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Breaking Boundaries: Exploring the Metaverse for Innovative Education

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Although the pandemic increased the adoption of non-education platforms for teaching, it brought challenges to online higher education. These challenges encompass fatigue from excessive use of video conferencing applications, frustration experienced by instructors when students keep their cameras off during online classes, low student engagement, and notable silence in response to questions or concerns. As digital education and online interaction continue to evolve, the concept of the metaverse has emerged as a potential solution to enhance engagement and collaboration within virtual spaces (Mistretta, 2022).

The metaverse, as defined by the Acceleration Studies Foundation, represents the convergence of virtually enhanced physical reality and physical-persisted virtual space (Kye et al., 2021). It constitutes an interactive, three-dimensional virtual environment where individuals can interact with one another and digital entities, mirroring real-life interactions. The metaverse encompasses virtual worlds, online games, social networks, augmented and virtual reality experiences, and more. It blurs the line between the physical and digital realms, allowing for seamless and integrated experiences. Built upon the maturity of technologies such as virtual reality (VR), augmented reality (AR), big data, and blockchain, represents the future of education (Wu & Gao, 2022, cited in George, E. 2023). Hybrid and flexible environments facilitate the integration of these technologies, overcoming physical limitations and enabling students to immerse themselves in a completely virtual environment. Within this environment, students can engage in creative activities that foster learning, critical thinking, collaborative work, socialization, and positively impact student motivation (Almaguer et al., 2021; Burnett et al., 2021; Zhang et al., 2022).

Virbela is a virtual reality platform that recreates real-world settings, dynamics, and human interactions in virtual environments. Unlike video conferencing, digital collaboration tools, and online forums, Virbela provides the ability to replicate physical offices, events, or learning spaces while maintaining a sense of community and culture (Virbela, 2023).

Tec Virtual Campus is a Tecnologico de Monterrey virtual world created using Virbela. Accessible through a desktop application, this platform offers students a digital space where they can access using customizable avatars and enjoy freedom of movement as if they were on the physical campus (Villanueva, A. 2022). This environment enables the presentation of projects, complete class sessions, participation in forums, organization of educational events, and various other activities, all within an interactive 100% virtual space that utilizes three-dimensional animations and voice-enabled avatars.

In this context, we will provide examples of two educational activities implemented within the Virtual Campus for high-enrollment online courses encompassing over 100 students from diverse regions in Mexico. These courses span distinct disciplines: Engineering and Sciences, and Social Sciences and Government. These examples aim to demonstrate that regardless of the subject being studied or course characteristics, this immersive resource can be utilized to add value and innovation to virtual classrooms.

Keywords: Metaverse, virtual reality, higher education, educational innovation, online education.

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