



SoTL Grant Closure Report (2019 – 2020)

I. Basic Information

Title of Project: Exploring interactions in epistemic framing during problem solving

Investigator(s) Information

Principal Investigator:

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II. Project Update

Research Question

The goal of this project was to analyze classroom video data from an upper-level Electricity and Magnetism course in order to answer the question: how do groups with individuals who are framing the task differently negotiate and make progress on a problem? This study was a part of a larger project whose long-term goal is to identify how instructors can help students shift into more productive frames during problem solving. In doing so, we hope to ultimately produce a theory based, research validated set of tools which teachers can use in the classroom.

Progress Report

In the fall quarter, we planned to complete inter-rater reliability testing and researcher training for coding video data followed by identifying episodes where there appeared to be a framing mismatch. We planned to code a small subset of these episodes and identify initial claims as well as begin conducting instructional interviews based on our preliminary work. For the winter and spring quarters, we planned to code additional episodes in order to refine our claims and craft a paper for the Physics Education Research Conference Proceedings and use the results to inform the analysis of the instructional interviews.

The process of validating the coding scheme, identifying relevant episodes, and identifying initial claims was completed by our project meeting in January. Coding and analysis of relevant episodes proceeded through the winter quarter. A case study of one of these episodes was accepted for publication in the 2020 Physics Education Research Conference Proceedings. Further work on this part of the project was delayed due to the pandemic.

Exploring interactions in epistemic framing during problem solving

We decided to postpone the work on instructional interviews in favor of a new project within the larger collaboration. Two of the undergraduate researchers were in the unique position of conducting this research while also being students in an upper-level Electricity and Magnetism course. Thus, they began working on a collaborative auto-ethnography focused on the research question: How does knowing and researching epistemic frames as a student affect problem-solving throughout a course? These students were able to generate extensive data, conduct preliminary analysis, and identify initial claims before this project was curtailed by the pandemic.

Impact

The funding was used to pay three different undergraduate researchers (two DePaul students and one non-DePaul student) during fall quarter, winter break, and winter quarter, providing them with valuable research experiences, including participating in a multi-institutional collaboration, designing a project, and helping to host our project meeting in January 2020. This work provided new insight into epistemic framing, particularly with regard to the role of the instructor in facilitating problem solving. It will also contribute to our broader work to produce a theory based, research validated set of tools which teachers can use in the classroom to help their students become more productive problem-solvers. Finally, this work contributes to the broader shift from a more deficit-based model of student understanding to a more asset-based model.

Dissemination

Preliminary work from the collaboration based on work conducted in Summer 2019 was presented and accepted for publication in the 2020 Physics Education Research Conference Proceedings.

From the current study: the development of the coding scheme study was presented at the DePaul Undergraduate Research Showcase in November 2019 and a case study based on one episode was presented and accepted for publication in the 2020 Physics Education Research Conference Proceedings as well as presented at the American Association of Physics Teachers Annual Meeting.

Preliminary work on the collaborative autoethnography work will be shared via the CTL blog.

III. Expense Report

Expenditure	Amount Requested	Amount Spent	Notes
Undergraduate Researchers	\$2470	\$2010	Note: Student availability during fall quarter was lower than anticipated. We had also planned to continue the work during spring quarter, but student workers were not able to continue due to COVID-19.
	<u>Total</u> \$2470	<u>Total</u> \$2010	