Teaching Bits: Statistics Education Articles from 2012 and 2013

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We located 30 articles that have been published from November 2012 through January 2013 that pertained to statistics education. In this column, we highlight a few of these articles that represent a variety of different journals that include statistics education in their focus. We also provide information about the journal and a link to their website so that abstracts of additional articles may be accessed and viewed.

From *Teaching Statistics*

http://www.rsscse.org.uk/publications/teaching-statistics
An International Journal for Teachers that first appeared in 1979 and has been published three times a year ever since. It is available by paid subscription.

"Exploring students' intuitive ideas of randomness using an iPod shuffle activity"

By Laura Ziegler and Joan Garfield
Volume 35, number 1 (2013)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2012.00531.x/full
Abstract: This article presents an activity that engages students in considering characteristics of a random sequence, in this case, a randomly generated playlist of songs using the iPod shuffle feature. Students examine simulated sequences of randomly generated songs from a small music library in order to identify characteristics that are used to develop rules that they then apply to judge whether three suspicious lists are likely to be nonrandom.

"Teaching introductory statistics to blind students"

By Stephen M. Marson, Charles F. Harrington, and Adam Walls
Volume 35, number 1 (2013)

http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2012.00510.x/full

Abstract: The challenges of learning statistics, particularly distributions and their characteristics, can be potentially monumental for vision impaired and blind students. The authors provide some practical advice for teaching these students.

"A day in the life of a statistical knowledge for teaching course"

By Randall E. Groth
Volume 35, number 1 (2013)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2012.00520.x/full

Abstract: The article illustrates how statistical content and pedagogical reasoning were taught in tandem in an undergraduate course. A typical day in the course is described. It is also suggested that practicing teachers can benefit from strategies used in the course.

"Are statisticians cold-blooded bosses? A new perspective on the 'old' concept of statistical population"

By Yonggang Lu and Kevin S. S. Henning
Volume 35, number 1 (2013)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2012.00524.x/full

Abstract: Spurred by recent writings regarding statistical pragmatism, we propose a simple, practical approach to introducing students to a new style of statistical thinking that models nature through the lens of data-generating processes, not populations.

From *Technology Innovations in Statistics Education*

http://repositories.cdlib.org/uclastat/cts/tise/

TISE reports on studies of the use of technology to improve statistics learning at all levels, from kindergarten to graduate school and professional development. It is a free, online journal.

"Comparing training approaches for technological skill development in Introductory Statistics courses"

By James Baglin and Cliff Da Costa,
Volume 7, number 1 (2013)
http://www.escholarship.org/uc/item/1hc308sv

Abstract: Technology has transformed the modern introductory statistics course, but little is known about how students develop the skills required to use this technology. This study compares two different training approaches for learning to operate statistical software packages. Guided training (GT) uses direct instruction and explicit guidance during training, whereas active-exploratory training types, such as error-management training (EMT), promote self-directed exploration. Previous studies in general software training suggest that EMT outperforms GT at promoting adaptive skill transfer. This study recruited a sample of 115 psychology students enrolled in introductory statistics courses that ran concurrently across two campuses. These students completed weekly, one-hour training sessions learning to use the statistical

package SPSS. In the final week of the semester, students completed an SPSS certification task to measure adaptive skill transfer. The EMT and GT approach was implemented in Campus A and B respectively. Due to non-random allocation, the covariates of gender, personal access, statistical knowledge, and training progress were taken into account when modeling adaptive transfer between training approaches. After controlling for these covariates, no difference in adaptive transfer was found between training approaches. The results suggest that improving access to statistical packages may provide a more powerful way to improve the development of technological skills over using different training approaches.

From *Mathematics Teacher*

http://www.nctm.org/publications/mt.aspx
MT is an official journal of the National Council of Teachers of Mathematics. It is published nine times a year and is available by paid subscription.

"Bundled-Up babies and dangerous ice cream: Correlation puzzlers"

By Kathleen H. Offenholley
Volume 106, number 6 (2012)
http://www.nctm.org/publications/article.aspx?id=35291
Abstract: Discovering lurking variables encourages students to think critically about correlation.

From *Statistics Education Research Journal*

http://www.stat.auckland.ac.nz/~iase/publications.php?show=serj#archives/
SERJ is a peer-reviewed electronic journal of the International Association for Statistics Education (IASE) and the International Statistical Institute (ISI). It is published twice a year. SERJ is a free online journal.

"Students' attitudes toward statistics across the disciplines: A mixed-methods approach"

By James D. Griffith, Lea T. Adams, Lucy L. Gu, Christian L. Hart, and Penney Nichols-Whitehead
Volume 11, number 2 (2012)
http://www.stat.auckland.ac.nz/~iase/serj/SERJ11(2)_Griffith.pdf
Abstract: Students' attitudes toward statistics were investigated using a mixed-methods approach including a discovery-oriented qualitative methodology among 684 undergraduate students across business, criminal justice, and psychology majors where at least one course in statistics was required. Students were asked about their attitudes toward statistics and the reasons for their attitudes. Five categories resulted for those with positive and negative attitudes and were separated on the basis of discipline. Approximately 63% of students indicated a positive attitude toward statistics. Business majors were most positive and were more likely to believe statistics would be used in their future career. Multiple methodological approaches have now provided data on the various domains of attitudes toward statistics and those implications are discussed.

"Students' perceptions of statistics: An exploration of attitudes, conceptualizations, and content knowledge of statistics"

By Marjorie E. Bond, Susan N. Perkins, and Caroline Ramirez
Volume 11, number 2 (2012)
http://www.stat.auckland.ac.nz/~iase/serj/SERJ11(2)_Bond.pdf

Abstract: Although statistics education research has focused on students' learning and conceptual understanding of statistics, researchers have only recently begun investigating students' perceptions of statistics. The term perception describes the overlap between cognitive and non-cognitive factors. In this mixed-methods study, undergraduate students provided their perceptions of statistics and completed the Survey of Students' Attitudes Toward Statistics-36 (SATS-36). The qualitative data suggest students had basic knowledge of what the word statistics meant, but with varying depths of understanding and conceptualization of statistics. Quantitative analysis also examined the relationship between students' perceptions of statistics and attitudes toward statistics. We found no significant difference in mean pre- or post-SATS scores across conceptualization and content knowledge categories. The implications of these findings for education and research are discussed.

"The importance of attitudes in statistics education"

By Caroline Ramirez, Candace Schau, and Esma Emmioğlu
Volume 11, number 2 (2012)
http://www.stat.auckland.ac.nz/~iase/serj/SERJ11(2)_Ramirez.pdf

Abstract: People forget what they do not use. But attitudes "stick." Our article emphasizes the importance of students' attitudes toward statistics. We examine 15 surveys that purport to assess these attitudes and then describe the Survey of Attitudes Toward Statistics, a commonly used attitude survey. We present our conceptual model of Students' Attitudes Toward Statistics (SATS-M), which is congruent with Eccles and colleagues' Expectancy-Value Theory (Eccles' EVT), as well as others. The SATS-M includes three broad constructs that impact Statistics Course Outcomes: Student Characteristics, Previous Achievement-Related Experiences, and Statistics Attitudes. We briefly describe Eccles' EVT and other theories that support our SATS-M. We relate findings from research using the SATS to our model and end with implications for statistics education.

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