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Authors

Fenger, Alexis Leandra

Atit, Kinnari

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Ready, Set, LEGO®: Examining the effects of construction on undergraduates' 3D spatial learning using virtual and physical models

Alexis Fenger

University of California, Riverside, Riverside, California, United States

Kinnari Atit

University of California, Riverside, Riverside, California, United States

Abstract

One frequent task necessary to progress within STEM disciplines is understanding and reasoning about three-dimensional (3D) spatial information. Markedly, undergraduates find understanding and reasoning about 3D spatial content to be quite challenging. Today, educators use virtual, physical, or both kinds of models to better support their students' learning of abstract concepts. Prior research has provided insights into whether virtual or physical models provide better support when learning 3D STEM concepts (e.g., Casselman et al., 2021; Justo et al., 2022). However, the details of if and how physical versus virtual models support student learning of 3D spatial information devoid of domain-specific content is not well-understood. This study will examine the effects of virtual versus physical block construction on postsecondary students' 3D spatial learning and preliminary results will be presented. The findings from this study may have implications for facilitating 3D spatial learning and integrating digital tools in the classroom.