USING THE GAME-BASED LEARNING CONCEPT IN EDUCATION*

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Abstract

The article is devoted to the actual topic of gamification in education. Today, video games and gaming technology are becoming a significant part of modern educational technology. The article analyzes gamification as an educational trend and states that there are significant discrepancies in the interpretation of this phenomenon in modern pedagogical literature and, accordingly, in the disclosure of ways to create gamified educational courses. Beyond education, gaming offers avenues for collective action and collaboration. Multiplayer and cooperative gaming experiences enable players to join forces, pool resources, and collectively work towards sustainable solutions. Such collaborations not only enhance social cohesion but also allow for the co-creation of innovative strategies and ideas that can address complex environmental and development challenges. The need for a clearer differentiation of gamification and didactic-oriented computer games is emphasized, their essential features are highlighted, the possibilities of teachers developing the simplest versions of such games using online services are highlighted. The characteristics of the mechanisms inherent in the gameplay for maintaining the internal and external motivation of the player are given and the insufficient study of the influence of their transfer on the process of managing the educational activity of the subject is noted. A comparison is made of the game and educational motives of the student's activity and their hierarchy in the context of gamification, the importance of his awareness of the priority of non-game tasks is emphasized. The similarity of the elements of gameplay and the point-rating system

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for assessing the educational achievements of students in the aspect of maintaining the motivation of educational activity is revealed, and the illegality of reducing gamification to this system is fixed.

*Keywords*: computer game, gamification, educational activity, motivation, point-rating system

1. Introduction

The modern development of information and computer technologies determines the widespread use of the gaming industry in education in order to activate the subjects of learning and their interest in the educational process (Akchelov and Galanina, 2019). Learning with the use of game mechanics is not only pleasant for children, but also shows high efficiency. This is why the education technology (EdTech) industry is growing so rapidly. The pandemic has catalyzed the development of this market. Just a year ago, experts said that online learning and EdTech were the future. Now you do not need to be an analyst to understand: this is already the present (Akchelov and Galanina, 2011). So what can educators learn from video game developers? Therefore, the development and research of gaming technologies as a means of enhancing the educational process is an urgent task of the modern education system (Salin, 2015). Modern students are getting further from the classic blackboard and closer to various devices. Computers and tablets are often used by teachers as a way to extend the educational process outside the school walls and to involve students in it. Children are used to gadgets and gadgets and often learn them before they learn to read. Video games are part of their daily routine for them, with rare exceptions. Therefore, many companies are starting to release educational products with game-based learning (game-based learning). The most progressive teachers are already using them in schools (Galanina and Akchelov, 2016a).

Gamification is actively used today to increase the level of motivation and involvement of students in the educational process, which, due to this, becomes more exciting and interesting (Connolly et al., 2012). Over the past few years, gamification has been widely studied and discussed as an element of involvement in the field of education (Galanina and Akchelov, 2016b). Gamification is based on the use of elements of the game, and the game, in fact, is a good motivator for a particular activity. As G. Sickermann and K. Cunningham argued, based on three main components (pleasure, rewards and time), games are becoming one of the most influential forces of all mankind. Without a doubt, games are capable of motivating people to perform certain actions in situations where people do not always know how much they want to perform them without being forced (Moskovkin et al., 2013a). Gamification is game-based and therefore so successful. As K. Werbach and D. Hunter noted, “our brain requires problem solving, feedback and much more - what games give us. Study after study shows that play activates the dopamine system of the brain, which is associated with pleasure” (Moskovkin et al., 2013b). Furthermore, gaming has the potential to transcend the virtual realm and inspire real-world action. By integrating gamified elements into physical activities or incorporating gaming concepts into community initiatives, it becomes possible to motivate individuals to actively participate in sustainability efforts. From energy conservation to waste reduction, gaming can encourage individuals to adopt sustainable behaviors and contribute to a greener and more resilient future. Through the medium of gaming, individuals can explore simulated environments, experience the consequences of their decisions, and gain valuable insights into the intricate interplay between human activities and the natural world (van Beek et al., 2022). Moreover, gaming provides an unique platform for education, empowering players with knowledge about environmental issues and sustainable practices. This interactive learning experience can effectively foster a sense of responsibility and empower individuals to make informed choices in their daily lives.

Game thinking can be in the service of business, where “there are three types of gamification for business: external, internal gamification that changes behavior (Moskovkin et al., 2013b). Companies use internal gaming to “drive innovation, strengthen team spirit, or otherwise get positive...
results from their own employees. Internal gamification is sometimes called enterprise gamification” (Moskovkin et al., 2013b). The main features of internal gamification are as follows: firstly, gamification participants are part of the enterprise; secondly, “the motivational dynamics of gamification should interact with the existing management system and the enterprise's reward system” (Moskovkin et al., 2013b).

External gamification is aimed at improving the relationship between the company and its customers, at “attracting customers, recognizing the product, strengthening consumer loyalty and overall income growth” (Moskovkin et al., 2013b). As an example of external gamification, they cite the newspaper Record Searchlight, which has built a community on the site by turning passive readers into interested users. Record Searchlight has implemented a badge system for informative comments on articles on their website. Behavior-changing gamification is such a gamification that is aimed at the formation of new habits, such as, for example, a healthy lifestyle, proper nutrition etc. This type of gamification is often used by public and government organizations.

2. Business goals and gaming

2.1. Define the business goals

These are “specific goals for implementing a gaming system, such as increasing customer retention, building brand loyalty, or increasing employee productivity.” When defining business goals in the context of gaming, several key words and concepts come to mind.

These words highlight the unique aspects and considerations specific to the gaming industry (Huotari and Hamari, 2017; Seaborn and Fels, 2015): (i) monetization, which is the process of generating revenue from gaming products or services, often through mechanisms such as in-app purchases, subscriptions, or advertising; (ii) player engagement, focused on fostering an immersive and captivating experience that keeps players actively involved and invested in the game over an extended period. This can include elements like compelling storytelling, interactive gameplay mechanics, and regular content updates; (iii) user acquisition which refers to attracting and acquiring new players to the game through marketing and promotional activities, such as targeted advertising campaigns, influencer partnerships, or social media outreach; (iv) retention of the existing players and encouraging them to continue playing the game. This can involve strategies like providing regular updates, offering rewards, implementing social features, and fostering a sense of community, (v) community building which addresses the creation of a vibrant and supportive community around the game, where players can interact, share experiences, and provide feedback. This can be facilitated through forums, social media groups, in-game chat features, and organized events; (vi) user experience, which can ensure a seamless and enjoyable experience for players, encompassing aspects such as intuitive user interfaces, responsive controls, smooth performance, and immersive audiovisual elements; (vii) game balance, by striking a delicate equilibrium between challenge and reward within the gameplay mechanics to maintain player engagement and prevent frustration or monotony. Balancing factors can include difficulty levels, progression systems, and the distribution of in-game resources; (viii) innovation, meaning constantly pushing the boundaries of game design, technology, and storytelling to deliver unique and compelling experiences that captivate players and differentiate the game from competitors; (ix) competitive advantage, through identifying and leveraging distinctive strengths and features that set the game apart from others in the market, allowing it to attract and retain a dedicated player base. This can include unique gameplay mechanics, original intellectual property, cutting-edge technology, or exceptional visual and audio design; (x) long-term growth, which involves establishing a sustainable business model and implementing strategies that promote continued growth, expansion into new markets or platforms, and the ability to adapt to evolving player preferences and industry trends.
2.2. Delineate - a description of the desired behavior

This action can highlight target behavior of participants, that is, describe what behavior of participants will contribute to the achievement of business goals and how to encourage participants to such behavior.

When it comes to delineating the desired behavior in terms of gaming within a business context, several key words and concepts can be considered (Chu, 2015; Werbach and Hunter, 2012): (i) player engagement, by encouraging players to be actively involved and immersed in the game, fostering a sense of enjoyment, challenge, and satisfaction; (ii) goal orientation, by establishing clear objectives and targets for players to strive towards, providing a sense of purpose and direction within the game; (iii) skill development, by creating gameplay mechanics that allow players to progressively improve their skills, offering a sense of growth and mastery over time; (iv) strategic thinking, by designing gameplay elements that require players to think critically, make decisions, and develop effective strategies to overcome challenges and achieve success; (v) collaboration, by promoting teamwork and social interaction within the game, encouraging players to cooperate, communicate, and work together towards shared goals; (vi) ethical behavior, by setting standards for fair play, sportsmanship, and respect among players, fostering a positive and inclusive gaming environment; (vii) intrinsic motivation, by designing game mechanics that tap into players' internal drives, such as curiosity, creativity, and the desire for self-expression, to enhance their engagement and enjoyment; player empowerment by providing players with a sense of agency and control within the game, allowing them to make meaningful choices and shape their own experiences; (viii) replayability, by designing games that offer a high degree of replay value, with varied content, challenges, and outcomes, encouraging players to return to the game and continue exploring; (ix) reward structure, by establishing a balanced system of rewards and incentives that motivates players to achieve goals, progress, and feel a sense of accomplishment; (x) continuous improvement by emphasizing the importance of gathering player feedback, analyzing data, and making iterative updates and enhancements to the game to meet evolving player expectations and preferences; (xi) long-term engagement by creating a game experience that extends beyond a single session, fostering a long-lasting connection between players and the game through regular updates, events, and new content releases.

By delineating the desired behavior in terms of gaming within a business context using these words, companies can set clear expectations for the game's design, player experience, and overall business goals. It helps create a framework that aligns the game's mechanics and features with the desired outcomes, ensuring a compelling and rewarding experience for players while driving the success and growth of the business.

2.3. Describe - a description of the players

This framework examines the internal and external motivation of players to understand which motivational factors are most effective when used in a gaming system. When describing the players within the framework of business goals and gaming, several key words and concepts should be taken into account (Harmeling et al., 2017; Tondello et al., 2017): target audience, player segmentation, player persona, player behavior analysis, player motivation, player experience, player lifecycle, player feedback, player community, player value. It is important to recognize the potential value that players bring to the business beyond their initial gameplay. This includes factors such as their likelihood to make in-game purchases, engage with advertising, participate in events, or contribute to the growth of the player community.

By describing players within the framework of business goals and gaming using these words, companies can gain a comprehensive understanding of their target audience, tailor experiences to meet player expectations, and strategically align their business objectives with the needs and motivations of the players.
2.4. Devise - development of cycles of activity (cycles of involvement and promotion)

This context describes what the players are doing, why they are doing it and what the system does in response, as well as describe the player's entire journey, progressing from the starting point to the end. When it comes to devising cycles of activity, specifically cycles of involvement and promotion, within the framework of business goals and gaming, several key words and concepts come into play (Tondello et al., 2017; Zichermann and Cunningham, 2011): engagement cycles, progression systems, feedback loops, onboarding and tutorials, community interaction, promotional campaigns, viral mechanics, player rewards and incentives, seasonal or time-limited events, data analysis and optimization. By devising cycles of involvement and promotion using these words, businesses can create a dynamic and engaging game experience that keeps players actively participating and promotes sustained interest in the game. These cycles help foster player retention, attract new players, and align player engagement with the overarching business objectives of the game.

2.5. Don't forget - do not forget about entertainment

This action needs a constantly checking if the created gamiated system is fun and addicting. When considering business goals and gaming, it is essential not to forget about the importance of entertainment. Here are several words highlighting the significance of entertainment within this framework: enjoyment, immersion, engagement, emotional appeal, replay value, entertainment as a business goal, storytelling, visual and audio design, innovation and novelty, player satisfaction (Isbister and Schaffer, 2008; Nakatsu and Hoshino, 2008).

Remembering the importance of entertainment in the context of business goals and gaming is crucial for creating compelling and enjoyable experiences that resonate with players, foster engagement, and ultimately drive the success of the game.

2.6. Deploy - using the right tools

This framework involves the selection of the appropriate mechanisms and components for the implementation of the gamified system. Deploying the right tools is crucial for achieving business goals and enhancing gaming experiences (Kundu and Maulik, 2021). In both contexts, effective deployment involves selecting and implementing appropriate tools to optimize productivity, efficiency, and overall success. In the realm of business, deploying the right tools means identifying and utilizing software, hardware, and technologies that align with the organization's objectives. This can include project management software, customer relationship management (CRM) systems, analytics tools, communication platforms, and more. By deploying these tools strategically, businesses can streamline operations, improve collaboration, and gain valuable insights into their processes and customers. For example, a business aiming to increase sales and customer satisfaction might deploy a CRM system that centralizes customer data, streamlines communication, and automates sales processes. This tool allows sales teams to efficiently manage leads, track customer interactions, and deliver personalized experiences, leading to improved conversion rates and customer retention.

Similarly, in the gaming industry, deploying the right tools is essential for creating engaging and immersive experiences. Game developers rely on various tools and technologies to design, build, and optimize games. These tools can include game engines, design software, debugging tools, and performance optimization frameworks. By leveraging the right tools, developers can streamline the game development process, enhance graphics and audio quality, and optimize performance for different platforms. This results in smoother gameplay, visually stunning environments, and seamless multiplayer experiences, ultimately leading to higher player engagement and positive reviews (Aleem et al., 2016).

Moreover, deploying the right tools in gaming also extends to the player's perspective. Tools such as gaming consoles, virtual reality (VR) headsets, and gaming peripherals contribute to an
immersive and enjoyable gaming experience. These tools enable players to interact with games in new and exciting ways, enhancing their overall satisfaction and immersion. In both the business and gaming contexts, the successful deployment of tools is contingent upon understanding the specific goals, needs, and challenges of the respective domain. It requires careful evaluation, selection, and integration of tools that align with the objectives and enhance productivity, efficiency, and user experiences. By deploying the right tools, businesses can optimize their operations, while game developers and players can unlock new levels of creativity and enjoyment (Tanner et al., 2022).

3. Gamification as a way of developing and qualitatively improving the work of a commercial organization in a capitalist economy

The authors of the model described above are liberal theorists of gamification, they propose to consider gamification as a way of developing and qualitatively improving the work of a commercial organization in a capitalist economy.

3.1. The gamification model of K learning platform.

There are eight main driving forces of human motivation:

1. **Epic Meaning and Calling** - the need for a sense of self-worth - manifests itself when a person believes that he is doing something significant that is superior to himself, or he was chosen to do something important.

2. **Development and Accomplishment** - the need for development and achievement of success - an internal urge, the desire to develop their skills and progress, achieve mastery and overcome difficulties.

3. **Empowerment of Creativity and Feedback** - the need to develop creativity - is expressed in the involvement in the creative process, in which they constantly create something new and try different combinations. People have a need not only to express their creativity, but also to see its results, get feedback and change in response.

4. **Ownership and Possession** - the need to own and control something - manifests itself when a person experiences a feeling of possession and seeks to exaggerate and improve what he owns.

5. **Social Influence and Relatedness** - the need for social connections and influence on other people - includes all the social elements that motivate people: mentoring, social approval, other people's opinions, friendships, and even competition and jealousy.

6. **Scarcity and Impatience** - the desire to receive something, simply because it is rare, exclusive or unavailable at the moment - the need is associated with the fact that when a person cannot receive something right now, he continues to think about it constantly.

7. **Unpredictability and Curiosity** - curiosity and unpredictability - the need to be constantly involved, because you do not know what will happen next.

8. **Loss and Avoidance** - striving to avoid negative consequences and losses.

These eight needs are divided into two groups:

- left-brain (logic, analytical thinking etc.)
- right-brain (creativity, curiosity etc.), as well as “white” (make us strong, satisfied and fulfilled) and “black”(make us anxious, addicted and obsessed).

3.2. Game mechanics and techniques

Each driving force behind motivation is accompanied by game mechanics and techniques. For example, the Octahedron of Octaliz suggests the use of mechanics such as points, badges and leaderboards, progress bars, quest lists, boss fights, etc. to satisfy players' development needs and achieve success. To satisfy the curiosity of players, you can use "Easter eggs", random and sudden rewards,
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mini-quests etc. The essence of the Yu-Kai Chou gamification model is to use Octalize to analyze the needs and motivations of people who will be gamified and create new user experiences within the design. Focused on taking into account human interests. Octalize can be used in two ways: firstly, to analyze (audit) existing products in order to determine their strengths and weaknesses in achieving the desired user actions; second, to develop a fundamentally new, engaging user experience based on Octalize (Chu, 2015).

Before starting gamification, five elements need to be identified: (i) business metrics that lead to setting gamification goals; (ii) the target audience of the gamified system that will become players; (iii) the desired behavior of the participants in the system, leading them to win; (iv) feedback mechanisms that initiate desired actions and player behavior; (v) rewarding players for the desired behavior and achievement of victory. Thus, the Yu-Kai Chou gamification model pays considerable attention to the motivation of gamification subjects, however, in our opinion, the issues remain unclear: by what criteria to select game mechanics and techniques, how to correlate business and gamification goals with the interests of users.

4. A new approach to gamification in education

We propose to use a new holistic approach when creating gamification projects for education: it takes into account both the pedagogical goals and the needs and interests of the students themselves. The approach is based in general on the use of the potential of video games for education in two main directions: first, the design of a holistic virtual world based on an understanding of its fundamental properties and characteristics; secondly, the use of game mechanics. Algorithm of actions for the implementation of a new approach to gamification in education:

Step 1. With the help of these taxonomies, it is possible to clearly formulate the learning objectives. Thus, at the first stage, it is necessary to describe the pedagogical goals of the educational course using the taxonomies using keywords from the repositories. For example, the pedagogical goals of the educational course "Applied Systems Analysis" can be as follows: enumerate the properties of the system (level "memorization"), describe the principles of operation of the black box model (level "understanding"), use the composition model to describe the list of elements of a real system (level "application"), compare methods for generating alternatives in relation to the goal of the system ("analysis" level), design an improving intervention using applied systems analysis technology ("synthesis" level), evaluate the impact of the improving intervention on stakeholders. You can analyze the selected pedagogical goals using a picture.

Step 2. The diagram shows Octalysis in its relation to the levels of decomposition of the taxonomies of B. Bloom and E. Simpson on the cognitive, affective and psychomotor bases, which are designated accordingly (K - cognitive, A - affective, P - psychomotor). For example, the goals of the educational course "Applied Systems Analysis" formulated by us relate only to the cognitive basis and satisfy the following needs: to a greater extent the need for development and achievement of success, to a lesser extent the need for a sense of self-worth, in the development of creative abilities, in possession and control anything, curiosity and unpredictability. Accordingly, the remaining needs (the desire to avoid negative consequences and losses, the desire to receive something rare, the need for social connections and influence on other people) are not represented at all in the planned gamified educational course. In this regard, one of the possible ways to improve the educational experience of users would be the formulation and addition of pedagogical goals for missing and poorly represented needs. According to Yu-Kai Chou, the more funds are available to meet all eight needs for a gamified system, the richer the user experience.

Step 3. The selected and formulated pedagogical goals can be correlated with teaching and play mechanics. Here we can refer to the LM-GM model, which compares the levels of taxonomy with teaching and game mechanics. We have extended the LM-GM (Learning-Game Mechanics Model) by adding the affective and psychomotor bases of the taxonomies of educational goals. The extended LM-
GM model is designed in such a way that any combination of teaching and game mechanics is effective in achieving the relevant pedagogical goals. Thus, at this stage, on the basis of certain pedagogical goals of the educational course and an understanding of their levels, it is necessary to choose a set of teaching and game mechanics. For each goal, you should select at least one game and training mechanics (at your own discretion). This can be done as follows: first, determine the level and basis of taxonomies for a specific pedagogical purpose. For example, for a pedagogical purpose - to enumerate the properties of a system, the basis will be cognitive, and the level of taxonomy will be the first, that is, memorization; secondly, using the table of correspondence between educational game mechanics and the levels of taxonomies by B. Bloom and E. Simpson (see table), developed by us, it is necessary to select a certain set of game and teaching mechanics that will gamify the educational course. For example, for the pedagogical purpose - to list the properties of the system, in the table according to the corresponding level of "memorization", we can choose such mechanics as "repetition" and "information". A more detailed description of mechanics is presented in the literature. Thus, we have obtained a list of play and teaching mechanics that we can apply to achieve pedagogical goals in a gamified educational course.

**Step 4.** The developed basis of the gamified educational course must then be given a certain integrity, filled with meanings, meanings, goals and values. Suitable tools for this are: 1. Creation of a pedagogical trajectory (hero's journey). According to, the player goes through the stages of the monomyth or journey of the hero, highlighted by J. Campbell in the book "Many video game developers deliberately use the monomyth formula to guide the hero through the virtual world. The player himself goes through the main stages of monomyth: "exodus" (from the real world) - "initiation" (passing obstacles in the mythological, virtual world) - "return" (to the real world, updated, with the experience and knowledge gained). The scheme of the hero's journey allows for the progress and development of the player, the player's understanding of himself and his capabilities. It is universal and can be used for gamification of educational courses.

5. **How gaming technology affects early childhood development**

5.1. Some actions recommended for early childhood development in the frame of gaming

Early childhood is a critical stage in human development, and when appropriately leveraged, gaming can offer numerous benefits for children's growth and learning. Here are some recommended actions for early childhood development within the framework of gaming:

1. Help teach children to determine cause and effect, develop natural curiosity and the ability to educate themselves.
2. Devices with a touch screen, buttons and a computer mouse can be used as a tool for the development of fine motor skills, coordination of movements and strengthening the connection between the actions of the hands and the direction of gaze.
3. Allow students to conduct their own independent research on a topic of interest, including maintaining self-study skills at home. Children are keenly interested in everything new, and technologies provide almost endless opportunities for studying the biographies of famous people, interesting places on the planet, and historical facts.
4. By observing parents who are constantly using technology, children learn when and under what circumstances various devices and programs can be useful. Many children are already accustomed to seeing an adult pave the way to the right place using the phone, shop online, order food home. During the general quarantine, schoolchildren studied in detail other scenarios for using devices, observing how their parents work with office applications on a laptop, communicate with colleagues via video communication from a smartphone or tablet, and use special mobile applications.
5. Provide the ability to stay connected and maintain relationships with friends and family, despite distances and restrictions (eg, quarantine). Socialization through the device screen is one of the
mandatory components of the digital generation, although it does not replace the equally mandatory physical interaction in contact games.

Parental involvement and guidance are crucial when introducing gaming to young children. By following these recommended actions, you can harness the potential of gaming as a tool for early childhood development, promoting cognitive, social, and emotional growth while ensuring a well-rounded upbringing.

5.2. Differences between gamification and game-based learning

At first glance, it may seem that these are synonyms. Indeed, these terms are often confused and used interchangeably. In fact, you can make a difference in these definitions. Gamification involves the use of elements of game design and logic, mechanics in non-game environments and processes. Gamification is actually used to reward a child for certain behaviors, rewards in the form of stars, points, trophies. These methods can be used in online learning to stimulate the desire to learn more and compete with other children and can bring some advantages:

- Benefits of game-based learning
  - Educational games reinforce the impression that learning is fun and not scary, and make the overall classroom atmosphere more positive. In one study, 54% of students reported that they did not like math, and 67% that they did not know it well. After the inclusion of math games in the educational curriculum, almost 100% of these same students noted that their attitude towards the subject became either good or excellent.
  - The knowledge and skills gained in educational games are put into practice, so it includes “learning by doing”. Thanks to this, the child understands 20% better how new information and abilities will be useful to him in the real world. Due to this, children also develop the ability to self-learn and become quick learners, that is, they begin to "grasp on the fly."
  - Learning games, correctly selected for age, raise self-esteem, according to various sources, by about 20%. To do this, the tasks should not be too simple, but also not overly complex. This is called the desirable difficulty rule. Then the child feels that he was able to achieve something, climbing the levels in the game all the higher.
  - The level of conceptual understanding is increased by 11% due to interactivity and greater involvement of the student in the educational process. In general, this has a positive effect on the quality of education.

These methods improve memorization by an impressive 90% (results of the study by Tracy Sitzmann "A Meta-Analytical Examination of the Instrucional Effectiveness of Computer-Based Simulation Games", 2011) through visual reinforcement and clear illustrations of complex concepts. The so-called principle of visual learning (visual learning) reduces the time for mastering the material and increases the level of involvement, and as a result - the quality and effectiveness of training. According to an MIT study, children complete three times as many tasks in play as in traditional play. Just because it's fun.

Four times the chance to improve analytical skills and critical thinking through educational games that include tasks for logic, puzzle solving and critical thinking. This category, for example, includes the same sudoku, scrabble and crosswords. Also, some games in which you need to interact with other participants (for example, The Sims) increase leadership skills. Among the first educational games to be introduced into the curriculum at an MIT course in 2011 was the famous strategy game Civilization III. Kurt Squire, the project leader for the study of the effectiveness of games in teaching, was surprised to find that students were studying history on their own in order to succeed in the game.

Today we have access to a huge number of educational games for different ages in a wide range of subjects. These are ordinary Sudoku with crosswords for mobile phones, and learning English in games with the virtual robot Buddy.ai (recognized as the most innovative EdTech product of 2019 in the world in the GESAword competition), a fun alphabet and no less fun train.
In the game Funexpected (created by graduates of the Faculty of Mechanics and Mathematics of Moscow State University), children aged 3–7 “travel” around countries and master mathematics. In the "counting room" Fiete math, you need to place loads of different weights on the boat, training addition.

The well-known Minecraft is considered a game that serves educational purposes: it promotes spatial thinking, patience, cooperation, lays the foundations of algorithmic logic, that is, develops a child. As you can see, both gamification and game-based learning are close terms. Both methods can be successfully applied both at school and at home.

6. Conclusions

The utilization of game-based learning in education offers numerous benefits and has the potential to revolutionize traditional teaching methods. Through the integration of educational games into the curriculum, students can engage in a more immersive and interactive learning experience that enhances their understanding, retention, and application of knowledge. Firstly, game-based learning stimulates active participation and intrinsic motivation among students. By presenting educational content in a gamified format, students are more likely to be motivated and engaged, as they perceive learning as a fun and enjoyable activity. This increased engagement leads to improved knowledge retention and a deeper understanding of the subject matter. Secondly, game-based learning promotes critical thinking, problem-solving, and decision-making skills. Educational games often present students with challenging scenarios that require them to analyze information, make strategic choices, and solve complex problems. These cognitive processes foster the development of critical thinking skills that are crucial for success in the modern world.

Furthermore, game-based learning encourages collaboration and social interaction among students. Many educational games incorporate multiplayer features or collaborative elements, allowing students to work together towards common goals. This promotes teamwork, communication, and the development of essential social skills, preparing students for future collaborative work environments. Additionally, game-based learning offers personalized and adaptive learning experiences. Educational games can be designed to adapt to the individual needs and abilities of students, providing tailored feedback and challenges. This adaptive nature ensures that each student receives an education that is suited to their unique learning style and pace, facilitating better learning outcomes.

However, it is important to note that game-based learning should not replace traditional teaching methods but rather complement them. The integration of game-based learning should be accompanied by thoughtful instructional design, appropriate assessment strategies, and continuous monitoring to ensure its effectiveness.

In conclusion, it should be noted that this approach is at the stage of development and does not claim to be comprehensive and complete, since the list of game-training mechanics itself is not complete, and the ratio of the basic needs of users and the levels of bases of taxonomies of educational goals is currently presented as research hypothesis that requires further verification. Nevertheless, this approach for the first time compares the interests and motivation of students with the interests and goals of teachers, which can significantly contribute to the improvement of gamification projects in education.

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