

**STATISTICS EDUCATION
RESEARCH JOURNAL**

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STATISTICS EDUCATION RESEARCH JOURNAL

The *Statistics Education Research Journal (SERJ)* is a peer-reviewed electronic journal of the International Association for Statistical Education (IASE) and the International Statistical Institute (ISI). *SERJ* is published twice a year and is open source.

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EDITORIAL

Welcome to the second issue of *SERJ* for 2015. It is now eighteen months since I became Co-Editor of *SERJ* and Bob delMas stepped down, yet three of the five papers in this issue were submitted to Bob and shepherded to publication stage by him. Getting papers to publication stage can be a long process with delays in the reviewing stage or in authors submitting their revised papers (and in proper form). We are aiming to find ways to shorten the timeline between submission and publication such as putting a time limit on the submission of revised papers. We would also like to encourage researchers to submit papers on a wider range of topics and increase the number of submissions on pre-university age groups.

Before my discussion on the articles in this issue, there are two announcements. The first is that Jane Watson, University of Tasmania, has resigned as Associate Editor after giving twelve years of invaluable service to *SERJ*. We thank Jane for all her work and unstinting support for *SERJ*. We will miss her in-depth knowledge of statistics education research. The second announcement is that Christine Franklin, University of Georgia, has kindly agreed to be the Assistant Editor beginning June 2016. She will shadow current Assistant Editor Larry Lesser during the preparation of the May 2016 issue in order to learn about preparing articles for publication.

The articles published in this issue centre on students at the university-level: students' reasoning about p -values, student satisfaction with a virtual world approach to learning statistics, statistics anxiety and worry, self-efficacy calibration, and a psychometric analysis of a test instrument.

Birgit Aquilonious and Mary Brenner report on 16 community college students' reasoning about p -values. Students' understanding and interpretation of p -values and how to improve instruction is a topic that researchers have wrestled with for many years. In an attempt to understand why students were reasoning about p -values in a particular way, the authors used a two-person problem-solving protocol where students worked together on problems without intervention. After working on the problems, the students were interviewed about their work. Even though the students had been given concept definitions of the p -value by their instructors, none of the students were able to explicate its meaning. Translating statistical answers to the problem context was also problematic. With respect to concept images, they found that students "lacked the critical part of conditional probability." However, the production of a graph of the sampling distribution with the p -value marked in as an area seemed to assist students' solution process.

James Baglin, John Reece, and Jenalie Baker's paper is an example of research that seeks to improve the learning of statistics in courses through collecting data from students using instruments which are validated. They describe the use of a virtual environment, The Island, to simulate the statistical investigative cycle in their university quantitative research method courses. Their aim was to improve student engagement as well as course relevancy. To determine student satisfaction with using The Island in their courses, they sought feedback from 144 students via quantitative and qualitative data. Although accounting for factors such as statistics background, the only statistically significant variable was the tutor, the importance of whom was reinforced in the open-ended responses. They discuss possible ways to improve the course based on the student responses.

Amanda Williams studied statistical anxiety in 103 graduate students. Research on anxiety, beliefs, and attitudes in statistics has a long history as researchers have used

different settings and/or gradually identified more factors affecting student performance, self-perception and confidence. Many validated instruments are now available for research purposes. This study adds to the research literature by suggesting a relationship may exist between worry-related variables such as “believing worry is beneficial” and six types of statistical anxiety. Suggestions are given on ways instructors could ameliorate students’ concerns about statistics courses.

Whitney Zimmerman and Deborah Goins explore the relationship between self-efficacy and knowledge through the vehicle of a chi-squared test of independence. Their study examined 30 education graduate students – 15 with and 15 without prior experience of the topic. The results of this study “suggest that an assessment experience may influence the relationship between self-efficacy and knowledge.” The implication of their finding is that students’ self-efficacy calibration may be improved through doing practice assessments.

Anelise Sabbag and Andrew Zieffler provide insights into the necessary laborious processes and the multitude of possible explanatory considerations underpinning test development. They performed a psychometric analysis (based on 289 university students) of the GOALS-2 test instrument, comparing three measurement models. After determining which model was most appropriate for the student responses, they found that some items needed revision and more discriminatory items needed to be added to improve test information.

MAXINE PFANNKUCH