Analyzing the Quality of Interactions in a Technology-Enhanced STEM Education Classroom

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Perspectives & Framing

Background & Context
- Interactive talk between students in technology-enhanced STEM education contexts appears connected to improved student outcomes (Chi, 2009).
- However, more empirical work is needed to examine the nature and quality of talk between students in these settings, including why talking seems to lead to better outcomes as well as how the quality of talk (and thus teaching and learning outcomes) might be improved.
- To begin to address this challenge, this project proposes to examine the quality of talk in a STEM education context supported by Braincandy®, a technology designed to facilitate classroom talk among students’ prior conceptions of scientific understandings.

Proposed Methodology

Research Questions
- Within a technology-enhanced STEM education classroom, what are the qualities of teacher-student and student-student interactions during lessons designed to examine and evaluate student preconceptions about statistics?
- In what ways might the qualities of interactions be compared to learning outcomes realized by students during class?
- How might the nature and quality of student-student interactions and subsequent learning outcomes change as teacher-student interactions change in this context?

Data Sources
This work aims to focus on an instructional unit (PI) and one instructor using Braincandy technology in an underclassmen statistics course at a public university in the U.S. Southwest. This key data source for analysis includes videos of in-class student interactions through teacher- and student-elicited recordings of student-student and teacher-student interactions, and survey data for student responses.

Data Collection
Data to be collected over one month through Spring 2019 semester across an introductory statistics course (n=33) through video observations, video recordings, and survey responses.

Theoretical Framing

ICAP Categorization

Qualitative coding issues (n=20) of observed student-student and instructor-student interactions based on classifications of ICAP framework (Chi, 2009) followed by comparison to student outcomes (Braincandy submissions) by the end of various course periods.

Distributed Teaching & Learning Analysis
For selected areas of the ICAP framework, we will apply an interpretive framework of Distributed Teaching & Learning through analyzing interactions, and engaging in Braincandy discussions, we will apply an interpretive framework of Distributed Teaching & Learning Analysis (Chi, 2009) and analyze interactions, and engaging in Braincandy discussions, we will apply an interpretive framework of Distributed Teaching & Learning Analysis (Chi, 2009).