
GCSC Seminar Series

210 ASB
(Aline Skaggs
Building)

ALL ARE WELCOME

Refreshments &
meet the speaker at
3:45

Tuesday, January 15, 2019
4:00-5:00 PM

Lauren Barth-Cohen

Assistant Professor of Educational Psychology, University of Utah

“Capturing Three-Dimensional Science Learning about Climate Change in Classrooms through Embodied Modeling”



An overview of work on student learning in earth science concepts, and how to design for learning about climate change related concepts such as sea level rise and the earth's energy budget.

Abstract

Current science education policies and standards call on K-12 students to engage in three-dimensional science learning that emphasizes disciplinary core ideas, scientific practices, and cross-cutting concepts. Despite significant research documenting learning of disciplinary core ideas and scientific practices, there still remains sparse information on learning about crosscutting concepts. Building from existing research in conceptual change, I will present an overview of my work on student learning of often-difficult concepts in the physical sciences. Specifically, I focus on equilibrium, one of the crosscutting concepts that is meant to be a reasoning tool widely applicable across science framework that describes individuals processes of conceptual change in interview settings, I will present an empirical analysis of conceptual difficulties encountered and ways students made progress in a classroom environment. Based on video and audio data of ninth-grade earth science students who were engaged in a three-dimensional embodied modeling activity, I show how the students used the position of their bodies to make sense of a specific scientific scenario: the steady state energy of the earth. The students encountered conceptual difficulties, and yet, they were able to make progress by changing their models to better align their understanding of the scientific concept with their newly modified model—instances of individual and group learning. By documenting an instance of conceptual change in a classroom environment, this work is taking steps towards building an understanding of three-dimensional science learning that emphasizes crosscutting concepts. I will conclude by discussing recent follow-up work aiming to design for learning about several climate change related concepts through units focused on sea level rise and earth's energy budget.

Bio

Lauren Barth-Cohen is an Assistant Professor in the Department of Educational Psychology at the University of Utah and also holds an Adjunct Assistant Professor appointment in the Department of Physics & Astronomy. Dr. Barth-Cohen holds a BA in Physics from Smith College and a Ph.D. in Science and Math Education from the University of California, Berkeley. She previously held a post-doctoral position at the University of Maine and a Research Faculty position at the University of Miami. Her expertise is in Science Education and her research focuses on student and teacher learning in the physical sciences. She focuses on student learning of the often-difficult concepts in science that are foundational to the scientific enterprise and central to science education. Her approach to learning centers on characterizing conceptual learning over time, and she concentrate on contexts involving a variety of knowledge building practices that are similar to the practices of professional science and central to reform-based science education efforts (e.g. developing and using scientific modeling, analyzing and interpreting data, and engaging in argument from evidence). Her publications include articles in journals such as, *Science Education*, *Computers and Education*, *Instructional Science*, *Journal of Science Education and Technology*, and *The Science Teacher*. Her research has been funded by the National Science Foundation.