Title

Applying cognitive learning principles to practice: Challenges in translation and large-scale study design

Permalink

https://escholarship.org/uc/item/7c16f0b7

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 45(45)

Authors

Bartel, Anna
Matlen, Bryan
Rohrer, Doug
et al.

Publication Date

2023

Peer reviewed

Applying cognitive learning principles to practice: Challenges in translation and large-scale study design

Anna Bartel
WestEd, San Francisco, California, United States

Bryan Matlen
WestEd, San Francisco, California, United States

Doug Rohrer
University of South Florida, Tampa, Florida, United States

Jodi Davenport
WestEd, Alameda, California, United States

Abstract

Several learning principles have emerged from cognitive science research that have direct applications for education (e.g., interleaved practice, worked examples, etc.). However, applying these principles at scale in education is complicated, as the principles fail to specify how they should be applied in different content areas, curricula, and classroom contexts. We summarize several challenges we have faced when attempting to apply and study the efficacy of cognitive learning principles in STEM educational contexts: 1) design challenges, e.g., how to enact the principle in new materials, 2) contextual/practical challenges, e.g., feasibility of implementation, scalability; 3) study-design challenges, e.g., implementation variability, data collection considerations; and 4) theory-specification, i.e., areas where principles may be underspecified for application. We aim to provide concrete suggestions and lessons learned related to translating cognitive principles, as well as spark discussion that could lead to new research and advance theory specification.