Teaching Bits: Statistics Education Articles from 2011 and 2012

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We located 18 articles that have been published from November 2011 through January 2012 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/ts/
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.

"Active learning? not with my syllabus!"

By Michael D. Ernst
Volume 34, number 1 (2012)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2010.00454.x/abstract
Abstract: We describe an approach to teaching probability that minimizes the amount of class time spent on the topic while also providing a meaningful (dice-rolling) activity to get students engaged. The activity, which has a surprising outcome, illustrates the basic ideas of informal probability and how probability is used in statistical inference.

"What is a p-value?"

By Patricia Humphrey
Volume 34, number 1 (2012)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2010.00446.x/full
Abstract: An in-class activity is described that can be used not only to motivate hypothesis testing, but also to understand and compute the p-value and power in a statistical test.

"Sensitivity analysis in statistics teaching"

By Lingyun Zhang, Kondaswamy Govindaraju
Volume 34, number 1 (2012)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2011.00468.x/full
Abstract: The need to encourage what if questions for statistical thinking in a classroom environment is stressed in this article.

"Teaching statistics using classic psychology research: an activities-based approach"

By Karen Y. Holmes, Brett A. Dodd
Volume 34, number 1 (2012)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2011.00499.x/full
Abstract: In this article, we discuss a collection of active learning activities derived from classic psychology studies that illustrate the appropriate use of descriptive and inferential statistics.

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.

"Graduate Teaching Assistants' Statistical Content Knowledge of Sampling"

By Jennifer Noll
Volume 10, number 2 (2012)
http://www.stat.auckland.ac.nz/~iase/serj/SERJ10(2)_Noll.pdf
Abstract: Research investigating graduate teaching assistants' (TAs') knowledge of fundamental statistics concepts is sparse at best; yet at many universities, TAs play a substantial role in the teaching of undergraduate statistics courses. This paper provides a framework for characterizing TAs' content knowledge in a sampling context and endeavors to raise new questions about TAs' content knowledge and its potential impact on the teaching of undergraduate statistics. The participants in this study were sixty-eight TAs from 18 universities across the United States. These TAs demonstrated considerable knowledge of theoretical probability distributions. However, they experienced tensions when attempting to quantify expected statistical variability in an empirical sampling situation and had difficulty explaining conceptual ideas of variability.

"Publishing in SERJ: An Analysis of Papers from 2002–2009 "

By Andrew Zieffler, Joan Garfield, Robert delMas, Laura Le, Rebekah Isaak, Audbjorg Bjornsdottir, and Jiyoon Park
Volume 10, number 2 (2012)
http://www.stat.auckland.ac.nz/~iase/serj/SERJ10(2)_Zieffler.pdf
Abstract: SERJ has provided a high quality professional publication venue for researchers in statistics education for close to a decade. This paper presents a review of the articles published to explore what they suggest about the field of statistics education, the researchers, the questions addressed, and the growing knowledge base on teaching and learning statistics. We present a detailed analysis of these articles in order to address the following questions: What is being published and why, who is publishing research in SERJ, how is the research being carried out, and what do the results suggest about future research? Implications for future directions in statistics education research are suggested.

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.

"An Exploration of the Exact Distribution and Probabilities for Sample Means for Small Random Samples"

By Steven Hoff, Robert L. Heiny, and Jamis J. Perrett
Volume 6, number 1 (2012)
http://escholarship.org/uc/item/7hr9b543?display=all
Abstract: The computer algebra system, MathematicaTM, is used to determine the exact distributions for sums and means of small random samples taken from a specific probability density function. The method used is the Inverse Laplace Transform for real-valued functions. These distributions are used to compare exact probabilities for probability interval statements for sums and means with normal approximations for these probabilities using the Central Limit Theorem. The maximum normal approximation errors are determined for probability intervals for various sample sizes.

"Learning Statistics Using Motivational Videos, Real Data and Free Software"

By John A. Harraway,
Volume 6, number 1 (2012)
http://escholarship.org/uc/item/1fn7k2x3#
Abstract: Website and software products that have the potential to raise the profile of statistics in society are described. The website has links to case study videos describing contexts, study designs, data files and lessons using the new software for data exploration and analysis. Case study videos dealing with current research applying statistics have been selected to motivate discussion in class, and further "hands on" learning can be achieved through use of the software.

During the development phase in New Zealand in 2010 the software was trialed and student and teacher experiences are reported. A full day professional development workshop for teachers involving lessons using the software was recorded and these are on the website to assist teachers and students. The software is free for teachers and students at education institutes, and the procedure for obtaining a license is outlined.

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.

"Analyzing Highway Speeding Data in the Statistics Classroom"

By Paul Laumakis
Volume 105, number 5 (2011)
http://www.nctm.org/publications/article.aspx?id=31482
Abstract: Students bring the real world into the classroom by studying speeding data collected on two Pennsylvania highways.

"Finding Possibility and Probability Lessons in Sports"

By Nutjira Busadee, Parames Laosinchai, and Bhinyo Panijpan
Volume 105, number 5 (2011)
http://www.nctm.org/publications/article.aspx?id=31486
Abstract: Tackling probability problems before being introduced to the formulas—especially when the problems involve sports—enhances students' understanding of permutation and combination.

From *Mathematics teaching in the middle school*

MTMS 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.
http://www.nctm.org/publications/toc.aspx?jrnl=mtms

"Cleared for Takeoff: Paper Airplanes in Flight"

By Stacy L. Reeder
Volume 17, number 7 (2012)
http://www.nctm.org/publications/article.aspx?id=32237
Abstract: Math and science, as well as mean, median, and mode, made smooth landings during a three-day data-collection unit.

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