Metaverse and its possibilities in educational environments

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ABSTRACT
This article was prepared through a descriptive study that began with a bibliographic study on the importance and possibilities of the Metaverse in organizations and educational environments. The Metaverse has been one of the most talked about and discussed topics of the moment. This is because it presents itself as a collaborative and shared learning environment and because it is among the main educational trends of 2022, surpassing the technological sphere. It also gained a lot of attention in the news in 2021, when Mark Zuckerberg announced the change of the Facebook brand to Meta, also announcing that the company would invest in virtual reality. Despite all the notoriety surrounding the theme, the idea of Metaverse has been discussed for a long time. In this work, the focus of the study was to present the numerous possibilities of the Metaverse within the educational context, approaching something that goes beyond thinking about only online classes, considering that this technology reduces the border between what the student needs to know and the way how he will effectively learn about a certain subject. Thus, the bibliographic research of this article was developed from material already prepared, consisting mainly of scientific articles and documentary research carried out through blogs, videos and websites on the topic addressed.

Keywords: Metaverse, Education, Collaborative learning, Virtual environment.

1 INTRODUCTION

The Metaverse has been one of the most talked about and discussed topics of the moment. This is due to the fact that it stands out as a relevant educational tool, positioning itself as one of the main trends in the educational scenario from 2020 onwards, going beyond the technological sphere. This

shared virtual environment, which merges the boundaries between online and offline, is configured as an integrally digital platform capable of recreating physical experiences (Conceição et al., 2023). The approach of Silva and Pereira Jr. (2013) delimits the Metaverse as a space conducive to distance learning, as well as to the complementation of conventional disciplines, providing students with the opportunity to acquire knowledge beyond the limits of the classroom, notably in extracurricular activities.

The understanding of the Metaverse as an educational platform gains prominence when observed from the perspective of the generation of "digital natives". This generation, composed of individuals who were born and raised in the age of the Internet, demonstrates a natural affinity and ability to interact effectively in digital environments (Souza; Tonelli, 2012). This generation's inherent familiarity with the dynamics of the Metaverse highlights the potential acceptance and integration of this innovative technology in the educational context. However, it is worth investigating how the Metaverse can be effectively incorporated into the Distance Learning (DE) environment in Brazil, considering the educational nuances and specific needs of this modality (Conceição et al., 2023; Carmen, 2021).

In this context, this chapter proposes a more in-depth approach to the potential of the Metaverse as an educational tool. To this end, a comprehensive literature search was conducted, incorporating critical analysis of scientific articles and the evaluation of materials available on the Internet, including blogs, videos and educational websites specialized in the subject. This methodological approach aims to provide a comprehensive and grounded view on the role of the Metaverse in the contemporary educational landscape.

Thus, it is necessary to recognize that, although the Metaverse arouses enthusiasm and positive expectations, its adoption in the educational context entails challenges and ethical considerations. Issues related to accessibility, equity in access to technology, privacy, and security must be carefully examined to ensure that the transformative potential of the Metaverse is harnessed in an ethical and inclusive manner.

In summary, this chapter aims to contribute to a deeper understanding of the Metaverse as an educational tool, highlighting its potentialities and challenges in the context of distance education in Brazil. By integrating theoretical and empirical perspectives, it seeks to offer a solid basis for future research and for the effective implementation of the Metaverse as an enriching resource in the contemporary educational process.

2 THEORETICAL BACKGROUND

The COVID-19 pandemic has caused an unprecedented disruption in the global education landscape, making remote learning a reality. The health restrictions and social isolation, resulting from

the pandemic crisis, have projected educational technologies to the center of attention, highlighting, among them, the Metaverse as a crucial tool in the urgency of Distance Learning (DE). The acceleration of this transition highlights the need to explore and understand the Metaverse as an innovative educational platform in response to the challenging dynamics of contemporaneity (Serra et al., 2022; Flores et al., 2021; Carreira et al., 2023).

The term "Metaverse" was coined in 1992 by Neal Stephenson, an American writer, in the context of his science fiction novel "Snow Crash". In this work, Stephenson outlined a 3D virtual environment, conceiving the migration of human interaction to a fully virtual world. Although it originated in a literary context, the spread of the term gained greater prominence initially in the realms of computer games and video games. Subsequently, large corporations began to invest significantly in virtual reality, seeking to provide immersive and personalized experiences to consumers, consolidating the Metaverse as a concrete expression in technological environments (Ventura, 2022; Gabas, 2021).

The Metaverse can be defined as a shared virtual reality technology, standing out for its ability to recreate physical experiences in a collective, collaborative, and shared digital environment. Its primary purpose is to integrate online and offline reality, adopting omnichannel strategies (multi-screens) and employing various tools to reduce the gap between the physical and virtual environment, providing an improved user experience (Bassette, 2023; Carmen, 2021). Cardoso's (2015) conception corroborates this definition, by considering the Metaverse as multi-user virtual platforms equipped with graphical interfaces in three dimensions, also called virtual worlds.

In this context, the relevance of the Metaverse in education during the pandemic stands out as an innovative approach to address the challenges posed by the abrupt transition to remote learning. The in-depth understanding of this technology, its history and applicability contributes to a more solid foundation in its integration into the contemporary educational scenario, promoting an enriching dialogue between the academic literature and emerging practices in the field of education and technology.

The Metaverse, as a digital environment, acquired remarkable visibility in 2021, especially with Mark Zuckerberg's announcement about Facebook's rebranding to Meta and planned investments in virtual reality. Despite the recent prominence, it is crucial to recognize that the conception of the Metaverse has been a topic of discussion for a long time (Alves, 2021; Mascarenhas, 2021).

The essence of the Metaverse lies in the creation of a new world, providing interactions between individuals, brands, businesses, virtual properties, and educational institutions. Differentiating itself from conventional mouse or cell phone interactions, which take place on websites and social networks outside of an immersive context, the Metaverse enables fully immersive interactions within the virtual environment. This striking feature redefines the way users explore and participate in digital reality.

The fundamental differentiator of the Metaverse is its integration with physical reality, empowering interactions in three-dimensional environments. A practical example is the experience of visiting a store in 3D using virtual reality glasses. In this context, users, through avatars, can walk inside the bookstore, pick up the book, flip through the book, go to the counter and make the payment, all in the context of the Metaverse.

The educational environment would also be no different in the search for optimization, popularization and development of tools aimed at blended learning. The use of the Metaverse in the educational context aims to create a more attractive, sophisticated, and efficient education model compared to the face-to-face model. That is, this approach not only addresses a pressing need, but also offers substantial benefits by reconfiguring the way learning is conceived, shared, and absorbed. In other words, the Metaverse not only represents a paradigmatic shift in digital interaction, but also presents itself as an innovative tool with the potential to transform education, providing a more engaging and efficient approach for learners of all ages.

The Metaverse has presented itself as a necessity in the educational environment, driven by numerous factors, especially the school's responsibility to prepare its students for the challenges of the future job market. In a scenario in which organizations intensify their virtual economic activities, and the provision of services and commercialization of products increasingly occurs in virtual environments, educational institutions demand new teaching methodologies that provide the training of students for this new reality. This implies the need to prepare professionals capable of facing the challenges inherent to these new virtual environments, ranging from new management concepts to innovative manufacturing models.

In the educational field, teachers are faced with the constant challenge of providing an assertive learning experience to students. However, the Metaverse offers a potentially transformative solution by allowing the development of training environments that replicate, as faithfully as possible, the skills that learners need to master and the practical experience that they will actually face.

The Metaverse, therefore, emerges as an innovative means to enhance students' preparation for an ever-evolving job market. Through the immersion provided by these virtual environments, students have the opportunity not only to acquire specific skills, but also to develop a deeper understanding of the complexities and demands associated with new business models and virtual dynamics. The strategic use of the Metaverse in the educational process thus represents a proactive and efficient response to the growing digitalization and virtualization of economic and professional activities.

When we approach the interaction between the Metaverse and Education, we transcend the mere conception of online classes, entering a revolutionary and transformative domain. Not only does the Metaverse offer a platform for the learning experience, but it also proves to be an innovative solution for addressing challenges such as engagement and dropout by providing a practical and

authentic approach. In essence, the Metaverse acts on reducing the boundaries between the knowledge that the student needs to acquire and the effective methods by which he internalizes information about a given subject.

In the Metaverse, learning takes on a collaborative perspective, allowing for the creation of environments that can be shared among students, resembling parallel realities. Interacting with objects in the Metaverse provides a more natural learning experience, as students actively participate in the environment that surrounds them. This environment facilitates collaboration between students located anywhere in the world, transcending language barriers and sharing experiences in a universally accessible way.

Within this universal design context, students not only interact with the content but also collaborate effectively with their peers, contributing to a global and inclusive learning environment. The Metaverse, therefore, not only dissolves the traditional limitations of distance learning, but also opens doors to a new era of learning, where collaboration transcends physical boundaries and educational experiences become immersive, participatory, and truly global.

As we focus on Education, it becomes evident that the potential of the Metaverse is truly limitless. But what would those benefits be? Basically, there are three groups of objectives that enable a profound reconfiguration of learning experiences, namely:

2.1 ACCESSIBILITY

The Metaverse transcends geographical barriers, eliminating the need for physical travel to access educational venues and institutions. This results in an exponential increase in inclusivity, providing easy access regardless of location. Reducing the costs associated with physical travel not only makes education more accessible, but also expands learning opportunities for individuals in diverse parts of the world, creating a more inclusive and global approach to education.

2.2 22ST CENTURY SKILLS DEVELOPMENT

The Metaverse emerges as a catalyst for the development of crucial skills for the contemporary digital environment: both hard and soft skills. By optimizing high-level digital and technical skills, the Metaverse demands greater discipline and autonomy from the student, while simultaneously promoting remote connection and empathy. This means that, in addition to empowering students with essential skills for today's market, the Metaverse also contributes to the formation of more autonomous and connected professionals, ready for the challenges of the digital landscape.

2.3 PROMOTION OF MOTIVATION AND FOCUS:

Even for students who are not considered digital natives, those who still have an outdated school perception, the Metaverse provides a dynamic, engaging, and motivating learning experience. By inserting students into 3D environments, the Metaverse elevates interest, focus, and motivation by offering high-quality content in an innovative way. This approach revitalizes the perception of traditional teaching and broadens the participation of students who might otherwise feel disengaged in conventional educational settings.

This proposal, although bold, reflects a significant change in education, representing a communicational frontier that fundamentally alters the way people learn, work, communicate and interact. The first steps taken in this direction indicate the creation of unprecedented and unimaginable learning experiences, pointing to an educational future filled with limitless possibilities.

3 FINAL THOUGHTS

In view of the above, we consolidate the understanding that the Metaverse represents a futuristic vision that innovatively combines the real and virtual worlds, converging the Internet and a series of technological innovations, from holograms to devices such as virtual reality glasses, to the epicenter of human connections. In this virtual universe, avatars, holograms, virtual reality, and technologies such as virtual glasses are designed to enhance and centralize human interactions.

The central motivation driving the Metaverse is the maximum reduction of the perceived distance between what is viewed, for example, on a mobile screen, what occurs on a computer, and the effective interactions in the user's physical space. So, the intrinsic purpose is to enhance the user experience, using virtual reality as a tool to recreate these physical experiences in a more powerful way, promoting fluid integration between online and offline environments through omnichannel strategies.

In the educational sphere, the Metaverse triggers a significant transformation, making learning experiences more accessible and dynamic. The ability to carry out, in real time, text and audio conversations, interact with virtual objects, demonstrate constructions, conduct experiments, present ideas in a playful, clear and concrete way, creates a highly interactive and enriching educational environment. This technological advancement offers numerous possibilities for the improvement of teaching by providing a diverse range of educational experiences.

The Metaverse, although still in the development phase, reveals gigantic potential by integrating the real and virtual world in a synergistic way. In the educational field, this convergence means overcoming borders, allowing schools to cross geographical boundaries and establish interactions and teaching with students from anywhere in the world. What was once considered a

privilege for some becomes, with the effective implementation of the Metaverse, an accessible reality intrinsic to the global educational process.

We conclude, therefore, that the Metaverse represents not only a technological evolution, but a revolution in human interactions and education, promoting a new paradigm that redefines the way we teach, learn and connect globally. Its potential, still in the exploration phase, points to a future where the boundaries between the real and virtual worlds become increasingly permeable, providing more inclusive, innovative and enriching educational experiences.

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