

The influence of virtual presence: Effects on experienced cognitive load and learning outcomes in educational computer games

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Does the immersive design of an educational gaming environment affect learners' virtual presence and how much do they learn? Does virtual presence affect learning? This study tries to answer these questions by examining the differences in virtual presence and learning outcomes in two different computer-based multimedia environments: a gaming environment with high immersive design vs. hypertext learning environment with low immersive design. As the main focus, the effect of virtual presence on learning is also explained and tested. By identifying virtual presence as a variable that may determine learning, it is argued that computer gaming environments present a new challenge for researchers to investigate, particularly, the effects of virtual presence on the immersive design of games in order to help designers to predict which instructional configurations will maximize learning performance. In general, results revealed that the high-immersive gaming environment leads to the strongest form of virtual presence but also decreased learning. Although regression analyses indicate that virtual presence positively influences trivial- and non-trivial learning outcomes, learners who learned in a low-immersive environment outperformed the gaming group. A mediation analysis showed that the relation between virtual presence and non-trivial learning outcomes is partly mediated through increased cognitive load.