Active Learning: Analytics and Big (or Big-ish) Data

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It is a common belief that doing promotes learning in complex domains like mathematics and science, but there is little research that establishes the validity of this claim. I examine how people learn from doing, or active participation, both physical and social. Currently, I am examining how mobile and social learning environments provide online and in person influence content learning in mathematics, engineering and computational thinking using Educational Data Science (EDS) methods to understand learning processes at a fine-grained level.

A challenge in this endeavor is to find the signal of learning in the noise of the messy data streams that these environments produce. It is often difficult to design experimental studies, to discover the best ways to measure the types of learning occurring, and to capture the data needed to build these measures. However, engaging in the process often reveals novel findings and hypotheses.

In this talk, I will discuss research with games, online learning environments, and visual programming tools that illustrates 1) how theory can drive our EDS analyses; 2) how starting analyses “theory light” can reveal unexpected hypotheses; and 3) how novel analytic tools can make these types of analyses more accessible to a wider audience of researchers.

Taylor Martin is an Associate Professor in the Department of Instructional Technology and Learning Sciences at Utah State University. Currently, she is examining how mobile and social learning environments provided online and in person influence content learning in mathematics, engineering and computational thinking. Taylor Martin received her Ph. D. in educational psychology from Stanford. She also holds an M.S. in cognitive psychology, and a B.A. in linguistics.