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Overcoming digital exclusion: An analysis of virtual reality in contexts of geographic marginalization

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EDITORIAL

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Abstract

This editorial examines how virtual reality (VR) can help overcome digital exclusion in contexts of geographic marginalization. Digital exclusion remains a persistent manifestation of contemporary inequalities, particularly in remote, rural, and peripheral territories where limited infrastructure restricts access to digital services and visibility. Contrary to the perception of VR as an elitist technology, this analysis argues that, when designed with local contexts in mind, immersive technologies can reduce spatial barriers, enhance social visibility, and expand access to education, training, entrepreneurship, and cultural representation. VR is discussed as a socio-technical tool that can foster inclusion, empowerment, and territorial recognition rather than reinforce existing divides.

Keywords

Digital exclusion, Virtual reality, Geographic marginalization, Social inclusion, Immersive technologies

1. Introduction

Digital exclusion remains one of the most persistent expressions of data-related inequalities. The concept of geographic marginalization is used to describe the condition of territories and populations that, due to their spatial location, remain distant from major economic, political, and social flows, such as remote rural areas where limited access to infrastructure reinforces asymmetries in technological access (De Castro Romano Junior et al., 2025). In this context, virtual reality is often perceived as an elitist resource, poorly aligned with the realities of technological scarcity. Nevertheless, this perception deserves to be questioned.

Although technology was created with the promise of connecting people, it has also deepened existing divides. Access is unevenly distributed. While high-speed internet is taken for granted by many residents of large cities, this reality remains distant in remote or peripheral areas.

Amid rapid technological advancement mediated by platforms, applications, and online services, the absence of a recognized address creates barriers to making purchases, registering for services, and accessing basic provisions. Notably, Google Street View subtly yet powerfully reinforces territorial invisibility when it fails to capture everyday pathways in peripheral regions, such as islands. Because the platform depends on formalized roads, accessible routes, and urban standards, community trails are simply excluded from the visual map.

In practice, this means that the island cannot be virtually traversed. There are no navigable streets, no spatial continuity, and no visible daily life. To outsiders, the island appears as a void—an interrupted or nonexistent space. This distinction produces a form of exclusion: those who are connected fully participate in digital life, while those who do not remain on the margins, even while living within a digital society. Overcoming this divide requires more than technological innovation. It demands public investment, digital inclusion policies, and the recognition that access to high-quality internet is not a luxury but an essential condition for social, economic, and civic participation.

Virtual reality is not, by definition, exclusionary. What makes it inaccessible are implementation models that disregard local contexts, institutional capacities, and social needs. When designed according to centralized, market-oriented logics, technology tends to deepen inequalities. However, when integrated into strategies aimed at overcoming digital exclusion, virtual reality can open new pathways for access to knowledge, professional training, and social participation in historically marginalized territories.

In contexts of geographic marginalization, virtual reality can serve as a means of overcoming physical barriers. Immersive environments make it possible to simulate educational experiences, technical training, and management scenarios that would otherwise be inaccessible due to distance, cost, or the absence of local infrastructure. For isolated populations, this represents both technological innovation and a tangible expansion of opportunities.

Virtual reality can be used as a tool of displacement and politics: it does not physically move people, but it can shift the world's gaze toward them. Rather than keeping marginalized populations merely as objects of study or intervention, the technology makes it possible to place them at the center of visibility, as producers of narratives, experiences, and knowledge. Moreover, VR changes who tells the story. When communities participate in the creation of virtual experiences, they cease to be represented by others and begin to represent themselves. This includes showcasing ways of life, traditional knowledge, productive practices, cultural landscapes, and real challenges, such as a lack of infrastructure or environmental risks. The margins are no longer silenced and begin to speak in the first person.

In this context, virtual visibility generates social and economic value. Immersive experiences can support community-based tourism, cultural preservation, and even participatory urban planning. By making territories visible and understandable, virtual reality helps attract attention, resources, and public policies without requiring people to leave their places of origin in order to be recognized.

360-degree visualization has the power to transform little-known places into spaces that are visible, understood, and valued. By allowing anyone to virtually "enter" a territory, this technology breaks geographic barriers and fills gaps left by traditional mapping platforms, as is often the case in islands and hard-to-access areas. Instead of relying solely on physical

presence or conventional platforms, entrepreneurs can present their businesses in immersive formats, creating direct connections with external audiences (Paiva de Oliveira et al., 2026).

First, these technologies expand market reach. A small business located on an island, in a rural community, or in a peripheral region can be virtually visited by customers, partners, and investors from anywhere. Restaurants, guesthouses, tourism activities, workshops, fairs, and cultural experiences can be explored in 360 degrees, reducing the distance between the territory and the consumer. Second, the immersive experience generates trust and authenticity. Unlike isolated photographs or promotional texts, 360-degree visualization allows visitors to see the real environment, the productive context, and the relationship with the territory. Third, VR can support skills development and entrepreneurial innovation. Virtual environments enable training, service simulations, process organization, and skill development without high costs or the need for physical travel.

2. Conclusion

This discussion highlights that overcoming digital exclusion in contexts of geographic marginalization requires more than technological availability; it demands inclusive governance, public investment, and context-sensitive implementation strategies. Virtual reality, when detached from purely market-driven and centralized logics, emerges as a powerful socio-technical tool capable of reducing spatial barriers, enhancing territorial visibility, and fostering social, economic, and cultural inclusion. By enabling immersive access to education, training, entrepreneurship, and self-representation, VR can reposition marginalized communities from the periphery to the center of digital life. Ultimately, virtual reality should be understood not as an inherently elitist technology but as a catalyst for empowerment, recognition, and sustainable development when aligned with inclusive digital policies and local needs.

Conflict of Interest Declaration

The author has no conflicts of interest to declare or financial interest to report.

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