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Expanding Learning Reach: Innovative VR-Enabled Retention Strategies

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Abstract : The tech-savvy Gen Z's transfer towards interactive concept learning is hammering the demand for online collaborative learning environments, renovating conventional education approaches. The authors propose a novel approach to enhance learning outcomes to improve retention in 3D interactive education by connecting virtual reality (VR) and non-VR devices in the classroom and distance learning. The study evaluates students' experiences with VR interconnectivity devices in human anatomy lectures using real-time 3D interactive data visualization. Utilizing the renowned "Guo & Pooles Inventory" and the "Flow for Presence Questionnaires," it used an experimental research design with a control and experimental group to assess this novel connecting strategy's effectiveness and significant potential for in-person and online educational settings during the sessions. The experimental group's interactions, engagement levels, and usability experiences were assessed using the "Guo & Pooles Inventory" and "Flow for Presence Questionnaires," which measure their sense of presence, engagement, and immersion throughout the learning process using a 5-point Likert scale. At the end of the sessions, we used the "Perceived Usability Scale" to find our proposed system's overall efficiency, effectiveness, and satisfaction. By comparing both groups, the students in the experimental group used the integrated VR environment and VR to non-VR devices, and their sense of presence and attentiveness was significantly improved, allowing for increased engagement by giving students diverse technological access. Furthermore, learners' flow states demonstrated increased absorption and focus levels, improving information retention and Perceived Usability. The findings of this study can help educational institutions optimize their technology-enhanced teaching methods for traditional classroom settings as well as distance-based learning, where building a sense of connection among remote learners is critical. This study will give significant insights into educational technology and its ongoing progress by analyzing engagement, interactivity, usability, satisfaction, and presence.

Keywords : interactive learning environments, human-computer interaction, virtual reality, computer- supported collaborative learning
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