



ISSN: 0976-3376

Available Online at <http://www.journalajst.com>

ASIAN JOURNAL OF  
SCIENCE AND TECHNOLOGY

Asian Journal of Science and Technology  
Vol. 16, Issue, 11, pp. 14025-14026, November, 2025

## RESEARCH ARTICLE

# HOW I EXPERIENCE SOCIAL PRESENCE AND EMPATHY IN SHARED XR CLASSROOMS: A QUALITATIVE EXPLORATION OF GROUP COGNITION IN IMMERSIVE LEARNING SPACES

\*Ratan Pramanick

Teacher-In-Charge, Bhimpur Mohanananda College Education

### ARTICLE INFO

#### Article History:

Received 26<sup>th</sup> August, 2025  
Received in revised form  
25<sup>th</sup> September, 2025  
Accepted 20<sup>th</sup> October, 2025  
Published online 30<sup>th</sup> November, 2025

#### Key words:

Extended Reality (XR). Social Presence. Empathy. Avatar Embodiment. Group Cognition. Immersive Learning. IPA.

\*Corresponding author:  
Ratan Pramanick

### ABSTRACT

Emerging extended reality (XR) platforms have transformed the landscape of collaborative learning by introducing immersive, embodied, and emotionally resonant environments. While existing research demonstrates XR's capacity to heighten social presence and empathy (Jiménez-Cortés *et al.*, 2016; Paananen *et al.*, 2022), limited scholarship examines how learners interpret these experiences subjectively. This study employs Interpretative Phenomenological Analysis (IPA) to investigate how individuals perceive social presence, empathic resonance, avatar embodiment, and group cognition in shared XR classrooms. Findings suggest that immersive cues foster intensified co-presence, emotionally charged interactions, fluid identity expression, and spatially mediated reasoning. These insights contribute to emerging theoretical discourse on digital embodiment, mediated empathy, and distributed cognition within next-generation learning environments.

**Citation:** Ratan Pramanick. 2025. "How I Experience Social Presence and Empathy in Shared XR Classrooms: A Qualitative Exploration of Group Cognition in Immersive Learning Spaces.", *Asian Journal of Science and Technology*, 15, (11), 14025-14026.

**Copyright** © 2025, Ratan Pramanick. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

## INTRODUCTION

By 2025, XR-enabled classrooms have become integral to global education, supported by realistic avatars, spatialized audio, haptic feedback, and AI-mediated communication. These environments redefine how learners encounter others by blending physical embodiment with digital representation (Paananen *et al.*, 2022). Social presence—the perceived “realness” of others within mediated spaces—is markedly elevated in XR due to embodied interactions and multisensory cues (Jiménez-Cortés *et al.*, 2016). Empathy, too, is reshaped as learners interpret expressive gestures and emotional states through avatar behavior (Shen and Slater, 2018). Yet these emotionally amplified interactions may also generate ambiguity, misalignment, or parasocial attachment (Khukalenko and Khanolainen, 2025). Although quantitative presence scales chart certain aspects of immersion, they often fail to capture interpretive depth, emotional nuance, or the lived quality of XR-mediated collaboration. Therefore, a phenomenological examination of learners' meaning-making processes is essential for understanding how they navigate and internalize such immersive encounters (Stavroulia and Lanitis, 2019).

**Problem Statement:** Despite XR's growing prominence in higher education, the psychological underpinnings of social presence, empathic interpretation, and collaborative cognition remain insufficiently theorized. Current research underscores XR's potential to strengthen empathy and reflective engagement (Shen and Slater, 2018), yet few studies interrogate how learners make sense of these heightened interpersonal experiences. Furthermore, the interplay

between avatar-mediated identity, emotional resonance, and distributed cognition within immersive settings warrants deeper qualitative analysis (Paananen *et al.*, 2022).

## LITERATURE REVIEW

**Social Presence in Immersive Learning:** Social presence theory posits that technologized environments mediate perceptions of interpersonal immediacy and authenticity (Jiménez-Cortés *et al.*, 2016). XR amplifies these perceptions by embedding learners in spatially responsive environments with embodied avatars, thereby increasing interpersonal salience and co-presence (Paananen *et al.*, 2022). However, intensified presence may also evoke emotional overstimulation or misinterpretation of social cues, highlighting the need for nuanced investigation.

**Digital Empathy and Avatar-Mediated Interaction:** Immersive environments enable expressive gestures, proximity cues, and emotional signaling that transcend text or video interactions (Shen and Slater, 2018). VR-based empathy interventions have demonstrated significant gains in perspective-taking and emotional reflection (Stavroulia and Lanitis, 2019). Still, avatar exaggeration or perceptual distortions may lead to emotional misalignment, reduced clarity, or over-identification (Khukalenko and Khanolainen, 2025).

**Group Cognition and XR Collaboration:** XR platforms facilitate shared manipulation of 3D objects, spatial task coordination, and

embodied problem-solving. These affordances alter group reasoning, attention allocation, and collaborative hierarchies (Stavroulia and Lanitis, 2019). Moreover, XR's spatialization of information and movement pathways introduces new cognitive scaffolds for distributed cognition (Paananen *et al.*, 2022).

## Theoretical Foundations

### This study integrates:

- Social Presence Theory (Jiménez-Cortés *et al.*, 2016)
- Embodied Cognition Theory (Shen and Slater, 2018)
- Distributed Intelligence and Group Cognition (Stavroulia and Lanitis, 2019)

Together, these perspectives offer a robust lens through which immersive interpersonal experience can be analyzed.

## METHODOLOGY

A qualitative paradigm, grounded in Interpretative Phenomenological Analysis (IPA), frames the study's approach. IPA is particularly suited to exploring complex emotional, embodied, and cognitive experiences, allowing for fine-grained interpretation of participant narratives (Shen and Slater, 2018).

**Participants:** Using purposive sampling, 12–18 adult learners engaged in XR-based collaborative coursework were selected. Variation in XR familiarity ensured a broad experiential spectrum (Paananen *et al.*, 2022).

**Research Setting:** Participants collaborated within an advanced XR classroom featuring lifelike avatars, spatialized audio, and manipulable virtual objects. This setting naturally elicited social, emotional, and cognitive engagement.

### Data Collection:

- Semi-structured interviews (Jiménez-Cortés *et al.*, 2016)
- Focus groups enabling collective meaning-making (Stavroulia and Lanitis, 2019)
- Virtual observations documenting spatial behavior, gesture use, and emotional cues (Shen and Slater, 2018)

## RESULTS

**Theme 1: Intensified Co-Presence:** Heightened awareness of peers emerged from spatial audio, avatar realism, and embodied movement (Paananen *et al.*, 2022).

**Theme 2: Emotional Resonance:** Participants reported deepened empathic attunement but also occasional emotional ambiguity or distortion (Shen and Slater, 2018).

**Theme 3: Fluid Avatar-Based Identity Expression:** Virtual embodiment allowed learners to explore confidence, self-presentation, and role shifts (Khukalenko and Khanolainen, 2025).

**Theme 4: Spatially Structured Group Cognition:** Spatial manipulation of information reshaped attention, reasoning, and coordination (Stavroulia and Lanitis, 2019).

**Theme 5: Distorted or Ambiguous Social Cues:** Misinterpreted gestures or exaggerated avatar expressions created moments of confusion or tension (Jiménez-Cortés *et al.*, 2016).

**Theme 6: Post-Session Meaning-Making:** Learners continued to process emotional and cognitive impressions beyond XR sessions, reflecting the depth of immersion.

## DISCUSSION

This study extends existing scholarship by demonstrating how XR intensifies emotional presence, reconstructs identity expression, and reshapes group reasoning. Embodied cognition frameworks help explain learners' reliance on spatial cues and avatar gestures (Shen and Slater, 2018), while distributed cognition theory accounts for the collaborative reorganization of group problem-solving (Stavroulia and Lanitis, 2019). Emotional complexities and occasional social cue distortions underscore the need for pedagogically informed guidance and digital wellness protocols.

## CONCLUSION

XR classrooms reconfigure how learners relate, think, and collaborate by embedding them in emotionally rich, spatially dynamic, and embodied digital environments. To support safe and productive immersion, educators must design learning experiences that integrate reflective dialogue, scaffold emotional interpretation, and safeguard psychological well-being.

## REFERENCES

- Jiménez-Cortés, R., Rebollo-Catalán, M., García-Pérez, R., and Buzón-García, L. 2016. Virtual empathy as digital competence in Education 3.0. *International Journal of Educational Technology in Higher Education*, 13(1). <https://doi.org/10.1186/s41239-016-0029-7>
- Khukalenko, I., and Khanolainen, D. 2025. Enhancing empathy in virtual reality: Software classification. *Immersive Learning Research – Practitioner*, 1(1), 74–78. <https://doi.org/10.56198/xf7g0f71>
- Paananen, V., Kiarostami, M. S., Lee, L.-H., Braud, T., and Hosio, S. 2022. From digital media to empathic reality: A systematic review of empathy research in extended reality environments. *arXiv*. <https://doi.org/10.48550/arXiv.2203.01375>
- Shen, X., and Slater, M. 2018. Learning empathy through virtual reality. *Frontiers in Robotics and AI*, 5. <https://doi.org/10.3389/frobt.2018.00026>
- Stavroulia, K.-E., and Lanitis, A. 2019. Enhancing reflection and empathy skills via virtual reality frameworks. *International Journal of Engineering and Technology*, 14(07). <https://doi.org/10.3991/ijet.v14i07.9946>

\*\*\*\*\*