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Media Richness in Metaverse: The Effect of Immersive Emporium on User Presence and Enjoyment

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Abstract: *The purpose of this study is to examine the effect of media richness in shaping user presence and enjoyment within the immersive metaverse environment. With a focus on the impact of metaverse emporium on user experience, this research explores how multisensory cues, spatial design, and avatar embodiment influence communication and interaction and user experience. A user experience questionnaire on a Likert scale, followed by user interviews, measured the effect of metaverse content on Pakistani users. The immersive emporium in the metaverse was compared through two modalities: a mobile-based 360 virtual interface and VR headset. The research illustrated how intuitive, accessible design increased the acceptance of immersive technologies within the Pakistani context. The findings contribute to discourse on digital equity, emphasizing that high-quality immersive content can be delivered through economically sustainable design.*

Key Words: Immersive Media, Metaverse, Virtual Reality, Technology Adoption, Immersion, Digital Divide

Introduction

The Metaverse is not just a digital construct but a lived environment, where users are not just viewers but embodied participants. Immersive environments allow users to experience the media with rich sensory depth and an expanded field of vision, fully enveloping them within the virtual medium. Unlike traditional media, these immersive spaces attract users with unparalleled media richness, making their experience multisensory and vivid. As immersive technology evolves, the distinction between reality and simulation has blurred, inviting creatives to rethink the architecture of human connection in the virtual domains.

Significance of Research

This study investigates solutions to bridge the digital divide, accessibility issues, and make the metaverse culturally relevant for Pakistani users. This study aims to produce valuable insights for content creators, user experience designers, and metaverse developers and to facilitate the growing adoption of metaverse technologies that align with the local sociocultural context.

Research Problem

The metaverse market is projected to reach US$103.6 billion by 2025, expanding to US$507.8 billion by 2030, with user numbers expected to grow to 2.6 billion, and penetration increasing from 17.4% in 2025 to 39.7%. Limited access to immersive technology and infrastructure constraints restrict widespread adoption. Despite the growing interest in immersive media content, the adoption challenges have limited user engagement. Addressing these accessibility gaps is essential to ensuring equitable participation in metaverse experiences.

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Objectives

1. To identify factors that enhance presence, engagement, and enjoyment in the metaverse.
2. To measure the effect of the immersive emporium on the user experience.
3. To facilitate the diffusion of metaverse technologies among Pakistani users.

Research Question

RQ1: How does media richness in the metaverse experienced through mobile interface versus VR influence the sense of presence and enjoyment among Pakistani Users?

RQ2: How does the metaverse emporium accessed through a mobile interface compare to the VR immersion effect user experience among Pakistani users?

RQ3: Identify effective strategies that have supported the diffusion of metaverse technology among Pakistani Users.

Review of literature

Metaverse is a convergence of immersive virtual environments that has become a prolific user base for exploring media richness and its impact on experience and enjoyment. However, the accessibility of such technologies is often hindered by the digital divide. This review synthesizes theoretical and empirical works to examine the role of media richness and presence in immersive learning strategies to ensure equitable access.

Media Richness: refers to communication modalities in a content, that include multiple cues, including audio, visual, and sensory, and language variety.

Metaverse is an interoperable spatial internet, where users enter as avatars, interact, teleport, and engage in real time across interconnected virtual platforms.

Immersion is the level to which a virtual environment captures user attention, engages their senses through simulated and interactive elements that feel separate from the physical world.

Presence: refers to users' simultaneous involvement in real time as well as in the simulated world. It is a multisensory, subjective, and psychological state that depends primarily on the quality of graphics in the virtual environment.

Enjoyment is a positive emotional experience that arises from interacting with items of personal interest that drive pleasure and satisfaction. It refers specifically to user engagement with immersive content, including interactive items and other avatars.

Communication media differ in their ability to convey information based on four modalities: Feedback, message, cues, and language. Rich media, including audio, video, online messaging, and live calling, engages users through multiple cues and a variety of messages to immediately respond in a personalized manner (Daft & Lengel, 1986). Immersion is often described as the degree to which a system can create an inclusive, extensive, surrounding, and vivid illusion of reality to the participating user (Witmer & Singer, 1998). Immersion is not entirely a technological function, such as high resolution visuals and spatial audio, but also how these aspects engage users' cognitive and emotional state. Witmer & Singer emphasized that immersive systems enhance presence by completely engulfing users in a virtual experience. Immersive environments such as the metaverse use media richness and presence to simulate real-world interactions through visual, auditory, and interactive elements. These features enhance user experience and provide vivid and engaging communication channels for improved user experience.

Recent studies identified that accessibility, presence, and enjoyment are an integral part of immersive user experience. Bailenson suggested that immersive experiences should be emotionally and cognitively satisfying- both factors support aspects of enjoyment. (Bailenson, 2018) A study on the experience on demand revealed that virtual reality is intentionally designed to simulate impactful, real-world experiences customized to individual needs and motivations. Supporting a personalized experience in the metaverse (Natarajan et al., 2024), it was argued that users engage with immersive media to fulfill hedonic, utilitarian, and social needs, reinforcing the underlying factors of enjoyment and perceived value that lead to prolonged engagement. In contrast (Sorrentino et al., 2025), studies have identified crucial factors that

create a digital divide (Tukur et al., 2024) and hinder the equitable and accessible diffusion of technology. Unequal access to VR hardware, internet connectivity, unworkable user experience, and digital skills create a major barrier to realizing the metaverse's true potential. These inequalities limit entry in the immersive and impact the quality of experience for existing users (Van, 2020. Scholars distinguished three primary dimensions of the digital divide: **Access:** Availability of technology, **Skills:** Digital literacy, **Usage:** differences in how people utilize technology and derive any benefits from it. Expanding on this research gap, scholars have suggested inclusive and adaptive design features that can enhance experience, provide meaning and enjoyment, even for users having limited digital literacy (Cheiran et al., 2025). Studies on immersive emporium illustrate how multimodal and multisensory design and interactive storytelling can impact user engagement (Chang & Suh, 2025) and deepen emotional connection. Especially in the cultural and exhibition context (Zidianakis et al., 2021). Collectively, the literature suggests that metaverse user experience design must prioritize equitable accessibility, which could engage users despite technology barriers.

Media Richness Theory

Media Richness theory (Daft & Lengel, 1986) postulates that communication media vary in their ability to convey information effectively. Comparing rich media to lean media, it was observed that rich media allow instant interaction, face to face communications and enable immediate feedback, multiple cues (tone gestures, facial expressions) and personalization that enhance communication, whereas absence of such features in the lean media, Rich media support diverse linguistic expressions including informal and visual symbolic nonverbal communication.

Theoretical Framework

Media richness theory provides a structured approach to understanding metaverse adoption in Pakistan. It has been observed that richer media can facilitate better comprehension, engagement, and emotional connection.

Immediacy of Feedback in Metaverse: Rich media platforms designed to produce instant interactions create communication flow, reducing misunderstandings. Through this metaverse platform, users can communicate using a microphone, a camera, live video, and use integrated spatial communication features derived from a seamless AR VR interface.

Multiple CUES in Immersive Experiences: Verbal, nonverbal, gestural, and tonal cues performed by personalized avatars and their users through live video enhance screen-mediated and VR experiences. Having a supportive and dynamic interface, users could import items and customize them into their metaverse space.

Language Variety and Cultural Adaptation: Rich media support diverse linguistic expression, informal and reactive nonverbal communication. Users could express themselves using avatars that can perform multiple gestures, including claps, dance, jumps, and emoji reactions.

Personalization and user Engagement: Users could use the camera and live call features or enter the metaverse by creating their lifelike avatar. Metaverse, as a three-dimensional immersive space, enables users to co-create and personalize their own immersive spaces. Each user could interact with the environment as well as other users in a simple interface that delivered real-time video and voice cues while users lifelogged in the immersive environment.

Methodology

This section outlines the convergent parallel research design to examine media richness in the metaverse, comparing screen-mediated experiences with fully immersive VR interactions. The study evaluates user experience, enjoyment, and presence through quantitative and qualitative methods. The methodology was carried out as follows:

Sample: Included interviews, Observations, and a survey of university students in the metaverse emporium.

Experimental Procedure: Measuring the effect of immersive emporium through a user experience questionnaire.
Instruments: Two instruments were used :

1. Sense of presence and subscales were used to observe participants' engagement in the immersive space.
2. User Experience Questionnaire for usability testing, to measure aesthetic and enjoyment value of the immersive content.

Research Materials: Included internet connectivity, metaverse application spatial.io, immersive metaverse content, mobile devices, and VR headsets.

Research Design

A mixed-methods approach was developed to measure the effects of media richness on the metaverse users. Two modalities were compared: metaverse accessed through a screen interface and through VR, with an unrestricted field of vision. The experiment was conducted on the Spatial.io metaverse platform.

To assess the usability of the metaverse application on VR users, a qualitative user interview was conducted with 20 users separately. Users were selected based on prior technology experience, interest in fashion, and shopping experience. The sense of presence, engagement, ecological validity, and negative effects were assessed. Users were interviewed both individually and in a group setting. The factors affecting qualitative inquiry were dependent on the willingness of users to participate, the availability of the internet, and VR devices.

After a qualitative examination of seamless user experience, the effect of the metaverse emporium was tested on users for quantitative validation. Users entered the metaverse using mobile screens and VR headsets. In a span of six weeks, 300 users were observed both individually and in groups. The experiment was performed through randomized trials, in three stages: pretrial, trial testing, and post-trial experience evaluation. During the pretesting, 30 participants were recruited to test the validity of the test procedures; once the procedures were completed to satisfaction, research trials were conducted effectively. Followed by the trials procedure, participants rated their user experience through UEQ survey forms. During trials, the participants' observations were documented, and thereafter, findings from the effect of the metaverse emporium were compared between the two modalities.

Population and Sample

Based on the existing literature, the metaverse population *was measured* to be around 400 million users. However, *statistic*al *data on* metaverse users *for* Pakistan *was unavailable. Therefore,* th*is* study considered active social media mobile users, gamers, and online shopping customers as the reference population for estimating online engagement levels.

Table 1

Sample Selection and Size

Sample	Category	Number	Percentage
Gender	▸ Male and female	142 males 158 females	47.3% 52.6%
Age	▸ 18-22 ▸ 22-28 ▸ 28-34	100 115 95	33.3% 38.3% 31.6
Education	▸ Undergraduate ▸ Graduate	243 37	81% 12.3%
Occupation	▸ Media Student ▸ Fashion Students ▸ Design Students ▸ Architecture Student	60 65 120 55	20% 21.6% 40% 18.3%

The sample was selected based on the availability of devices, internet connectivity, and willingness to participate in the research. A total of 300 university participants, both male and female, were recruited from 4 universities across Rawalpindi and Islamabad.

A total of 150 participants used a VR headset to enter the immersive emporium.
A total of 150 mobile users entered the immersive experience from mobile screens.
Participants were divided into two groups:
VR Group: Users accessed the metaverse using an Oculus Quest 2 headset.
Mobile Group: Users experienced the metaverse through mobile screens.

Sample Procedure

To quantitatively measure the effects of the metaverse emporium, participants were recruited in a span of six weeks and were randomly assigned to either a screen-mediated or a VR group. Each participant signed a consent form that explained the study objectives and navigation process within the immersive emporium. Data was collected in a structured manner, adhering to ethical and academic values.

Trial Conditions and Duration: Each participant experienced the metaverse emporium for approximately 15 to 20 minutes. Participants, individually or in groups, spent time exploring the emporium, interacting with displayed objects and simulated users. Few trials included 10 participants entering the immersive environment at one given time.

Research Method and Procedure

A comparison of screen-mediated experience via mobile devices and fully immersive VR headset experience was conducted using the MRT framework. Users entered the immersive emporium through both interfaces. Their sense of presence and enjoyment in the immersive experience was documented using interviews, observations, and the Likert scale questionnaire. This approach was designed to carefully extract accessibility concerns that directly or indirectly influence the adoption of metaverse technologies among Pakistani users.

Method for Measuring the Effects of Immersive Emporium on Users

Presence: The multisensory features of the metaverse enable presence to be examined in terms of how users felt enveloped by the simulated architecture of the metaverse. Presence included both proprioceptive and aesthetic aspects of user experience. As users experienced a sense of teleportation into the metaverse, their physiological and emotional states were also influenced by the immersive encounter. The core question was whether the VR modality could induce positive effects on users.

Enjoyment: This experimental study examined how immersive experience can influence users' emotional states, enhancing positive feelings of ease and enjoyment and leading to prolonged engagement with immersive media content.

Research Instruments

To measure the effect of immersive emporium, two instruments were used. Qualitative user research measured the sense of presence, engagement, and enjoyment through a designed open-ended questionnaire. A quantitative inquiry through a questionnaire measured the effects of the emporium on user experience.

VR User Interviews and Observations Procedure

The Sense of Presence Constructs (Coelho et al., 2006) was used to observe participants' immersive presence through VR intervention in the immersive emporium. The scales of presence included immersive presence, ecological conditions, engagement, involvement, and negative effects. The scales of presence informed questions for user interviews.

Questions evaluating the Sense of presence

Q1: Describe how real or lifelike the simulated environment felt to you.
Q2: How does the state of being present physically and immersed at the same time influence your experience?
Q3: What was your level of involvement during the experience from start to end?

Q4: What aspects of the experience did you enjoy the most and why?
Q5: How believable or natural did the immersive environment feel to you?
Q6: Describe the environment's visual, spatial, and kinesthetic aspects in a few words.

Usability testing of user experience through User Experience Questionnaire

The method of usability testing (Dumas & Redish, 1993) required users to perform tasks on a product while observer monitor their interactions. The User experience questionnaire (Schrepp et al., 2014), designed by the experts, was taken as an instrument for this research. It was a fast and reliable measure to evaluate user experience in the immersive emporium. The procedure was simple. Users had to fill out their response on a Likert scale from 1 to 7.

Scale of Structure and Methodology of the User Experience Questionnaire

The UEQ contained 6 scales with 26 items. The questionnaire measured three constructs from multiple aspects; this method helped maintain consistency in results. The scale measured the perceived value of content attractiveness, pragmatic, and hedonic value. Attractiveness measured the appeal and aesthetics of the media content. Pragmatic value measures efficiency, dependability, and perspicuity. Hedonic scale measured Stimulation and Novelty.

Attractiveness: content is perceived to be attractive, enjoyable, friendly, and pleasant.

Efficiency: the user can perform tasks fast, efficiently, and from a pragmatic perspective. The interface appears organized.

Perspicuity: The content is understandable, clear, simple, and easy to learn.

Dependability: The interaction with the application is predictable, secure, and meets expectations. Tasks are performed effortlessly.

Stimulation: content is perceived to be interesting, exciting, and motivating.

Novelty: The content is innovative, creative, and inventive.

Results and Findings

This section identified aspects (RO1) that enhanced presence, engagement, and enjoyment in the metaverse in both modalities, handheld (mobile screen) and VR headset. Measured the effect of metaverse emporium (RO2) through mobile interface and VR intuitive interface. Findings from the comparative experience study outlined factors that supported the diffusion of metaverse (RO3) technologies in Pakistan.

Figures 1

Figure 2

Figure 3

Comparison and Analysis of Results from User Experience Questionnaire (Mobile interface vs VR intuitive interface)

In both modalities of immersive, mobile 360-degree and VR intuitive interface, a single content – Metaverse emporium, was examined through an interactive application, Spatial IO. This metaverse content was co-created using platform-integrated AR VR tools and tested through this research. The Likert scale ranged from 1-7, and was further simplified into a range from -3 (strongly negative) to +3 (strongly positive) in value. Results of values appearing less than 0.8 were regarded as negative, and those above 0.8 were neutral. The results derived from six collective scales, measuring the impact of immersive content in both modalities, are discussed below.

Attractiveness: The content appeared attractive, enjoyable, friendly, and pleasant.
Mobile users rated the overall aesthetics of the content at a value of 1.66 on a scale ranging from -3 to +3. Indicating a positive perception of visual appeal. In contrast, the average aesthetic ratings from the VR users were 2.08 on the scale, indicating a strong positive response to the visual appeal of the immersive content.

Efficiency: The experience was fast, efficient, and organized.
In terms of perceived efficiency, mobile users rated the experience at 1.85, slightly over the VR results of 1.70. This slight difference suggested that the participants found the mobile interface slightly more efficient to navigate and use compared to VR.

Perspicuity: The experience was clear, simple, understandable, and easy to learn.
Users rated the perspicuity of the mobile interface at 1.73, while the VR interface received a higher score of 2.10. The difference indicated that the VR user experience was more intuitive and easier to understand.

Dependability: The interaction with the application is predictable, secure, and meets expectations. Tasks are performed effortlessly. On the scale, dependability was rated at 1.73 for mobile interface and 1.55 for VR, indicating a higher perception of reliability in the mobile experience.

Stimulation: The content was perceived to be interesting, exciting, and motivating.

Stimulation was rated at 1.74 for the mobile interface and 1.99 for VR, indicating that the VR experience was perceived as more engaging and mentally stimulating.

Novelty: The content is innovative, creative, and inventive.
Novelty was rated at 1.68 for the mobile interface and 2.13 for VR, indicating that users perceived the VR experience to be more original and innovative.

Table 2

Comparison and difference between Mobile and VR UX

Scale	Mobile	VR	Difference
Attraction	1.66	2.08	0.42
Efficiency	1.85	1.70	0.15
Perspicuity	1.73	2.10	0.37
Dependability	1.73	1.55	0.18
Stimulation	1.74	1.99	0.25
Novelty	1.68	2.13	0.45

A Comparative Analysis of Pragmatic and Hedonic Value of Experience

Data from VR responses scored higher in four out of six categories, particularly attraction and novelty, compared to the mobile interface, the difference exceeding 0.4 points. The results suggest that users preferred the VR intuitive interface and found it more immersive and appealing. However, results on efficiency and dependability favored the mobile interface, suggesting that users preferred the familiar and accessible mobile interface over VR. In the study, the mobile interface performed slightly better on the pragmatic dimension - efficiency and dependability. On the contrary, the VR interface scored significantly higher across Hedonic value. Particularly novelty and stimulation. This indicates that users found the VR experience more engaging and emotionally appealing.

Usability testing Results through User Experience benchmark

Figure 1

Results of UX using Mobile Interface

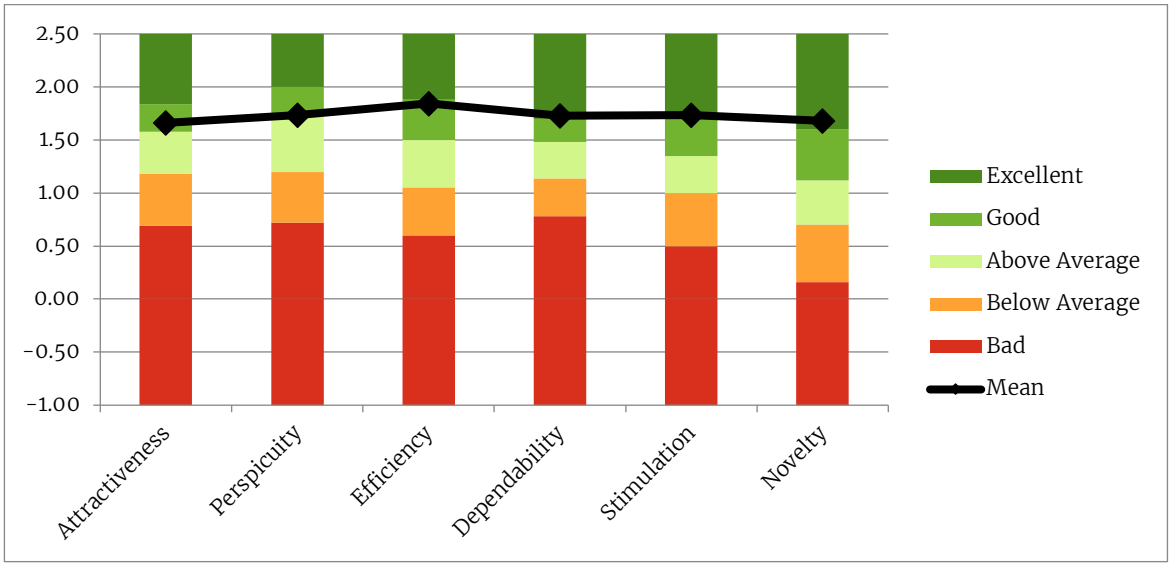

Table 3a

Scale	Mean	Comparison to the benchmark	Interpretation
Attractiveness	1.66	Good	Better than 75% of results
Perspicuity	1.73	Good	Better than 75% of results
Efficiency	1.85	Good	Better than 75% of results
Dependability	1.73	Excellent	In the range of the best results
Stimulation	1.74	Excellent	In the range of the best results
Novelty	1.68	Excellent	In the range of the best results

Table 3b

Pragmatic and Hedonic Quality	
Attractiveness	1.66
Pragmatic Quality	1.77
Hedonic Quality	1.71

Figure 2

Results of UX using a VR headset

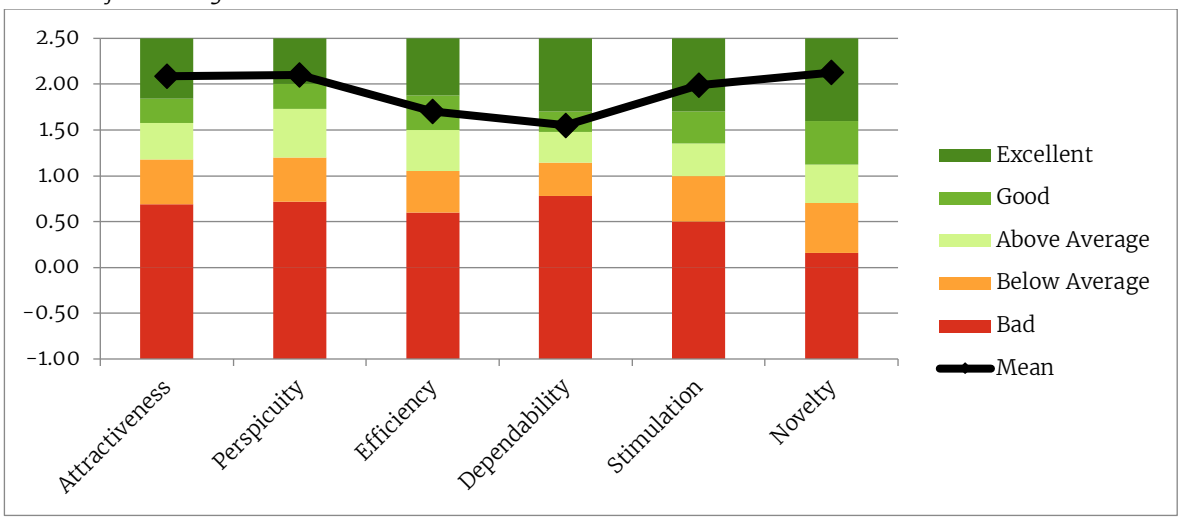

Table 4a

Scale	Mean	Comparison to the benchmark	Interpretation
Attractiveness	2.08	Excellent	In the range of the best results
Perspicuity	2.10	Excellent	In the range of the best results
Efficiency	1.70	Good	Better than 75% of results
Dependability	1.55	Good	Better than 75% of results
Stimulation	1.99	Excellent	In the range of the best results
Novelty	2.13	Excellent	In the range of the best results

Table 4b

Pragmatic and Hedonic Quality	
Attractiveness	2.08
Pragmatic Quality	1.79
Hedonic Quality	2.06

Findings

Participants' Observations and responses from interviews

Observations of Participants in the immersive environment were carefully documented using notes, screen recordings, and videos. The effects of immersive on presence and enjoyment (RO1) through both modalities: handheld and VR headset, are compared below.

Visual Quality of the Immersive Content

Participants in the mobile interface, accompanied by their avatars, could communicate through text, video, and voice cues and could also switch on their cameras to support a video dialogue in the immersive environment. 80% of total mobile users appreciated the intuitive interface and noticed a high level of fidelity and realism in the immersive emporium; the banners and items featured in the emporium appeared clear, detailed, and realistically familiar.

In the VR conditions, in the absence of a mobile interface, participants experienced viewing the visual details of spatial architecture and items displayed in static and video formats. The textures and fibers of clothing, viewed from a close distance, appeared realistic. Users mentioned that the vastness of immersive architecture was pleasant, realistic, and visually easy to view. The colors of visuals, videos, and items were clear and unobstructive, confirming that users experienced no cognitive load.

Presence In the Immersive

Mobile participants experienced presence in the immersive environment as a gameplay. They moved their avatars as players and were found running and teleporting in the immersive interface. Most users perceived it to be a game mission.

In contrast, wearing a VR headset provided participants with an unrestricted field of vision, enhancing their sense of physical presence within the immersive emporium. 90% of users felt truly "there" and felt they could freely engage with other users and objects. VR users felt a sudden shift and separation between their physical body and the simulated environment, also regarded as a proprioceptive shift that made their immersive entry exciting and enjoyable. New users were particularly captivated by the vast, clear aesthetic appearance of the immersive emporium.

Enjoyment in the Immersive

Participants using the metaverse mobile interface described it as fun, fast-paced, and generally pleasant. Meanwhile, VR participants were captivated by the spatial and vast view of the simulated environment. They enjoyed the depth of field view, the multisensory effect of natural sounds from their simulated movements, and the environment created a calming, relaxing, and realistic effect. The architecture and immersive visual merchandise appeared familiar and close to reality. Materials of garments displayed on mannequins, shoes, scarves, décor, furniture, billboards, and Video ads were visible in clear detail. VR participants reported that their immersive presence within the simulated environment closely mirrored the sensation of an actual visit to the emporium, reinforcing the perceived authenticity of their experience in real time.

Enjoyment and Social Interaction

As participants from different locations joined the immersive emporium live, the emporium started bustling with real-time social interactions. Avatars engaged with the interface using multiple communication options available. A few participants played and creatively customized their avatars in fantasy themes. 90% of mobile participants enjoyed the exchange of reactions, dances, gestures, voice cues, emojis, and their conversations through the immersive medium, which enriched their user experience. In the discourse of immersive communication, camera features within the emporium enabled participants to communicate through live video. They could choose to appear as an avatar or interact via video only.

The experienced users in the VR conditions embodied their avatars with real-time synchronicity, aligning their gestures with their avatar movements. Participants lifelogged and socialized with others, using video and supported microphone features. VR participants mostly used the metaverse to digitally explore and navigate in immersive environments. Participants entered individually; therefore, their experience was more focused on exploring the spatial web and teleporting to other metaverse environments.

Connectivity and Engagement in the Immersive

Participants entering the emporium through a mobile interface felt more involved when other users joined them live in the immersive space. Visiting the emporium as avatars allowed them to express reactions more freely, enhancing social interactions and making the experience more dynamic. As virtual interactions increased, the user experience became more pleasurable and memorable. In contrast, VR participants experienced a deeper sense of immersion and engagement within the immersive space. Their interactions with other avatars were perceived as more simulated than real.

Movement and Navigation in the Immersive

Mobile participants as avatars could perform gestures, sit, run, and dance, and react to items and virtual interactants, like players in a game. The mobile interface provided a sense of freedom, allowing users to explore space and interact with other avatars at will. They could also import items from the metaverse library, such as furniture, plants, drinks, and other aesthetic elements, to further enhance their interactions.

The immersive VR experience was highly proprioceptive and synchronized with the user's real-time gestures, allowing them to control their avatars with their real-time movements. However, due to the absence of a user interface, VR users could not control their avatar functions, such as sitting or using emoji reactions.

Challenges and Negative Effects

In Pakistan, technology users have limited access to VR headsets. New participants in the VR modality experienced immersive environments as solitary and isolating. Those familiarizing themselves with VR conditions felt reserved and socially distant. New users, after prolonged use, experienced a degree of cognitive load and were hesitant to continue their experience through the headset. A few participants reported that the unnatural characters of avatars and artificial interaction did not provide them with any value. This cognitive perplexity produced the Uncanny Valley effect.

Inexperienced VR users felt discomfort, blurry vision, motion sickness, and eye strain using VR headsets. Fast movements in the immersive interface affected user physiology and caused feelings of nausea and cognitive load. A few participants felt obscured and isolated wearing the VR headset. Some participants, after experiencing it, expressed their reluctance to accept the simulated environment, favoring a traditional brick-and-mortar setting instead. They found the immersive virtual spaces cumbersome.

Analysis and Discussion

This study illustrated how an enjoyable, affordable metaverse design can influence user acceptance of immersive technology, particularly in Pakistan. Examining the effect of metaverse content on users, a mobile-based 360-degree virtual interface emerged as a key enabler of accessibility and affordance. These virtual interfaces enable users with accessibility concerns to experience an immersive emporium from their handheld screens. Simple and intuitive interface, familiar audiovisual cues, and cultural resonance in the immersive content bridged accessibility and technological gaps. This study presented an inclusive gateway to affordable metaverse experiences.

Measuring the effect of immersion, the usability test favored the mobile interface on account of being familiar, practical, and reliable. The VR experience was rated as more enjoyable and engaging. Mobiles performed better on functional features, including efficiency and dependability. VR experience outperformed emotional and experiential aspects: stimulation and novelty. The findings suggested that the mobile interface was preferred in terms of usability, while the experience from the VR headset was perceptually more convincing and immersive. The realistic spatial design and natural motions and avatar embodiment, when accessed through a VR headset, intensified the effect of presence and immersion on users.

Observing the limiting aspects of users' experience, importing multiple digital items in the spatial design increased the content loading time, which caused delays and affected the overall aesthetic value. In comparison, the avatar experience from the mobile 360 interface was efficient. The user experience flow

through VR was relatively inconsistent because of internet connectivity issues. Inexperienced users required frequent support in device handling and reported occasional signs of physical discomfort caused by the weight of the VR headset.

Regarding perceptions of immersive technology in Pakistan, it was witnessed that social interactions with multisensory cues in both modalities shaped users' perceptions regarding the metaverse. The innovative spatial and immersive communication enhanced users' perceptions of the metaverse and positioned the metaverse as a platform for more meaningful pursuits.

This study intentionally chose participants from universities that were already enrolled in the creative disciplines. Therefore, the quality content and simplified user journey inspired several participants to incorporate creative tools from metaverse design into their creative practice. Participants in the metaverse were not indulged as viewers; rather, they had the autonomy to co-create their experience. Cocreation provided users a sense of ownership and, in turn, made them more involved in the immersive content. Challenging the traditional centralized model of the internet, the metaverse emporium gave users tools and freedom to creatively present their content and contribute to the growing immersive economy. This study affirmed that media richness is not exclusive to expensive devices; rather, the quality of experience is largely dependent on functional communicative and accessible design. This study contributed to producing quality immersive media content from low resources.

Recommendations for Optimizing Metaverse Adoption

Adjustable VR headsets accommodate diverse user needs. Gamified immersive experience supports prolonged engagement with immersive content. Simplified user navigation and intuitive interface confirm increased usability of the metaverse across diverse user segments.

Conclusion

This study confirmed that the metaverse environments have the potential to reshape the visual, emotional, and communicative dimensions of human interactions. Traditional media, often characterized by one-way content delivery, positioned users as passive users; in contrast, decentralized immersive media redefine this relationship. This shift enabled users to create, co-create, shape, and engage with content in more meaningful and participatory ways. The communicative affordance of immersive technology was a primary barrier to adoption. Mobile-based metaverse provided a valuable entry point for users to actively create, participate, and contribute to the growing immersive economy. Usability aspects of the metaverse through devices have revealed that mobile interfaces were favored by users. The 360 virtual interface from mobile, expanded the virtual field of vision, and performed better in functional dimensions -efficiency and dependability. The VR experience was rated higher in emotional and experiential aspects, including stimulation and novelty. While mobile interface supported accessible usability, VR modality provided a richer, more immersive sense of presence. Elements of spatial realism, natural motion, and avatar interactions positively influenced users' emotional states. The research findings suggest the metaverse emporium as a scalable model that operates within infrastructure constraints, cultivates meaningful participation, and promotes inclusivity for diverse user needs.

References

Bailenson, J. (2018). *Experience on demand: What virtual reality is, how it works, and what it can do*. WW Norton & Company. https://psycnet.apa.org/record/2019-04570-000

Chang, S., & Suh, J. (2025). The Impact of Digital Storytelling on Presence, Immersion, Enjoyment, and Continued Usage Intention in VR-Based Museum Exhibitions. *Sensors*, *25*(9), 2914. https://doi.org/10.3390/s25092914

Cheiran, J. F. P., Bandeira, D. R., & Pimenta, M. S. (2025). Measuring the key components of the user experience in immersive virtual reality environments. *Frontiers in Virtual Reality*, *6*. https://doi.org/10.3389/frvir.2025.1585614

Coelho, C., Tichon, J., Hine, T. J., Wallis, G., & Riva, G. (2006). Media presence and inner presence: The sense of presence in virtual reality technologies. In G. Riva, M. T. Anguera, B. K. Wiederhold, & F. Mantovani (Eds.), *From communication to presence: Cognition, emotions and culture towards the ultimate communicative experience: Festschrift in honor of Luigi Anolli* (pp. 25–45). IOS Press. https://psycnet.apa.org/record/2009-20644-002

Daft, R. L., & Lengel, R. H. (1986). Organizational Information Requirements, Media Richness and Structural Design. *Management Science*, *32*(5), 554–571. https://doi.org/10.1287/mnsc.32.5.554

Dumas, J. F., & Redish, J. C. (1993). *A practical guide to usability testing*. Greenwood Publishing Group Inc. https://dl.acm.org/doi/abs/10.5555/573014

Natarajan, T., Pragha, P., & Dhalmahapatra, K. (2024). Uses and gratifications of metaverse: understanding the user adoption factors through a mixed method approach. *Asia Pacific Journal of Marketing and Logistics*. https://doi.org/10.1108/apjml-03-2024-0395

Schrepp, M., Hinderks, A., & Thomaschewski, J. (2014). Applying the User Experience Questionnaire (UEQ) in Different Evaluation Scenarios. *Design, User Experience, and Usability. Theories, Methods, and Tools for Designing the User Experience*, 383–392. https://doi.org/10.1007/978-3-319-07668-3_37

Sorrentino, G., Tricco, G., & Almenar, R. (2025). Connectivity in the Metaverse: Digital Divide and the Advent of Satellite Mega-Constellations. *Digital Society*, *4*(1), 1–26. https://doi.org/10.1007/s44206-025-00187-6

Tukur, M., Schneider, J., Househ, M., Dokoro, A. H., Ismail, U. I., Dawaki, M., & Agus, M. (2024). The Metaverse digital environments: A scoping review of the techniques, technologies, and applications. *Journal of King Saud University - Computer and Information Sciences*, *36*(2), 101967. https://doi.org/10.1016/j.jksuci.2024.101967

van, D. J. (2020). The digital divide. Cambridge/Medford: Polity. 208 pp. *Communications*, *46*(4), 611–612. https://doi.org/10.1515/commun-2020-0026

Witmer, B. G., & Singer, M. J. (1998). Measuring Presence in Virtual Environments: A Presence Questionnaire. *Presence: Teleoperators and Virtual Environments*, *7*(3), 225–240. https://doi.org/10.1162/105474698565686

Zidianakis, E., Partarakis, N., Ntoa, S., Dimopoulos, A., Kopidaki, S., Ntagianta, A., Ntafotis, E., Xhako, A., Pervolarakis, Z., Kontaki, E., Zidianaki, I., Michelakis, A., Foukarakis, M., & Stephanidis, C. (2021). The Invisible Museum: A User-Centric Platform for Creating Virtual 3D Exhibitions with VR Support. *Electronics*, *10*(3), 363. https://doi.org/10.3390/electronics10030363