Teaching Bits: Statistics Education Articles from 2012

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Journal of Statistics Education Volume 20, Number 2 (2012),
www.amstat.org/publications/jse/v20n2/garfieldtb.pdf

We located 23 articles that have been published from January 2012 through July 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.

"Lexical ambiguity: making a case against spread"

By Jennifer J. Kaplan, Neal T. Rogness, Diane G. Fisher
Volume 34, number 2 (2012)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2011.00477.x/abstract
Abstract: We argue for decreasing the use of the word spread when describing the statistical idea of dispersion or variability in introductory statistics courses. In addition, we argue for increasing the use of the word variability as a replacement for spread.

"Testing a student generated hypothesis using student data"

By Herle M. McGowan, Joel Vaughan
Volume 34, number 2 (2012)

http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2010.00452.x/abstract
Abstract: We describe an activity that allows students to experience the full process of a statistical investigation, from generating the research question, to collecting data and testing a hypothesis. Implementation of the activity is described both with and without use of clickers, handheld remotes that allow instant data collection.

"Updating formulae for the sample covariance and correlation"

By Kevin Hayes
Volume 34, number 2 (2012)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2011.00491.x/abstract
Abstract: This article provides an easy derivation of updating formulae for the sample covariance and, by extension, for the Pearson product–moment correlation coefficient.

"Digging into data with graphics"

By Thomas E. Bradstreet, John S. Palcza
Volume 34, number 2 (2012)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2011.00490.x/abstract
Abstract: Data from a cough challenge study are displayed with dot charts to demonstrate the importance of graphs in understanding data, principles of graph construction and visual perception. The data are available for use in the classroom.

"A result concerning runs when tossing a fair coin"

By A.S. Gabhe, K.S. Bhanu, M.N. Deshpande
Volume 34, number 2 (2012)
http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9639.2011.00478.x/abstract
Abstract: We establish an interesting connection between the number of runs and the length of the first run when tossing a fair coin.

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.

"A Multi-Institutional Study of the Relationship between High School Mathematics Achievement and Performance in Introductory College Statistics"

By Danielle N. Dupuis, Amanuel Medhanie, Michael Harwell, Brandon LeBeau, Debra Monson, and Thomas R. Post
Volume 11, number 2 (2012)
http://www.stat.auckland.ac.nz/~iase/serj/SERJ11(1)_Dupuis.pdf

Abstract: In this study we examined the effects of prior mathematics achievement and completion of a commercially developed, National Science Foundation-funded, or University of Chicago School Mathematics Project high school mathematics curriculum on achievement in students' first college statistics course. Specifically, we examined the relationship between students' high school mathematics achievement and high school mathematics curriculum on the difficulty level of students' first college statistics course, and on the grade earned in that course. In general, students with greater prior mathematics achievement took more difficult statistics courses and earned higher grades in those courses. The high school mathematics curriculum a student completed was unrelated to statistics grades and course-taking.

"Retention of Statistical Concepts in a Preliminary Randomization-Based Introductory Statistics Curriculum"

By Nathan Tintle, Kylie Topliff, Jill VanderStoep, Vicki-Lynn Holmes, and Todd Swanson
Volume 11, number 2 (2012)
http://www.stat.auckland.ac.nz/~iase/serj/SERJ11(1)_Tintle.pdf
Abstract: Previous research suggests that a randomization-based introductory statistics course may improve student learning compared to the consensus curriculum. However, it is unclear whether these gains are retained by students post-course. We compared the conceptual understanding of a cohort of students who took a randomization-based curriculum (n = 76) to a cohort of students who used the consensus curriculum (n = 79). Overall, students taking the randomization-based curriculum showed higher conceptual retention in areas emphasized in the curriculum, with no significant decrease in conceptual retention in other areas. This study provides additional support for the use of randomization-methods in teaching introductory statistics courses.

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.

"Using Applets and Video Instruction to Foster Students' Understanding of Sampling Variability"

By Scott N. McDaniel, Lisa B.Green,
Volume 6, number 1 (2012)
http://escholarship.org/uc/item/1nh4n607#
Abstract: Online instructional modules that combine an applet, audio-visual tutorials, and guided discovery questions were created to teach the concept of sampling variability. The modules did contribute to an increase in understanding. However, they are a supplement to, not a replacement for, traditional instruction. The researchers found, using pretests and posttests, that student understanding of sampling distributions increased. There is room for further improvement, which could be accomplished in two ways. A focus on designing for the

introductory, rather than advanced, statistics student could be helpful. Also, giving students more feedback could help their performance in later modules.
