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GAMES THAT TEACH: THE CHARM OF GAMIFICATION IN EDUCATION

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ABSTRACT
This study investigated how gamification can be used to promote student learning and motivation in the contemporary educational context. The overall objective was to analyze the impact of gamification on education, exploring effects on motivation, academic performance, and the development of cognitive and social skills of students. The research was of a bibliographic nature, with a qualitative approach, and consisted of the review of articles, dissertations and books on the subject. The main concepts of gamification, the applications in teaching, and the challenges encountered by educators when implementing it in the school curriculum were analyzed. The results indicated that gamification has a positive impact on students' motivation and performance, as well as contributing to the development of cognitive skills, such as problem-solving, and social skills, such as teamwork. However, significant challenges were also identified, such as resistance from educators and a lack of adequate technological resources. Gamification has proven to be a tool for educational inclusion, especially for students with special needs, providing greater accessibility and personalization of learning. The final considerations pointed out that, although the benefits of gamification are evident, the implementation requires adjustments in pedagogical practices and greater infrastructure. Future studies could investigate best practices to overcome the challenges and expand the use of gamification in education.

Keywords: Gamification. Motivation. Apprenticeship. Educational Inclusion. Cognitive Development.

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INTRODUCTION

Gamification has been consolidated as an innovative approach in the educational field, standing out as a strategy to transform the teaching-learning process. The use of typical game elements, such as challenges, rewards, and scores, in educational contexts has been shown to be effective in increasing student motivation and engagement. The concept of 'games that teach' refers to the application of these playful principles to facilitate learning, enabling students to acquire content in an interactive and dynamic way. The use of games in teaching has been explored in early childhood education and in the early grades of elementary school, but the scope has expanded to several areas of knowledge, including mathematics, science, and even language teaching.

The choice to study gamification in education is justified by the growing interest in new pedagogical methodologies that aim to modernize educational practices, in the face of technological transformations that impact the daily lives of students and educators. The new generations of students are immersed in the digital universe, which makes the use of resources such as games an attractive way to integrate learning into everyday experiences. Gamification not only enhances student engagement, but also favors collaborative learning, the development of cognitive skills, and creative problem-solving, essential elements for the educational process in the twenty-first century. In this way, the research on 'Games that teach' presents itself as a fundamental contribution to understand how games can be a tool for improving teaching and learning.

The question that guides this research is: how can gamification be used to promote student learning and motivation in the contemporary educational context? From this problem, it seeks to understand the main benefits of gamification, identify the challenges faced by educators in the implementation of this strategy and discuss the impact of technologies on the teaching-learning process. The general objective of the research is to analyze the use of gamification as a teaching tool, investigating effects on students' motivation, learning and skill development.

This text is structured in order to present, at the beginning, a theoretical review of the concept of gamification and its application in education. Next, the results of research related to the impact of gamification on teaching are discussed, addressing as many benefits as the limitations encountered by educators. Then, the main challenges faced in the implementation of games in the school curriculum will be analyzed, based on case studies and practical experiences. The text will conclude with the final considerations,

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which summarize the findings of the research and suggest directions for future investigations on the subject.

THEORETICAL FRAMEWORK

The theoretical framework is structured in order to provide a solid conceptual basis for understanding gamification in the educational context. At first, the fundamental concepts of gamification are addressed, highlighting the definition, historical evolution and the main elements that characterize it. Then, the learning theories that support the application of gamification in education are explored, with an emphasis on constructivist approaches and theories that link student motivation and engagement to the use of games. The framework also argues for the integration of educational technologies and the role of digital tools in the implementation of gamification, in addition to analyzing the benefits and challenges that arise when applying this methodology in the school environment. Finally, studies will be presented that highlight the impacts of gamification on learning, focusing on different areas of knowledge, such as science, mathematics, and languages.

THE EFFECTIVENESS OF GAMIFICATION IN EDUCATION

Gamification has stood out as a strategy to increase student motivation and engagement, transforming the learning process into an interactive and engaging experience. According to Alves (2008, p. 14), research on games in education has expanded, becoming a field of academic and investigative interest:

> Electronic games began to occupy universities in Brazil from the beginning of the twenty-first century, as objects of investigation in master's and doctoral research and later in specializations and graduations, giving rise to the creation of undergraduate courses in the area of game development and design, mainly in the Southeast regions (Rio de Janeiro, São Paulo and Minas Gerais) and South (São Leopoldo – Rio Grande do Sul). The theoretical discussion around this theme began in Bahia in 2001 and with more intensity from 2003 onwards, when academia finally surrendered to the need to investigate the potential of this new media.

Thus, Fernandes (2022) points out that the use of games in the educational environment has shown a positive impact on student performance, since the integration of playful elements, such as rewards, challenges, and competitions, makes learning attractive.

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The academic literature also points out the importance of games as pedagogical tools and their ability to engage students in learning processes. According to Alves (2008, p. 30):

> Games classified as simulation allow players to experience situations that cannot often be realized in everyday life. Thus, through the mediation of these games, it is possible to create new forms of life, manage economic systems, form families, in short, simulate reality, anticipate and plan actions, develop strategies, design the affective, cultural and social content of the player who learns in the interaction with electronic games complex social and historical simulations, mediated by games such as *Age of Empires, Age of Mythology, Civilization, Food Force, The Sims, Sim City*, among others.

These elements are capable of creating a dynamic learning environment, in which students feel motivated to participate in the proposed activities. In addition, Meira and Blikstein (2019) state that gamification also contributes to the development of cognitive skills, such as problem-solving and critical thinking. The use of games allows students to face challenges progressively, which encourages overcoming obstacles and autonomous learning. In this way, gamification acts as a motivator for learning, since students get involved in the activities, having the opportunity to learn from mistakes and successes throughout the process.

Cunha, Barraqui and de Freitas (2017) point out that gamification provides a learning environment that goes beyond the simple transmission of content. It allows for the personalization of learning, adapting to the pace and needs of the students. Through the dynamics of rewards and challenges, students experience a sense of achievement that favors continuity in the learning process. Thus, gamification not only facilitates the acquisition of knowledge, but also strengthens students' autonomy and responsibility in relation to their own learning.

Finally, Pantoja and Pereira (2018) highlight that, by incorporating gamification into pedagogical practices, educators create a collaborative teaching environment, in which students, by engaging in playful activities, develop essential social and emotional skills. The healthy competitiveness and teamwork encouraged by games promote interaction between students, which results in greater engagement and an increase in motivation to learn. Thus, gamification emerges as a powerful tool for the transformation of educational practices, engaging students in a meaningful way.

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GAMIFICATION AND DEVELOPMENT OF COGNITIVE AND SOCIAL SKILLS

Gamification has proven to be a tool in the development of students' cognitive and social skills. According to Di Bartolomeo, Stahl and Elias (2015, p. 82), this approach favors dynamic and engaging teaching, creating conditions conducive to the construction of learning:

> The use of game elements in the context of training is still capable of creating engagement and relaxation in those involved in order to establish the need for overcoming and continuous development. In addition, the creation of an alternative reality provides the individual with security to express himself and make decisions, enhancing his skills and applying what has been learned in a meaningful experience that will later be transmitted to the real world.

This perspective reinforces the importance of proper planning for the implementation of gamification, since the lack of structure can compromise its effectiveness. Thus, the success of gamification in corporate training depends on well-planned methodologies that ensure the immersion and motivation of participants. When implemented correctly, these systems promote learning in line with new market demands.

When it comes to cognitive skills, gamification offers an environment conducive to practicing problem-solving. Many educational games require students to face complex challenges that involve logical reasoning and critical thinking. Fernandes (2022) highlights that, when inserted in gamification contexts, the student is constantly challenged to find creative solutions, which not only reinforces the content learned, but also stimulates the ability to adapt and solve problems in unforeseen situations. In this way, gamification acts as a catalyst for cognitive development, providing a safe space for experimentation and the improvement of problem-solving strategies.

In addition, gamification contributes significantly to the development of soft skills, such as teamwork. Meira and Blikstein (2019) argue that educational games often involve collaborative activities, in which students need to cooperate to achieve a common goal. This type of social interaction promotes the building of communication, cooperation, and negotiation skills. By participating in gamified group activities, students learn to listen to others, share responsibilities and make joint decisions, strengthening the sense of collectivity and mutual support.

Klock, Carvalho and Rosa (2014) point out that, when interacting in games that require cooperation, students are encouraged to understand different perspectives and learn to deal with conflicts in a constructive way. These collaborative experiences are

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critical for social development, as they help students hone their ability to work in groups and develop empathy. Therefore, gamification, by integrating cognitive and social challenges, provides holistic learning that involves both intellect and interpersonal skills.

Finally, Pantoja and Pereira (2018) reinforce that gamification not only promotes the learning of academic content, but also creates a space in which students can explore and strengthen social skills in an environment of healthy competition and cooperation. Interaction with colleagues during gamified activities, while fostering team spirit, also allows the management of emotions and adaptation to different social contexts, skills that are essential for the complete development of the student. In this way, gamification contributes to the formation of individuals who are capable not only academically, but also socially.

GAMIFICATION IN THE TEACHING OF DIFFERENT DISCIPLINES

Gamification has been successfully applied in several areas of knowledge, such as mathematics, science, and languages, demonstrating the flexibility and potential to promote engaging learning. In mathematics education, for example, gamification is used to create an interactive environment in which students can practice complex concepts in a playful and stimulating way. Fernandes (2022) highlights that, by incorporating mathematical challenges into games, students are encouraged to solve problems in a creative and dynamic way, which facilitates the understanding of topics such as algebra, geometrics, and arithmetic. The games provide a scenario in which students can apply the knowledge acquired, in addition to allowing the answers to be evaluated immediately, promoting continuous reflection on mistakes and successes.

In addition, the application of gamification in the sciences has also been shown to be beneficial, especially in the teaching of abstract concepts, such as biological, chemical, and physical processes. Meira and Blikstein (2019) point out that, by using games to simulate scientific experiments or scenarios, students can explore complex phenomena in an accessible and understandable way. Games offer a visual representation of scientific concepts, allowing students to visualize and manipulate variables in real time, which makes it easier to understand processes that might otherwise be difficult to understand through theoretical explanations alone.

In language teaching, gamification has been used to encourage the practice of communication and the development of language skills, such as reading, writing, listening comprehension and conversation. According to Pantoja and Pereira (2018), educational

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games that involve the use of vocabulary, grammatical structures and interactive dialogues provide a rich environment for linguistic immersion. Gamification allows students to engage in contextual and realistic situations, in which they can apply the language in a spontaneous and practical way, promoting natural learning. In addition, digital games allow students to practice at their own pace, receiving immediate *feedback* and being able to revisit activities until they reach the desired level of mastery.

Thus, gamification, when applied in various disciplines, offers an innovative way of teaching and learning, providing students with opportunities to interact with the content in a meaningful way. The integration of games in the teaching of mathematics, science and languages, in addition to increasing student engagement, also favors active learning, in which the student takes the lead in the educational process, applying knowledge in a practical and collaborative way.

METHODOLOGY

The present research is characterized as a bibliographic research, with the objective of analyzing and reviewing studies, articles, dissertations, books and other academic publications related to the theme of gamification in education. According to Santana, Narciso and Fernandes (2025), bibliographic research allows the identification, organization and analysis of scientific productions on a given topic, enabling an essential theoretical deepening to support new investigations. The approach adopted is qualitative, since it seeks to interpret and understand the ideas and theories discussed in the selected materials, without the application of quantitative data.

For data collection, a search was carried out in academic databases, such as *Google Scholar*, *Scielo* and specialized journals, as well as repositories of dissertations and theses. The selection of materials was made based on the relevance and timeliness of the publications, prioritizing the studies cited in the area of gamification and applications in teaching. Primary data collection instruments or techniques, such as interviews or questionnaires, were not used, since the research is restricted to the analysis of secondary sources. To organize the information collected, the selected publications were grouped by central themes, such as the concepts of gamification, the underlying theories, and the impacts of application on education, according to the guidelines of Narciso and Santana (2024).

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The following is a table with the main publications used to support the theoretical framework of the research, organized by author(s), title as published, year and type of work.

Chart 1 - References Used in the Research

Author(s)	Conforming title published	Year	Type of Work
ALVES, L. R. G.	Games and education – the construction of new meanings	2008	Article
KLOCK, A. C. T.; CARVALHO, M. F. de; ROSA, B. E.	Analysis of gamification techniques in Virtual Learning Environments	2014	Article
DI BARTOLOMEO, R.; STAHL, F. H.; ELIAS, D. C.	Gamification as a strategy for training and development	2015	Article
CUNHA, G.; BARRAQUI, L.; OF FRIARS, S. A. A.	Use of gamification in the early years of Brazilian elementary school	2017	Article
CARVALHO, M. S.	Gamification in elementary education: a review of the academic literature	2018	Article
PANTOJA, A. da S.; PEREIRA, L. M.	Gamification: how games and technologies can help in language teaching. Case study: a public school in the State of Amapá	2018	Article
MEIRA, L.; BLIKSTEIN, P.	Playfulness, digital games and gamification in learning	2019	Book
AVELAR, M. G.	'Game on': an experience with games in the training of English language teachers	2020	Dissertation
FERNANDES, M. A.	Gamification in elementary school: use of new technologies as tools to motivate learning	2022	Dissertation

Source: authorship.

The table presented summarizes the main bibliographic sources that were consulted for the elaboration of the theoretical framework of this research. These publications were selected based on the relevance of topics for understanding gamification in education, ranging from fundamental concepts to the practical applications of this approach in the classroom. The sources were grouped by type of work to facilitate consultation and understanding of the contributions of each study to the development of the proposed theme.

RESULTS AND DISCUSSION

Next, a word cloud is presented that highlights the frequent and significant terms present in the references consulted for this research. The terms that emerged as visual highlights reflect the central concepts that will be addressed in the following topics, in the

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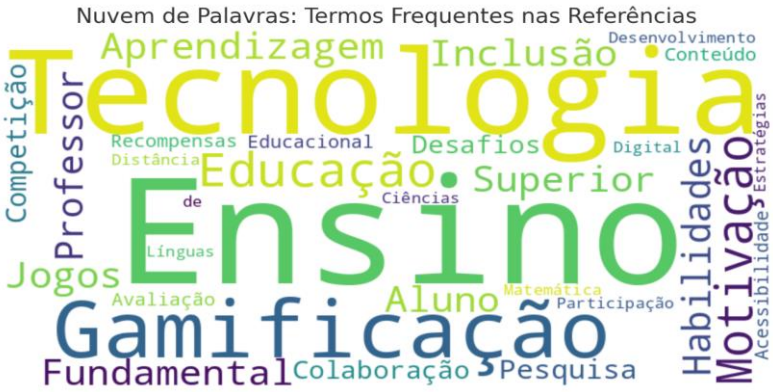
results and in the discussions. The cloud illustrates the relevance of topics such as gamification, education, motivation, learning, skills, inclusion, and the use of technology in the educational context. These terms indicate the key areas of the study, evidencing the main focus of the research on the application of games and playful strategies in teaching.

Image 1 - Word Cloud



Source: authorship.

These terms, when viewed in this way, help to understand the relevance of each concept in the development and implementation of gamification as an educational tool. They will be explored in the following chapters, where it will be discussed how gamification can influence student motivation and performance, as well as facilitate educational inclusion and the development of cognitive and social skills. The analysis of these terms reinforces the centrality of gamification in the contemporary educational context and its applicability in various areas of knowledge.

IMPACT OF GAMIFICATION ON STUDENT MOTIVATION

Gamification has been recognized as a strategy to increase student motivation and performance. Studies show that the application of games in the educational process results in greater student engagement, providing a dynamic and interactive experience. According to Fernandes (2022), gamification increases students' interest by inserting playful elements that make activities attractive and challenging. By offering rewards, scores, and the possibility of reaching new levels, games awaken a sense of accomplishment that motivates students to continue dedicating themselves to learning. These playful aspects have the power to transform academic tasks, often considered monotonous, into engaging activities.

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In addition, gamification contributes to the improvement of student performance, since the integration of games into the educational environment allows students to practice skills in a repetitive and interactive way. Meira and Blikstein (2019) highlight that games provide a safe environment for students, in which they can make mistakes and learn from mistakes without the pressure of traditional assessments. This immediate and continuous feedback is one of the factors that encourage students to strive to achieve better results. Repeating activities and tracking progress help solidify learning, creating a cycle of positive motivation in which students are encouraged to engage.

Pantoja and Pereira (2018) also point out that gamification has a significant impact on student motivation by providing a competitive and collaborative environment, depending on the nature of the game. Healthy competition, where students seek to achieve goals and overcome challenges, along with cooperation in group games, contributes to a significant increase in engagement. These game elements, by involving students in an emotional and cognitive way, create a sense of belonging and involvement with the content, which impacts on the improvement of academic performance. Thus, gamification not only improves motivation, but also plays a key role in improving learning, making it effective for students.

Therefore, the results of the research indicate that gamification is a tool to increase student interest and improve performance, providing an engaging and personalized approach to learning.

CHALLENGES AND LIMITATIONS OF IMPLEMENTING GAMIFICATION

Implementing gamification in the school curriculum, while recognized for the benefits, presents significant challenges that need to be overcome to ensure success. One of the main obstacles pointed out by Fernandes (2022) is the resistance of some educators to adopt new teaching methodologies, such as gamification. Many teachers are still used to traditional methods and may have difficulties adapting to the use of games as a pedagogical tool. This resistance can be influenced by a lack of familiarity with technology and the belief that gamification can be a distraction rather than a learning aid. Thus, the paradigm shift in the educational process requires a reconfiguration in pedagogical practices, which can generate a certain discomfort and insecurity for teachers.

However, practical experiences show that this resistance can be overcome when teachers have the opportunity to interact directly with games and reflect on their potential.

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According to Avelar (2019, p. 87), the reports of teachers who participated in an extension action showed significant changes in the perception of the use of games in education. An example of this is the speech of Jill, one of the participants, who described her transformation throughout the course:

> My prejudiced view of games was revised, I left thinking about how I could use the reflections of the meeting in the classroom. (...) For me, the course brought significant personal and professional gains, as I reviewed my practice, my methodologies, overcame prejudice and had fun.

The research also revealed that the interaction with games stimulated reflections on language teaching, providing new pedagogical approaches. In this sense, Avelar (2019, p. 88) presents Leon's statement, which reinforces the importance of playfulness in learning:

> I hope that in my future classes as an English language teacher, I can use all the learning acquired to teach my students. To show them that learning English is not just about memorizing the words they have in the games, that it is not just about knowing that 'start' means 'to start'. (...) make them understand the English language by interacting with it, with friends, because this is how a language is learned, not through rules, but through the contact we have with it and its speakers.

Still, for gamification to be implemented, it is necessary to face other structural barriers. Meira and Blikstein (2019) point out that the lack of adequate technological resources in schools is a considerable challenge. Gamification relies on the use of digital platforms and electronic devices, which are not always available in educational institutions, especially in regions with infrastructure limitations. The shortage of equipment, such as computers and *tablets*, as well as the lack of internet access, can restrict the effective implementation of educational games.

Pantoja and Pereira (2018) add that, in addition to technological difficulties, the implementation of games in the school curriculum requires planning and adapting the games to the syllabus. Not all games are suitable for all subjects or age groups, and selecting or creating games that meet specific pedagogical needs requires time and effort. Many educators also report difficulties in assessing student performance in gamified environments, since the dynamics of games do not always align with traditional assessment methods, such as tests and assignments. The need to adapt the ways of measuring learning and find ways to integrate gamification into the existing assessment system is one of the main challenges faced by educators.

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Therefore, despite the advantages of gamification, implementation in the school curriculum faces obstacles related to the resistance of educators, the lack of adequate technological resources, and the difficulties in aligning games with pedagogical objectives and traditional forms of assessment. These limitations need to be overcome so that gamification can be used and reach its potential in the teaching-learning process.

GAMIFICATION AND EDUCATIONAL INCLUSION

Gamification has proven to be a tool in promoting educational inclusion, especially with regard to students with special needs. By integrating playful elements into the learning process, gamification offers new possibilities for these students to get involved in educational activities. According to Meira and Blikstein (2019), the use of digital games allows for the personalization of learning, which can be beneficial for students with disabilities. Games offer a flexible platform that can be tailored to meet the specific needs of each student, whether it's the pace of learning or the types of challenges presented. This personalization makes the educational environment accessible and inclusive, allowing students with special needs to benefit from individualized teaching.

In addition, Fernandes (2022) highlights that gamification can be used to create an inclusive learning environment by promoting the active participation of all students, regardless of limitations. Through games, students with special needs, such as hearing, visual or cognitive impairments, can access content in an intuitive and interactive way. The use of technological tools, such as adaptive games and accessible interfaces, makes it possible to overcome physical and cognitive barriers, allowing students to develop skills independently and without the need for constant support. These features, often incorporated into games, such as audio narration or subtitles, increase accessibility, favoring inclusion in the school environment.

Pantoja and Pereira (2018) add that gamification can also play a key role in the development of social skills of students with special needs. By promoting collaborative activities in games, in which students need to work as a team, gamification contributes to the development of social skills, such as communication and cooperation. These social experiences are essential for the integration of students with special needs, as they provide a safe space to interact with classmates. In this way, gamification not only facilitates access to academic content, but also helps to build interpersonal relationships and strengthen students' self-esteem.

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Therefore, gamification presents itself as an essential tool to promote educational inclusion, offering resources that favor accessibility and the active participation of students with special needs. By providing personalized and accessible learning, as well as stimulating social interaction, gamification plays a significant role in creating an inclusive and equitable educational environment.

FINAL CONSIDERATIONS

The final considerations of this research aim to synthesize the main findings related to the central issue, which was to understand how gamification can be used to promote student learning and motivation in the contemporary educational context. The results obtained indicate that gamification exerts a significant influence on increasing student motivation and performance, providing an engaging and interactive learning environment. Games, by integrating elements such as challenges, rewards and competition, arouse the interest of students, creating a stimulating atmosphere that favors learning. In addition, the application of gamification in the educational process allows students to develop cognitive skills, such as problem-solving, and social skills, such as teamwork, contributing to the student's integral development.

However, the survey also revealed that implementing gamification faces substantial challenges. The resistance of educators, the lack of adequate technological resources and the difficulties in aligning games with existing pedagogical objectives are issues that hinder the application of this approach. These challenges indicate that, although gamification is a tool, adoption requires a process of adapting pedagogical practices and investing in technological infrastructure, which can be an obstacle in some educational institutions.

Regarding the issue of educational inclusion, gamification was identified as a tool to promote accessibility and active participation of students with special needs. By providing a personalized and adaptable learning environment, gamification facilitates access to academic content and stimulates social interaction, favoring the inclusion of these students in the educational context. However, it is essential to highlight that the application of adaptive and accessible games still requires investments in technological resources and specialized training for educators.

The main contribution of this study was the identification of the benefits and limitations of gamification in education, especially with regard to increasing motivation, developing cognitive and social skills, and promoting educational inclusion. In addition, the

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research helped to clarify how gamification can be integrated into the school curriculum, addressing the practical issues surrounding implementation. However, the results also indicated that the full adoption of gamification in schools requires a series of adjustments in teaching methodologies and infrastructure, as well as greater training of educators.

Although this study has provided an understanding of the effects of gamification in education, there is a need for further studies that investigate the best practices for the implementation of this strategy in different educational contexts. It is critical that future studies explore the relationship between gamification and learning outcomes across different age groups and across disciplines. In addition, it is necessary to expand research on technological tools for the application of educational games, especially with regard to accessibility for students with special needs.

Therefore, this study represents an advance in the understanding of the impacts of gamification in education, but the continuity of research is essential for the evolution of this pedagogical approach. Conducting additional studies could provide important insights into how to optimize gamification, overcoming the challenges identified, and expanding the possibilities in the educational context.

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