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Translation and Reception of Culture-Loaded Terms: A Multimodal Intercultural Communication Study of the Qi Culture VR Museum

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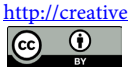

Abstract

This study investigates how VR technology transforms the translation of culture-loaded terms from linguistic conversion to multimodal meaning production. Using the "Qi Culture VR Museum" as a case study, we demonstrate that VR enables an active process of meaning reconstruction through "perceptual construction" and "context generation." By integrating multimodal analysis with critical theory, this research develops an "immersive translation" model to analyze how concepts like "Jixia Academy" are encoded in VR. Findings indicate that while increasing immersion, VR also subtly shapes cultural cognition through its technological framework. This interdisciplinary work connects translation, media, and cultural studies, offering new insights for digital heritage communication and critical perspectives for cultural digitization. Note: This study does not analyze user-response data; thus, "reception" is treated as an inferred construct based on design analysis rather than an empirically measured outcome. This interdisciplinary work connects translation, media, and cultural studies, offering new insights for digital heritage communication and critical perspectives for cultural digitization.

Subject Areas

Cross-Cultural Communication

Keywords

Culturally Loaded Words, Multimodal Reconstruction, VR Museum, Immersive Translation, Media Theory, Critical Discourse Analysis

1. Introduction

1.1. Research Origin: The Paradigm Shift in Digital Media Revolution and Cultural Heritage Communication

The protection and dissemination of global cultural heritage are undergoing a profound transformation driven by digital technologies. Virtual Reality (VR), as a cutting-edge technology, has evolved from a display tool into a narrative medium capable of reshaping cultural cognition and experience. This shift marks a fundamental change in the paradigm of cultural heritage communication: from reliance on static texts and two-dimensional images to the dynamic construction of immersive, multisensory experiences. As revealed by Li Ziqi's successful cross-cultural outreach through intersemiotic translation in videos, the transmission of cultural meaning in the "age of image reading" increasingly depends on the collaborative narrative of multimodal symbols (Zhao, 2025) [1]. Against this backdrop, projects such as the "Qi Culture VR Museum" have emerged. They are not merely digital archives of artifacts but experimental fields that attempt to reconstruct historical contexts and cultural narratives through VR. This prompts us to reflect: when culture-loaded terms (Liu, 2025) [2]—defined here as words or phrases that carry culturally specific meanings, values, or references not easily transferable across languages—such as "Dao follows nature" or "Jixia Academy", which carry unique ethnic and cultural connotations—are placed within virtual spaces woven from code, 3D models, and interactive logic, what revolutionary changes occur in the underlying mechanisms of their cross-cultural communication? This study is situated precisely at the intersection of this digital media revolution and paradigm shift.

1.2. Core Question: How Does VR, as a "Translation Medium," Reconstruct the Meaning of Culture-Loaded Terms?

Based on the above context, the core concern of this study is to analyze the intrinsic operational logic of VR technology as a new type of "translation medium." Traditional translation theories, whether the three-dimensional transformation (linguistic, cultural, communicative) of eco-translatology (Sheng, 2025) [3] or the triadic synergy model of "text-image-translation" in picture book communication (Mao & Chen, 2025) [4], struggle to fully encompass the complexity of meaning reproduction for culture-loaded terms in VR environments. In VR, "translation" has transcended the equivalent conversion between linguistic signs and evolved into a systematic project of re-embodiment and re-contextualization within virtual space. Therefore, this paper poses the core research question: How does the VR medium, through its unique technological attributes and multimodal architecture, reconstruct, encode, and transmit the meaning of culture-loaded terms? Specifically, this study will investigate: (1) how visual, auditory, spatial, and interactive modalities in VR environments collaborate to achieve "perceptual construction" of abstract cultural concepts; (2) while enhancing immersion and reducing "cultural discount," whether this technologically mediated translation har-

bors new interpretive frameworks or ideological biases imposed by the technological logic itself; and (3) what challenges and expansions this process poses to core concepts in traditional translation theory, such as "fidelity" and "equivalence."

1.3. Integrated Theoretical Lenses

To deeply examine the above questions, this study will construct an interdisciplinary theoretical analytical framework integrating the following three perspectives:

1.3.1. Social Semiotics and Multimodal Discourse Analysis: Deconstructing the Grammar of Meaning Construction

This study is grounded in the social semiotics and visual grammar theory of Kress and van Leeuwen (1996/2020). This theory treats language, image, sound, layout, action, etc., as signifying resources produced within sociocultural contexts. We consider the entire VR experience as a "multimodal text" and employ its three metafunctions—representational meaning (narrative and conceptual representation), interactive meaning (establishing connections with users through perspective, distance), and compositional meaning (information value, salience, framing)—to systematically analyze how various signs in the "Qi Culture VR Museum" are organized and collaboratively construct specific narratives about Qi culture. This provides a refined operational toolkit for deconstructing the "grammar" of complex meaning production in VR.

1.3.2. Media Ecology Perspective: "The Medium Is the Message"—VR as a Perceptual Environment

Drawing on Marshall McLuhan's classic dictum "the medium is the message," this study emphasizes the fundamental shaping influence of the VR medium's form on communicated content. VR not only transmits content; its immersiveness, interactivity, and spatial narrativity themselves constitute a new perceptual and cognitive environment (Díaz-Kommonen *et al.*, 2024) [5]. It alters the physical and mental modes through which users receive and process cultural information. For example, the experience of "strolling" through the Jixia Academy in VR differs fundamentally from reading a textual description or viewing a flat image in terms of the cognitive pathway to understanding concepts like "academic freedom" or "contention of a hundred schools of thought." This perspective requires us to focus on how VR, as an "environment," subtly prescribes the ways in which culture is experienced and understood.

1.3.3. Critical Theory: Attending to the Ideology and Power Relations of Technology

To avoid falling into the optimistic imagination of technological determinism, this study introduces a critical theory perspective to examine the power relations and cultural politics potentially naturalized within VR translation. On one hand, drawing on Stuart Hall's encoding/decoding theory, it analyzes the cultural presuppositions, historical perspectives, and ideologies embedded during the production (encoding) of VR content, and considers the possible negotiated or op-

positional readings by users (decoding). On the other hand, it reflects on Walter Benjamin's discussion of the withering of "aura" in the age of mechanical reproduction (Benjamin, 1969) and its new form in the digital reproduction era: does the "simulated" reality created by VR reconstruct a new cultural authority and "digital aura," or does it foster a more egalitarian and open interpretive community? This perspective ensures the necessary reflexivity and critical depth of the research.

1.4. Research Methodology: Critical Multimodal Textual Analysis Based on Publicly Available Materials

Given the limited direct access to the complete internal design materials of the "Qi Culture VR Museum," this study adopts critical multimodal textual analysis based on publicly available materials as its core research method. The research materials primarily include: (1) officially released promotional videos, demo videos, user interface screenshots, and introductory texts of the project; (2) publicly available user experience reports, media reviews, and related academic discussions; (3) research literature on analogous VR cultural heritage projects (e.g., the "Pop-up-VR Museum" of the Design Museum Helsinki) for indirect comparison and theoretical reflection (Díaz-Kommonen *et al.*, 2024) [5]. The analysis process will proceed in three steps: Firstly, identifying the core culture-loaded terms involved in the target VR experience and their typical occurrence scenarios. Secondly, applying multimodal discourse analysis methods to conduct a meticulous, "slow-motion" decomposition of these scenarios, describing the presentation methods of various modal elements and their synergistic, complementary, or tension-filled relationships. Finally, combining the critical theory perspective to interpret the potential technological logic, narrative strategies, and cultural-ideological implications behind this multimodal construction, thereby answering the core question of how VR operates as a translation medium.

2. VR as a Translational Apparatus

2.1. Case Presentation and Textual Definition

The essence of a VR museum is not that of a neutral "container," but rather an apparatus for active meaning production. Through the precise coordination of its three core systems, it accomplishes a translation from "cultural ontology" into a "controlled experience." This process is filled with selection, emphasis, and omission, representing a new form of cultural representational practice enabled by contemporary digital technologies. The interface system introduces and acclimatizes through semiotic means, establishing the cultural tone and operational logic. The spatial system structures and solidifies through materialization, providing a stage for narrative and authoritative visual evidence. The interactive system guides and internalizes through ritualized methods, allowing users to personally "perform" and ultimately "identify with" the predesigned meanings through embodied practice. The core function of VR as a translational medium lies precisely in

the synergy of its interface, spatial, and interactive systems. It transforms the complex cultural ontology of Qi culture into an immersive, multimodal, and interactive textual form, offering users a comprehensive pathway for cultural experience.

2.2. Visual Anchoring and Reification

As a formless and imageless philosophical category, the "Dao" must be endowed with a visual form in VR. Conversely, "Li"—a system of social norms—is materialized into arrays of ritual vessels, ceremonial spaces, or behavioral flowcharts. By gazing upon these "congealed rituals," users subconsciously internalize the underlying hierarchical logic. Spaces representing the Dao may employ diffuse volumetric lighting, suggesting its omnipresence, while spaces for Li utilize directional parallel light to reinforce the rigor of order. Symbols of the Dao are often placed at the center of a circular space or at the terminus of a sightline axis, compelling the user to circumnavigate or approach—a metaphor for the process of "seeking the Dao." In contrast, displays of Li predominantly adopt symmetrical layouts, positioning the user along the central axis, thereby replicating the "host–guest hierarchy" of traditional sacrificial ceremonies. Through the coordinated design of 3D models, lighting, and composition, the VR visual system anchors and reifies abstract concepts and institutions such as the Dao and Li in Qi culture, transforming them into visual objects that are both contemplative and perceptible.

2.3. Spatial Narrative and Disciplinarity

In the VR museum, space is not a static container but a dynamic narrative apparatus and disciplinary system. Through the coordinated operation of path design, viewpoint control, and spatial scale, it guides the user's bodily movement and line of sight, thereby imperceptibly constructing a specific historical cognitive framework and power order. Paths weave the politics of time: In the Qi Culture VR Museum, user movement is guided through a predetermined itinerary, including one-way passages and mandatory nodes, as observed in the promotional videos. This design choice echoes findings from other VR heritage projects, such as the Pop-up-VR Museum (Díaz-Kommonen *et al.*, 2024) [5], where similar linear pathways were used to structure user experience. Users are encouraged to move toward reinforced narrative cores (e.g., royal rituals), while marginal narratives (e.g., daily life of commoners) become negligible backgrounds. This design constitutes a "narrative hegemony" under the illusion of democratic exploration. Viewpoints allocate the power of the gaze: Through differentiated designs of upward, level, and free perspectives, the connotative expression of different cultural scenes is intensified. The virtual reconstruction of spatial scale facilitates the transformation of the user's emotional perception of Qi culture into value-based cognition. Scale encodes the order of values: VR can arbitrarily distort spatial proportions to serve narrative purposes—for instance, enlarging weapon models to emphasize martial traditions, while reducing the scale of everyday objects to downplay ordinary narratives. This "politics of scale" etches judgments of cultural value

into the very fabric of spatial perception. Together, these three elements transform the user's body into both an actor in the narrative performance and a carrier of ideology.

2.4. Auditory Evocation and Affective Endowment

The auditory system functions as an independent apparatus for emotional encoding and ideological infusion, operating through a layered structure: environmental sound establishes authentic atmosphere, narration carries cultural information with emotional tone, and music elevates overall emotional depth. Environmental sound acts as an invisible spatial guide. Sound orientation, distance, and reverberation are deliberately designed—clear and directional at key narrative points, while blurred and backgrounded in secondary spaces—subtly guiding user attention through acoustic topology. Narration persists as a constant auditory presence, even during "free exploration," continuously anchoring scattered visual experiences within a unified interpretive framework and correcting potential cognitive deviations. Music culturally encodes abstract values through melody, harmony, and instrumentation. For example, the theme for "Dao" may use ethereal tones, pentatonic scales, and natural sounds to evoke metaphysical detachment, while the theme for "Li" employs regular rhythms and metallic resonance to symbolize order and authority. Ultimately, the VR auditory system assigns specific emotional values to visual symbols, enabling users—through the dual-channel experience of "vision + hearing"—to deepen their perception and understanding of cultural essence, thereby achieving affective construction of the multimodal text.

2.5. Interactive Interpretation and Relational Definition

Interaction modes are by no means merely technical interfaces; they constitute a grammatical system that defines the power relations between users and cultural objects. Actions such as clicking, grabbing, and walking—through their physical metaphors, degrees of operational freedom, and feedback mechanisms—subtly shape the user's posture toward cultural heritage. Whether it is "veneration," "interactive engagement," or "exploration" is essentially pre-scripted by interaction design as a cultural relationship narrative. The "gaze + light touch" mode is suited for sacred cultural objects, using distance and a sense of ceremony to establish a relationship of veneration. The "grab + manipulate + observe" mode is suited for practical artifacts, using closeness and playfulness to establish a relationship of interactive engagement. The "free movement + multi-dimensional interaction" mode is suited for complex scenes and abstract concepts, using openness and depth to establish a relationship of exploration. The integration of multiple modes enables the dynamic transformation of the relationship between users and cultural objects, driving the systematic construction of cultural cognition. The most profound ideological effect of VR interaction lies in its ability to make users physically enact, with their own bodies, how cultural heritage ought to be treated in the digital age—as both an immersive "spectacle" and a "datafied object" that must be

kept at a safe distance. This unity of body and cognition is precisely the ultimate power of interaction as a technology of cultural politics.

2.6. Close Reading of a Qi Culture VR Museum Scene: The Jixia Academy

In the VR representation of the Jixia Academy, users begin at the entrance of a traditional courtyard, marked by a wooden archway inscribed with animated Chinese characters. As users walk through the gateway, spatial audio transitions from ambient nature sounds to distant scholarly discussions. The architectural layout follows a bilateral symmetry, guiding users toward a central lecture hall. Inside, virtual scholars are seated in rows, their postures static but gaze directed toward an empty teaching position, suggesting ongoing discourse. Users can approach and "listen" to explanations triggered by proximity. The visual modality uses warm lighting to evoke a sense of intellectual vitality, while interactive elements allow users to pick up and examine replicas of bamboo slips. This scene illustrates how spatial, auditory, and interactive modes jointly construct the meaning of "academic freedom" and "philosophical debate" associated with the Jixia Academy, transforming an abstract historical concept into an embodied experience.

3. Critical Scrutiny

3.1. The Illusion of Transparency

"Immersion" is the central pursuit of contemporary digital technology—from video games to virtual reality, from augmented reality to metaverse narratives, all strive to create the perfect illusion of "being elsewhere." The ultimate goal of this experience is to make users perceive an illusion of transparency of the medium: as if they are not accessing content through complex hardware and software systems, but are directly "inside" that world. Recognizing the ideological function of immersion is not to deny immersive technology itself, but to call for the cultivation of a critical immersive literacy.

The most effective ideology is not one that imposes a worldview upon us, but one that makes us forget there are other ways of seeing the world. In fact, the "immersion" of VR is itself a technologically constructed cognitive experience, behind which there always exists a power dynamic of "who presents, what is presented, and how it is presented." The so-called "transparency" is merely technology, by intensifying immersion, concealing the traces of content selection and meaning simplification, thereby rendering the ideological tendencies of the technology "invisible."

3.2. Do Gamified Tasks, Linear Processes and Seamless Interactions Reduce Complex Cultural Experiences to a Form of Consumerist "Digital Sightseeing"

This process constitutes a systematic taming of culture, transforming an inherently ambiguous, tension-rich domain into a streamlined and controlled con-

sumption pipeline. It fosters a "tourist" mentality driven by efficiency and instant gratification, rather than cultivating the deeper, more reflective engagement of a "pilgrim" or "researcher." Through gamified tasks and seamless interaction, VR achieves an entertainment-driven domestication of experience. The true engagement with a culture like Qi culture should be intellectually demanding—requiring contextual understanding, reflection on its spiritual and institutional dimensions, and active interpretation of complex symbols. Instead, the designed linear pathways predetermine the user's route, restricting autonomous exploration and packaging culture into standardized "experience packages." This reflects a logic of cultural commodification, where the user is molded into a consumer-subject: desires, satisfaction, and participation are predefined by the gamified system. Users perceive freedom through the choices the system permits, and derive satisfaction from goals the system validates—a cycle that naturalizes the very constraints it imposes.

3.3. Whose Authoritative Gaze Is Implied in the First-Person Perspective and Fixed Narrative Lines? To What Extent Is the User's "Autonomy" Predesigned

This perspective design is, in essence, a "hegemony of perspective." The authoritative gaze of the first-person perspective is a collaborative construct of developers, narrators, and the technological system. It grants users the illusion of "subjectivity," while in reality, it anchors them firmly to a strictly defined position as a viewing/experiencing subject. This position is precisely the point of ideological access. The user's first-person experience is, fundamentally, a process of "personally experiencing" a technologically constructed cultural scene along this fixed narrative line, thereby accepting the specific value positioning assigned to Qi culture by the mainstream ideology. What is even more deserving of critique is that the user's so-called "autonomy" is, in essence, a technologically pre-designed "illusory autonomy." The VR museum appears to grant users the rights of "autonomous movement, autonomous interaction, and autonomous observation." However, this autonomy is always confined within the boundaries preset by the technology—users can move autonomously, but only along preset paths; users can interact autonomously, but only through preset interactions; users can observe autonomously, but only what is preset for them to see. True autonomy begins with the awareness of and interrogation into this very framework.

3.4. The Fading of Cultural *Aura* and the Emergence of Digital Spectacle

VR technology's reproduction and representation of cultural objects does not simply "weaken" the aura but, through a dialectical process of dissolution and reconstruction, gives rise to a new form of digital spectacle authority. From the perspective of Benjamin's theory of the "aura," VR reproduction first leads to the dissolution of the "aura" of Qi cultural objects, undermining their authority and authenticity. The material remains of Qi culture—such as the bronze vessels of

the Qi state and the site of the Jixia Academy—derive their "aura" from their unique historical context, irreproducible physical attributes, and authentic sense of presence. The cultural experience in VR is, in essence, a highly politicized coded simulation. The user's "immersion" often implies an unconscious acceptance of this new coding system. The "digital authenticity" of VR reproduction can never replace the "historical authenticity" of traditional cultural objects; likewise, the "digital authority" reconstructed by VR can never substitute for the "historical authority" of traditional cultural objects.

4. Theoretical Synthesis: Construction of the "Immersive Translation" Model

4.1. Model Proposal: A Four-Stage Translation Mechanism from Words to Experiences

This model presents VR as a meaning-generating system that translates culture-loaded words into embodied experiences through four stages: (1) Deconstruction—Culture-loaded concepts are analyzed across institutional, ideological, spatial, and symbolic dimensions; (2) Multimodal Recombination—Meaning elements are selectively reassembled based on technical and cultural constraints; (3) Embodied Experience—VR environments enable bodily interaction, condensed historical timeframes, and emotionally curated atmospheres; (4) Interpretive Framing—Users receive an implicit understanding framework that guides cultural interpretation through pre-emptive, holistic, and naturalized experiences. The model demonstrates how VR mediates cultural meaning while reshaping cross-cultural communication through technological affordances.

4.2. Explanation of Core Mechanisms: Replacing Interpretation with Perception and Internalizing Meaning through Experience

The core mechanism of the "Immersive Translation" model lies in the precedence of technological logic over linguistic logic, which necessitates clarification through dialogue with traditional translation theories:

4.2.1. From "Equivalence" to "Equivalent Effect" and Then to "Equivalent Experience"

Traditional translation theories pursue "equivalence," with Nida proposing "dynamic equivalence" to emphasize the equivalence of reader responses. VR translation transcends this paradigm. The assumption of "equivalence" relies on the linear conversion of linguistic symbols, whereas VR achieves the nonlinear recombination of multimodal symbols. "Equivalent effect" focuses on the similarity of cognitive and emotional responses, whereas VR directly manufactures these responses. "Equivalent experience" emerges as an implicit standard, with the key objective being to evoke in users a sensation akin to that of firsthand experience. This shift marks the evolution of translation from a representational act to a constructive one, with VR generating meaning forms that are only possible under

technological conditions.

4.2.2. Perceptual Precedence: The Body as a Pre-linguistic Medium of Understanding

Merleau-Ponty's phenomenology of perception provides the philosophical foundation, positioning the body as the primary medium of understanding in the VR environment.

Users "walk" through the Jixia Academy from a first-person perspective, with their bodily postures themselves constituting acts of understanding. These postures convey information such as spatial scale and architectural symmetry, constructing a sense of cultural intimacy. Understanding precedes linguistic interpretation and is more persuasive.

This challenges the linguocentrism of translation studies, as perceptual experiences can directly bear cultural meaning, potentially being more effective for digital natives. However, there is a risk that "feeling right" may replace "understanding accurately," obscuring the historical complexity and critical dimensions of culture-loaded words.

4.2.3. Context Generation: From "Context" to "Environmental Envelopment"

In traditional translation, "context" refers to the linguistic context or cultural background knowledge, which translators textualize through annotations and other means.

VR translation transforms context into a habitable environment, where space, time, and social relations become contextual elements. This vastly enriches the contextual information of culture-loaded words, making "presence" possible. However, it also limits the possibilities of meaning by controlling the boundaries of the context.

4.3. Dialogue with and Transcendence of Classical Theories

4.3.1. Comparison with "Thick Translation" Theory: From Textual Annotation to Environmental Envelopment

Appiah's proposal of "thick translation" emphasizes embedding rich cultural contextual information within translations, offering significant insights for translating culture-loaded words. However, its text-centric nature limits its applicability in the digital age.

The "Immersive Translation" model transcends "thick translation," with the key difference lying in the fact that the "thickness" of "thick translation" refers to an increase in information volume, whereas the "thickness" of "Immersive Translation" pertains to the expansion of perceptual dimensions. Nevertheless, the latter faces the challenge of "visualization bias."

4.3.2. Comparison with Hofstede's "Cultural Dimensions" Theory: From Static Values to Dynamic Perception

Hofstede's cultural dimensions theory provides a structured analytical framework for cross-cultural communication, yet it has been criticized for its static, binary,

and value-oriented characteristics.

The "Immersive Translation" model offers an alternative pathway, shifting from values to perceptions, from dimensions to configurations, and from comparison to generation. This aligns with contemporary cultural studies' emphasis on "fluidity" and "performativity." However, caution must be exercised, as the sharing of perceptual experiences does not necessarily equate to the attainment of genuine understanding, potentially masking the deep-seated incommensurability of cultures.

4.4. Limitations of the Model: Abstraction, Contradictions, and Ethical Risks

Every theoretical model has its applicable boundaries, and the "Immersive Translation" model faces challenges to its effectiveness in the following scenarios:

4.4.1. Visualization Dilemmas for Highly Abstract Concepts

The core meanings of certain culture-loaded words lie in their non-materializability. When VR translates them into visual symbols, it may lead to ontological misinterpretations. For instance, using cloud and mist effects to represent "Dao" (the Way) reduces a transcendent concept to an aesthetic spectacle, leaving the "Immersive Translation" lacking in cultural significance, with technological affordability becoming a constraint.

4.4.2. Technological Dissolution of Contradictions and Controversies

Culture-loaded words carry historical controversies and contemporary disagreements. The pursuit of fluency in VR tends to dissolve these contradictions, presenting culture as a harmonious whole through a unified aesthetic style and emotional tone. This approach is ideological, effectively depoliticizing the cultural and political dimensions.

4.4.3. Ethical Risks: Experiential Capitalism and Cultural Consumption

By incorporating the logic of the cultural industry, the "Immersive Translation" model risks reducing culture-loaded words to commodities in the experiential economy. Users may purchase the thrill of "time travel" rather than seeking serious understanding. "Experiential capitalism" transforms cultural depth into metrics of user satisfaction, with VR translation becoming an accomplice in cultural flattening.

4.4.4. Epistemological Violence: The Imposition of Perceptual Frameworks

VR translation implicitly involves epistemological violence by controlling sensory inputs to enforce specific understanding frameworks, which are obscured by the sense of "immersion." When Western users "experience" Qi culture through VR, their understanding may merely be a repetition of the preset frameworks designed by the creators, potentially reinforcing cultural stereotypes rather than promoting cross-cultural understanding. These limitations do not negate the value of the

model but rather delineate the boundaries for its critical use. The model must be combined with reflective practice to avoid becoming a tool for technological determinism or cultural essentialism.

5. Practical Implications: Towards a Reflective Design Philosophy

5.1. Implications for Digital Practices in Cultural Heritage Museums: Shifting from "Technological Implementation" to "Meaning Design"

Currently, the development of VR museums adheres to a "technology-driven" logic. There is a call for a shift towards "meaning-first" design, taking a deep understanding of culture-loaded words as the starting point for design, with technology selection serving the goal of meaning conveyance.

5.1.1. Cultural Sensitivity in Multimodal Grammar

Designers need to develop a conscious awareness of "multimodal cultural grammar" and understand the differences in the symbolic functions of various modalities across different cultures.

Visual Modality: The emotional associations of "green" in Qi culture and "blue" in Western culture differ significantly, making color selection a form of cultural translation.

Spatial Modality: Traditional Chinese "courtyard-style" spaces and Western "square-style" spaces embody different social ideals. Replicating these spatial layouts in VR design is tantamount to choosing a particular cultural narrative.

Auditory Modality: The free rhythm of "sanban" in Chinese classical music and the harmonic structure of Western classical music shape time perception and emotional tones differently.

Interactive Modality: The "kowtowing" interaction evokes different feelings in different cultures, necessitating careful consideration of the cultural coding of bodily movements.

Practical Recommendation: Establish a "multimodal cultural audit" mechanism. During the design review phase, invite cultural researchers, representatives of the target audience, and technical experts to participate together in evaluating the cultural implications of modality choices.

5.1.2. From "Restoring History" to "Constructing an Understandable Past"

The claim by VR museums to "restore historical scenes" is misleading, as any historical representation is a construction based on contemporary issues.

The VR reconstruction of the "Jixia Academy" aims to create an understandable past for contemporary users. It is essential to acknowledge this constructiveness, clearly indicating the historical evidence and speculative elements, and treating "uncertainty" as part of the exhibition content. Introduce multiple perspectives by offering selectable viewpoints to showcase the multifaceted nature of history.

Maintain space for interpretation, avoiding overly determined visual details, and invite users to imagine and inquire through "fuzzy design."

5.2. Redefining Localization Strategies: Going beyond Language Translation

Traditional localization focuses on surface-level adaptations such as language translation, currency units, and date formats. However, the localization of VR cultural products requires deep-level reconstruction.

5.2.1. Cross-Cultural Adaptation of Interactive Logic

Individualism vs. Collectivism Cultures: Users from individualistic cultures expect "heroic" exploration, while those from collectivist cultures find "shared" experiences more appealing.

High-Context vs. Low-Context Cultures: Users from high-context cultures prefer implicit and atmospheric information presentation, whereas those from low-context cultures require clearer navigation and explanations.

Power Distance: Users from high power distance cultures accept "guided" linear experiences, while those from low power distance cultures demand "free choice" non-linear exploration.

5.2.2. Interface Adaptation to Cognitive Habits

Spatial Cognition: Different cultures have varying interpretations of spatial metaphors such as "up/down" and "inside/outside."

Time Orientation: Users from past-oriented cultures resonate with "historical time travel" narratives, while those from future-oriented cultures require stronger connections to the present in design.

Causal Reasoning: Linear causal thinking and circular/relational causal thinking impose different requirements on narrative structures.

5.2.3. Sensory Adaptation to Aesthetic Expectations

Visual Density: East Asian aesthetics appreciate "negative space," while Western preferences lean towards "information richness."

Emotional Distance: The "ma" aesthetic in Japanese culture emphasizes emotional restraint, contrasting with the expressive emotionality of the Romantic tradition.

Dynamic Range: The "wandering view" perspective in Chinese landscape painting differs from the "fixed-point" perspective of Western perspective methods.

Practical Recommendation: Adopt the "cultural prototype testing" method. Invite target culture users to participate in experience testing during the early stages of development to capture instances of "cultural discomfort."

5.3. Advocating for "Reflective Immersion" Design: Preserving Space for Critical Thinking

This approach counters "transparency illusion" and "experience domestication" by embedding critical thinking within immersion. Design strategies include

breaking the fourth wall through director commentary, presenting multiple interpretations of the same concept, and using glitch aesthetics to expose technological mediation. Interaction shifts from consumption to negotiation via questioning mechanisms, co-creation tools, and ethical dilemma scenarios that engage users in cultural controversies. Educational strategies promote metacognition through pre-experience guides, embedded reflective prompts, and post-experience deconstruction toolkits—training users to recognize how multimodal symbols operate and make implicit understandings explicit.

5.4. Future Prospects: Model Expansion and Cross-Civilizational Dialogue

The "immersive translation" model can be extended to other immersive media, including augmented reality, the metaverse, and multisensory VR environments. Each medium presents unique challenges: AR must balance added cultural meaning with environmental authenticity; social VR introduces collective meaning negotiation across cultures; and emerging haptic/olfactory technologies require consideration of how cultural values are encoded through bodily senses. Comparative studies across civilizations could examine how different cultural contexts implement immersive translation, exploring differences in authenticity between Chinese and Western approaches, power dynamics in colonial versus postcolonial representations, and the potential emergence of hybrid cultural forms in digital spaces like the Digital Silk Road. Methodological innovation should move beyond textual analysis to include participatory research approaches, combining eye-tracking and physiological measurements with qualitative methods like interviews and user testing to empirically evaluate how audiences receive and interpret VR translations.

6. Conclusions

6.1. Research Summary

Through a critical multimodal discourse analysis of the Qi Culture VR Museum, this study demonstrates that virtual reality fundamentally reshapes the translation paradigm for culture-loaded terms. Building on the findings of the Pop-up-VR Museum project (Díaz-Kommonen *et al.*, 2024) [5], our analysis confirms that VR translation transcends mere linguistic conversion. Rather than serving as a neutral channel, VR actively reconstructs cultural meaning through integrated perceptual experiences. For instance, concepts like "Jixia Academy" and "ritual systems" are not simply translated through subtitle texts but are recreated as immersive spatial narratives where architecture, soundscapes, and interactive rituals collaboratively construct meaning. This process aligns with what Mao and Chen (2025) [4] describe as the "text-image-translation" triadic synergy, though VR introduces the crucial fourth dimension of embodied interaction. Consequently, VR translation represents a profound mediatized transformation where the technology's affordances—its spatial logic, interface design, and interactive mechanics—become

integral to meaning-making, going beyond traditional translation frameworks that separate content from medium.

6.2. Major Theoretical Contributions

This study makes three significant theoretical contributions. Firstly, it advances an interdisciplinary analytical framework that synthesizes insights from translation studies, media studies, and cultural heritage research. By applying multimodal discourse analysis (Kress & van Leeuwen, 1996/2020) to VR environments, we extend translation theory beyond its conventional linguistic boundaries, addressing what Eco-translatology calls the "three-dimensional transformation" (Sheng, 2025) [3] into a multidimensional, perceptual domain. Secondly, we propose the "immersive translation" model, which accounts for how VR's technological characteristics—such as its ability to generate presence and facilitate first-person perspective—create new conditions for cross-cultural understanding. This model resonates with Hall's high- and low-context communication theory (Mao & Chen, 2025) [4] but emphasizes how VR can externalize high-context cultural elements through multimodal simulation. Third, the study offers a critical perspective on technology-mediated cultural communication. Drawing on insights from VR museum projects (Díaz-Kommonen *et al.*, 2024) [5] and architectural aesthetics translation (Zhong, 2026) [6], we highlight that while VR can reduce cultural discount through immersive engagement, it also introduces new forms of cultural framing. The design choices in representing cultural artifacts—such as whether to use transliteration plus annotation for terms like "Haidongqing" (sacred bird) as seen in Manchu Xincheng Opera translation (Ma & Cai, 2025) [7] or to employ adaptive localization strategies for ASEAN audiences (Du & Gao, 2025) [8]—carry implicit ideological implications about what aspects of culture are emphasized, simplified, or privileged.

6.3. Research Boundaries and Future Prospects

This study acknowledges several limitations that point toward future research opportunities. Methodologically, our reliance on textual and visual analysis of available materials, while providing valuable insights, cannot capture actual user reception and cognitive processing. Future research should incorporate empirical audience studies, employing methods such as those used in picture book translation research (Mao & Chen, 2025) [4] where reader feedback was systematically collected, or like the SPICE project's evaluation of senior citizens' engagement with VR museums (Díaz-Kommonen *et al.*, 2024) [5]. Such approaches would strengthen our understanding of how different demographic groups actually decode VR-mediated cultural content. Secondly, the single-case focus on Qi Culture, while allowing for depth, limits generalizability. Comparative studies across different cultural domains—for instance, contrasting the translation of architectural aesthetic terms (Zhong, 2026) [6] with performance art terminology (Ma & Cai, 2025) [7] in VR environments—could reveal how translation strategies vary

across cultural genres and technological implementations. Thirdly, as technology continues to evolve, future research should examine emerging platforms like augmented reality (AR) museums and AI-generated cultural experiences. These developments will likely create new translation challenges and opportunities, particularly regarding how to balance cultural authenticity with technological innovation—a tension already evident in debates about translating culturally specific items (Aixelá, 1996) that now takes on new dimensions in interactive digital environments. Finally, expanding the theoretical dialogue to include more non-Western perspectives on technology and translation would enrich our understanding of how different cultural traditions approach the digital mediation of heritage.

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Conflicts of Interest

The authors declare no conflicts of interest.

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