

FLIPPED CLASSROOM AND GAMIFICATION IN HIGHER EDUCATION: CONTRIBUTIONS TO MEANINGFUL LEARNING, STUDENT AGENCY, AND PEDAGOGICAL INNOVATION

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Abstract

Contemporary transformations in higher education have driven the adoption of active methodologies aimed at promoting more dynamic, participatory, and student-centered pedagogical practices. In this context, the present study aimed to analyze the contributions of the flipped classroom and gamification in

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higher education, with emphasis on meaningful learning, student agency, and pedagogical innovation. This is an integrative literature review, carried out through searches for studies in the LILACS, ERIC, and DOAJ databases and OJS repositories, covering publications from 2021 to 2026 in Portuguese, English, and Spanish. Descriptors related to active methodologies, gamification, flipped classroom, and meaningful learning were used. After applying the inclusion and exclusion criteria, studies were selected to compose the final analysis. The results show that the flipped classroom reorganizes the teaching-learning process, promoting greater student autonomy and active participation. Gamification, in turn, stands out as a strategy capable of increasing students' motivation and engagement. The integration of both methodologies favors the construction of more meaningful learning and promotes pedagogical innovation in higher education. It is concluded that these strategies contribute to the transformation of educational practices, strengthening students' active role and promoting more dynamic, interactive, and collaborative learning environments. Longitudinal empirical studies are suggested to deepen the understanding of the impacts of these methodologies on academic education.

Keywords: Active methodologies, Flipped classroom, Gamification, Meaningful learning, Pedagogical innovation.

INTRODUCTION

Contemporary higher education is undergoing a continuous process of transformation, driven by the incorporation of active methodologies, the expansion of digital technologies, and the need to redefine traditional pedagogical practices. In this scenario, there is a progressive move beyond models centered on the transmission of content toward approaches that prioritize students' active participation, autonomy, and meaningful learning (Moran; Bacich, 2018).

The flipped classroom constitutes a pedagogical approach that reorganizes the time and space of learning, shifting theoretical exposition to moments prior to the face-to-face meeting, while classroom time is devoted to practical, collaborative, and in-depth activities. This methodology has been recognized

as a strategy that favors student agency and the active construction of knowledge (Bergmann; Sams, 2016). Accordingly, studies indicate that its application in higher education contributes to greater student engagement and better use of classroom time (Bueno; Da Rosa Rodrigues; Moreira, 2021).

Within the scope of educational transformations, blended learning emerges as an important foundation for practices such as the flipped classroom, as it integrates face-to-face and digital learning experiences. This perspective favors the personalization of teaching and expands the student's role as an active subject in the educational process (Bacich; Tanzi Neto; Trevisani, 2015).

Gamification, in turn, has become consolidated as an innovative pedagogical strategy by incorporating game elements, such as challenges, rewards, and goals, into the educational context. This approach contributes to increasing students' motivation, engagement, and participation in the learning process (Baldo; Da Conceição, 2024). In addition, its application in educational environments has been associated with pedagogical innovation and the transformation of teaching practices (Rodrigues; Neto; Da Silva, 2025).

The integration of the flipped classroom and gamification has been widely discussed as a promising possibility for higher education, especially because it enhances active learning and the development of cognitive and socio-emotional competencies. Evidence indicates that the combination of these strategies can improve academic performance and foster more dynamic and interactive learning (Chang; Kim; Kim, 2024). In this sense, such methodologies contribute to the construction of more meaningful educational experiences.

The meaningful learning proposed by Ausubel constitutes an essential theoretical framework for understanding the impacts of these methodologies on the educational process. According to this perspective, learning occurs more effectively when new knowledge is related to existing cognitive structures, assigning meaning to the content learned (Ausubel, 1982). Thus, active pedagogical practices, such as the flipped classroom and gamification, favor the consolidation of this type of learning by promoting the articulation between theory and practice.

Pedagogical innovation has also been widely discussed as a central element in improving the quality of higher education. Studies indicate that innovative strategies contribute significantly to academic performance and to students' critical education (Suárez et al., 2025). Furthermore, the adoption of approaches based on active pedagogical design favors the collaborative construction of knowledge and reflective learning (Zhao; He; Su, 2021).

Despite advances, there are still significant challenges related to the implementation of these methodologies, such as the need for continuous teacher training, adequate technological infrastructure, and cultural changes in the educational process. Research indicates that the effectiveness of the flipped classroom depends directly on structured pedagogical planning and student engagement (Baig; Yadegaridehkordi, 2023). In this sense, the articulation between theory and practice becomes fundamental to the success of these strategies.

Given this scenario, it can be observed that active methodologies represent a significant advance in higher education by promoting greater student participation, pedagogical innovation, and meaningful learning. The integration of the flipped classroom and gamification strengthens this movement by creating more dynamic, interactive, and student-centered educational environments (Moran; Bacich, 2018). These approaches reinforce the need to rethink the traditional teaching model.

Therefore, this study is justified by the relevance of analyzing the contributions of the flipped classroom and gamification in higher education, especially with regard to the promotion of meaningful learning, student agency, and pedagogical innovation. This is a current and relevant theme that dialogues with contemporary educational demands and with the need to train professionals who are more critical, autonomous, and prepared for complex contexts.

METHODOLOGY

This study is characterized as an integrative literature review, a method that enables the synthesis, critical analysis, and integration of scientific evidence on a given topic, allowing a broad understanding of

the phenomenon under investigation and the identification of gaps in knowledge. This type of review is widely used in the field of education because it enables the systematization of results from different methodological approaches.

The guiding question that oriented this study was: *what are the contributions of the flipped classroom and gamification to meaningful learning, student agency, and pedagogical innovation in higher education?*

The survey of studies was carried out in the LILACS, ERIC, and DOAJ databases and in scientific repositories linked to the OJS system (Open Journal Systems), as these are relevant sources for national and international scientific production in the areas of education, pedagogical innovation, and educational technologies. These databases were selected for their scope, reliability, and indexing quality.

For the article search, controlled and uncontrolled descriptors in Portuguese, English, and Spanish were used, including: “sala de aula invertida,” “flipped classroom,” “gamification,” “*gamificação*,” “*aprendizagem significativa*,” “meaningful learning,” “*enseñanza invertida*,” “*innovación pedagógica*,” and “active learning.” The descriptors were combined with the Boolean operators AND and OR in order to broaden or refine the results according to the needs of the investigation.

Studies published between 2021 and 2026, available in Portuguese, English, and Spanish, and directly addressing the themes of flipped classroom, gamification, and their contributions to higher education were included. Original articles, systematic reviews, integrative reviews, and empirical studies available in full were considered.

Duplicate studies, editorials, letters to the editor, simple abstracts, incomplete works, as well as publications that did not directly address the proposed theme or that were outside the established time frame, were excluded.

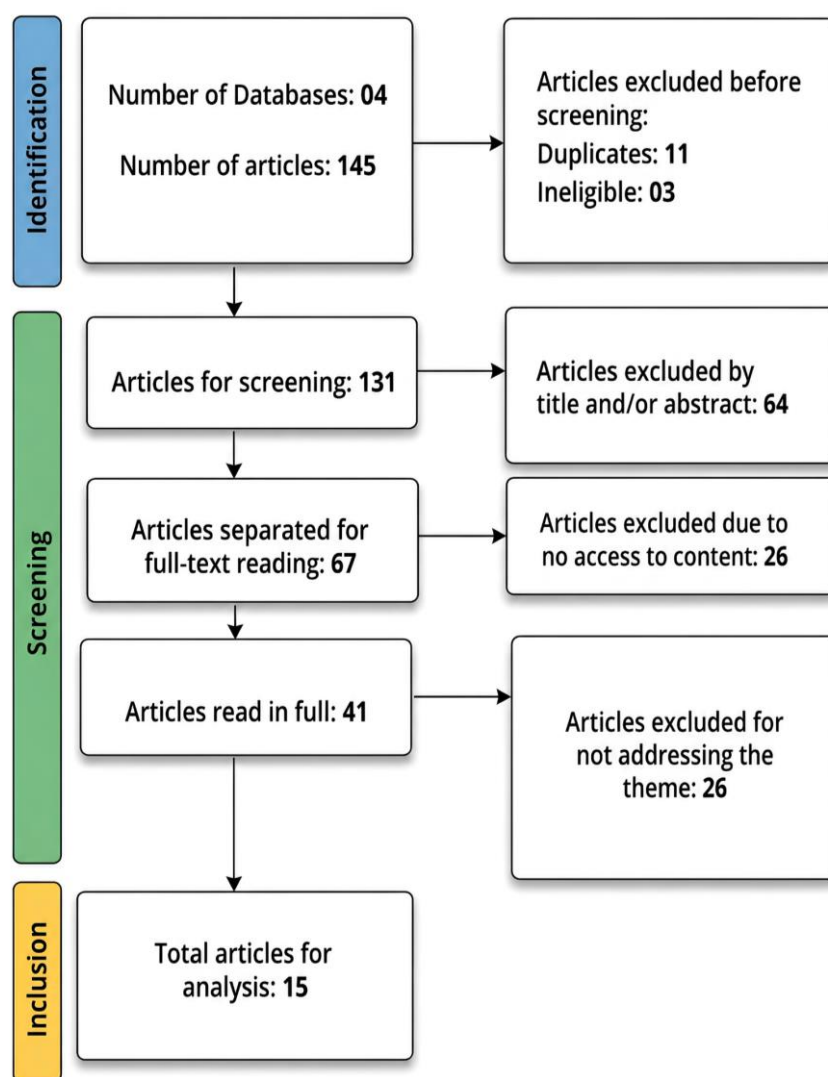
The study selection process occurred in sequential stages, comprising identification in the databases, screening by titles and abstracts, full-text reading, and application of the eligibility criteria. This process ensured methodological rigor, transparency, and reproducibility of the integrative review.

Data organization and analysis were carried out through thematic categorization, allowing the identification of convergences, divergences, and gaps in the scientific productions analyzed. This stage enabled the synthesis of evidence related to the contributions of active methodologies in higher education.

The methodological process for selecting the studies is represented in Figure 1, which visually summarizes all stages followed from the initial search to the definition of the final sample included in the review.

Figure 1

Flowchart of the study selection process



Source: Authors (2026).

Figure 1 systematically presents the methodological pathway adopted, allowing greater transparency, organization, and traceability of the selection process of the studies included.

Finally, it should be emphasized that the integrative review enables an in-depth and comprehensive understanding of the topic investigated, contributing to the consolidation of scientific knowledge and to the strengthening of innovative pedagogical practices in higher education.

RESULTS AND DISCUSSION

The bibliographic search was carried out in the Latindex, ERIC, DOAJ, SpringerLink, and Miguilim databases, covering national and international scientific productions related to emerging technologies, knowledge production in the digital society, epistemological transformations, and the implications of these changes for education and pedagogical innovation. These databases were selected for their academic relevance, breadth of indexing, and contribution to the dissemination of qualified scientific studies.

After the rigorous application of the previously established inclusion and exclusion criteria, as well as the removal of duplicate publications, the reading of titles and abstracts, and the careful analysis of the full texts, 15 scientific articles were selected to compose the final sample of this integrative review. This process ensured greater methodological rigor, reliability, and consistency in the selection of studies.

The included studies were published between 2021 and 2026 and presented different theoretical and empirical approaches to the influence of emerging technologies on the processes of constructing, sharing, and validating knowledge. The evidence analyzed reveals relevant contributions to the understanding of contemporary educational transformations and their implications for innovative pedagogical practices.

The characterization of the selected articles enabled a systematic and comparative analysis of the scientific productions. This organization makes it possible to identify trends, convergences, and gaps in

the knowledge produced.

Table 1

Synthesis of the studies included in the integrative review

Author/Year	Objective of the Study	Axis of the Study	Main Contributions
Ng; Lo (2022)	To assess the impact of the flipped classroom associated with gamification on academic performance and student engagement in sustainable learning contexts	Flipped classroom and gamification in higher education	Shows that the articulation between flipped classroom and gamification enhances academic performance, strengthens student engagement, and promotes greater academic commitment, contributing to more active, sustainable, and student-centered learning
Lopes et al. (2022)	To analyze students' perceptions of the flipped classroom approach in an educational innovation project	Student perception and pedagogical innovation	Demonstrates high acceptance of the methodology by students, highlighting increased autonomy, greater involvement in the learning process, and a positive perception of the reorganization of pedagogical time
Guerrero-Quiñonez et al. (2023)	To investigate the gamified flipped classroom as a pedagogical strategy in higher education from a systematic perspective	Gamification and flipped classroom	Shows that the integration of gamification and the flipped classroom intensifies intrinsic motivation, promotes continuous engagement, and favors the construction of active, dynamic, and meaningful learning
Huesca et al. (2023)	To implement and analyze a combined strategy of gamification and flipped classroom in basic programming courses	Application of active methodologies in higher education	Indicates that the combined strategy favors the development of higher-order cognitive competencies, improves academic performance, and strengthens problem-solving capacity in practical contexts
Priyaadharshini; Maiti (2023)	To investigate the use of learning analytics associated with gamification in the flipped classroom in higher education	Data-based learning and gamification	Highlights that the analysis of educational data enables continuous monitoring of learning, favoring the personalization of teaching and more precise and efficient pedagogical interventions
Parreira et al. (2023)	To analyze the relationship between active methodologies, meaningful learning, and the flipped classroom	Meaningful learning and active methodologies	Reinforces that learning becomes more meaningful when students relate prior knowledge to new content, assuming an active, reflective, and protagonist role in the educational process
Lopes et al. (2024)	To evaluate students' perceptions of the flipped classroom in higher education contexts	Student experience and blended learning	Shows a positive perception of the methodology, with emphasis on greater autonomy, engagement, and better understanding of the content addressed

Kelly; Wu; Liebe (2024)	To investigate the use of generative artificial intelligence to enhance gamification in the flipped classroom in higher education	Artificial intelligence, gamification, and pedagogical innovation	Demonstrates that the use of AI enhances the personalization of learning, increases student engagement, and favors more interactive, adaptive, and dynamic educational experiences
Niyazova; Nelidova (2024)	To explore innovative teaching and learning approaches in higher education aimed at student empowerment	Pedagogical innovation and student agency	Shows that innovative pedagogical practices strengthen student autonomy, expand critical competencies, and promote greater agency in the learning process
Lopes et al. (2024)	To investigate the optimization of the flipped classroom associated with gamification and team-based learning	Integrated active methodologies	Indicates that the combination of active strategies promotes greater engagement, peer collaboration, and improved academic performance
Majini; Bella (2025)	To analyze the impact of innovative pedagogical practices on student engagement in higher education	Student engagement and pedagogical innovation	Demonstrates that innovative methodologies significantly increase students' engagement, motivation, and active participation in dynamic educational environments
Carreço et al. (2025)	To analyze the application of active methodologies in basic and higher education, focusing on flipped classroom and gamification	Active methodologies and educational innovation	Shows that such methodologies contribute to the development of cognitive, social, and collaborative competencies, promoting more meaningful learning
Ribeiro et al. (2025)	To discuss the flipped classroom as a new paradigm for contemporary teaching and learning	Pedagogical transformation and flipped classroom	Reinforces the centrality of students in the learning process and the redefinition of the teacher's role as a mediator of knowledge
Da Rocha Nobre et al. (2025)	To analyze peer instruction as a strategy within active methodologies	Collaborative learning	Highlights that peer learning strengthens the collective construction of knowledge, promoting greater interaction, cooperation, and conceptual consolidation
Rúdio et al. (2025)	To propose the integration of active, agile, immersive, and analytical methodologies in contemporary education	Educational innovation and methodological integration	Presents an innovative educational model based on the convergence of methodologies and emerging technologies, promoting the transformation of teaching and learning processes
Severino et al. (2026)	To analyze flipped classroom strategies in contemporary education	Flipped classroom in higher education	Shows that the flipped classroom strengthens student autonomy, improves prior study, and improves the dynamics of classroom interactions

Source: Authors (2026).

The integrated analysis of the studies shows that the adoption of active methodologies, especially the flipped classroom associated with gamification, represents a significant transformation in the teaching-learning process in higher education. The findings demonstrate convergence among different authors regarding the strengthening of student agency, the expansion of academic engagement, and the promotion of more dynamic, interactive, and student-centered pedagogical practices.

In this context, the discussion was organized into two main thematic axes: (1) the flipped classroom as a strategy for pedagogical reorganization and strengthening of active learning; (2) gamification and emerging technologies as catalysts for engagement and educational innovation.

THE FLIPPED CLASSROOM AS A STRATEGY FOR PEDAGOGICAL REORGANIZATION AND STRENGTHENING OF ACTIVE LEARNING

The studies analyzed demonstrate consensus that the flipped classroom constitutes a pedagogical strategy capable of significantly reorganizing the dynamics of higher education, shifting the focus from the transmission of content to the active construction of knowledge. For Ng and Lo (2022), the inversion of the traditional logic favors greater academic commitment and improved performance by allowing students to assume a more active role in the educational process. In the same direction, Lopes et al. (2022) reinforce that students' perception of the model is widely positive, especially with regard to autonomy and involvement in learning activities.

In a complementary manner, Guerrero-Quíñonez et al. (2023) highlight that the flipped classroom, when systematically structured, enhances students' continuous engagement and favors active learning, especially when associated with interactive strategies. Huesca et al. (2023) corroborate this perspective by showing that the practical application of the methodology in complex subjects contributes to the development of higher-order cognitive skills, such as logical reasoning and problem solving.

The centrality of students in the educational process is also emphasized by Parreira et al. (2023), who highlight that meaningful learning occurs when students establish relationships between prior

knowledge and new content in active contexts. This understanding is reinforced by Ribeiro et al. (2025), who defend the flipped classroom as a new educational paradigm in which the teacher assumes the role of mediator and the student becomes the main agent of learning.

Furthermore, Severino et al. (2026) show that the strategy contributes to better organization of prior study and improves classroom interaction dynamics, strengthening student autonomy. Lopes et al. (2024) also point out that the methodology favors greater conceptual understanding and engagement, reinforcing its effectiveness in higher education. Accordingly, Da Rocha Nobre et al. (2025) add that strategies associated with peer learning further enhance the collaborative construction of knowledge within this model.

Thus, broad agreement can be observed among the authors in recognizing that the flipped classroom promotes a significant reorganization of the pedagogical process, favoring active learning, student autonomy, and the strengthening of cognitive and collaborative competencies, consolidating itself as a relevant strategy for contemporary educational innovation.

GAMIFICATION AND EMERGING TECHNOLOGIES AS CATALYSTS FOR ENGAGEMENT AND EDUCATIONAL INNOVATION

The studies analyzed indicate that gamification, when integrated with the flipped classroom, acts as a catalytic element for student engagement and pedagogical innovation. Ng and Lo (2022) highlight that gamification contributes directly to increasing students' involvement and improving academic performance, especially when associated with active learning strategies. Similarly, Guerrero-Quíñonez et al. (2023) show that gamification intensifies intrinsic motivation and promotes greater continuous participation in the educational process.

Huesca et al. (2023) reinforce this perspective by demonstrating that the combination of gamification and the flipped classroom in practical contexts, such as programming, favors not only academic performance but also the development of complex competencies. Priyaadharshini and Maiti

(2023) broaden this discussion by highlighting the role of learning analytics in gamification, emphasizing that the use of educational data enables the personalization of teaching and more precise pedagogical interventions, based on continuous monitoring of student performance.

In this scenario, Kelly, Wu, and Liebe (2024) add a relevant technological dimension by showing that the integration of generative artificial intelligence with gamification enhances the personalization of learning and significantly expands interactivity in the educational environment. This perspective dialogues with Majini and Bella (2025), who emphasize the positive impact of innovative pedagogical practices on student engagement, evidencing greater motivation and active participation.

In addition, Lopes et al. (2024) demonstrate that the combination of flipped classroom, gamification, and team-based learning strengthens collaboration among students and improves academic performance. Accordingly, Carreço et al. (2025) highlight that gamification, when integrated with other active methodologies, contributes to the development of social and cognitive competencies that are fundamental to contemporary education.

Pedagogical innovation is also emphasized by Niyazova and Nelidova (2024), who point out that student-centered approaches strengthen student agency and expand critical skills essential for the twenty-first century. Complementarily, Rúdio et al. (2025) highlight that the integration of active, immersive, and analytical methodologies represents a significant advance in contemporary education, promoting structural transformations in the teaching-learning process.

Finally, Da Rocha Nobre et al. (2025) reinforce the importance of collaborative learning as an element that enhances active methodologies, showing that peer interaction contributes to the consolidation of knowledge. Thus, there is consensus among the authors that gamification, combined with emerging technologies and active methodologies, constitutes a central axis for educational innovation, promoting greater engagement, personalization of learning, and transformation of pedagogical practices in higher education.

CONCLUSION

Taken together, the evidence analyzed in this integrative review enabled an in-depth understanding of the contributions of the flipped classroom and gamification in the context of higher education, especially with regard to the promotion of meaningful learning, the strengthening of student agency, and the innovation of pedagogical practices.

In light of the guiding question, the results show that the integration between flipped classroom and gamification exerts a positive and consistent influence on the learning process by favoring the active construction of knowledge, the articulation between prior knowledge and new content, and the increase of academic engagement. In this sense, such methodologies expand student autonomy and qualify students' participation in the educational process.

Regarding the proposed objective, which consisted of analyzing the contributions of the flipped classroom and gamification in higher education, the findings demonstrate that both strategies promote significant changes in the organization of the teaching-learning process. It is observed that the flipped classroom reconfigures the teacher's role, while gamification acts as a dynamic element of learning, intensifying students' motivation and interest.

With regard to the main findings of the investigation, the convergence among the studies analyzed stands out in relation to the strengthening of student agency, evidenced by increased autonomy, active participation, and collaborative learning. Furthermore, gamification appeared recurrently as a strategy capable of enhancing engagement, especially when associated with active methodologies and emerging technological resources.

From the perspective of pedagogical innovation, the results indicate that the adoption of these methodologies contributes to the reconfiguration of educational practices in higher education, making them more flexible, interactive, and aligned with contemporary demands. In addition, it is observed that the use of digital technologies, such as artificial intelligence and educational data analysis, expands the possibilities for personalizing teaching and qualifying the educational process.

Thus, it can be inferred that the flipped classroom and gamification constitute complementary and effective strategies capable of promoting more active, meaningful, and student-centered learning. Their integration favors the overcoming of traditional teaching models, contributing to the construction of more participatory, dynamic, and innovative educational environments.

Finally, as a recommendation for future research, it is suggested that longitudinal empirical studies be conducted to investigate the effectiveness of the integrated application of these methodologies in different higher education contexts, with emphasis on the analysis of variables such as academic performance, levels of engagement, development of competencies, and impact on students' professional education.

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