MATHEMATICS & SCIENCE EDUCATION RESEARCH SEMINAR SERIES 2015

Learning Trajectories/Progressions in Mathematics & Science

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Friday, February 27, 2015

9:00 – 10:30 am

4500 Pacific Hall, UCSD

ABSTRACT

Learning trajectories and progressions are seeing a surge in popularity, as evidenced by their role in the Common Core State Mathematics Standards and their promise to productively influence and align assessment, instruction, curriculum, and standards. In this talk, I share a framework that emerged from our review of literature on learning trajectories and progressions (in both mathematics and science education) for the forthcoming NCTM *Handbook of Research on Mathematics Teaching and Learning.* We categorized the literature according to seven different conceptualizations of learning trajectories/progressions. Each conceptualization has consequences for the purposes, benefits, and trade-offs of the approach.

ABSTRACT

The Framework for K-12 Science Education and the Next Generation Science Standards embody a developmental perspective on learning in their proposed *learning progressions* for core disciplinary ideas and science practices. These progressions describe paths of successively more sophisticated ways of reasoning in a domain that develop over the course of schooling. Their development depends on carefully designed instruction that builds on students existing ideas in productive ways. Learning progressions have been touted as a promising approach to aligning standards, curriculum, and assessment. To realize any potential of LPs we need to systematically validate and refine these hypothetical models in real-world contexts. Such validation efforts are challenging, as they require the coordination of messy empirical data with, often, under-specified theoretical models. In my talk I will discuss some of the challenges of developing and testing learning progressions as well as their implications for standards, curriculum, and assessment.

Sponsored by
the UCSD/SDSU Mathematics & Science Education Ph.D. Program (MSED) and a charitable gift from Larry & Judy Sowder