**Abstract**

N/A

**Background**

The immersiveness and interactivity related to using IVR may increase learning outcomes by increasing a learner's affective processes and boosting cognitive processes associated with high motivation, such as attention and focus.

the level of immersion in many IVR experiences is associated with a user's sense of presence. Immersion and presence are closely related but distinct concepts. Immersion is an objective property of the physical technology, in which some technologies (such as immersive virtual reality using a head-mounted display) are considered to involve higher levels of immersion than other technologies (such as a desktop computer or printed book). In contrast, presence refers to the subjective feeling of “being there” (Nilsson, Nordhal, & Serafin, 2016).

Learning environments with higher objective immersive qualities, such as higher resolution head tracking, faster update rates, stereoscopic vision (rather than monoscopic vision), greater degrees of freedom of head rotation and tracking, higher image and sound quality, more external visual occlusion and/or a larger field of view compared to environments with less immersive qualities, tend to elicit greater psychological presence.

using IVR may increase the learning outcomes by increasing motivation associated with feeling present and positive emotions in the immersive environment.

One example of a generative learning strategy is practice testing, which can be defined as low-stake or no-stakes prompts to recall or transfer previously learned material

**Case against:** features of IVR may serve to detract from learning processes by causing cognitive or affective distraction.

The coherence principle from CTML states removing these extraneous stimuli improves learning outcomes

**Goals/Hypothesis**

N/A

**Participants**

N/A

**Methodology**

N/A

**Results**

suggest that learning in virtual reality is emotionally arousing, particularly with positive emotions.

learning in IVR did not create more affective processing as measured by physiological arousal than learning with conventional media.

there is evidence that learning in IVR creates more distraction during learning than learning with a desktop.

the results support the distraction hypothesis; in that IVR led to more cognitive distraction, which was associated with poorer performance on learning outcomes. These results are in line with previous empirical studies, that found that academic lessons displayed in IVR led to worse learning outcomes than other media

**Conclusion**

As expected, students felt more presence, enjoyed the experience more and perceived the lesson as easier in IVR than with conventional media; however, liking the experience did not translate into better learning processes or outcomes.

**Limitations**

N/A

**Relevance**

The IVR lesson had extraneous sounds, animations and interactions that were not pertinent to learning the information from the lesson. These features, as well as the use of an unfamiliar technology, could have also induced extraneous cognitive or affective processing.

benefits of IVR could be domain specific, or more specifically, depend on whether the lesson involves the use of spatial abilities, such as a navigation or mental rotation. During these lessons, the use of a 3D learning environment, rather than a 2D environment that is meant to represent a 3D space, such as a desktop computer, may be useful.

**Reference:**

Parong, J., & Mayer, R. E. (2021). Cognitive and affective processes for learning science in immersive virtual reality. *Journal of Computer Assisted Learning*, *37*(1), 226–241. <https://doi.org/10.1111/jcal.12482>