Exploratory Learning Using Consistency Problems: Activity Type Matters

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EXPLORATORY LEARNING
Exploring a novel problem prior to receiving instruction has been found to improve conceptual understanding (Schwartz & Bransford, 1998; Loibl et al., 2016; Kapur, 2016; Weaver, Chastain; DeCaro, DeCaro, 2018).

Exploration helps students activate prior knowledge, increase perceived knowledge gaps, and recognize problem features (Loibl et al., 2016).

However, exploratory learning does not always lead to learning benefits (e.g., Chase & Klahr, 2017; Fyfe, DeCaro, & Rittle-Johnson, 2014).

In addition, many prior studies have not used controlled experimental designs to examine the benefits of exploratory learning (see Hsu et al., 2015, Loibl et al., 2016; Schwartz et al., 2011).

RESEARCH QUESTION
Does the type of activity impact whether exploration before instruction benefits learning?

RESULTS

<table>
<thead>
<tr>
<th>Order of Instruction</th>
<th>Rich Dataset</th>
<th>Contrasting Cases</th>
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</table>

Activity type mattered. Exploratory learning did improve scores when the activity used contrasting cases but did not improve posttest scores when the activity included a rich dataset.

Contrasting cases may help students discern important problem features (e.g., mean, N, consistency among scores in one column compared to another column).

Currently conducting further research on exploratory learning and recruiting more participants to this study.

By presenting exploratory activities before learning, these results help us better understand both when and why exploratory learning improves understanding.