform nearly all of the functions allocated by games' investigators, namely:

- personal fulfillment function in the game (one of the most basic). The game is important as the medium of self-realization as individuals. It is in this respect that more important is the process, not the result, the spirit of competition and the possibility of self-realization to achieve the objective;
- the therapeutic function of the game. The game can and should be used to overcome various difficulties arising in a person's interaction with others, in the study process. Assessing the therapeutic value of gaming devices, D.B. Elkonin wrote that the effect of game therapy is determined by the practice of new social relations received by the individual in the role game;
- the correction function of the game. Psychological correction in the game occurs naturally since all participants are equal: there are no strong and weak students, but there are a story and the roles and purpose of their games in common. Often, poor students prepare better than the strong ones, and the discrepancy is eliminated;
- the socio-cultural function. Students learn to communicate with each other during the game, increase the level of development of their information culture;
- the entertainment feature of the game. The entertainment feature of the game is associated with the creation of a favorable atmosphere, peace of mind and joy as a defense mechanism, i.e. stabilization of personality that helps to gain confidence and enjoy the opening of its own potential.

In sociological questionnaires participants noted (study 2015) that the festival has helped them meet new and interesting people (30%), learn how to work in a team (10%), provided new and useful information on different subject matters (10%), contributed to the development of creative thinking (10%).

## **5. CONFIRMATION**

Our studies have led to the following conclusions:

The number of educational projects using gamification elements, creating new educational apps, using gaming techniques is gradually growing in the world; gaming technologies with the multi-function user interface are being developed, different educational platforms are being modified by the idea of gamification.

The Internet-festival “Pokolenie. RU Bryansk”, established and implemented as a game educational project is an example of gamification of vocational education; it uses most of the components typical of gamification while maintaining the possibility of the implementation of educational, educational, scientific problems.

The structure, gaming and educational content of the festival, techniques, the experience of the meeting may be exported to any educational institution while maintaining high performance and getting a variety of effects, as evidenced by acts of psycho-pedagogical and sociological research of participants of the Internet Festival.

Putting together the efforts of scientists from different countries will help to create an effective concept of gamification of modern education and to form a class of specialists who are ready to successfully implement it in the practice of universities and schools.



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