

**THEORETICAL AND METHODOLOGICAL ANALYSIS OF MODERN
EDUCATIONAL PHENOMENA: GAMIFICATION, DIGITALIZATION**

**ANÁLISE TEÓRICA E METODOLÓGICA DOS FENÔMENOS EDUCATIVOS
MODERNOS: GAMIFICAÇÃO, DIGITALIZAÇÃO**

**ANÁLISIS TEÓRICO Y METODOLÓGICO DE LOS FENÓMENOS EDUCATIVOS
MODERNOS: GAMIFICACIÓN, DIGITALIZACIÓN**



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ABSTRACT: The positioning of digital and game segments as educational phenomena is an urgent issue in need of theoretical and methodological analysis. The aim of the article is to highlight the features of gamification and digitalization in the context of innovative development of education. The task of scientific exploration focuses on the harmonization of digital and game elements in the formation of the modern educational paradigm. The research methodology focused around the potential of general scientific (analysis, systematization, forecasting) and scientific and pedagogical methodological discourse (conceptualization, modeling). The results indicate that the digital and game components form the innovative dimension of educational strategies. At the same time, two ways of reconciling the key components of the educational space are distinguished: innovativeness & traditionalism and innovativeness vs traditionalism. Consequently, gamification and digitalization are the factors that determine the ratio of traditional and innovative components in educational development strategies.

KEYWORDS: Digital educational space. Gamification in education. Educational strategies. Innovativeness in education. Education 4.0.

RESUMO: *O posicionamento dos segmentos digital e de jogos como fenômenos educacionais é uma questão urgente que necessita de análise teórico-metodológica. O objetivo do artigo é destacar as características da gamificação e da digitalização no contexto do desenvolvimento inovador da educação. A tarefa de exploração científica centra-se na harmonização dos elementos digitais e de jogos na formação do paradigma educacional moderno. A metodologia de pesquisa concentrou-se no potencial do discurso metodológico científico geral (análise, sistematização, previsão) e científico e pedagógico (conceitualização, modelagem). Os resultados indicam que os componentes digital e de jogo formam a dimensão inovadora das estratégias educacionais. Ao mesmo tempo, distinguem-se duas formas de conciliar os componentes-chave do espaço educativo: inovação e tradicionalismo e inovação versus tradicionalismo. Consequentemente, a gamificação e a digitalização são os fatores que determinam a proporção de componentes tradicionais e inovadores nas estratégias de desenvolvimento educacional.*

PALAVRAS-CHAVE: Espaço educativo digital. Gamificação na educação. Estratégias educativas. Inovação na educação. Educação 4.0.

RESUMEN: *El posicionamiento de los segmentos digital y del juego como fenómenos educativos es una cuestión urgente que requiere un análisis teórico y metodológico. El objetivo del artículo es destacar las características de la gamificación y la digitalización en el contexto del desarrollo innovador de la educación. La tarea de exploración científica se centra en la armonización de los elementos digitales y de juego en la formación del paradigma educativo moderno. La metodología de investigación se centró en el potencial del discurso metodológico científico general (análisis, sistematización, previsión) y el discurso científico y pedagógico (conceptualización, modelización). Los resultados indican que los componentes digitales y de juego constituyen la dimensión innovadora de las estrategias educativas. Al mismo tiempo, se distinguen dos formas de conciliar los componentes clave del espacio educativo: innovación y tradicionalismo e innovación frente a tradicionalismo. Por consiguiente, la gamificación y la digitalización son los factores que determinan la proporción de componentes tradicionales e innovadores en las estrategias de desarrollo educativo.*

PALABRAS CLAVE: Espacio educativo digital. Gamificación en educación. Estrategias educativas. Innovación en educación. Educación 4.0.

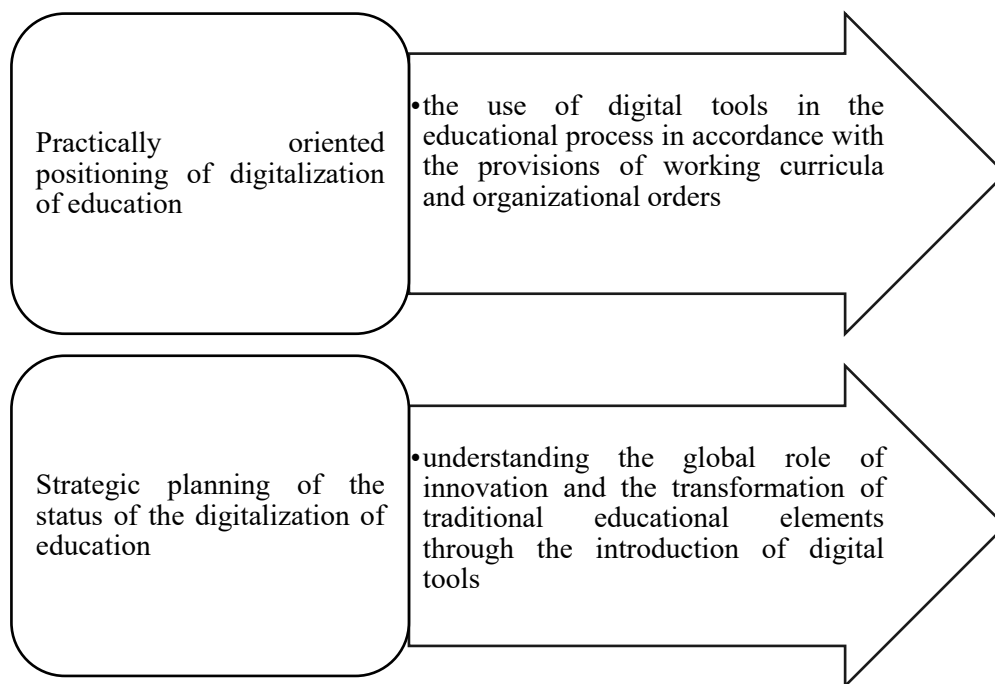
Introduction

A characteristic feature of modern civilizational development is an orientation toward pragmatism. The educational sphere is no exception in this trend of socio-cultural realities. Consequently, the search for mechanisms to ensure efficiency and quality in education has actualized the cluster of information and communication technologies, which are the dominant element in the social activity of our time. As a consequence, digitalization of education, along with the mundane dimension, emerged as a specialized tool aimed at improving learning, teaching and organization of the educational process, and gamification diversified the practically oriented dimension of pedagogy. The modern worldview has chosen developmental and progress-orientation as a fundamental principle (SARKER *et al.*, 2019). The use of digital game space in education confirms this trend and ensures its practical implementation. In this context, a key research problem emerges - the correlation of global-strategic and practical innovative dimensions of modern education. Digital and play space, being elements of a holistic global educational trend, play a role in practical and everyday educational life. Digitalization transforms the content and format of acquiring knowledge (BADER; OLEKSIENKO; MERENIUK, 2022).

Two formats of educational activity have been chosen as the site of research: educational strategies and local practical plane of pedagogical activity. These paradigms incorporate elements of digital and playful tools and analyze the effectiveness of the educational model. The results of the study show a growing trend in the role of digitalization and gamification in the educational system and their positive impact on improving the quality of education.

According to Da Motta Reis *et al.* (2020) “Education 4.0” seeks to connect the information available in the real and virtual world. Digitalization in the era of Education 4.0 encompasses all components of the educational space without exception: pedagogical, administrative, academic, and attitudinal (AINI *et al.*, 2020). The successful implementation of digital resources in the educational process has led to the introduction of these elements in educational strategies. This, in turn, implies not only the use of digital tools, but the reflection of their role and status in the educational system. The transformation of digital cluster positioning in the educational space can be traced in Figure 1, which indicates the features of digitalization and gamification implementation in the program and strategic educational programs.

Figure 1 – The Digital Segment in Education System 4.0 (practical and strategic dimensions)



Source: Prepared by the authors

The aim of the scientific exploration is to analyze the practically oriented and strategic components of the digital game space as an innovative element of educational strategies of our time. The tasks of the article are to highlight the features of gamification and digitalization of education, namely:

- the impact of digital and game-based learning environments on the participants in the educational process;
- concretization of skills acquired in a digital and game-based learning environment.

Literature Review

In the current academic literature, digitalization of education is based on the cultural-historical activity theory and the concept of learning levels (PETTERSSON, 2021). In this paradigm, the place and role of innovative elements like digital resources and game environments are gradually changing. Aini *et al.* (2020) note the need to harmonize all components of this model, which increases the integration of the digital and game element in the educational system.

Filipova and Usheva (2021) point out moments of perception of the digital-game element by all participants in the educational process. Such guidance is actualized due to the fact that innovative formats of the educational process have primarily human-centered dimension.

Digitalization and gamification are fully in line with the interdisciplinary synergetic trends of contemporary education and culture, which can be seen in the study of Balyer and Oz (2018). Bygstad *et al.* (2022) note the role of digital-gaming resource in organizing the educational process.

Scholarly exploration, based on the analysis of articles that address digitalization and gamification of education, attempts to build an educational strategy of innovation based on self-organizing principles.

The characterization of gamification and digitalization in education has been expressed in research studies predominantly exploring structure rather than content (PALOMINO *et al.*, 2019). However, the affirmation of gamification and digital segments in the educational environment contributes to the concretization of these issues in the scientific and pedagogical discourse. The target format of scientific reflection on gamification and digitalization in education is gradually reoriented to user experience with a detailed description of the practical implementation of these innovative elements.

A survey of scholarly production on the topic of gamification in education was conducted by Swacha (2021) using bibliometric analysis. The exploration reveals a sharp growth of interest in this problem not only in the practically oriented dimension, but also in the aspect of the formation of theoretical and methodological settings in the organization of digital and game spaces.

Research in recent years related to gamification and digitalization of education has changed the scientific and research priorities on the quantitative characterization of this process to the identification and analysis of qualitative indicators of the implementation of game tools (HUANG *et al.*, 2020).

In the scientific and pedagogical discourse, a key role is given to the analysis of the role of participants in the educational process when using elements of digitalization and gamification. An important aspect is the moderating role of the tutor, which involves the correlation of pedagogical and information-game components (OFOSU-AMPONG, 2020).

A relevant aspect in the literature review of the problem of gamification and digitalization of education is the analysis of the results of the effectiveness of these elements in

different conditions (organizational, socio-economic, moral and ethical, etc.). As a rule, modern scientific research considers gamification and digital mechanisms as ways to implement basic educational guidelines (LUO, 2022).

Methodology

The creation of new landscapes and environments are characteristics of the new sociocultural space. The new trends have not bypassed the educational sphere, which has transformed from a traditional center of knowledge acquisition into an innovative educational and technological center that offers future skills. Such transformations require new methodological approaches, which will effectively ensure the transformation processes. Traditional empirical tools of scientific and pedagogical discourse are being replaced by methodological tools based on digital experiences (TELUKDARIE; MUNSAMY, 2019). The key methodological characteristics of digital experience are dynamism and continuity of operation (actually online). The study proposes to identify practically oriented ways to realize educational continuity through gaming and digital innovations in the field.

Active and in-demand use of gaming space in the educational process has led to gamification to the cohort of key trends in modern education. Such realities need proper methodological support. Toda *et al.* (2019) point to the importance of creating a taxonomy of game elements used in the educational process and promote standardization of terminology related to gamification in education. Scholarly exploration suggests a strategy for aligning traditional and innovative educational elements related to gaming and digital resources.

The approach using the communication element of the digital segment is addressed through the narrative methodology of “Ed-Tech conversation” (MERTALA, 2020). This methodology is important in the proposed study because through it the principles of gamification and digitalization are combined.

It should be noted that the implementation of digital and gamification space in the educational system is a complex process not only in the teaching and methodological, but also in the organizational dimension. Therefore, the study proposes the use of change management strategy as a relevant methodological principle for the organization of digital game educational environment (JACKSON, 2019). This approach fully corresponds to the dynamism characteristic of digitalization and gamification of education and once again emphasizes the phenomenality of these principles in the modern educational space.

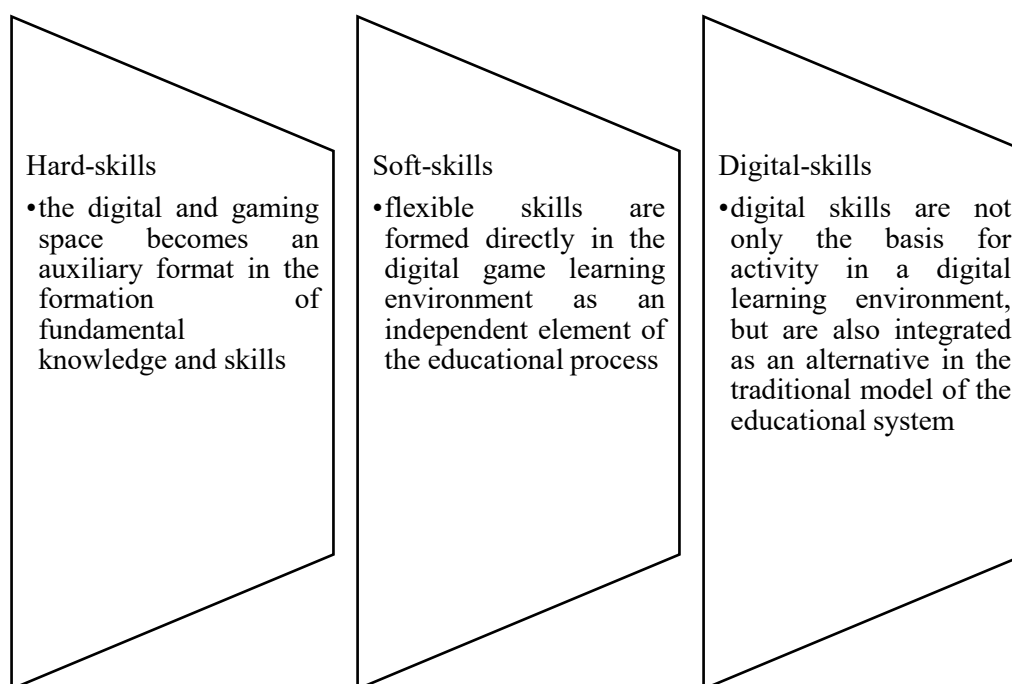
As innovativeness habitually brings significant change to the educational process, it is important to maintain the principles of critical thinking that will prevent the potential negative manifestation of digitalization of education (CATAL; TEKINERDOGAN, 2019). The study proposes defining critical, analytical, and predictive thinking in the context of evaluating the impact of digital-gaming resources on the educational system of innovativeness.

Results and Discussion

The introduction of virtual and distance learning formats at the practical level has emphasized the importance and demand for the use of the digital game segment in education (TSEKHMISTER *et al.*, 2021). With the introduction of digitalization, the principles of labor relations and relationships of all participants in the educational process have changed dramatically. Filipova and Usheva (2021) point out that a simple statement of this fact is not enough, and it is necessary to plan the development of educational strategies taking into account these realities, defining new roles for teachers (not a mentor, but a moderator), applicants for education (not a recipient, but a seeker of skills), organizers of the educational process. Important in the analysis of gamification and digitalization as educational phenomena are peculiarities of the development of fundamental elements of game and digital learning environments. In particular, if we consider the spread of game cluster at different educational levels, it is obvious that game tools are most relevant and effective at the primary educational level and are gradually losing their position at the level of secondary and higher education. The opposite trend can be observed when considering the digital learning environment which is the most implemented in the segment of higher education (BENAVIDES *et al.*, 2020).

When considering the formation of knowledge and skills using digital game formats, the following picture can be seen (see Fig. 2).

Figure 2 – Formation of skills in a digital game learning environment



Source: authors' own development

A relevant issue for the scientific and pedagogical community is the readiness of the participants in the educational process to introduce game and digital-game learning environments as independent educational elements (BALYER; ÖZ, 2018). Even in today's education system, with its total embrace of digital tools, digital and game-based learning spaces are positioned as auxiliary segments in the traditional learning format. The educational community now faces the inevitable recognition of the digital learning space as a full-fledged educational cluster in its own right. The digital and game format of the educational process helps to overcome many physical and moral boundaries (BYGSTAD *et al.*, 2022).

A special feature of the use of digital elements in education is their perception in society. Traditionally, innovative digital technologies are approved and developed in other industries and then implemented in education (SCHMIDT; TANG, 2020). This sequence facilitates the rapid adaptation of the digital element to the educational process, since its participants have already encountered digital tools in everyday use in other spheres of social activity. This explains the phenomenon of the digitalization of education when it comes to the perception of digital principles. In the vast majority of cases, digital content and digital mechanisms are expected and desired by participants in the educational process. This demand for digital cluster in education can be explained by several factors:

- user experience with digital tools that have been proven to be effective in the economic-financial or cultural-entertainment segment;
- availability of technological support, thanks to which it is possible to use elements of digital or digital-game educational content;
- global trends that define digitalization as a key model of innovative development of all spheres of social activity.

Innovative elements of 4.0 learning provide educational applicants with cognitive, social, and interpersonal skills relevant in the context of the 4th industrial revolution (OLIVEIRA; DE SOUZA, 2022). An important feature of the implementation of gamification principles in the educational space is their targeting. If previously innovative formats were often used according to the principle “innovation for innovativeness”, then there has been a reorientation according to the principle: “innovation for efficiency”. Gamification is directed for the development and implementation of such practically oriented activities as: concentration, motivation, involvement, mobility, experience (OLIVEIRA *et al.*, 2022).

In addition to its fundamental educational functions, the digital-game learning environment is an important factor for the observance of the value principles of educational organization in the civilized world. Thanks to digitalization and gamification the proper level of implementation of immersive technologies in education is achieved (BAKHMAT *et al.*, 2022). Consequently, the issues of mobility, inclusiveness, humanistic education move from the theoretical stage of proposals to the practical implementation of these principles.

Increasing the share of innovativeness in the educational system through the implementation of elements of digitalization and gamification requires updating the education system and stimulates the use of new formats and tools. ICT is an optimal resource for providing a game and digital learning environment. Combining gamification with the potential of cloud computing, artificial intelligence, or virtual reality is in its early stages, but a significant potential for such synergy has already been established (HAKAK *et al.*, 2019).

Considering the aspects of gamification in the educational space, it should be noted that the emphasis is placed on the use of game elements in non-game settings (HALLIFAX *et al.*, 2019). Consequently, the issue of adaptation of game activities in the educational space is actualized. Here we see a difference between the principles of digitalization and gamification implementation in the educational system. Digitalization has much more opportunities for integration into the general educational space. Information and communication and

technological elements have a clear positioning in the educational process: either combined with the educational and didactic potential, or becoming its alternative. For gamification, the relationship with the traditional education cluster is more complicated, since the game space cannot exist autonomously from the learning space. For gamification, alignment with the teaching-methodological or didactic segment is mandatory and not always clearly defined. Such realities form the need for pedagogical evaluation of game-based learning methods. It is noteworthy that the information and digital element is designed to help in the process of adapting game models in the educational environment, as it has the necessary methodological and technological potential.

The findings of Manzano-León *et al.* (2021) indicate that “educational gamification has a potential impact on students' academic success, commitment, and motivation.” Such findings prompt further research into the effects of gamification on education. Interesting and promising questions to explore are:

- perception of new formats of the learning environment by the participants of the educational process and their correlation with the available information and technological resources, which are actualized in the educational system;
- finding the optimal balance between traditional educational and didactic elements and innovative clusters (in particular, the game and digital segment) in an educational practice-oriented environment;
- uncovering the potential threats associated with the use of digital and gaming tools and developing mechanisms that will level out the risks to the targeted educational process.

Considering the modern scientific and pedagogical discourse, Handayani Tyas and Naibaho (2021) indicate that “the technologies developed by the 4th industrial revolution considerable potential dangers. Education must respond to these challenges in an effective way - by improving the quality of knowledge and skills” (p. 176).

At the same time, the threats posed by the overuse of ICTs in the educational sphere are becoming more relevant. “Innovative learning formats based on digital tools have begun to be legitimized in the classroom, in addition to traditional educational technologies such as lectures and textbooks” (UGUR, 2020, p. 18). Among the potentially actualizable risks in the digital learning environment, we note: the leveling of the status of the teacher and the dependence of the applicant for education on the external educational segment. That is, there is a certain

elimination of the human dimension of the educational process. In addition, the digital world in the everyday dimension is often associated with the sphere of comfort and entertainment (HANS; CRASTA, 2019). Transferring this positioning of the digital segment to the educational environment is risky relative to the value-purpose role of education in general.

A promising area of research in the innovation education cluster is the synergistic combination of different segments. In particular, Ofosu-Ampong (2020) notes that a factor in the spread of innovation in education will be the creation of game information systems. That is, game tools will first be coordinated with information and digital mechanisms, and already in the form of information and game systems - to integrate into the educational process.

Conclusions

Consequently, gamification and digitalization are vivid examples of the implementation of innovative elements in the modern educational space. An in-depth analysis of digital tools and technologies used in the modern educational process indicates the need for a clear formulation of the status of digital-game learning environment. This approach will allow the development of relevant educational strategies, in which the digital and game cluster will be full-fledged components of the educational environment. It is relevant to focus on the fact that digitalization and gamification are the principles by which knowledge and skills are acquired, and not just provide a comfortable and entertaining cluster of the educational environment.

Digital and game-playing educational space involves all its participants: educators, applicants for education, organizers of the educational process. Gamification and digitalization are important factors in the formation of fundamental skills, priority in the acquisition of soft-skills and non-alternative in the formation of digital-skills. At the same time, the skills and competencies acquired through gaming and digital tools have both practical and operational characteristics and become components of long-term educational strategies.

The digital and gaming components of the educational process somewhat shift the balance in the educational space in terms of the relationship between the traditional and innovative vectors of the educational space. A promising area of research is the choice of an optimal model for the coexistence of the key vectors of the educational process development - a synergistic format: innovation & traditionalism and a dialectical dimension: innovation vs. traditionalism.

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