Collaborative Learning with Virtual Reality: A Classroom Perspective

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Summary

VR enables learners to engage with subject content in embodied and interactive ways, offering opportunities for authentic experiences related to history, geography, language, and culture. However, effective learning in VR-supported classrooms depends not only on technological immersion but also on pedagogical design, collaborative learning (CL) strategies, scaffolding, and teacher facilitation.

This dissertation investigates how VR-supported collaborative learning can be implemented in real classroom settings. In contrast to laboratory-based research, the study focuses on authentic educational contexts and addresses the practical challenges of integrating immersive technologies into everyday teaching. Using examples from history, geography, and English as a Foreign Language (EFL) education, the dissertation comprises three empirical sub-studies that examine the interplay between technological affordances and pedagogical strategies.

The first sub-study explores how different levels of immersion influence historical learning and empathy. Using a quasi-experimental mixed-methods design, the study compares immersive virtual reality (IVR) with flatscreen VR in a history classroom. While no significant differences in historical knowledge acquisition were found, qualitative results indicate that students using IVR demonstrated stronger forms of "physical empathy," a concept introduced in this dissertation to describe embodied emotional engagement in immersive learning environments.

The second sub-study examines an immersive virtual field trip approach in geography education. Results from a quasi-experiment show that the immersive approach enhanced peer interaction, collaboration tendencies, and students' perceptions of media support, although no significant effects on academic achievement were observed. Students described the learning sexperience as engaging, comprehensible, and supportive of communication.

The third sub-study introduces a virtual classroom map designed to support knowledge sharing and teacher monitoring during IVR-supported collaborative learning. A randomized crossover study in an EFL classroom revealed that the map-supported approach improved students' writing performance without increasing cognitive or emotional burden, highlighting its potential to foster a sustainable culture of sharing in formal education.

Overall, the dissertation demonstrates that VR-supported collaborative learning can enrich classroom practices when immersive technologies are aligned with appropriate pedagogical strategies and scaffolding. The findings contribute practical design principles for the implementation of immersive collaborative learning in real educational contexts.