The Roles of Engagement: Network Analysis in Physics Education Research

Abstract: Understanding the roles that interaction plays in bringing about change is key to understanding both physics and physics learning. Network Analysis is a theory and method for analyzing data which are relational in nature. With origins in quantitative sociology and more recent development in graph theory, Network Analysis is a rapidly growing interdisciplinary approach to data collection and analysis. The emergence of Network Analysis in education is the result of a recognition that student interactions naturally give rise to relational data. In this talk, I provide a background on network analysis and provide several examples illustrating how I have been using network analysis to better understand informal student communities, classroom communities, and even to diagnostic tests such as the Force Concept Inventory. These analyses will demonstrate how Physics Education Research seeks to understand how physics is learned and known and thus informs instruction and departmental practices.

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