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REFLECTIONS ON DIGITAL GAMES AND GAMIFICATION AS TOOLS FOR THINKING ABOUT CONTEMPORARY EDUCATION -

REFLEXÕES SOBRE OS JOGOS DIGITAIS E GAMIFICAÇÃO COMO INSTRUMENTOS PARA PENSAR A EDUCAÇÃO CONTEMPORÂNEA –

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RESUMO

O uso das tecnologias na educação vem sendo discutido há muitos anos. Porém, com a pandemia da Covid-19, esse tema ganhou força e ampliou as possibilidades de interação com os recursos digitais. Além disso, as novas gerações estão cada vez mais inseridas em um ambiente tecnológico, o que faz com que os professores precisem incorporar novas práticas na escola. O presente artigo é um ensaio teórico qualitativo com o objetivo de discutir as potencialidades dos jogos digitais e da gamificação no âmbito da educação escolar contemporânea. Apresentamos discussões que abordam o advento dos games na escola, as teorias que fundamentam essa metodologia, os desafios e os olhares críticos sobre o tema. Esperamos que este ensaio suscite reflexões sobre a importância de considerar os jogos digitais e a gamificação como metodologia de ensino, bem como a necessidade de estar consciente dos desafios e limites dessa abordagem.

Palavras-chave: Tecnologias; Gamificação; Jogos Digitais; Educação Contemporânea;

ABSTRACT

The use of technology in education has been discussed for many years. However, with the Covid-19 pandemic, this topic has gained strength and expanded the possibilities for interacting with digital resources. Moreover, new generations are increasingly immersed in a technological environment, which requires teachers to incorporate new practices in schools. This article is a qualitative theoretical essay aimed at discussing the potential of digital games and gamification in contemporary school education. We present discussions that address the advent of games in schools, the theories that support this methodology, the challenges, and critical perspectives on the subject. We hope that this essay will encourage reflections on the importance of considering digital games and gamification as a teaching methodology, as well as the need to be aware of the challenges and limitations of this approach.

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Keywords: Technologies; Gamification; Digital Games; Contemporary Education.

1 INTRODUÇÃO

Contemporary education has been constantly challenged to incorporate new methodologies and technologies to meet the demands of a changing society. In this context, digital games and gamification have emerged as promising strategies capable of enhancing learning and student engagement. However, despite the growing interest in these approaches, there are still many questions to be asked about their effectiveness and applicability in the educational environment. Today, the “digital natives” generation is made up of individuals who grew up in parallel with the digital revolution and for whom electronic games, used for entertainment, play a fundamental role in shaping their culture (AZEVEDO, 2012).

The COVID-19 pandemic has had significant consequences for national and global education. The urgency of keeping people safe, isolating them from social interaction, has directly affected educational environments, which have had to close their doors and look for alternatives. Among the possibilities available, technologies, which until then had been used timidly in school spaces, were rushed in and used in various ways, in different contexts, in order to guarantee access to education at that critical time worldwide.

This essay aims to discuss the potential of digital games and gamification in education, analyzing their contributions, challenges and limitations. From a critical approach, the aim is to reflect on how these strategies can be used to promote meaningful learning and the development of essential skills for the 21st century. It also considers the need to understand the pedagogical foundations that underpin these practices, avoiding their implementation merely as a motivational resource without adequate theoretical backing. Methodologically, this text is configured as a theoretical essay, which seeks to promote a circumstantial reflection with the purpose of deepening a particular discussion that presents new ideas on the subject (MENEGHETTI, 2011). For Michel (2015), an academic theoretical essay involves presenting a new bias, a new approach, characteristic, quality or problem of the object of interest.

The relevance of this discussion lies in the fact that technology plays an increasingly central role in students' lives, which makes it essential to assess how it can be effectively integrated into teaching. To this end, the article is structured in sections that present the theoretical basis of digital

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games and gamification, a critical analysis of their applications and, finally, considerations about their implications for educational practice.

2 FROM TRADITIONAL GAMES TO THE EMERGENCE OF GAMIFICATION

Since time immemorial, education has sought creative ways to engage students and promote effective learning. One of the oldest and most enduring approaches is the incorporation of games and play into the educational environment. Through playful activities, teachers have captivated students' attention and stimulated the assimilation of knowledge in a lighter and more natural way. Historically, traditional games and play have been used as educational tools. Through board games, charades and group activities, learning was transformed into an interactive experience, making abstract concepts more concrete and tangible for students. This approach not only encouraged active participation, but also stimulated creativity and collaboration among students (GRANDO, 2000; PRADO, 2018).

With the advance of technologies, especially with the rise of computer games, education has found new opportunities to reinvent itself. The introduction of simulators, educational software and digital games has allowed for a deeper and more engaging exploration of the various services on offer. The interactivity and experiences provided by these technological tools have brought a new dimension to the learning process, making it more attractive and meaningful for digital generations (TLILI, 2022). Games provide different forms of motivation, encouraging progression through their stages and offering rewards as obstacles are overcome. They have the ability to educate, inspire and engage in ways that conventional society often fails to achieve (McGONIGAL, 2012).

For this reason, education has constantly had to search for more attractive mechanisms and methods for students. Many methodologies, games, materials and lesson styles have tried to meet this demand. However, as a turning point in relation to school technologies, education and technology sciences have been discussing the idea of using gamification to teach. Gamification is an innovative approach that combines elements of game design with educational contexts in order to increase student motivation and engagement. Kapp (2012, p. 15) defines gamification as “the use of game mechanics, aesthetics and thinking to engage people, motivate action, promote learning and solve problems”. Gamification transcends the mere use of games as teaching tools, adopting a more holistic approach. It incorporates elements such as challenges, rewards, healthy competition and engaging narratives to create a dynamic and exciting learning atmosphere. By transforming

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educational activities into game-like experiences, gamification caters to the intrinsically human nature of seeking achievements and overcoming obstacles.

The benefits of gamification in education are widely recognized. Koushik, Guinness and Kane (2019) explain that games can offer initiating and exciting learning experiences in which players face challenges, experiment and receive immediate feedback. Through gamification, educators can create learning environments that encourage problem-solving, creativity, collaboration and perseverance. Tolomei (2017, p. 2) states that “Cyberculture has brought a new way of knowing and living together, with new attitudes and ways of thinking. The individual of this generation is not satisfied with just receiving knowledge; they need to test, experience and experiment.” In this way, we believe that the journey of education, from the use of traditional games to the advent of gamification, demonstrates the constant search for innovative methods to engage and empower students. Games and play have always played a crucial role in learning, evolving to adapt to technological changes and contemporary educational needs. Gamification represents the culmination of this evolution, providing a highly effective means of transforming the teaching and learning process into a more attractive and modern journey. In the next topic, we'll look at the role of playfulness and engagement as key factors for the success of gamification.

3 PLAYFULNESS AND ENGAGEMENT AS DRIVERS OF GAMES

Gamification inherently fosters an environment of greater interactivity and curiosity. Even so, it's important to stick to certain characteristics that make the relationship between the game and the game user truly interesting. More and more schools, companies and groups of individuals are looking for innovative ways to motivate and engage their circle in their tasks, which is why gamification has emerged as a playful means of developing actions, courses and tasks (ALVES; TEIXEIRA, 2014). The playful element enhances the learning environment, because it is through spontaneous, free experience and particular interest that the individual will feel that they are doing an action that they enjoy and therefore get involved in what they are doing, without looking at the hands of the clock. Playfulness can be understood as activities that inherently attract an individual's interest, but it is also possible to generate a stimulus so that an experience becomes naturally interesting, in other words, playfulness as an experience internal to the individual and playfulness generated from an external stimulus (MASSA, 2015). Luckesi (2014, p. 17) reinforces that “playfulness is configured as a state internal to the subject; however, the activities called playful belong to the external domain of the subject”.

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Thus, by bringing the concept of gamification into the school environment, playfulness serves to foster greater student engagement in the teaching and learning process—an external event that positively impacts the individual's internal state. But how can playful stimuli be generated in a digital format? How does a student become genuinely interested in and experience virtual interaction? According to Massa (2015), the current generation seeks new learning stimuli that no longer fit the model from twenty years ago. The computer and speed-driven generation wants to skip steps and multitask. It can be said that individuals of the current generation—Generation Z—are more familiar with the virtual than the physical world, as they were born into this era. However, they also tend to become bored more easily, given that everything needs to be highly stimulating to capture their interest.

Therefore, it is essencial to sustain the attention of "Generation Z" for longer periods. Since every human being has unique characteristics and playfulness is a subjective experience, an activity may be perceived as playful by one individual but not by another, as it depends on the person's internal state (MASSA, 2015). For both the individual engaging in the so-called playful activity and the one facilitating it—whether a teacher, instructor, or other educator—the intention of playfulness will be experienced in practice. This occurs because playfulness involves personal characteristics such as emotions, moods, and the circumstances surrounding the activity. These activities, which students may classify as positive or negative, can ultimately be perceived as playful or not (LUCKESI, 2014).

In gamification, the focus is to “emotionally engage the individual by using game-based mechanisms, fostering the creation of an environment conducive to individual engagement” (BUSARELLO; ULBRICHT; FADEL, 2014, p. 12). In the school setting, gamification emerges as a strategy to engage and motivate students through challenge, leisure, and entertainment (ALVES; MINHO; DINIZ, 2014). The concept of playfulness is linked to the word "game"—which is also present in its semantic origin, derived from the Latin ludus, one of whose meanings is "game." Among the various meanings attributed to ludus in relation to playfulness are both children's and adults' playful activities (Massa, 2015). Some terms associated with different manifestations of playfulness include: brincar (playing) as entertainment, brinquedo (toy) as an artifact for children's amusement, jogar (gaming) as a form of distraction, recrear (recreating) as taking a break, and lazer (leisure) as a period of freedom to engage in desired activities (MASSA, 2015 apud LOPES, 2004). Thus, drawing on the principle of playfulness, the goal is to enhance student motivation and engagement

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in the learning process through games, playful activities, recreational experiences, and other forms of interactive learning.

4 THE POTENTIAL OF GAMES FOR THE TEACHING AND LEARNING PROCESS

As in other social spaces, educators must contend with the fact that younger generations are highly connected to information and communication technologies (ICT). Added to this challenge are the well-documented difficulties in promoting effective and meaningful learning through traditional lecture-based teaching, which relies on the passive reception of knowledge. In this context, incorporating games or game elements (gamification) into learning can capture students' attention in ways that traditional teaching methods—particularly expository approaches—often fail to achieve (SABEL; JONES, 2022).

The use of games or their elements in education goes far beyond merely providing fun and entertainment. While these factors certainly contribute to making the learning process an enjoyable and engaging experience associated with positive emotions, their significance extends well beyond that. Several theoretical perspectives support and justify the relevance of using games as teaching and learning tools, emphasizing how they align with psychopedagogical views on how people learn and what motivates them to engage in the learning process. Among the most notable theories are:

Active Learning Theory: This theory emphasizes the active involvement of students in the learning process, in which they actively construct knowledge through exploration, experimentation, and problem-solving. Games promote active learning by providing environments where learners must make decisions, face challenges, and interact with content (BONWELL; EISON, 1999).

Intrinsic Motivation Theory: This theory suggests that individuals are more motivated when engaged in activities they find inherently rewarding, which games often provide (DECI; RYAN, 2008). Gamification can enhance students' intrinsic motivation by offering internal rewards, such as overcoming challenges and achieving goals

Multiple Intelligences Theory: This theory proposes that individuals have different types of intelligence (GARDNER, 1994). Games can be designed to encompass various forms of intelligence, allowing students to explore and apply their unique abilities.

Autonomy and Self-Direction Theory: Games often give players control over their actions and decisions. This can promote a sense of autonomy and self-direction in learning, which is crucial for motivation and engagement (DECI; RYAN, 2010).

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In addition to these well-established theories, recent studies have demonstrated various advantages of gamification as a pedagogical strategy (FARDO, 2013; SALEN; ZIMMERMAN, 2012). Below, we present the main factors and elements that should be considered when constructing a game or gamified environment:

Immediate Feedback: Feedback on the player's performance, as well as additional information about the subject matter, allows students to instantly identify their mistakes and areas for improvement.

Personalization of Learning: The game can be adapted to meet the needs or learning gaps of each individual player. This is crucial in the learning process, as each learner progresses at their own pace and skill level.

Reduction of Fear of Failure: In game dynamics, players are expected to fail multiple times before achieving success. Bringing this concept into the educational process helps reduce students' fear of failure, fostering a growth mindset and resilience in the face of challenges.

Memorization and Retention: Active and repeated interaction with information in a game environment can assist in memorization and retention of educational content. It is important to acknowledge that gamification is neither a panacea nor a one-size-fits-all solution to educational and learning challenges. The concern with design and careful adaptation to students' needs, their life contexts, and educational goals is essential for gamification to be effective as a teaching strategy. In this sense, we consider it crucial to also address, in this article, gamification from a critical perspective.

5 A CRITICAL PERSPECTIVE ON TECHNOLOGY AND GAMIFICATION IN EDUCATION

The COVID-19 pandemic brought significant consequences for both national and global education. This situation highlighted issues that have long been addressed in Brazilian educational literature: the lack of infrastructure in educational environments, the insufficient preparation of teachers in using new teaching tools, and the social inequalities faced by the population in terms of access to and use of these technologies (UNESCO, 2023).

Furthermore, research such as that by Fonseca et al. (2021) presented the perceptions of secondary school students about this period and their learning experiences with the use of technology. Despite the positive aspect of continuing their studies, students faced difficulties with

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individual learning, being aware of their limited academic progress even with the assistance of technology. Additionally, as a consequence of this historical moment, we witnessed a decline in the country's learning levels, leading to estimates of educational delays across different age groups (UNESCO, 2023).

In the effort to mitigate the impacts of COVID-19 on national education, one of the proposed solutions was the continuous integration of technology in schools. The educational technology development market, already on the rise, saw an opportunity to create tools focused on students' teaching and learning, resulting in a flood of technologies presented as solutions to educational problems (UNESCO, 2023). In the case specifically analyzed by this article, gamification is used as one of the potential technological tools to be employed. Thus, it has become one of the fastest-growing industries in recent decades, surpassing even the giant film industry. According to data presented by Elizabeth Andrade in her work on games and the cultural industry, the following is noted:

> According to data from NewZoo (2022), a market analysis and intelligence company in the gaming sector, the industry generated approximately $175.8 billion in 2021; this performance is expected to lead one of the major entertainment segments to exceed $200 billion in 2023 (ANDRADE, 2022, p. 31).

Video games generate billions annually and are present in the lives of children, adolescents, and young people within the school-age range. Latin America accounts for 10% of the global gaming market, and data shows that 75% of Brazilians used electronic games in 2022 (GLOBO, 2022), demonstrating that there is significant interest and acceptance of these tools by the public. Despite all the positive marketing created by the companies that produce these educational tools, the UNESCO report (2023) on the use of technologies in the school environment analyzes this flood of mechanisms with concern, stating that children, adolescents, and young people are extremely exposed and vulnerable to technologies, especially the internet.

Data presented by the UNESCO report and by the study of Nilton de Sousa (2022) highlight that the use of technologies can lead to compulsivity and depression when this use is not controlled at home or in the school environment. Even Sweden, one of the countries with the highest educational standards in Europe, is reconsidering its digitalization plan for schools, as the government states that after the introduction of screens in classrooms, student reading levels in the

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country have declined, thus opting for a return to using textbooks in the classroom (IHU, 2023). Furthermore, UNESCO critiques the use of public funds for acquiring these technologies without proper knowledge of the school reality, noting that many of these tools may not be effective for educational purposes. As mentioned earlier, social disparities, such as in Brazil, result in public schools with inadequate infrastructure (poor electrical networks and lack of internet access), and students without the means to access technology at home, preventing the use of some tools (UNESCO, 2023).

Another important point that must be considered is that technologies are pedagogical support tools, not the solution to all educational problems. As an example presented in the UNESCO report: "In Peru, when over 1 million laptops were distributed without being incorporated into pedagogy, learning did not improve" (UNESCO, 2023, p. 7). Beyond the tools, teachers, key players in educational development, must be aligned with technologies for their effective and qualitative use in the classroom. For this to happen, in addition to good infrastructure, these professionals need training to recognize the potential of digital tools in their work environment, as pointed out in another example presented by the UNESCO report:

> The technology does not need to be advanced to be effective. In China, high-quality recorded lessons distributed to 100 million rural students improved their results by 32% and reduced the wage disparity between urban and rural populations by 38% (UNESCO, 2023, p. 7).

We must understand technologies as tools that need to be consciously integrated into the school environment, avoiding unnecessary spending on materials that do not align with the school's reality and ensuring the active participation of teachers, who need to understand the benefits of incorporating this teaching tool into their pedagogical practice and applying it qualitatively. The school has a social role in shaping the individual and their relationship with others. The use of technology is a reality that extends beyond the school, and we cannot deprive students of its use; however, excessive use, in addition to stimulating individuality, can trigger mental disorders detrimental to the development of the individual. It is up to institutions, along with their professionals, to understand their reality, the reality of their student body, and to responsibly and efficiently integrate the use of these tools into everyday school life, so that the educational objective is truly achieved.

6 GAMIFICATION IN OFFICIAL CURRICULUM GUIDELINES

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For some time now, we have observed the space that the concept of gamification has been gaining in the discourse of educators and educational institutions. When contextually associated with pedagogical practices and the documents and principles that guide the main competencies to be developed by schools, the use of games in education provides motivating learning environments, mediated by challenge and playfulness. For example, in the final years of elementary school, applying gamification can be an excellent tool to engage students and encourage learning in a playful, interactive, and (why not?) fun way. However, it is important to consider the alignment of these activities with the National Common Curricular Base (BNCC).

The BNCC is a set of guidelines developed by the Ministry of Education (MEC) to guide basic general education in schools across the country. The document guides the development of curricula for educational institutions, establishing the competencies and skills that students must develop at each stage of basic education. It is important to emphasize that the foundation of the documents governing education in the country follows the educational theories developed by renowned thinkers such as Paulo Freire and Vygotsky – to name a few – even if, for now, they are somewhat distant from the information and communication technology of the 21st century.

For Freire, knowledge should be developed critically, in a way that teaches students to think, encouraging them to reach conclusions, rejecting the old view of the teacher as merely a transmitter of information. It is urgent to position the teacher as a mediator of knowledge and the student as the protagonist of their own education, and the BNCC also addresses this proposition. In Vygotsky's sociocultural theory (1991), we see that in the learning processes, one must take into account the environment in which the student is inserted, so that knowledge can be better applied and produced. Development, in this sense, is related to the social and cultural context in which the individual (student) is embedded. Interpreting the Vygotskian sociocultural perspective, it is clear that education and schools cannot ignore the social context in which young people are inserted – in this case, the gamified context being discussed here.

Turning attention back to the BNCC, in order to ensure that gamification is aligned with this document, it is necessary for the activities developed to contemplate the learning objectives outlined in it, which already consider games as part of the literacy practices of 21st-century children and adolescents, prescribing digital literacy and literacy. Games appear among the ten general competencies and many of the specific skills for all levels of basic education. For example, in the general competencies, the BNCC establishes that, throughout basic education, students should learn to:

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> Understand, use, and create digital information and communication technologies in a critical, meaningful, reflective, and ethical way in various social practices (including school practices) to communicate, access and disseminate information, produce knowledge, solve problems, and exercise agency and authorship in personal and collective life. (BRAZIL, 2018, p. 10).

Although there are conceptual differences, games in the classroom, according to the BNCC, are already included in the "various literacy practices" of students from early childhood education.

> The various literacy practices in which the student has already **engaged** in their broader social life, as well as in Early Childhood Education, such as singing songs, reciting rhymes and jingles, listening to and retelling stories, following rules **in games** and recipes, **playing games**, recounting experiences and experiments, will progressively be intensified and made more complex, leading to secondary genres with more complex texts. (BRAZIL, 2018, p. 89, emphasis added).

Furthermore, it is necessary for gamification activities to be carefully planned and structured so that they can effectively contribute to students' learning. It is important to reflect about how games and challenges can be used to develop specific skills, such as problem-solving, logical reasoning, creativity, writing, among others.

> (EF67LP11) Plan reviews, vlogs, videos, and varied podcasts, as well as texts and videos typical of youth cultures (some possibilities: fanzines, fan clips, e-zines, gameplay, walkthroughs, etc.), among others, considering the conditions for text production – objective, readers/viewers, media vehicles, circulation, etc. – based on the choice of a **cultural production** or event to analyze – book, movie, series, **game**, song, music video, fan clip, show, readings, slams, etc. – the search for information about the selected production or event, synthesizing information about the work/event, selecting aspects, elements, or resources to highlight positively or negatively, **or rules of the game,** for subsequent video recording. (BRAZIL, 2018, p. 60, emphasis added).

Kapp (2012, p. 15) defines gamification as "the use of game mechanics, aesthetics, and thinking to engage people, motivate action, promote learning, and solve problems." Therefore, the use of games in education makes gamification a tool that can promote greater engagement and motivation among students, allowing them to become more active in the learning process. Additionally, this approach can also stimulate the development of socio-

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emotional skills, such as teamwork, resilience, and critical thinking, all of which are also outlined in the BNCC.

7 SOME CONSIDERATIONS

In conclusion, it is evident that the incorporation of gamification into modern education represents a significant step towards a more interactive and engaging learning environment. Through the strategic use of game elements, it is possible to stimulate student engagement in a unique way, providing a space where playfulness intertwines with the educational process. Moreover, the convergence between the digital culture inherent in gamification and the objectives of the Base Nacional Comum Curricular (BNCC) cannot be ignored, as both aim to prepare students for an increasingly technological and interconnected world. However, it is crucial to emphasize that the success of gamification in education is not merely in the superficial application of game mechanics but in the active role of educators as facilitators of the environment.

Teachers play a key role in integrating gamification as an effective pedagogical tool, adapting it to curriculum content and the individual needs of students. Likewise, students play a key role and should engage actively and consistently in the process and should adopt an eager and committed approach to gamification as a learning tool.. Ensuring that all students have access to and the skills to equally benefit from gamification strategies is essential to avoid disparities in the educational process. In this regard, policies and initiatives aimed at digital inclusion must be accepted and integrated so that gamification can reach its full potential as an efficient and equitable educational approach.

In summary, the incorporation of gamification into contemporary education carries immense potential to revolutionize how we learn and teach. However, this potential can only be effectively realized when educators act as active facilitators, students embrace the approach with seriousness, and efforts are made to ensure digital inclusion for all. Collaboration between educators, students, institutions, and society at large is the key to fully harnessing the benefits that gamification can offer to the current educational landscape.

Considering the potential and limitations discussed, future research should investigate in greater depth the specific conditions required for the responsible implementation of gamification in technical and industrial education. Studies may explore, for example, which game design elements are most suitable for the diverse student profiles within this sector, as well as analyze the impacts of

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gamification on the development of both technical and socio-emotional competencies. Furthermore, it is recommended that technical education institutions promote ongoing professional development for teachers, providing guidance on the pedagogically conscious use of digital technologies—avoiding purely motivational practices and ensuring the educational intentionality of gamified activities. These guidelines may contribute to a more effective and critical application of gamification as a teaching strategy in technical and industrial education contexts.

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