INCLUDERE: A Mobile-VR Demo for Inclusive, Empathy-Oriented Storytelling

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Abstract. *INCLUDERE is a six-minute, culturally grounded mobile-VR experience that invites visitors to* inhabit*—rather than merely observe—the spatial, sensory, and social frictions shaping disabled life in Brazil. The journey unfolds through six metaphor-driven vignettes (autism, dwarfism, visual, motor and hearing impairments, plus an intersectional finale), each pairing a tailored interaction mechanic with stylised volumetric live-action footage running in real time on Meta Quest headsets.*

1. Overview and Objectives

Technological advances have positioned VR as a powerful engine for perspective-taking and pro-social attitude change [Slater and Sanchez-Vives 2016, Herrera et al. 2018, Ahn et al. 2016], including in domains such as disability awareness [Zorzi et al. 2024]. Yet Latin America—Brazil in particular—lacks Portuguese-language, culturally grounded experiences that address inclusion through first-person immersion. *INCLUDERE* addresses this gap by weaving six metaphor-driven vignettes that let visitors feel how architectural, social and attitudinal barriers shape everyday life. The project aims to design, deploy, and preliminarily validate a mobile-VR experience that fosters affective and cognitive empathy, guided by three research questions on mitigating cybersickness, measuring empathic gains, and extracting transferable design lessons for Brazilian audiences.

2. Experience Design

The narrative unfolds across six tightly scoped scenes, each binding a disability perspective to an iconic interaction and a salient sensory hook to sustain performance and presence on standalone headsets.

Scene 1 — Spectrum (Autism) (Figure 1). Abstract strokes and an urban-noise crescendo visualise sensory overload often reported by autistic people, establishing the empathy premise through calibrated discomfort.

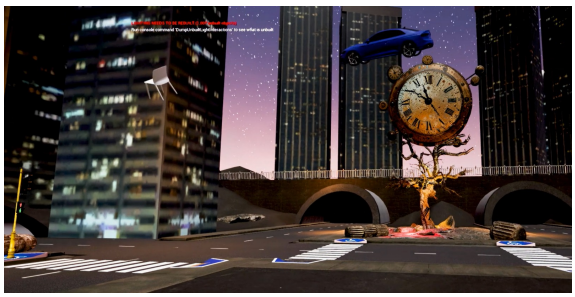

Figure 1. Abstract strokes and a crescendo of urban noise visualise sensory overload often reported by autistic people.

Scene 2 — Microworld (Short stature) (Figure 2). An oversized bedroom and a cat wearing a Braille tag ("sorte") foreground everyday spatial challenges; attempts to dismount the bed end in a clumsy fall beneath it.

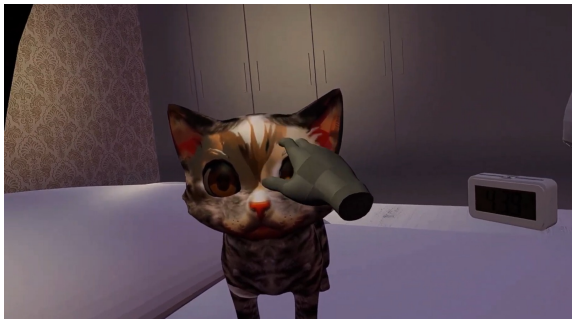

Figure 2. A cat wearing a Braille tag and an oversized bedroom set highlight everyday spatial challenges experienced by people of short stature.

Scene 3 — Echoes (Visual impairment) (Figure 3). In darkness, a glowing cane and musical paw-prints create an auditory–haptic trail that rearranges into a Braille warning before a wheel-shaped portal extracts the user.

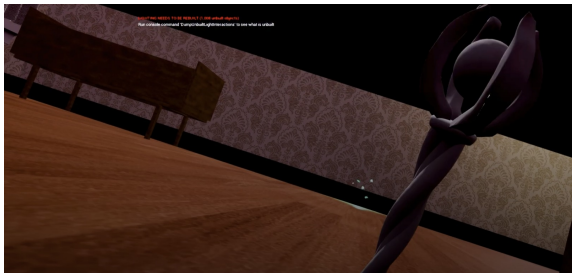

Figure 3. Luminous paw prints and a glowing cane create an auditory–haptic trail through darkness, evoking orientation techniques used by visually impaired individuals.

Scene 4 — Momentum (Motor and Deaf experience) (Figure 4). A hand-propelled wheelchair on a cobblestone lane culminates in a tip-over; surrounding avatars

communicate solely in Libras (e.g., “Are you okay?”, “Call an ambulance!”), and framing conveys social disempowerment.

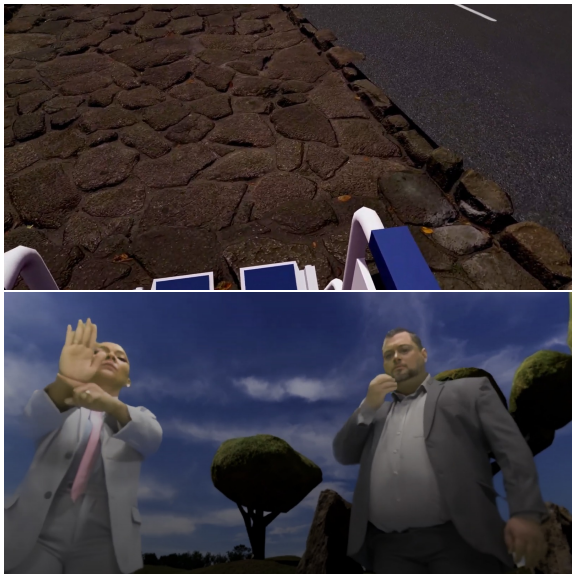

Figure 4. A cobblestone lane and a hand-propelled wheelchair immerse the user in motor and Deaf perspectives; surrounding avatars communicate solely in Brazilian Sign Language.

Scene 5 — Eyes in the Void (Sensory crescendo) (Figure 5). A starless void fills with watchful eyes and spiralling cacophony until everything detonates in a flash, bridging tension into the finale.

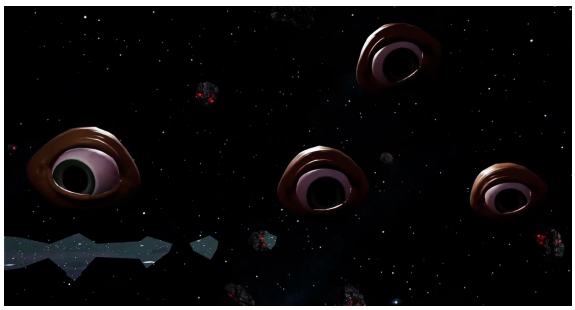

Figure 5. A star-field of watchful eyes and a swirling soundscape intensify to a climactic flash, bridging tension into the closing scene.

Scene 6 — Garden of All (Intersectional finale, live action) (Figure 6). Five real people (short stature, autistic adult, wheelchair user, Deaf signer, visually impaired individual) appear; the Deaf participant signs—now with captions and voice-over—“The world should be designed for everyone, don’t you think?” Flowers bloom, music swells, and the scene dissolves to white.

A two-minute pre-show acclimates newcomers to 6-DOF VR with hand-tracking tutorials and diegetic narration to reduce presence breaks [Meta Platforms Inc. 2025, Cahill and Cummings 2023].

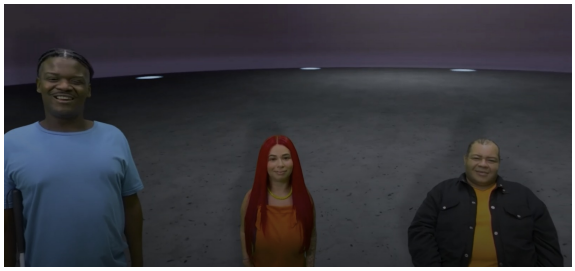

Figure 6. Live-action performers representing diverse disabilities invite a reflective moment as flowers bloom and the world fades to white.

2.1. Accessibility and Comfort

Hand-tracking replaces physical controllers throughout; locomotion combines arm-swing with teleport failsafes, with a teleport-only option for motion-sensitive users [Jerald 2015]. Accessibility safeguards include colour-blind safe palettes, closed captions, adjustable vignette masks to limit peripheral motion—shown to reduce sickness—and skip buttons for users who prefer not to experience specific scenes [Jicol et al. 2023, Dudley et al. 2023].

3. Technical Implementation and Deployment

INCLUDERE runs entirely offline on Meta Quest 2/3, relying on the Meta Interaction SDK so that controllers are not required [Jerald 2015, Meta Platforms Inc. 2025].

The primary deployment uses itinerant headsets on swivel chairs within a controlled $3 \times 3\,\mathrm{m}$ zone, with trained attendants handling hygiene, triggering, and seated assistance. Builds are fully offline; no user data are stored or transmitted.

4. Formative Evaluation

A first formative test with nine adults (mean age 29.4; 21–37) experienced the full six-scene build on Quest 2 while seated and unassisted, then completed an anonymised Portuguese questionnaire (closed and open items). All nine would recommend the experience. Seven reported complete comprehension of the metaphors (two, partial—mainly the Microworld scale shift). Seven rated navigation/interaction as accessible; two cited brief hand-tracking loss or difficulty propelling the wheelchair. Seven felt representations were respectful; two asked richer context for dwarfism. Six believed the experience deepened understanding; three agreed only partly, noting that six minutes felt brief for reflection.

Across categories, message comprehension, respectful representation, and accessibility exceeded 75% positive responses, while technical difficulties split opinion (44% negative), guiding subsequent refinements.

Semi-structured interviews with nine stakeholders (20–35 min, May 15–June 3, 2025) were thematically analysed by two researchers following Braun and Clarke's reflexive thematic-analysis procedure [Braun and Clarke 2019]. Three recurrent themes emerged: embodied empathy ("I felt the limitation first-hand"), scene-specific friction (impactful but disorienting darkness/sound in Spectrum; powerful but tiring wheelchair mechanics), and desire for greater agency in scenes such as *Echoes*.

5. Design Implications, Limitations, and Next Steps

Immediate refinements include a calibrated brightness pass in *Spectrum*, a wheelchair-assist toggle (continuous arm-swing vs. discrete trigger pushes) to reduce fatigue, unobtrusive diegetic prompts in *Microworld*, and a short reflection hub after the finale. The small, convenience sample and bespoke items are acknowledged limitations; a forthcoming public beta (target ≥ 60 visitors) will combine standardised instruments (TEQ, IPQ) with interviews to strengthen the evidence chain.

6. Conclusion

INCLUDERE chains multiple embodiments into a single, culturally resonant arc, positioning VR not as spectacle but as a tool for civic reflection—balancing narrative ambition, technical rigour, and ethical accountability from the headset runtime envelope to the exhibition kiosk [Slater and Sanchez-Vives 2016].

By letting people inhabit (not just observe) the spatial, sensory, and social frictions of disability through six short, metaphor-driven VR vignettes—autism, short stature, visual and motor/hearing perspectives, and an intersectional live-action finale—this experience reframes disability from an individual deficit to a societal design problem. Its culturally grounded, Portuguese-language narrative normalizes Libras and wheelchair mechanics in everyday contexts; its inclusive interaction choices (hand-tracking, comfort/skip options, captions) model universal design in practice; and its formative evaluation indicates high comprehension, perceived respect, and willingness to recommend—signals that it can shift attitudes rather than merely entertain. If deployed in schools, museums, and public services, it should become a replicable tool for empathy-building, staff training, and policy dialogue: reducing stigma, challenging paternalistic stereotypes, and catalyzing concrete commitments to accessibility ("the world should be designed for everyone"). In short, it helps move society from awareness to action—crucial to dismantling the attitudinal and architectural roots of ableism.

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