Improving STEM Education & STEM Education Research: Methods, Data, & Designs.

Organizer: Janice Earle, National Science Foundation

Introduction and Opening Remarks:
Sarah-Kathryn McDonald, National Science Foundation

Paper 1: Using Social Network Analysis in Targeted Improvement Initiatives
William R. Penuel, University of Colorado Boulder

In this presentation, Prof. Penuel will describe how scholars are using social network analysis in educational research. He will present examples from studies that use social network methods to investigate initiatives seeking to improve school leadership practice, instructional coaching, and teaching. Emphasis will be placed on how researchers can model the effects of innovations on networks and on how networks affect outcomes of innovations.

Paper 2: Designing Impact Studies in Science Education
Jessaca K. Spybrook, Western Michigan University

The purpose of this presentation is to consider the design of impact studies that seek to evaluate the effectiveness of science interventions and strategies. Specifically, Prof. Spybrook will report empirical estimates of design parameters relevant to planning cluster randomized trials (CRTs) focused on science achievement. She will demonstrate the use of these parameters with several examples of planning science related CRTs.

Paper 3: Using Data from Digital Environments to Better Understand Learning
Andrew E. Krumm, SRI International

For this presentation, Dr. Krumm will describe the ways in which multiple researchers are measuring noncognitive constructs and learning behaviors using data from digital learning environments. Drawing on elements of the assessment framework Evidence Centered Design, he will highlight the ways in which researchers can operationalize constructs in ways that support capacity building among researchers while simultaneously supporting communication with stakeholders, such as technology developers and teachers.

Discussant: Edith Gummer, National Science Foundation