
NEWSLETTER

Does Enhanced Immersion Improve Learning Outcomes: The Impact of Immersive Experience on Learning Outcomes and Its Mechanism

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IMMERSIVE experience can affect the learner's sense of presence, cognitive load, and emotions, which may facilitate or impede learning. Based on the existing literature on the application of immersive technology, this study conducted experimental research on the impact of immersion levels (immersive virtual reality or desk-top VR video) in fire safety education on learning outcomes, cognitive load, emotion valence and arousal, user presence, and learning motivation among college students. These variables were measured by relevant knowledge tests and scales.

Research findings show that:

- Immersive VR was more effective in eliciting positive, high-arousal emotions and enhancing presence and learning motivation, whereas there was no significant difference in the effects on cognitive load and instant and long-term knowledge retention between immersive VR and desk-top VR videos.
- Emotional valence, the sense of presence, and learning motivation mediated the relation between immersive VR experiences and student learning outcomes.

Implications:

- In teaching practice, the choice of VR technologies should be related to the specific learning tasks, since immersive VR contributes to enhancing learning experience, but not necessarily learning outcomes.
- In cases where VR head-mounted display is unavailable or VR headsets are inconvenient to wear in classroom teaching, desktop VR videos can serve as an alternative, for they are comparable with immersive VR as facilitators of student mastery of knowledge and skills.
- It is important to control cognitive and affective factors in the process of instruction to optimize student learning experience and outcomes.

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