Editorial: Call for Papers Focused Collection of *Physical Review Physics Education Research* Quantitative Methods in PER: A Critical Examination

Guest Editors

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Quantitative research is used throughout *Physical Review Physics Education Research* (PER) to study student and faculty achievement, demographics, and even behavior both online and in the classroom. These data are powerful as they go on to guide policy and practice in both localized and national settings. As a result of this power, many tools and analysis techniques have become standard ways to measure student learning and outcomes, faculty teaching behaviors, departmental changes, and more.

As PER matures and research progresses, new tools and analysis techniques are becoming available. Introducing these new tools and techniques means researchers must make decisions about which are appropriate for particular studies. Differences among these tools, even ones that have the same general measurement goal, are not always clear to PER researchers or the broader PER community.

The goal of this Focused Collection is to provide a set of research articles that critically examine current tools and analysis techniques used in PER for quantitative data as well as those that offer new and interesting methods that might not be currently used in PER. We invite manuscripts that examine and challenge standard quantitative research methods in PER as well as those that use novel analysis techniques to provide new insights into data. Rather than simply present what is available, this collection will delve into differences among current tools and techniques to support researchers in making informed choices for their quantitative work. This collection envisions articles covering (but not limited to):

- Study design. How are quantitative studies designed to align collected data, methods, and appropriate analysis techniques in order to develop robust claims?
- Comparison of statistical methods. Which statistical methods are most appropriate for particular types of data, studies, and analyses? What do we gain and lose from using one statistical method over another?
- Data collection tools. What are the differences among currently used instruments, and how do these differences impact the data and our understanding of the studied phenomena? What other types of quantitative data are available to researchers and what can be learned from them?
- Data interpretation. What questions can be answered using various data and analysis techniques? What assumptions are made in interpreting the analysis and what issues might they create?

We invite papers that focus on quantitative research methods that are of interest to the PER community and/or that could be used to advance PER. We encourage article submissions from researchers outside PER as well as collaborations between PER and non-PER researchers.

Submission Guidelines

Interested authors should submit 500-word proposals for full papers by **October 31, 2017**, to the guest editors, Alexis Knaub, John Aiken, and Danny Caballero at quant.prper@gmail.com. Proposals for manuscripts of empirical studies, review manuscripts, and theoretical manuscripts are welcome; each proposal must clearly indicate the type of manuscript that is envisioned. Submission requirements are as follows:

- Proposals for manuscripts of empirical studies must describe the theoretical basis of the work, the research question(s), and research methods that will be used, including data analysis.
- Proposals for review and theoretical manuscripts should include the motivation for the review topic and a sampling of references that will be used in the article.

All proposals must include contact information and institutional affiliation of the lead author.

The guest editors will, in consultation with the PRPER editor, Charles Henderson, review proposals and notify authors of the status of their submission by **December 1, 2017**. Authors of accepted proposals will be asked to prepare manuscripts that will go through the standard PRPER review process. Complete manuscripts will be due by **July 31, 2018**. Given the short review cycle, we expect the submitted manuscripts to be complete works. Works in progress or incomplete articles will be returned to the author without review. This Focused Collection is expected to be published in **early 2019**.

This Focused Collection will be supported by an advisory board comprised of Lin Ding (The Ohio State University), Paula Engelhardt (Tennessee Technological University), Xiufeng Liu (State University of New York - Buffalo), Tim Stelzer (University of Illinois Urbana-Champaign), and John Stewart (West Virginia University). Volunteers to review articles are welcome; please send a message to the guest editors at quant.prper@gmail.com.

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Charles Henderson
Editor

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