

## **Invited Paper Proposal for JMM 2020**

**Title:** Modernizing the Introductory Statistics Course

**Sponsor:** SIGMAA Stat Ed

**Organizers:** Alana Unfried, California State University, Monterey Bay, [aunfried@csumb.edu](mailto:aunfried@csumb.edu)  
Lisa Carnell, High Point University, [lcarnell@highpoint.edu](mailto:lcarnell@highpoint.edu)

### **Potential Speakers:**

Nathan Tintle, Dordt College

Beth Chance, Cal Poly

Patti Frazer Lock, St. Lawrence University

Robin Lock, St. Lawrence University

Kari Lock Morgan, Penn State University

Danny Kaplan, Macalester College

Beverly Wood, Embry-Riddle Aeronautical University

Albert Kim, Smith College

As we move further into the 21<sup>st</sup> century, many introductory statistics courses have not kept up with changes in the discipline. Further, current innovations seem to point in many different directions. Simulation-based inference is gaining momentum, with dedicated textbooks and grant-funded course development. However, the use of the statistical programming language R in introductory statistics is also growing, sometimes in conjunction with simulation-based inference, but often not. The rise of data science is impacting the choice of topics within the introductory statistics classroom as well. Lastly, the recently-updated GAISE (Guidelines for Assessment and Instruction in Statistics Education) report discusses a broad framework for implementing a modern introductory statistics course. These sometimes competing, sometimes synergistic frameworks can leave a professor wondering which direction is appropriate to take.

In this invited paper session, leading experts in statistics education research will discuss the future of the introductory statistics course, presenting research-based evidence for the directions that they see the course heading in terms of content, pedagogy, and technology. These talks will present evidence for each of these ideas within the statistics classroom, from a research-based perspective. For example, Tintle and Chance may present analysis of data collected from over 15,000 students nationally regarding the effectiveness of simulation-based inference. Wood may present results of a pilot study of instructor experiences in implementing GAISE 2016 in their classrooms. Speakers will also discuss when certain ideas are implemented in isolation (for instance, simulation-based inference without R) and when used in conjunction with one another (R and Data Science). Attendees will leave understanding the future direction of the introductory course, along with pros and cons of each possible approach.