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INFLUENCE OF DIGITAL DISTRIBUTION PLATFORMS ON THE PEDAGOGICAL AND PSYCHOLOGICAL FEATURES OF LEARNING PROCESS GAMIFICATION

INFLUENCIA DE LAS PLATAFORMAS DE DISTRIBUCIÓN DIGITAL EN LAS CARACTERÍSTICAS PEDAGÓGICAS Y PSICOLÓGICAS DEL PROCESO DE APRENDIZAJE GAMIFICACIÓN

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ABSTRACT

The paper examines the pedagogical aspects of the use of digital distribution platforms for learning process gamification in general education schools. The significance and targets of gamified learning are substantiated. Using systems analysis and content analysis, the study establishes criteria for the selection of computer games to be used in the learning process and the advantages and disadvantages of specific digital distribution platforms for the selection of games for the educational process. The conclusion is made that gamification is possible only when it is needed and yields the maximum effect, i.e., when it is organized expediently from the pedagogical and psychological standpoint. Properly selected computer games can effectively influence the quality of the educational process. The teacher needs to understand the purpose of their application, the types of student activity they want to stimulate, how they are going to assess it, how these measures are going to help achieve the goal, and how to set up feedback from students.

Keywords:

Educational process, gamification, educational computer game, digital distribution platform, internet.

RESUMEN

El artículo examina los aspectos pedagógicos del uso de plataformas de distribución digital para la gamificación del proceso de aprendizaje en escuelas de educación general. Se fundamenta la importancia y los objetivos del aprendizaje gamificado. Mediante el análisis de sistemas y el análisis de contenido, el estudio establece criterios para la selección de juegos de computadora que se utilizarán en el proceso de aprendizaje y las ventajas y desventajas de plataformas de distribución digital específicas para la selección de juegos para el proceso educativo. Se llega a la conclusión de que la gamificación es posible solo cuando es necesaria y produce el máximo efecto, es decir, cuando se organiza de manera conveniente desde el punto de vista pedagógico y psicológico. Los juegos de computadora seleccionados adecuadamente pueden

influir de manera efectiva en la calidad del proceso educativo. El profesor debe comprender el propósito de su aplicación, los tipos de actividad estudiantil que desea estimular, cómo la va a evaluar, cómo estas medidas ayudarán a lograr el objetivo y cómo configurar la retroalimentación de los estudiantes.

Palabras clave:

Proceso educativo, gamificación, juego de computadora educativo, plataforma de distribución digital, internet.

INTRODUCTION

The development of advanced technology urges scholars to seek new effective educational tools and revise and modernize the existing ones (Gabidullina et al., 2023). One of these tools increasingly discussed in the pedagogical scientific community is gamification, which relies on the use of games in the educational process, including computer games (Kotlyarova et al., 2023). The incorporation of gaming technologies into the educational process fosters students' interest in knowledge, develops their creativity and initiative, and boosts cognitive activity (Polozhentseva et al., 2023).

Gamified learning is a type of educational process organization whose essential component, content, and formal shape is games. With the help of a gaming program, the student gains new knowledge by engaging in a game played by rules set by the teacher with the application of a separate specialized system of rewards.

Researchers believe that the main goal of gamified learning is the assimilation and application of knowledge, not just passing or getting a good grade. Gamification realizes the following functions in education: building competencies defined by educational goals by including applicants in the game process; monitoring the competencies that applicants have and those that are just developing; and solving complex tasks aimed at building and assessing competencies.

In this context, it is relevant to explore the possibilities of digital platforms in the implementation of educational process gamification.

Today there is a considerable body of research devoted to the phenomenon of gamification (Nikolaeva et al., 2024). Despite being rather new, the concept has many definitions in scientific literature. However, when analyzing these studies, it becomes clear that there is still no established interpretation of the term in the scientific community.

Gamification is interpreted as a method to engage the audience in solving educational tasks through the use of game thinking and dynamics, turning the learning process into a game or as the use of game elements and game techniques in a non-game context. Authors offer a more detailed understanding of gamification as the use of the principles of game methods, aesthetics, and thinking to involve the subjects of education in the learning process to increase their motivation for learning and improve their comprehension of the material (Gorlova et al., 2023).

Gamification combines the use of both computer games and game elements in non-game practices. K. Salen and E. Zimmerman note that gamification immediately focuses its participants on the goals of real activities rather than on the game, which differs from other game formats. The game elements are applied to real-life situations to motivate certain forms of behavior under certain conditions (Denisova et al., 2023).

Gamification is also defined as a method of engaging users in solving educational problems through gaming practices and mechanisms in a non-gaming context. Some authors interpret gamification as a tool for increasing user engagement; explores the positive experience of gamification in the educational environment based on the example of technical disciplines; review approaches to the essence of gamification as a phenomenon.

According to Kornilov (2017), notes that the incorporation of computer games into the learning process enriches motivation and promotes interest in the task, increasing the probability of achieving the set goals with high-quality results. Authors interpret gamification as a developing approach to increasing student motivation and engagement in learning by applying game design elements in the educational environment (Dicheva et al., 2019).

Studies emphasize that gamification focuses primarily on forming a specific learning goal among its participants rather than on the game itself (Batashev et al., 2023). Gamification can also be understood as the use of game mechanisms found in modern game projects (especially in multiplayer games) (Alomari et al., 2019). The difference between gamification and other game forms is that its participants are focused on the goal and the final result of their activity, rather than on the game, and game elements are synthesized with real situations to motivate behavior in specific situations.

Thus, gamified education is a type of learning process organization, whose essential component, content, and formal shape is a game. With the help of a game program, the student acquires new knowledge while participating in a game played by the rules established by the teacher and uses a separate specialized system of incentives.

At the present stage in the development of digital technology, we should distinguish between the use of game elements in traditional learning and the use of electronic game content in the age of digitalization (Goltsova & Protsenko, 2020). If we are dealing with the application of game elements, the learner, while obtaining rewards for successfully learned material, still obtains information from books, lectures, and other sources. If the learning process is built based on proper game content, the game becomes the main means of learning (Giliazova & Zamoshchanskaia, 2022).

We believe that the use of gamification in the educational process as a means of getting the user interested in solving educational tasks by means of gaming practices and mechanisms as part of the traditional learning process adds to these directions. The gamification of learning can combine the use of both computer games and game mechanics without the use of computer equipment altogether.

One of the methods of realizing gamification in education is the use of computer games in instruction – digital game-based learning (DGBL) (Karpenko et al., 2018). Educational computer games are understood by researchers as interactive applications created with digital technology, specialized software, or online services that help students in class master the material in more detail or test their knowledge in the form of a game using a computer (Davis et al., 2018).

The introduction of game components in the educational process increases students' cognitive interest, develops learning motivation and initiative, and builds their ability to express their opinions (Alsawaier, 2018; Ling et al., 2024). Computer games serve as a universal means of gaining experience, a simulator for the development of skills and abilities necessary for human functioning (Iglin, 2020).

Today, owing to the advancement of information technology, computer games are distributed on various platforms (Soboleva, 2017). This is facilitated by the active development of the Internet, the mass cheapening of electronics, and the development of digital distribution platforms for computer games, such as Steam, Epic Games Store, itch.io, etc.

This paper aims to explore the possibilities of using digital distribution platforms to select games for the learning process.

MATERIALS AND METHODS

In accordance with the outlined approaches to gamification in the educational process, a qualitative research approach was adopted.

The study was conducted in the form of a review of the scientific literature on the topic and an analysis of the representation of educational computer games on digital distribution platforms. The aim was to summarize findings connected with the research questions: 1. What are the criteria for selecting computer games for use in the educational process? 2. What are the advantages and disadvantages of specific digital distribution platforms for selecting games for educational purposes?

In the course of the study, we employed the following general scientific and special research methods and techniques, the combination of which was directed at obtaining objective and reliable results:

- Systems analysis to establish the extent to which scholars have developed the problem; the articles that potentially answer the first research question were found on Researchgate, Google Scholar, and Scopus. Only articles published after 2015 were included in the filtered results. Reverse search was also used to include articles of interest to the research goal and questions;

- Content analysis was used to study the content of digital distribution platforms;

- Synthesis was employed to systematize the research materials.

RESULTS AND DISCUSSION

The literature review showed that the computer games beneficial for the educational process have to differ from those used for entertainment. Researchers and educators have developed several criteria for the content of such games (Table 1).

Table 1. Criteria for computer games appropriate to use in the educational process.

№	Criterion	Source
1	The presence of an articulated task or the opportunity to work on a task-within-a-task basis, where a complex task requires the completion of several simpler ones	Dicheva et al. (2019)
2	No violent content and no gambling element	Giliazova & Zamoshchanskaia (2022)
3	Appropriate design, colorful elements, and the absence of aggressive components	Davis et al. (2018)
4	A clear and transparent assessment system (e.g., tests with closed-ended or open-ended questions, a scoring system to determine the grade, etc.) that can be influenced solely by in-game skills	Alsawaier (2018)
5	A quiet genre that can sustain attention but does not have aggressive provocative gameplay (visual novel, puzzle, etc.)	Kornilov (2017); Kozhomuratova et al. (2024)

Source: Prepared by authors

Our content analysis of digital distribution platforms for computer games shows that the greatest variety of educational computer games is found on the world's most famous and large platform Steam and the indie game platform itch.io.

Steam was created in 2004, originally to sell Valve games. In the age of active Internet development, the store began to rapidly grow and add products by other companies. In 2012, Steam started to actively collaborate with indie developers (developers without large budgets), which led to a radical increase in offers on the platform. A loyal attitude to new developers and assistance in creating projects gave the platform a selection of not only entertaining, but also useful games, many of which were created for educational purposes.

itch.io appeared much later than Steam (2012) as the main counterpart to the market monopolist, becoming a "safe haven for indie developers". Today it is the largest platform for independent developers of small games, successfully used to promote projects by students and present experimental games and ideas.

Below we shall investigate the advantages and disadvantages of Steam and itch.io for games for the learning process.

The advantages and disadvantages of using Steam to choose games suitable for the educational process are listed in Table 2.

Table 2. Advantages and disadvantages of Steam.

Advantages	Disadvantages
Works in Russia officially; A system of reviews that gives an idea of product quality and advantages and disadvantages before purchase; Product quality control, which reduces the likelihood of coming across low-quality computer games; A working return system (known as Refund), where a game can be returned if used for no more than two hours with a guaranteed full refund; In most cases, there is contact with developers and Steam support to help resolve issues with games.	Steam requires up-to-date personal computer hardware, a recent operating system, and high-speed Internet access; An educational institution needs to have several accounts with purchased games and monitor them.

Source: Prepared by authors

Steam is a popular and universal platform offering educational games. Its utilization in the gamification of the educational process is expedient in the form of convenient game search.

The advantages and disadvantages of using itch.io to find games suitable for the educational process are outlined in Table 3.

Table 3. Advantages and disadvantages of itch.io.

Advantages	Disadvantages
Most of the games on the platform: - Are either free or cost much less than in other stores; - Have simpler system requirements for installation or use, do not require registration to download free software products (a significant number of the games will work on older hardware, making them cost-effective for schools that have not yet upgraded their computer hardware); Does not require the installation of additional store software or a permanent Internet connection to run; Is adaptive enough for students to download it and upload their own projects for further evaluation.	Low control over the quality of the games offered (some may not work at all); Lack of feedback with many developers, some projects are abandoned (abandonware – abandoned software that is not being developed); English interface – virtually all games are published in English, which requires knowledge on the part of the teacher and students.

Source: Prepared by authors

In summary, the platforms Steam and itch.io can be used as a source for finding and integrating computer games into the learning process.

Apart from the selection criteria in Table 1, game developers need to consider the following quality requirements: the game needs to be colorful and dynamic and have an interesting plotline; it has to present educational materials in various formats (text, video, images, animation) and different forms of knowledge testing (open and closed-ended tests, comparisons, drawing connections, relations); the game has to have a hierarchical structure, i.e., consisting of several interdependent levels; the results of knowledge control should be recorded and considered in the course of the game; the game should provide the possibility of obtaining additional information to stimulate progress in the game (Kornilov, 2017). An educational computer game should not contain elements of cruelty, which can contribute to aggression; it should not be too complex and suit the maximum number of learners; it should not contain elements that cause addiction or unhealthy excitement (e.g. monetization).

The developers of game models and applications intended for the sphere of education list several functions of the game in the modern educational process (Karpenko et al., 2018), in particular: the game's ability to be a means of creating an innovative environment; a focus on acquiring knowledge from different fields; promoting the emergence and flow of discussions; opportunities to perform research; the ability to simulate related (particularly professional) activities to learn practical skills; and the ability to serve as a mode of role-playing behavior and reflection.

It is expedient to use computer games in the course of presenting thematic materials that provide knowledge in a subject area (Knyazeva et al., 2023). For example, the Civilization game series can be used to study history, specific historical epochs and events. Some popular Internet services use gamification: Codeacademy – training in coding; Motion Math Games – a selection of mobile games that add special dynamism to studying mathematics; Foldit – a service that presents scientific problems as puzzles.

Computer games are a universal means for gaining experience, skills, and abilities that can be actively used in later life. As suggested by Karpenko et al. (2018), the specific features of gamification include competitiveness (rewards or the development of the game plot encourage students to learn the material, providing a high level of motivation); play without a winner (if the task is completed, all players receive a reward); goal visualization (significantly increases interest in learning new material, especially if it is well illustrated).

Among the key aspects of gamification, we should name those specific ones that affect children's development and support their interest in learning: dynamism –organization and algorithm of scenario utilization that constantly keeps the player's interest on a high level, continuously offering new mechanics or improving the existing ones; mechanics – the rules of the game process; aesthetics – the creation of a gaming experience that makes the player feel not like an observer, but a participant in the events, which promotes emotional involvement and deeper interest; social interaction – the use of cooperative play techniques that enable interaction between the player and the game or many players among themselves.

Using game technologies in teaching, the teacher should observe several conditions, namely: consider the relevance of the game to the objectives of the lesson; ensure the appropriateness of the game to the age characteristics of learners; maintain a reasonable balance in the use of gamification and traditional tools in the classroom. When choosing a computer game to be used in the educational process, it is crucial to analyze the expediency of this step and determine the following: at what stage of the lesson the game can be applied; what learning objectives it realizes; whether the game materials correspond to the content of the educational material and students' knowledge, skills, and abilities; whether the game provides feedback, etc. Only with these questions answered can the educator move on to developing an

educational computer game or choosing from the ones already available.

CONCLUSIONS

Gamification is possible only when it is needed and yields the maximum effect, i.e., when it is organized expediently from the pedagogical and psychological standpoint: the place of the game in the learning process in combination with other methods is determined; productive models of activity are selected; the proposed situations are as close as possible to real life; students are psychologically ready for the distribution of roles and playing games; an appropriate emotional background and atmosphere of interaction is created; the role of the teacher in conducting the game is determined.

A proper selection of computer games can effectively influence the quality of the educational process. To choose the complex of educational games right, the teacher needs to know the purpose of their use, the types of student activity they wish to stimulate, how they are going to measure it, how this will help them achieve the goal, and how to set up feedback with students.

The game changes the very role of the teacher/instructor: they become not only an organizer but a leader of the process. To effectively introduce interactive games into the educational process, the teacher has to be competent in technology and ready to use gamification in the learning process. This training has to take place as part of future teachers' training in higher education, where the conditions to master the basics of this activity must be created. Having mastered the technologies of gamification of learning, the teacher is likely to apply them in their professional practice, and the rapid development of digital technologies will allow them to transform the educational process from traditional to modern with the introduction of game technologies.

The training of teachers for the gamification of the educational process can be a prospect for further research.

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CONFLICT OF INTEREST

There is no conflict of authors

The percentage of participation in its preparation is equitable