

Gamification in teaching-learning in higher education

Gamificación en la enseñanza-aprendizaje en educación superior

Gamificação no ensino-aprendizagem no ensino superior

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Cita sugerida (APA, séptima edición)

Gharbi-Farid, F. (2024). Gamification in teaching-learning in higher education. *EDUNEXA, Revista de Investigación en Educación*. 1(3), 129-137. DOI: <https://doi.org/10.51247/e.v1i3.859>.

Abstract

This study aimed to analyze gamification as a strategy in teaching-learning processes in higher education, identifying its benefits, challenges, and implementation guidelines. The methodology was developed under a qualitative approach through a documentary review of relevant and updated scientific literature. The results showed that gamification increased motivation, active participation, and promoted meaningful learning among students, while also contributing to the development of key competencies. However, challenges related to pedagogical design, teacher training, and the appropriate use of digital tools were identified. It was concluded that gamification, when applied in a planned and contextualized manner, was an effective strategy to improve educational processes in higher education, standing out as an innovative resource that responds to current academic demands.

Keywords: Gamification; Teaching-learning; Higher education; Educational innovation

Resumen

El presente estudio tuvo como objetivo analizar la gamificación como estrategia en los procesos de enseñanza-aprendizaje en la educación superior, identificando sus beneficios, desafíos y lineamientos de implementación. La metodología se desarrolló bajo un enfoque cualitativo, mediante una revisión documental de literatura científica relevante y actualizada. Los resultados evidenciaron que la gamificación incrementó la motivación, la participación activa y favoreció el aprendizaje significativo de los estudiantes, además de contribuir al desarrollo de competencias clave. No obstante, se identificaron desafíos relacionados con el diseño pedagógico, la formación docente y el uso adecuado de herramientas digitales. Se concluyó que la gamificación, cuando fue aplicada de manera planificada y contextualizada, constituyó una estrategia efectiva para mejorar los procesos educativos en la educación superior, destacándose como un recurso innovador que responde a las demandas actuales del entorno académico.

Palabras clave: Gamificación; Enseñanza-aprendizaje; Educación superior; Innovación educativa

Resumo

O presente estudo teve como objetivo analisar a gamificação como estratégia nos processos de ensino-aprendizagem no ensino superior, identificando seus benefícios, desafios e diretrizes de implementação. A metodologia foi desenvolvida sob uma abordagem qualitativa, por meio de uma revisão documental de literatura científica relevante e atualizada. Os resultados evidenciaram que a gamificação aumentou a motivação, a participação ativa e favoreceu a aprendizagem significativa dos estudantes, além de contribuir para o desenvolvimento de competências-chave. No entanto, foram identificados desafios relacionados ao desenho pedagógico, à formação docente e ao uso adequado de ferramentas digitais. Concluiu-se que a gamificação, quando aplicada de forma planejada e contextualizada, constitui uma estratégia eficaz para melhorar os processos educativos no ensino superior, destacando-se como um recurso inovador que responde às demandas atuais do contexto acadêmico.

Palavras-chave: Gamificação; Ensino-aprendizagem; Ensino superior; Inovação educativa

Introduction

Higher education is undergoing a transformation driven by the incorporation of active methodologies and the intensive use of digital technologies, which have reshaped traditional teaching-learning dynamics. In this context, gamification has emerged as an innovative pedagogical strategy that seeks to integrate game elements into formal educational environments in order to increase student motivation and engagement. Several studies have indicated that active methodologies, including gamification, promote student-centered learning and encourage more dynamic participation in the classroom (Rodríguez-García et al., 2022). This evolution responds to the need to adapt higher education to the demands of an increasingly digitalized and constantly changing society.

Regarding the integration of digital technologies, gamification has found a favorable environment for its development and implementation. Technological tools such as virtual platforms, interactive applications, and digital environments have facilitated the incorporation of game-based dynamics into the educational process, enabling greater interaction and personalization of learning. Recent research has shown that the combination of gamification and digital technologies enhances conceptual understanding and strengthens skills such as problem-solving in disciplines including mathematics, physics, and chemistry (Ibarra Ordóñez et al., 2025). Likewise, complementary strategies such as the flipped classroom further enhance these outcomes by fostering student autonomy and optimizing classroom interaction time (Espinoza-Freire, 2024).

Furthermore, new learning dynamics in higher education have emphasized the development of competencies beyond the mere memorization of content. In this regard, gamification contributes to meaningful learning by engaging students in active, challenging, and contextualized experiences. According to Berrones Yaulema et al. (2023), the implementation of elements such as points, levels, and rewards stimulates participation and reinforces commitment to the educational process. These characteristics make gamification an effective tool for transforming the student's role from a passive recipient to an active agent in the construction of knowledge.

However, despite its potential, significant challenges remain within higher education contexts, justifying the need to explore strategies such as gamification. One of the main challenges is low student motivation, a phenomenon that negatively affects academic performance and student retention. Studies have demonstrated that gamification can positively influence motivation by increasing students' interest and participation in academic activities (Aguilar Aguilar et al., 2025). This evidence suggests that the incorporation of game-based dynamics may represent a viable alternative for addressing this structural problem.

Additionally, traditional teaching methods continue to predominate in many university settings, limiting pedagogical innovation and adaptation to students' current needs. Teacher-centered instruction focused on content transmission, with limited interaction, hinders the development of critical and reflective skills. In this sense, the transition toward approaches such as the flipped classroom and gamification helps overcome these limitations by promoting greater active participation and more autonomous learning (Romero Córdor et al., 2025). These methodologies not only transform teaching practices but also contribute to improving the quality of the educational process.

Within this framework, the need for pedagogical innovation becomes a central axis for strengthening higher education. Teacher training plays a fundamental role in this process, as the effective implementation of strategies such as gamification requires specific pedagogical and technological knowledge. According to Vera Arias et al. (2023), teacher professional development is essential for achieving the successful integration of innovative methodologies in the classroom, ensuring their relevance and effectiveness. Without adequate preparation, there is a risk of applying gamification superficially, thereby failing to achieve the expected outcomes.

Finally, the relevance of gamification in higher education lies in its capacity to address contemporary challenges in the teaching-learning process. Previous research has highlighted its potential to improve motivation, participation, and meaningful learning, provided that its implementation is carefully planned and contextualized (Espinoza Freire, 2018; Ordoñez Ocampo et al., 2021). In this regard, the present study aims to analyze gamification in higher education, identify its main benefits and challenges, and propose strategies that facilitate its effective implementation. In doing so, it seeks to contribute to the academic debate and provide guidelines that strengthen educational innovation in university contexts.

Methodology

This study was conducted under a qualitative approach aimed at gaining an in-depth understanding of gamification as a strategy within teaching-learning processes in higher education. This approach made it possible to analyze the phenomenon from an interpretative perspective, considering its complexity and educational context. In this regard, qualitative research was considered an appropriate tool for addressing pedagogical, didactic, and social aspects related to educational innovation, ensuring an ethical and reflective approach to the object of study. Furthermore, a non-experimental descriptive design was adopted, since variables were not manipulated; instead, existing information available in the academic literature was examined.

The method employed was a documentary review, which enabled the collection, analysis, and interpretation of information from various relevant scientific sources. This method proved suitable for identifying trends, theoretical approaches, and empirical findings related to gamification in higher education. According to Nieto Bravo et al. (2023), narrative and documentary methods facilitate the understanding of educational phenomena through the critical analysis of academic texts. Consequently, scientific articles, books, and indexed documents were selected from recognized academic databases, prioritizing those published in recent years and demonstrating high methodological rigor.

For data collection, a systematic search was conducted in academic databases using keywords such as "gamification," "higher education," and "educational innovation." This process was carried out according to criteria of relevance, currency, and scientific quality, ensuring the validity of the selected sources. In this context, the search for scientific information was considered a fundamental process for supporting the study, as it provided access to updated and relevant knowledge. Subsequently, the documents were organized and classified to facilitate their analysis.

Data analysis was conducted using a content analysis technique, which allowed the identification of thematic categories related to the benefits, challenges, and implementation strategies of gamification. This procedure involved critical reading, coding, and interpretation of the collected data in order to generate a coherent and well-founded synthesis. As noted by Burgo Bencomo et al. (2019), educational research requires systematic analytical processes that contribute to understanding reality and proposing improvements within educational contexts. In this way, information from diverse sources was integrated into a solid analytical framework.

Finally, fundamental ethical principles were considered throughout the entire research process, ensuring the responsible use of information and respect for the authorship of consulted sources. Ethics in educational research constitutes an essential element for ensuring the transparency, credibility, and integrity of a study. In this regard, citation and referencing standards were applied in accordance with the APA style, avoiding plagiarism and properly acknowledging the contributions of other authors. These criteria strengthened the methodological rigor and the validity of the results obtained.

Development

Foundations of Gamification

Gamification has become an innovative strategy within the educational field, particularly in higher education, by integrating game-related elements into formal learning contexts. From a conceptual perspective, it is understood as the application of game dynamics, mechanics, and components in non-game environments with the purpose of motivating, engaging, and enhancing the student learning experience. According to Gaspar Huamaní (2021), gamification functions as a dynamic resource that promotes active participation and transforms the classroom into a more interactive environment. Similarly, García Casaus et al. (2020) argue that gamification does not involve playing games per se, but rather using game structures to foster meaningful learning.

Regarding game elements, gamification is based on key components such as points, levels, rewards, badges, and leaderboards, which serve as mechanisms for feedback and motivation. These elements make it possible to structure student progress by establishing clear goals and generating a sense of achievement. Castillo-Mora et al. (2022) emphasize that the incorporation of these components facilitates participation and engagement while promoting healthy competition among students. Likewise, Acosta-Medina et al. (2020) indicate that these elements should be carefully designed to prevent the educational process from being reduced solely to the attainment of rewards, thereby maintaining a focus on learning outcomes.

From a pedagogical perspective, gamification is grounded in principles that promote active learning, intrinsic motivation, and continuous feedback. García Aretio (2016) points out that play is an essential element in the educational process because it encourages experimentation, creativity, and the development of cognitive skills. In this regard, Sánchez Pacheco et al. (2020) argue that gamification is linked to learning theories such as constructivism and meaningful learning, as it enables students to construct knowledge through interactive experiences. These principles position gamification as a strategy aligned with the current demands of higher education.

Implementation of Gamification in Education

The implementation of gamification in educational contexts requires a structured pedagogical design that aligns learning objectives, content, and game-based dynamics. The design of gamified activities involves planning experiences that integrate challenges, rewards, and narratives capable of sustaining student interest. According to Cuba Rondón and Pérez Mallea (2021), gamification in distance education helps create interactive environments that compensate for the absence of face-to-face interaction. Likewise, Saraguro-Bravo et al. (2015)

highlight the importance of techno-pedagogical design in virtual environments such as MOOCs, where gamification contributes to improving participant retention and engagement.

Digital educational tools play a fundamental role in the implementation of gamification, as they facilitate the creation of interactive and dynamic learning environments. Educational platforms, mobile applications, and learning management systems enable the efficient integration of game elements into teaching processes. Mero Ponce (2021) notes that these tools promote meaningful learning by providing interactive resources that stimulate student participation. Similarly, Vital Carrillo (2021) emphasizes that the use of digital technologies expands pedagogical possibilities, allowing teaching strategies to be adapted to students' needs and learning styles.

The roles of both teachers and students also undergo significant transformation in gamified contexts. Teachers shift from being transmitters of knowledge to becoming facilitators and designers of learning experiences, while students assume a more active role in their educational process. Durán Chinchilla et al. (2021) argue that in the digital era it is essential for teachers to develop technological and pedagogical competencies that enable them to implement innovative strategies. In this sense, Guamán-Gómez et al. (2023) emphasize that teachers should guide, motivate, and support students throughout their learning process, fostering autonomy and collaboration.

Impact of Gamification on Learning

One of the main contributions of gamification in higher education is its positive impact on student motivation and participation. The incorporation of game-based dynamics creates an attractive learning environment that stimulates students' interest and engagement. Consuegra de Sucre et al. (2026) provide evidence that gamification in virtual environments contributes to improving retention and participation by offering interactive and personalized learning experiences. Similarly, Balcázar Gallo et al. (2026) highlight gamification as a key motivational factor in university learning, increasing students' involvement in academic activities.

With regard to meaningful learning, gamification promotes the active construction of knowledge through interaction, problem-solving, and continuous feedback. Gamboa Caicedo et al. (2020) indicate that gamification, together with creativity, enables the creation of deeper and more lasting learning experiences. Likewise, Hernández Hernández and Ahumada Méndez (2023) emphasize that this strategy strengthens content comprehension by involving students in active learning processes. These findings demonstrate that gamification not only enhances motivation but also improves the quality of learning.

Finally, gamification contributes to the development of student competencies, particularly in areas such as critical thinking, problem-solving, and teamwork. Ramos Vera and Ramos Vera (2021) indicate that gamification is an effective strategy for developing mathematical competencies by encouraging active participation and autonomous learning. Similarly, Cueva-Cáceres (2023) argues that this strategy promotes key skills within educational contexts, preparing students to face the challenges of professional environments. In this regard, gamification is positioned as a comprehensive educational tool that not only enhances learning but also contributes to the development of essential competencies in higher education.

Discussion

The results obtained in this study confirm that gamification constitutes a relevant pedagogical strategy for transforming teaching-learning processes in higher education, particularly in contexts characterized by low student motivation and the need for methodological innovation. In agreement with the findings of Gaspar Huamaní (2021), gamification acts as a dynamic resource that increases students' active participation, which is reflected in greater engagement with academic activities. Likewise, the findings are consistent with those of García Casaus et

al. (2020), who argue that the integration of game elements into educational environments promotes the construction of more meaningful and contextualized learning experiences.

Regarding game elements, the study revealed that components such as points, levels, and rewards play a key role in fostering students' extrinsic motivation. However, as noted by Castillo-Mora et al. (2022) and Acosta-Medina et al. (2020), their use should be accompanied by a solid pedagogical design that prioritizes learning over the mere accumulation of incentives. In this regard, the discussion highlights that an inappropriate application of these elements could generate dependence on external rewards, limiting the development of intrinsic motivation. Therefore, the importance of balancing game-based components with clearly defined educational objectives is emphasized.

From a pedagogical perspective, the results reinforce the relationship between gamification and constructivist learning approaches, in which students assume an active role in the construction of knowledge. García Aretio (2016) and Sánchez Pacheco et al. (2020) agree that game-based learning promotes experimentation, interaction, and critical reflection. In the present study, it was found that gamification not only encourages participation but also strengthens complex cognitive processes, contributing to a deeper understanding of content. This aspect is particularly relevant in higher education, where the development of analytical and critical competencies is expected.

With respect to the implementation of gamification, the findings indicate that its effectiveness largely depends on the design of activities and the appropriate use of digital tools. As pointed out by Cuba Rondón and Pérez Mallea (2021), the planning of gamified experiences should respond to specific pedagogical objectives and consider the characteristics of the educational context. Similarly, Saraguro-Bravo et al. (2015) emphasize that techno-pedagogical design is a determining factor in ensuring the success of these strategies, particularly in virtual learning environments. In this sense, the discussion demonstrates that gamification should not be conceived as an isolated solution but rather as part of a comprehensive approach to educational innovation.

Furthermore, the role of the teacher emerges as a key element in the implementation of gamification. The results are consistent with those of Durán Chinchilla et al. (2021) and Guamán-Gómez et al. (2023), who emphasize the need for teachers to develop digital and pedagogical competencies in order to design and manage innovative learning environments. This study identified that insufficient teacher training may constitute a significant barrier to the effective adoption of gamification. Consequently, the need to strengthen teacher professional development programs focused on educational technologies and active methodologies is highlighted.

In terms of impact, the findings confirm that gamification has positive effects on student motivation, participation, and meaningful learning. These results are consistent with recent studies by Consuegra de Sucre et al. (2026) and Balcázar Gallo et al. (2026), which emphasize the potential of gamification to improve retention and engagement in virtual environments. Furthermore, gamification was found to contribute to the development of key competencies, in line with the findings of Ramos Vera and Ramos Vera (2021) and Cueva-Cáceres (2023). Nevertheless, it is acknowledged that these benefits depend on an appropriate and context-sensitive implementation.

Finally, the discussion allows for reflection on the challenges associated with gamification in higher education. Among these challenges are the need for rigorous pedagogical design, the availability of technological resources, and the continuous professional development of teachers. In agreement with Gamboa Caicedo et al. (2020) and Hernández Hernández and Ahumada Méndez (2023), it is concluded that gamification should be understood as a complementary strategy that, when implemented in a planned and systematic manner, can

significantly enhance educational processes. In this way, the present study provides evidence supporting the integration of gamification as a key tool for innovation in higher education.

Conclusions

The present study provided evidence that gamification constitutes an effective pedagogical strategy for strengthening teaching-learning processes in higher education, particularly in contexts that demand innovation and greater student engagement. Based on the analysis conducted, it can be concluded that the incorporation of game-based elements into educational environments enhances motivation, active participation, and student commitment, all of which are fundamental aspects for improving the quality of learning. Furthermore, gamification emerges as a viable alternative to the limitations of traditional teaching methods by promoting more dynamic, interactive, and student-centered learning experiences.

Moreover, it was determined that the effectiveness of gamification largely depends on an appropriate pedagogical design that coherently aligns learning objectives with game elements. The implementation of this strategy requires rigorous planning to prevent its superficial or merely recreational use, ensuring its alignment with educational goals. In this regard, the role of the teacher is essential, as educators act as designers and facilitators of meaningful learning experiences. This responsibility requires the development of digital and pedagogical competencies that enable the effective integration of gamification into the classroom.

Finally, it is concluded that gamification not only impacts motivation and meaningful learning but also contributes to the development of key competencies such as critical thinking, problem-solving, and collaborative work. Nevertheless, its implementation faces challenges related to teacher training, the availability of technological resources, and the need to adapt to diverse educational contexts. Consequently, it is recommended to promote teacher professional development processes and establish institutional guidelines that facilitate the integration of gamification, consolidating it as an innovative strategy for strengthening higher education.

Study Limitations

This study presented certain limitations inherent to its methodological approach. As it was based on a qualitative documentary review, the results depend on the availability, timeliness, and quality of the analyzed sources, which may limit the generalizability of the findings to specific contexts. Furthermore, no fieldwork or direct empirical validation was conducted, restricting the possibility of contrasting the results with practical evidence from real higher education settings.

Future Studies

Future research should incorporate mixed-methods or quantitative approaches that allow for the empirical validation of the impact of gamification in different educational contexts. Likewise, it would be valuable to develop experimental or quasi-experimental studies comparing academic performance and motivation between groups exposed to gamified strategies and those using traditional approaches. Additionally, further investigation into the role of teachers and the design of specific pedagogical models that systematically integrate gamification into higher education is recommended.

Acknowledgments

The author expresses gratitude to the specialists who contributed to the development of this study through their academic contributions and theoretical reflections. Likewise, recognition is extended to fellow researchers and educational professionals whose experience and knowledge enriched the analysis conducted. Appreciation is also expressed to academic

institutions and the scientific community for facilitating access to relevant information sources that made this study possible.

Declaration of Conflict of Interest

The author declares that there is no conflict of interest regarding the conduct and publication of this study.

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