

## **Coordinating Principles and Examples through Analogy and Explanation**

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Research on expertise suggests that a critical aspect of expert understanding is knowing the conceptual relations between domain principles and the problem features (Chi, Feltovich, Glaser, 1981). In the current work we investigate two sense-making pathways hypothesized to facilitate students' deep learning of these relations. The first path is through self-explaining how worked examples instantiate domain principles and the second path is through the analogical comparison of worked examples. Students in an introductory physics class were randomly assigned to one of three worked example conditions (self-explain, analogical comparison, or reading explanations) when learning about concepts in rotational kinematics and then took a set of conceptual and problem solving tests. Preliminary results show that the participants in the sense-making groups (self-explain and analogical comparison) showed more conceptual learning and robust transfer than participants who read explanations of the worked examples.