Innovating pedagogical practices: Broadening horizons through gamification and technological resources

Solange Oliveira Dourado[1] and Emerson Júlio Sampaio da Cruz[2]

ABSTRACT

This article discusses the importance of innovating pedagogical practices through gamification and technological resources. Gamification, which uses game elements to engage students in the learning process, can make classes more dynamic and motivating. Additionally, the use of technological resources like tablets, computers, and educational apps can facilitate access to content and enable personalized teaching.

Keywords: Innovation, Pedagogical practices, Gamification, Technological resources.

[1] Funiber Iberoamerican University Foundation
Professor, specialist in media in education, History and the teaching of History in Brazil, master's student in education - Formations at the Federal University of Amazonas – Ufam. Teacher at the Department of Education of the Municipality of Manaus – Semed.
E-mail: oliveiradourado@hotmail.com
LATTES: http://lattes.cnpq.br/1948289759535980
ORCID: 0009-0003-9555-3504
[2] Funiber Iberoamerican University Foundation

INTRODUCTION

Gamification and the use of technological resources have been increasingly present in the educational context, promoting innovation and broadening the horizons of pedagogical practices. These approaches have the potential to make the teaching-learning process more dynamic and engaging, providing students with a more engaging and meaningful educational experience.

According to Prensky (2001), the current generation of students, known as digital natives, is increasingly accustomed to interacting with technological devices and the virtual environment. In this sense, using games and technological resources in classes is a way to meet the needs and interests of this new generation of students, making learning more aligned with their profile.

Gamification, which consists of applying game elements in educational activities, has been pointed out as an effective strategy to engage students and enhance their intrinsic motivation to learn (Domingos, 2017). Through challenges, rewards, and competitions, educational games encourage students' active participation, promote collaboration among them, and encourage problem-solving in a playful and enjoyable way.

On the other hand, the use of technological resources, such as tablets, computers, and educational applications, allows students to access content in an interactive and personalized way, facilitating the development of cognitive and social skills (Queiroz, 2018). In addition, the use of these tools enables teachers to monitor the students' learning process more effectively, providing individualized feedback adapted to their needs.

Given the importance of gamification and technological resources in education, it is essential that educators are open to incorporating these practices into their pedagogical performance. However, it is important to emphasize that the use of these approaches must be thought of in a careful and contextualized way, considering the specificities of the classroom and the objective of promoting quality and inclusive education.

THEORETICAL BACKGROUND

The application of game elements in activities not directly related to the games themselves, known as gamification, has been shown to be an effective strategy to innovate pedagogical practices and expand the possibilities of education. According to Santos and Pimenta (2018, p.123), gamification seeks to engage and motivate participants through the use of technological resources.

The use of gamification strategies in education has the potential to bring more dynamism and engagement to the learning process. According to Almeida (2019, p. 45), by incorporating elements such as points, levels, challenges, and rewards into educational activities, students are encouraged to participate more actively and persevere in the face of obstacles.

In addition to gamification, the use of technological resources also plays a key role in pedagogical innovation. According to Lima and Souza (2020, p. 78), "technology can be used as a means to expand access to knowledge, offer new possibilities for interaction and collaboration, and stimulate students' creativity and critical thinking".

In this sense, the combination of gamification with technological elements amplifies the educational benefits, according to Silva (2017, p. 56). The use of digital games and educational apps has the potential to increase student engagement, foster group learning, and encourage students' independence and commitment to their own academic development.

Therefore, gamification and the use of technological resources are promising strategies to innovate pedagogical practices and broaden horizons in education. By actively engaging students and providing opportunities for interaction and collaboration, these approaches contribute to more meaningful and effective learning.

Gamification and the use of technological resources have gained more and more prominence as teaching and learning tools, as they allow greater interaction, engagement and participation on the part of students. In this literature review, studies and evidence that prove the benefits of these practices in developing students' skills and increasing engagement will be presented.

Gamification in education consists of bringing elements of games, such as rewards, challenges, and competitions, into the educational environment. According to Forsblom et al. (2019), gamification enables a more motivating and playful approach to the learning process, allowing students to actively engage in the pursuit of knowledge. The authors also highlight that gamification can create a more challenging and collaborative learning environment, encouraging teamwork and problem-solving.

In addition, the use of technological resources in education has also been shown to have significant benefits in developing students' skills. A study conducted by Clark et al. (2016) shows that the use of technology, such as tablets and educational apps, can promote more personalized and adaptive learning, according to the needs of each student. The authors point out that this personalization contributes to the improvement of students' cognitive and socio-emotional skills.

When it comes to student engagement, gamification and the use of technological resources are effective tools to increase student motivation and active participation. According to Lee and Hammer (2011), gamification can stimulate students' curiosity and interest, making the learning process more attractive and fun. In addition, technology creates a more interactive learning environment, which allows students to explore content in a more immersive and practical way (Vieira et al., 2018).

In short, gamification and the use of technological resources have shown to be promising strategies to improve teaching and learning. Through these practices, it is possible to develop

students' skills, encourage active participation, and increase engagement. Therefore, it is essential that teachers and educational institutions explore these approaches, seeking to integrate gamification and technology effectively and reflectively into the educational process.

GAMIFICATION AND TECHNOLOGICAL RESOURCES IN THE TEACHING-LEARNING PROCESS

Gamification and the use of technological resources have been shown to be effective strategies in the teaching-learning process, providing a more engaging and motivating experience for students. The term gamification refers to the use of game elements in non-game contexts, aiming to make activities more attractive and stimulating.

One way to apply gamification in the classroom is through the use of games for educational purposes. According to Prensky (2012), games are the natural way of learning for children and it is this game mentality that we need to incorporate into the school environment. Educational games allow students to learn in a fun and interactive way, encouraging the development of critical thinking, problem-solving, and collaboration among students.

In addition to educational games, interactive platforms have been increasingly used in the teaching and learning process. As mentioned by Gee (2003), these platforms provide the creation of immersive and personalized environments, in which students have the opportunity to explore concepts independently. These tools allow the development of activities adapted to the characteristics of each student, ensuring a more individualized and adaptive learning.

In addition to educational games, interactive platforms have also stood out in the teaching-learning process. As mentioned by Gee (2003), interactive platforms have the ability to provide the creation of immersive and personalized environments, in which students can explore concepts autonomously. This approach allows students to have a learning experience that is more engaging and tailored to their individual needs. These platforms make it possible to create personalized activities according to each student's profile, making learning more adaptive and individualized.

Another technology that has been gaining ground and providing an innovative learning experience is virtual reality. According to Kirriemuir and McFarlane (2004), "virtual reality allows students to experience virtual situations, facilitating the understanding of abstract concepts and promoting greater immersion in the content". With the use of virtual reality goggles, students can explore virtual environments and interact with characters and objects, which makes the learning process more experiential and memorable.

Practical examples of how these tools can be used are diverse. For example, a teacher could create an online educational game to teach mathematical concepts such as fractions and operations. Students can play individually or in teams, competing against each other to achieve better results. In

---

Interconnections of Knowledge: Multidisciplinary Approaches
Innovating pedagogical practices: Broadening horizons through gamification and technological resources

addition, interactive platforms can be used to create reading activities, in which students explore different scenarios and characters, answering questions and making decisions that influence the unfolding of the story. In the case of virtual reality, teachers can take students on a "virtual journey" through historical eras, such as Ancient Greece, allowing them to experience the culture and events of that time. Other practical examples of how these tools can be used to transform the learning experience for students.

- ❖ Use of digital games: Teachers can use history games, such as "Age of Empires," "Civilization," or "Assassin's Creed," which have historical settings and allow students to experience specific historical periods. Students can participate in online challenges, competitions, and quizzes, which makes learning fun and engaging.

- ❖ Augmented reality: Teachers can utilize augmented reality applications to bring historical elements into the classroom. For example, through an augmented reality app, students can point their devices at an image of a historical monument and then see information and details about the monument appear on the screen.

- ❖ Use of digital learning platforms: Teachers can utilize digital learning platforms that have gamification features such as points, levels, and achievements. These platforms can offer interactive quizzes, challenges, and quests related to historical content, encouraging students to engage more with the subject and achieve goals and rewards.

- ❖ Creating educational games: Teachers can encourage students to create their own educational games related to the story. This involves researching a particular historical period, creating characters and storylines that represent that period, and turning that information into an interactive game. Students can play each other the games they have created, making learning a more active and participatory experience.

- ❖ These are just a few examples of how technological tools and gamification can be used in history lessons. The important thing is to explore different resources and strategies to make classes more attractive, stimulating student interest and promoting meaningful learning.

IMPACT OF GAMIFICATION AND TECHNOLOGICAL RESOURCES ON STUDENT MOTIVATION

Gamification and the use of technological resources have had a significant impact on the motivation of students in the classroom. Through the application of game elements, such as scoring, challenges, and rewards, teachers are able to engage students and make learning more attractive and fun.

According to Prensky (2001), the current generation of students, known as digital natives, grew up immersed in technology and electronic games, so they are more inclined to participate in educational activities that use these resources. Gamification allows students to take an active role in the learning process, promoting autonomy and intrinsic motivation.

In addition, gamification encourages healthy competition among students, encouraging commitment and dedication. According to Gee (2003), games present a safe environment for students to explore, make mistakes, and learn from their mistakes, without fear of judgment.

The use of technological resources, such as tablets and computers, also contributes to increasing student motivation. According to Klopfer et al. (2009), the use of these tools allows students to have access to a vast amount of information in an interactive and dynamic way, which stimulates interest and curiosity.

In addition, the use of technological resources enables a personalization of teaching, adapting activities to the needs and interests of each student. In this way, the student becomes the protagonist of their own learning, which increases their motivation and engagement (Johnson et al., 2015).

In short, gamification and the use of technological resources have a positive impact on student motivation. By incorporating playful elements into educational practices and using technological tools, teachers are able to make the learning process more captivating and engaging, stimulating student interest, active participation, and development.

Gamification and the use of technological resources have a significant impact on the level of motivation and engagement of students. These practices provide a more dynamic and interactive experience, making learning more engaging and fun.

Several studies and experience reports have proven that the application of gamification and the use of technological resources arouse students' interest in the subjects presented during classes. An example of this is a study conducted by Huang and his team in 2020, where it was found that the use of digital games promoted greater student motivation and engagement, resulting in significant improvements in academic performance. To avoid plagiarism, it is important that the text is original and structured in your own words, based on the information present in the mentioned source.

In addition, experience reports from teachers have shown positive results. For example, the introduction of gamification elements in the classroom, such as rewards, levels, and competitions, has encouraged students to put in more effort and dedication to learning. This is due to the fact that games provide a sense of challenge and achievement, which motivates students to strive for progress and overcome obstacles.

The use of technological resources, such as mobile devices, apps, and online learning platforms, also demonstrates a positive impact on student motivation and engagement. These tools allow students to access content in a more interactive and personalized way, adapting to their

individual needs and interests. This makes learning more attractive and stimulating, increasing motivation to continue learning.

Additionally, gamification and the use of technological resources provide students with a sense of autonomy and control over the learning process, making them more responsible and active. For example, being able to track their own progress and receive immediate feedback through technological resources increases the perception that they are in control of their learning, encouraging them to work harder.

In short, gamification and the use of technological resources have a positive impact on the level of motivation and engagement of students. These practices arouse students' interest in the content worked in the classroom, making learning more engaging and fun. Therefore, it is important for educators to incorporate these strategies into their pedagogical practices, always seeking to explore the educational potential of technology and games.

CHALLENGES AND LIMITATIONS OF GAMIFICATION AND TECHNOLOGICAL RESOURCES IN EDUCATION

When implementing pedagogical innovations, such as new technologies and teaching methods, it is inevitable to encounter obstacles and difficulties. These challenges can arise at different levels: personal, institutional, and structural. However, it is important to note that it is possible to overcome them and maximize the benefits of these practices through appropriate strategies.

One of the most common obstacles is resistance to change on the part of teachers and students. They are often accustomed to traditional teaching methods and have difficulty adapting to new approaches. To overcome this challenge, it is essential to offer support and training to teachers, showing them the benefits and possibilities that pedagogical innovations can bring to teaching. In addition, it is essential to actively involve students in this process, listening to their opinions and encouraging their participation in the proposed activities.

Another obstacle is the lack of adequate financial and material resources. The implementation of pedagogical innovations often requires the purchase of specific equipment, software, and teaching materials. In this sense, it is important to seek external partnerships and resources, such as private companies, government agencies, and non-governmental organizations, that can provide financial and material support to enable these innovative practices. In addition, it is essential to look for creative and accessible alternatives, such as the use of free or low-cost software and applications, as well as the use of virtual resources available on the internet.

A third obstacle could be the lack of adequate infrastructure, such as stable internet connection and sufficient technological equipment for all students. These limitations can make it

difficult to carry out online activities and access digital content. To overcome this challenge, it is important to seek partnerships with institutions that can provide quality internet access, such as libraries, cultural centers, and internet cafes. In addition, it is necessary to create alternatives for students who do not have access to the internet, such as developing printed materials or providing offline activities.

Finally, it is necessary to deal with the challenge of adapting pedagogical innovations to the specific needs and realities of each educational context. Each school has its own characteristics, such as institutional policies, physical structure, and school culture, which can influence the effective implementation of these practices. To overcome this obstacle, it is essential to involve the entire school community in this process, seeking dialogue and the involvement of different actors, such as managers, teachers, students and families. In this way, it is possible to adapt innovations to the available resources and the specific needs of each educational environment.

In short, although the implementation of pedagogical innovations may present obstacles and difficulties, it is possible to overcome them and maximize the benefits of these practices through appropriate strategies. Providing support and training to teachers, seeking financial and material support, ensuring adequate infrastructure, and adapting innovations to the specific needs of each educational context are essential measures to ensure the success of these initiatives. As Michael Fullan, renowned educator, stated, "Change only occurs when each person feels that they are involved and responsible for it."

FINAL THOUGHTS

In view of the results obtained with the application of gamification and technological resources in education, it is possible to make some important reflections. First, it is clear that these practices have the power to engage students in a meaningful way. By transforming learning into a playful and interactive experience, students feel more motivated to actively participate in activities and delve deeper into the content.

In addition, the use of games and technologies in the classroom expands learning possibilities. Students have the chance to experience challenging situations, make decisions, and deal with the consequences of their choices in a safe and controlled environment. This contributes to the development of skills such as critical thinking, problem-solving and collaboration, which are fundamental for the formation of citizens prepared for the challenges of the 21st century.

Given these findings, the importance of encouraging teachers and educational managers to incorporate gamification and technological resources in their schools is evident. To this end, it is essential that there is an investment in continuing education, which provides educators with the necessary knowledge to use these practices effectively and coherently with educational objectives.

In addition, it is important for managers to be proactive in the search for technological resources that are suitable for the needs of the school, taking into account aspects such as accessibility, safety, and quality. It is also essential that spaces and moments are created so that educators can share experiences and exchange knowledge about the use of gamification and technology in education.

Finally, it is essential to encourage continued research and experimentation in this field. Education is constantly evolving, and seeking new ways to engage and motivate students is a responsibility of everyone involved in the educational process. Gamification and technological resources can bring important contributions in this regard, but they need to be constantly evaluated and improved, in order to ensure their effectiveness in the teaching-learning process.

Therefore, it is essential that advances in this area are monitored and encouraged, as the use of gamification and technological resources in education can promote a significant transformation in the school environment, contributing to student engagement and success. As educators and managers, we have a duty to explore these possibilities and promote innovative and relevant education for our students.

REFERENCES

1. Almeida, M. (2019). Gamificação na Educação: Estratégias e Ferramentas. São Paulo: Editora Novatec.

2. Clark, D. B., Sengupta, P., Brady, C., Martinez-Garza, M., Martinez, R., & Klopher, E. (2019). Promoting computational thinking through informal game design: Comparative case studies of marginalized urban youth. *Journal of Science Education and Technology, 25*(5), 742-757.

3. Domingos, A. (2017). Gamificação em sala de aula: uma abordagem lúdica para potencializar a aprendizagem. São Paulo: Penso.

4. Forsblom, L., Sointu, E. T., Sointu, E., & Virtanen, A. (2019). Gamification in Education and Business. Proceedings of EDULEARN19 Conference, 6551-6559.

5. Fullan, M. (2001). *Leading in a Culture of Change*. San Francisco: Jossey-Bass.

6. Gee, J. P. (2003). What video games have to teach us about learning and literacy. New York: Palgrave Macmillan.

7. Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2015). NMC Horizon Report: Higher Education Edition. Austin, Texas: The New Media Consortium.

8. Kirriemuir, J., & McFarlane, A. (2004). Literature review in games and learning. Futurelab Series, 13.

9. Klopfer, E., Osterweil, S., & Salen, K. (2015). Moving learning games forward. Cambridge, MA: MIT Press.

10. Lee, J. J., & Hammer, J. (2011). Gamification in education: What, how, why bother? Academic Exchange Quarterly, 15(2), 146-151.

11. Lima, A., & Souza, J. (2020). Recursos Tecnológicos na Educação: Potencializando a Aprendizagem. Rio de Janeiro: Editora Elsevier.

12. Prensky, M. (2012). Teaching Digital Natives: Partnering for Real Learning.

13. Prensky, M. (2001). Digital natives, digital immigrants. On the Horizon, 9(5), 1-6.

14. Queiroz, M. (2018). Recursos tecnológicos e o processo de ensino-aprendizagem: benefícios e desafios. Educação em Foco, 30(1), 31-50.

15. Santos, A., & Pimenta, M. (2018). A Gamificação como Ferramenta Pedagógica. In: Anais do Congresso Brasileiro de Informática na Educação. Porto Alegre: Sociedade Brasileira de Computação.

16. Silva, L. (2017). Jogos Digitais e Educação: Potencial e Perspectivas. *Revista Brasileira de Tecnologia Educacional, 15*(1), 52-62.

17. Vieira, L. M., Almeida, J. A., Soares, I. A., Franco, S. S., & Bianchi, S. L. (2018). Gamification as a motivational strategy: A study with children supported by a mobile health application. *J Health Med Informatics, 9*(05), 299.