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SHORT COMMUNICATION

Metaverse and education: affective bonds, cognition, and ethics in immersive environments

Metaverso y educación: vínculos afectivos, cognición y ética en entornos inmersivos

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ABSTRACT

This paper explores how metaverses have shaped new forms of social, emotional, and pedagogical connection in immersive digital environments. It analyzes how the personalization of avatars and the construction of virtual identities have allowed users to express subjective dimensions that often cannot be found in physical spaces. This dynamic has fostered the emergence of deeper relationships but has also brought with it ambivalent effects such as emotional dissociation and digital burnout. It also examines the role of pedagogical strategies, gamification, and accessibility as key factors in the quality of interactions. The study highlights the importance of incorporating ethical and digital justice principles to counter risks such as exclusion, algorithmic surveillance, and unequal access. Overall, it offers a critical and situated perspective on the potential of the metaverse to generate safe, inclusive, and emotionally meaningful environments. Intentional design, educational support, and political commitment have been identified as necessary conditions for transforming these spaces into true scenarios of collective construction and shared well-being.

Keywords: Metaverse; Virtual Identity; Social Presence; Immersive Learning; Education; Affective Interaction.

RESUMEN

El presente trabajo ha explorado cómo los metaversos han configurado nuevas formas de vínculo social, afectivo y pedagógico en entornos digitales inmersivos. Se ha analizado cómo la personalización de avatares y la construcción de identidades virtuales han permitido a los usuarios expresar dimensiones subjetivas que muchas veces no encuentran lugar en el espacio físico. Esta dinámica ha favorecido la emergencia de relaciones más profundas, pero también ha traído consigo efectos ambivalentes como la disociación emocional o el agotamiento digital. Asimismo, se ha examinado el papel de las estrategias pedagógicas, la gamificación y la accesibilidad como factores claves en la calidad de las interacciones. El estudio ha destacado la importancia de incorporar principios éticos y de justicia digital para contrarrestar riesgos como la exclusión, la vigilancia algorítmica o la desigualdad en el acceso. En conjunto, se ha planteado una mirada crítica y situada sobre el potencial del metaverso para generar entornos seguros, inclusivos y emocionalmente significativos. El diseño intencional, el acompañamiento educativo y el compromiso político han sido identificados como condiciones necesarias para transformar estos espacios en verdaderos escenarios de construcción colectiva y bienestar compartido.

Palabras clave: Metaverso; Identidad Virtual; Presencia Social; Aprendizaje Inmersivo; Educación; Interacción Afectiva.

INTRODUCTION

Today, the metaverse is beginning to occupy an important place in debates about technology and society. It is not just a technical innovation but a broad reconfiguration of how people relate to each other in digital environments (Román Acosta, 2023; Sánchez Carrera et al., 2023). It is a three-dimensional, immersive space where augmented reality, artificial intelligence, and blockchain converge. Moreover, all of this, which may sound abstract, has a very concrete impact on how we live and share with others. What we understand as community or presence is changing and redefined (Valdés Godínes & Angel Rueda, 2023; Lee et al., 2021).

Unlike traditional platforms, where users merely look at a screen, the experience here differs. It is an environment designed to provoke more immersive sensations: sounds, images, and even emotions. It is not just that we interact; it is that we inhabit these worlds. And that has many implications. What is built there is not only interaction but also bonds, emotional ties, and ways of being with others. Of course, this has both psychological and political implications.

From different perspectives, recent studies have begun to explore how these spaces can facilitate new forms of collaboration and care. In particular, within education and therapy, these environments can generate richer community experiences (Scavarelli et al., 2021; Codina Felip, 2023; Román Acosta et al., 2023). On the other hand, we cannot ignore the less desirable effects. Because they are also there: more isolation, more exclusion, and more inequality, all mediated by algorithms that we do not always see or fully understand (Florida, 2021).

So, this paper proposes to pause for a moment and reflect on all of this. To take a critical pause and look at the metaverse as a technological promise and a contested terrain. A space where something important is at stake in terms of human relations. From a perspective that crosses the educational, technological, and social spheres, this text seeks to open up questions rather than close answers. Questions about how people live there, what relationships are possible, and which are not so much.

DEVELOPMENT

To understand how metaverses shape new forms of educational relationships, it is essential to analyze the dynamics of interaction generated there. These immersive environments not only enable other forms of presence and communication but also reconfigure subjective, emotional, and political dimensions of social bonds. Far from being neutral spaces, virtual worlds are shaped by design decisions, technological mediations, and access conditions that influence how people meet, express themselves, and learn within them.

In this sense, the development of this work has been structured around three principal axes. First, immersive sociability and new forms of presence are addressed, emphasizing the role of collaborative design and pedagogical strategies. Next, we delve into the emotional and subjective dimensions of connection, analyzing how the construction of virtual identities impacts the user's affective experience. Finally, we examine these spaces' socio-technical risks and horizons of responsibility, considering access gaps and the ethical and political implications of using the metaverse in educational contexts.

Immersive sociability and new forms of presence

One of the key elements in designing effective virtual environments is how interactions between those who inhabit them are promoted. It is not enough for digital spaces to exist; they must be built to facilitate joint work, honest dialogue, and collaboration. These tools, especially in educational contexts, are essential for strengthening shared learning and enhancing the social bonds formed there (Villacís et al., 2023; Perez-Perez & Castro, 2022). In many cases, these environments allow for the development of social and emotional skills that, although it may seem obvious, are not always learned outside the digital realm. These are skills that, when activated, completely transform the way we exist in the virtual world (Roman-Acosta & Barón Velandia, 2023; Diaz, 2023).

However, we are not just talking about chats or video calls. Interaction in the metaverse goes further: it involves occupying a body, moving around, and feeling like you are elsewhere. People communicate and position themselves physically and emotionally within digital worlds through avatars. This, of course, changes the rules of the game. Body language becomes virtual, shared spaces are symbolic, and the sensory experience is multiplied thanks to the combination of images, sounds, and movements. This together produces a closeness that is difficult to achieve in more traditional media (Oh et al., 2018). From the social presence theory, it is understood that these environments favor more complex, emotionally dense relationships, which can improve learning, therapy, and collaborative work. However, this does not happen on its own. The design of these spaces must actively consider dynamics such as empathy and recognition of others (Han et al., 2023).

In this sense, instructional design plays a role that cannot be ignored. When strategies such as gamification are introduced, or truly immersive environments are created, participation levels tend to rise. Not only that but motivation and commitment also improve. Gamification, for example, has proven helpful in learning more and creating community and collaboration among participants. Moreover, that is essential when building meaningful bonds (Mora et al., 2023; González-Yebra et al., 2018).

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Furthermore, allowing users to personalize their experience within the environment—to adapt it to their interests, tastes, and needs—positively affects their relationship with the content and the bonds they form with other people. This personalization ability, especially when accompanied by contextualized feedback, makes interactions more authentic. It also helps to strengthen critical skills that are often better developed in flexible and safe contexts (Vásquez, 2022; Pereda-Loyola & Duran-Llaro, 2023; Cabrera, 2022).

Moreover, all this cannot work well if those who design or mediate these spaces are unprepared. Teacher training and appropriate pedagogical design are essential. Only when there is intentional mediation and trained people can virtual environments truly become settings where valuable relationships are built through interaction and collective learning (Chavarria, 2023; Duarte-Herrera et al., 2019).

Emotional and subjective dimension of the bond

One aspect that most influences how people interact within the metaverse is the ability to customize almost everything, from avatars to the spaces they inhabit. This is not just an aesthetic detail. It directly affects how users see themselves and others. Designing an avatar, choosing where to be, how to move, how to look: all of this is part of a process in which identity is negotiated, and parts of the self are projected that might not exist, or at least not in the same way, in the physical world (Makransky & Mayer, 2022). That freedom of design helps create more authentic, intimate, and human connections, even in the digital realm.

The avatar is not just a visual representation. It is an emotional bridge. It allows users to establish a different relationship with the virtual environment, one that is closer and more effective. The more personalized it is, the greater the user's identification level with the character they have created. Moreover, that, of course, is not neutral: it influences how they act, how they communicate, and how they feel in that digital world (León-Domínguez, 2022; Gárgoles, 2023). The aesthetics, functionality, gestures, and everything that defines the avatar become an extension of the user, or at least a meaningful version of themselves. Moreover, that is where the immersive experience begins to take on depth.

It has been shown that when the avatar resembles the user or faithfully reflects their identity—even if it is a reinvented identity—the sense of empathy, emotional presence in the environment, and connection with others increases. This strengthens emotional bonds and also community ties. There is something there that hooks you, making the experience more real and satisfying (Gárgoles, 2023). Moreover, it is no coincidence that many studies agree that the quality of the user experience has a lot to do with whether they return, stay, and build community (García, 2021; García & Guzmán, 2023; Roman-Acosta, 2023b).

However, it is not all that simple. Some effects are more complex and more ambiguous. Because that same plasticity of identity can generate the opposite: an emotional disconnection, a splitting that ends up fragmenting what the user perceives as their self. Sometimes, a type of exhaustion appears that is not only physical. It is emotional and mental. Studies in neurocognition have shown that affective responses in the virtual world can be as intense as those in the real world but with significant variations depending on the level of immersion and how much control is perceived within the environment (Pan & Hamilton, 2018). Therefore, social bonding in the metaverse is not a flat phenomenon. It is complex, contradictory, and requires constant ethical and pedagogical support.

In some cases, avatars also function as a resource for managing emotions. Being able to choose how to look and how to present oneself can give a sense of control that helps regulate feelings. It is like an emotional self-regulation mechanism that, if well-guided, can reduce anxiety or discomfort and prevent the user from disconnecting completely from the environment (Cabada et al., 2021; González-Hernández & Victoria-Uribe, 2023). The simple act of creating an avatar already becomes a safe, almost therapeutic space. There, you can explore, play, and make mistakes without fear. Moreover, that, especially in education, is hugely valuable. Because when someone feels comfortable with their avatar, it is easier for them to participate, learn, and connect with others (Cobos-Sánchez et al., 2019; Márquez, 2011).

Sociotechnical risks and horizons of responsibility

Although the metaverse has enormous potential, it also intensifies many of the tensions already part of today's digital ecosystem. These are new problems and old inequalities that take on different forms in these environments. The access gap, the use of anonymity to spread hate speech, covert surveillance through algorithms, and the constant extraction of personal data are just some of the conditions that are currently causing concern. These elements force us to rethink sensitive issues: how to protect freedom of expression, what it means to feel emotionally safe in a virtual space, and who has control over the identity projected there (Southgate et al., 2019; Abreu Fuentes & Román-Acosta, 2022).

In regions where structural inequality is more evident, such as in much of Latin America, metaverses risk becoming exclusionary spaces if these gaps are not addressed directly. Many people are left out without sufficient infrastructure and equitable access to technology. The development of public policies that guarantee fundamental digital literacy, along with improvements in connectivity, cannot be delayed any longer if we are

serious about inclusion (Iparraguirre-Bernaola & Huillca, 2023; Ramírez-Herrero et al., 2023).

Another fundamental issue is the design of the platforms themselves. It is not enough to open access; usability must also be considered. Incorporating universal design principles, with accessible interfaces and appropriate assistive tools, is essential to enable people with different abilities to participate on an equal footing. Furthermore, if the metaverse is to play a significant educational role, environments must be able to adapt to a wide range of learning needs without imposing rigid or exclusionary models (Avalos-Pulcha et al., 2023; López-Belmonte et al., 2023).

There is also the increasingly debated issue of algorithmic surveillance. Personal data is collected and processed in many of these spaces without users fully understanding how or why. Therefore, developers and institutions using these technologies must commit to clear transparency policies with specific limits on the use of information. Not only that, but it is also essential to educate users on privacy and digital ethics so that they can exercise greater control over what they share and what they decide to show (O-Miranda & Campos, 2023; Reyes et al., 2023; Meza Ruiz et al., 2023).

In this context, creating culturally responsible virtual spaces requires more than just regulation. It requires collective will. Educational institutions, in particular, face the challenge of opening up spaces for dialogue on the ethical implications of using the metaverse, not from above, but in a participatory manner. Involving the community in the co-creation of these environments is what can ensure that they reflect diversity, respect differences, and do not reproduce exclusions that we already know well (Daimiel et al., 2022; Londoño Valencia et al., 2022).

CONCLUSIONS

The ability to customize avatars and build identities within the metaverse has become central to forming emotional and subjective bonds in these environments. It is not just a visual or technical resource but a way for users to express themselves, recognize each other, and connect. Through their avatars, many people can show aspects of themselves that they may not dare or be able to share in the physical world. This strengthens their sense of belonging, leads to greater autonomy, and allows everyone to construct social space symbolically.

However, this process is not without risks. As environments become more immersive and emotionally intense, specific vulnerabilities also increase. Affective dissociation, digital fatigue, and identity confusion are some of the effects that can arise when boundaries are not established or there is no adequate mediation. All of this undoubtedly impacts the quality of the relationships built there.

That is why the design of these spaces cannot be left to chance. It must be thought out carefully, with critical awareness and an ethical perspective that prioritizes digital inclusion. It is essential to ensure that more people can access these spaces and that no one is left out due to a lack of resources or technological barriers. To achieve this, educational support is needed, but so are political decisions that guarantee a fair distribution of opportunities.

Finally, some elements are non-negotiable if we want these worlds to be truly livable: privacy protection, respect for differences, accessible design, and the ability to regulate one's feelings. Only then can the metaverse become an environment where exploring, learning, and interacting are meaningful experiences, both personally and collectively. And if that is achieved, then yes, we could be talking about a space capable of generating genuine connections and contributing to the well-being of those who inhabit it.

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