Teaching Bits: Statistics Education Articles from 2011

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www.amstat.org/publications/jse/v19n3/garfieldtb.pdf

We located 38 articles that have been published from January 2011 through October 2011 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 *The American Statistician*

http://pubs.amstat.org/
The American Statistician contains articles related to statistics education that are organized into the following sections: Statistical Practice, Teacher's Corner, Reviews of Books and Teaching Materials. It is published quarterly and is available by paid subscription.

"AP Statistics: Building Bridges Between High School and College Statistics Education"

By Christine Franklin, Brad Hartlaub, Roxy Peck, Richard Scheaffer, David Thiel, Katherine Tranbarger Freier
Volume 65, number 3 (2011)
http://pubs.amstat.org/doi/abs/10.1198/tast.2011.09111
Abstract: After providing a brief history of the AP Statistics program and a description of the AP Statistics course content, exam and grading, the paper presents a discussion of current challenges for statistics education in the schools and a look at opportunities for the statistics profession, especially college faculty, to aid the AP Statistics program so as to improve statistics teaching in both venues and thus strengthen the quantitative literacy of future generations of high school or college graduates. This article has supplementary material online.

"A Capstone Course for Undergraduate Statistics Majors"

By Nicole A. Lazar, Jaxk Reeves, and Christine Franklin
Volume 65, number 3 (2011)
http://pubs.amstat.org/doi/abs/10.1198/tast.2011.10240
Abstract: Many undergraduate statistics students receive limited exposure to real data and the challenges of real data analysis. To help improve our undergraduate program at the University of Georgia, we developed a Statistics Capstone Course. The course has three main threads: (1) teaching advanced/modern statistical methods to undergraduate statistics students; (2) giving these students an intensive, year-long data-analysis experience; and (3) providing the students with an opportunity to improve their written and oral communication skills. In this article, we describe the philosophy behind the Capstone Course, detail its implementation, and informally evaluate the success of our endeavor.

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.

"Cheating Partners, Conditional Probability and Contingency Tables"

By Jane M. Watson
Volume 33, number 3 (2011)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2010.00421.x/abstract
Abstract: Developing statistical literacy for older school students includes recognizing and interpreting conditional statements in the media. Data on couples' success in predicting whether their partners have cheated provides a motivating context for teachers to lead their students through this process.

"Data and Dialogue in Primary School"

By John Paramore
Volume 33, number 3 (2011)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2010.00427.x/abstract
Abstract: Many primary school teachers will have not heard of the data-handling cycle as set out in the English Key Stage 3 (UK ages 11–14) curriculum. This article argues that with a little adjustment, it could become the defining model for a holistic and dialogical approach to data handling at Key Stage 2 (UK ages 7–11).

"Consecutive Successes: A Recursive Approach"

By Jared Burch
Volume 33, number 3 (2011)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2009.00399.x/abstract
Abstract: This article illustrates the importance of one's initial thoughts in problem solving through an entertaining example.

"Employing Introductory Statistics Students at 'Stats Dairy'"

By Kellie Keeling
Volume 33, number 3 (2011)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2010.00429.x/abstract
Abstract: To combat students' fear of statistics I employ my students at a fictional company, Stats Dairy, run by cows. Almost all examples used in the class notes, exercises, humour and exams use data 'collected' from this company.

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). SERJ is published twice a year and is free.

"Measuring Statistics Attitudes: Structure of the Survey of Attitudes Toward Statistics (SATS-36)"

By Stijn Vanhoof, Sofie Kuppens, Ana Elisa Castro Sotos, Lieven Verschaffel, Patrick Onghena
Volume 10, number 1 (2011)
http://www.stat.auckland.ac.nz/~iase/serj/SERJ10(1)_Vanhoof.pdf
Abstract: Although a number of instruments for assessing attitudes toward statistics have been developed, several questions with regard to the structure and item functioning remain unresolved. In this study, the structure of the Survey of Attitudes Toward Statistics (SATS-36), a widely used questionnaire to measure six aspects of students' attitudes toward statistics, is investigated. This study addresses the previously unexplored issue of individual item functioning. Based on confirmatory factor analysis using individual items, the results suggest that the SATS-36 can be improved by removing some poorly functioning items and that depending on the goals of a specific study either six subscales could be used or three of them (Affect, Cognitive Competence, and Difficulty) can be combined into one subscale without losing much information.

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.

"Introductory Statistics Unconstrained by Computability: A New Cobb Salad"

By Robert H. Carver
Volume 5, number 1 (2011)
http://escholarship.org/uc/item/81d8c04j#
Abstract: Technology continues to change not only how we teach, but also what we teach in the introductory course. Recently there has been lively discussion about which topics belong in the course. George Cobb has challenged us to rethink the curriculum in light of the computational power of our technologies. This paper proposes a framework for structuring a course using JMP, omitting some traditional topics, leaving space for emphasis on concepts, on data production, on visualization, and on topics that are rarely included in an introductory course. Through such a structure, we can more directly connect statistics education to students' disciplinary contexts in business, engineering, social and natural sciences, etc. Additionally, we can strengthen students' conceptual foundations in the field so that, in their roles as citizens and professionals, they can become more critical consumers of statistical arguments.

"Innovative Activities: How Clickers can Facilitate the Use of Simulations in Large Lecture Classes"

By Jennifer J. Kaplan,
Volume 5, number 1 (2011)
http://escholarship.org/uc/item/1jg0274b#
Abstract: This paper is a technology case study that addresses the theme of using technology in a large lecture format undergraduate introduction to statistics class to develop student conceptual understanding of inference. In the activities described, each student in the lecture performs a simulation once on a calculator and the results are collected via a personal response system (clicker). This provides not only an active learning environment, but also allows students to experience statistical concepts such as distributions or models, variability, and the Central Limit Theorem, in ways that they cannot experience without these technologies. The large class, therefore, becomes a learning asset, rather than a liability. The two activities that are described in detail are part of a set of twelve activities that were designed to improve conceptual understanding of statistical inference.

From *Journal for Research in Mathematics Education*

JRME is an official journal of the National Council of Teachers of Mathematics. It is published five times a year and is available by paid subscription.
http://www.nctm.org/eresources/journal_home.asp?journal_id=1

"Investigation of factors mediating the effectiveness of authentic projects in the teaching of elementary statistics"

By Dianna J. Spence, Julia L. Sharp and Robb Sinn
Volume 30, number 4 (2011)
http://www.sciencedirect.com/science/article/pii/S0732312311000368
Abstract: Four instructors used authentic research projects and related curriculum materials when teaching elementary statistics in secondary and undergraduate settings. Projects were authentic in that students selected their own variables, defined their own research questions, and collected and analyzed their own data. Classes using these projects were considered treatment groups in the study. Student outcomes measured were content knowledge, perceived usefulness of statistics, and statistics self-efficacy. These outcomes were compared with those of students taught by the same instructors in prior terms without authentic projects (the control groups). Although all three outcomes increased for the treatment group in both settings, simple t-tests indicated that these gains were not statistically significant. Variables were identified as potential factors mediating the effects of treatment, and multivariate and univariate models were then used to examine treatment, setting, instructor effects, and student achievement level as variables jointly contributing to these three outcomes. Follow-up analyses suggested that some treatment effects were significant in more restricted contexts (e.g., in certain settings for certain types of students). The models also suggest multiple significant interactions among treatment, setting, individual instructor, and student achievement level, particularly on affective outcomes.