Surveying Accessibility Features in VR Applications for Meta Quest 3

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Abstract

Virtual reality (VR) delivers immersive and engaging experiences, yet accessibility remains a significant barrier for users with disabilities. Although prior research has identified key challenges and proposed solutions, it is unclear whether the advances have been adopted in real-world applications. We systematically evaluated current accessibility in Meta Quest 3 applications, analyzing interaction modes and support for mobility, auditory, visual, and cognitive impairments. Our findings reveal significant gaps: many apps lack critical accessibility features, particularly for vision, fine motor control, and audio accessibility, which are absent or minimally supported. This inconsistency suggests that accessibility is often treated as an optional enhancement rather than a core requirement. These results underscore the urgent need for standardized accessibility guidelines and inclusive design practices in VR development.

CCS Concepts

• **Human-centered computing** → **Accessibility systems and tools**.

Keywords

Virtual Reality, Accessibility, Software Review, Meta Quest 3, Inclusive design, Gaps in VR Design

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1 Introduction

Virtual reality (VR) offers transformative potential across multiple domains, providing unique opportunities for users with disabilities through experiences like virtual travel and sensory substitution [7]. However, despite growing adoption, accessibility implementation remains inconsistent [11]. While previous research has documented accessibility gaps in earlier platforms [4, 6, 11], it remains unknown whether these issues persist on newer hardware like Meta Quest 3, particularly for underrepresented needs such as one-handed interaction.This study evaluates 33 commercial VR applications on Meta Horizon and Steam using Quest 3, assessing mobility, vision, hearing, and cognitive accessibility. Building on existing guidelines [6, 11], we investigate whether market dominance translates to accessibility progress.

2 Related Work

In contrast to other technologies, there are few guidelines for VR accessibility [11]. This lack of easily accessible resources likely plays a part in low adoption of VR accessibility [4].

Heilemann et al. [6] developed a set of guidelines derived from non-VR guiudelines. Additionally, the W3C guidelines [12], the Meta VR Accessibility Guidelines [8, 9], and the BBC XR Accessibility research [1] all propose partial solutions to address accessibility barriers in VR but are not all encompasing or commonly implemented in current VR applications [11]. While Naikar et. al. examined 106 free Meta Quest 2 apps, revealing that 36.8% lacked any accessibility features [11]. While existing studies reveal implementation gaps, we investigate whether Meta's market-leading position [5], translates to enhanced accessibility in their newest Quest 3 system.

3 Methodology

To assess the current state of accessibility, we conducted a systematic review of 33 VR applications available on two major platforms (Meta Horizon and Steam) on the Meta Quest 3. Our evaluation was guided by a structured list of accessibility features to look for in the applications derived from established standards, including Meta's

accessibility guidelines [3] and previous research in inclusive design in applications [6, 11]. By synthesizing these guidelines, we developed a consistent evaluation rubric, enabling systematic data collection and comparative analysis across applications. Due to limited guidance on upper-body mobility, we focused on practical controls for limited dexterity (e.g., one-handed operation, controller switching, reduced grip needs) which yielded 23 core features (Table 1).

The evaluation of VR applications followed a standardized testing protocol to ensure consistent assessment of accessibility features. Each application was launched natively through the Meta Quest 3 interface, with screen recordings capturing both gameplay interactions and menu navigation. During testing, real-time audio commentary documented first-hand experiences with accessibility implementations while exploring the application's core functionality and tutorial systems. Notably, feature documentation adhered to relevant criteria—only functionalities essential to an application's core interaction model were recorded (e.g., spatial movement controls were omitted for stationary experiences like Beat Saber, where positional tracking is unnecessary for gameplay). This approach maintained methodological rigor while accounting for genre-specific design paradigms across the sampled applications.

4 Results and Discussions

Table 1 shows that fewer than 20% of apps include basic accommodations like closed captions (19%) or difficulty modes (6%), despite these being well-documented needs [10]. This compliance crisis persists even for fundamental motor accessibility features; teleportation (36%) and in app height calibration (15%) remain rare being essential [3].The results also highlight a critical gap in both research and implementation regarding upper-body motor accessibility in VR. Our findings reveal how one-handed operation (45%) and finger-specific accommodations (such as grip styles at 12%) remain dangerously overlooked.Haptic feedback was the most implemented accessibility feature (58%), while vision and audio options lagged significantly: magnification (6%), label visibility (6%), independent volume control (9%), and closed captions (19%). These adoption rates fall far below established accessibility guidelines [2, 3], highlighting a substantial gap between recommended and actual practices. The pattern suggests developers either lack awareness of requirements or prioritize them inadequately without mandated standards.

5 Limitations and Future Work

The analysis was confined to Meta Horizon and Steam, excluding newer platforms like PSVR2 which may employ different accessibility approaches. The reliance on researcher evaluation rather than testing with disabled users may have overlooked practical usability issues, such as fatigue in one-handed modes. Future work should prioritize participatory methods involving disabled communities, especially users with intersecting needs (e.g., vision and motor impairments). Expanding platform coverage to include Pico, Vive XR, and PSVR2 would help determine whether accessibility gaps are platform-specific or industry-wide.

Table 1: Accessibility Feature Implementation Across Application Categories

Category	Accessibility Feature	# With Feature	# Relevant Apps	% Available
Motion	Snap turn feature/Smooth	16	25	64.00
	Snap turn angles	16	25	64.00
	Crouching control	13	26	50.00
	Movement controls provided	15	25	60.00
	Teleportation	9	25	36.00
	Calibrating height	5	33	15.15
	Pointing to interact with objects far away	4	25	16.00
Mobility: One Hand	Could be played 1-handed	15	33	45.45
	Switch Left/Right dominant controllers	17	33	51.52
Mobility: Fingers	The side trigger not used	4	33	12.12
	Doesn't require the thumb/index to be used	2	33	6.06
	Provides Grip styles	3	33	9.09
Vision	Haptic feedback	19	33	57.58
	Magnification feature	2	33	6.06
	Showing/Hiding button labels	2	33	6.06
Audio	Volume adjustment	3	33	9.09
	Closed captions available	6	32	18.75
	Audio help with tutorial	6	32	18.75
Cognitive	Task-based tutorial	11	33	33.33
	Changing difficulty	2	30	6.67
	Detailed tutorial provided about the goals of the game	24	32	75.00
	Assisted gameplay mode	6	33	18.18

6 Conclusion

This study systematically evaluated the accessibility of 33 commercial VR applications, revealing significant gaps across all disability categories—particularly in upper-body motor, visual, and auditory accommodations. Critical features like tutorial, teleportation, and single-handed operation either absent or underdeveloped. These findings underscore a critical disconnect between recommended practices and real-world adoption, highlighting the limitations of voluntary compliance. Without mandated standards, accessibility will continue to be treated as optional rather than foundational, perpetuating exclusion.

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