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 free.

SERJ aims to advance research-based knowledge that can help to improve the teaching, learning, and understanding of statistics or probability at all educational levels and in both formal (classroom-based) and informal (out-of-classroom) contexts. Such research may examine, for example, cognitive, motivational, attitudinal, curricular, teaching-related, technology-related, organizational, or societal factors and processes that are related to the development and understanding of stochastic knowledge. In addition, research may focus on how people use or apply statistical and probabilistic information and ideas, broadly viewed.

The *Journal* encourages the submission of quality papers related to the above goals, such as reports of original research (both quantitative and qualitative), integrative and critical reviews of research literature, analyses of research-based theoretical and methodological models, and other types of papers described in full in the Guidelines for Authors. All papers are reviewed internally by an Associate Editor or Editor, and are blind-reviewed by at least two external referees. Contributions in English are recommended. Contributions in French and Spanish will also be considered. A submitted paper must not have been published before or be under consideration for publication elsewhere.

Further information and author guidelines are available at:
http://iase-web.org/Publications.php?p=SERJ

Submissions

Manuscripts must be submitted by email, as an attached Word document, to co-editor Robert delMas <delma001@umn.edu>. Submitted manuscripts should be produced using the Template file and in accordance with details in the Guidelines for Authors on the Journal's Web page:
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Peter Petocz, Macquarie University, Sydney, North Ryde, New South Wales 2109, Australia. Email: peter.petocz@mq.edu.au

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Lawrence M. Lesser, Department of Mathematical Sciences, The University of Texas at El Paso, El Paso, Texas, 79968, USA. Email: Lesser@utep.edu

Associate Editors

Nick J. Broers, Department of Methodology and Statistics, Maastricht University, P.O. Box 616, 6200 MD, Maastricht, The Netherlands. Email: nick.broers@stat.unimaas.nl

Joan B. Garfield, Educational Psychology, University of Minnesota, 161 EdSciB, 56 East River Rd, Minneapolis, MN 55455, USA. Email: jbg@umn.edu

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Aisling Leavy, Mathematics Education, Mary Immaculate College - University of Limerick, South Circular Road, Limerick, Ireland. Email: aisling.leavy@mic.ul.ie

Hollylynne Stohl Lee, Department of Science, Technology, Engineering, and Mathematics Education, North Carolina State University, Campus Box 7801, 502D Poe Hall, Raleigh, NC 27695, USA. Email: hollylynne@ncsu.edu

M. Gabriella Ottaviani, Dipartimento di Statistica Probabilitá e Statistiche Applicate, Universitá degli Studi di Roma "La Sapienza", P.le Aldo Moro, 5, 00185, Rome, Italy. Email: Mariagabriella.ottaviani@uniroma1.it

Maxine Pfannkuch, Mathematics Education Unit, Department of Mathematics, The University of Auckland, Private Bag 92019, Auckland, New Zealand. Email: m.pfannkuch@auckland.ac.nz

Dave Pratt, Institute of Education, University of London, 20 Bedford Way, London WC1H 0AL. Email: d.pratt@ioe.ac.uk

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Gilberte Schuyten, Faculty of Psychology and Educational Sciences, Ghent University, H. Dunantlaan 1, B-9000 Gent, Belgium. Email: Gilberte.Schuyten@UGent.be

Jane Watson, University of Tasmania, Private Bag 66, Hobart, Tasmania 7001, Australia. Email: Jane.Watson@utas.edu.au

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EDITORIAL

Welcome to the first issue of *SERJ* for 2014. This is my last issue as editor. Maxine Pfannkuch (University of Auckland, NZ) will be taking over the reins this summer and will serve as co-editor for the next four years. Maxine is an accomplished researcher in statistics education who has published several articles in *SERJ* and elsewhere. Please join me in welcoming her to *SERJ*. I am pleased and excited that she agreed to assume the stewardship of *SERJ* and expect that she will take the journal in new and interesting directions.

I started as co-editor in the fall of 2009, publishing my first issue as editor in May 2010. Now, nearly four and a half years later, I can say that serving as co-editor for *SERJ* has been an enriching experience, both personally and professionally. I have enjoyed reading the numerous manuscripts submitted to *SERJ* and the opportunity to bring many of them to publication. None of this could have happened without the hard work of the *SERJ* Associate Editors and the numerous referees who have volunteered their time to review manuscripts. I thank them all for the time, effort and service they provide to *SERJ*. And a special expression of appreciation to my fellow co-editor, Peter Petocz, for his invaluable guidance and feedback, as well as to the previous Assistant Editor, Beth Chance, and the current Assistant Editor, Larry Lesser, who both put in countless hours combing over details and fine-tuning articles before rolling out an issue.

Four very interesting articles are published in this issue. Two articles explore students' understanding of two different statistical concepts, randomness and *p*-values. Another article studies the development of teachers understanding and use of technology to teach statistics. The last article identifies statistical topics that students in a biostatistics course found difficult to understand and the potential role of technology in helping students overcome their difficulties.

Jennifer Kaplan, Neal Rogness and Diane Fisher report on their continuing research into students' understanding of statistical terminology, this time focusing on the word *random*. They note that encountering the word *random* in a statistics course may produce lexical ambiguity for students due to conflicting meanings between the mathematical/statistical meaning and the students' everyday usage. They present evidence for the efficacy of an innovative instructional approach designed to address students' lexical ambiguity for the word *random* by contrasting the colloquial and technical meanings of the word as well as focusing on the random processes instead of the outcomes of random processes. Their methodology makes use of webmaps to identify the complexity of students' conceptual understanding as well as connections that are strengthened and weakened by the instructional approach.

Hollylynne Lee, Gladis Kersaint, Suzanne Harper, Shannon Driskell, Dusty Jones, Keith Leatham, Robin Angotti, and Kwaku Adu-Gyamfi looked at the role of dynamic, interactive software in supporting the transnumerative actions of teachers enrolled in a course on teaching statistics at eight different institutions. The course is designed to develop teachers' statistical knowledge and technological statistical knowledge through activities designed around exploratory data analysis and developing an understanding of randomness, sampling variability and informal inference. The results identify numerous ways in which the dynamic software allowed the teachers to produce linked and enhanced graphical representations that supported their thinking and reasoning. In addition to the discussion of the results and their implications for instruction and teacher development, I expect statistics education researchers to find the methods used to analyze the qualitative data of great interest.

Robyn Reaburn reports the results of a design experiment aimed at identifying difficulties tertiary-level students encounter when trying to understand *p*-values. The study was conducted over four semesters, allowing Robyn to use the results from one semester to inform changes in instruction during a subsequent semester. The motivation for each new teaching intervention (computer simulation, tabular representation of hypothesis testing logic, having students write explanations of their reasoning, diagrammatic representations of *p*-values and presentation of Karl Popper's

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falsifiability criterion) is presented along with evidence suggesting that a larger proportion of students improved their understanding of *p*-values each semester.

The final article by Weili Xu, Yuchen Zhang, Cheng Su, Zhuang Cui and Xiuying Qi presents results from a questionnaire administered to undergraduates enrolled in a biostatistics course. The questionnaire was designed to identify topics and concepts that students found troublesome, as well as to identify what students did to help them understand difficult concepts. One of the main findings was an association of an inaccurate conception of the discipline of statistics and of "random sample" with difficulty in understanding confidence intervals and hypothesis testing. Xu and her colleagues provide an interesting discussion of threshold concepts (i.e., concepts that need to be understood in order to understand other concepts) and how technology can facilitate the learning of threshold concepts.

ROBERT DELMAS

CALL FOR A NEW *SERJ* CO-EDITOR

DEADLINE FOR SUBMISSION OF NOMINATIONS:
10 JUNE 2014

The International Association for Statistical Education (IASE) is starting a search for the next co-editor of *Statistics Education Research Journal* (*SERJ*), its peer-reviewed electronic journal. The new editor will serve a four-year term starting 1 January 2015 and ending 31 December 2018. The new editor will replace Peter Petocz (Macquarie University, Australia), who will end his tenure at that time, and join Maxine Pfannkuch (The University of Auckland, New Zealand), the continuing co-editor whose term ends December 2017.

1. ABOUT *SERJ*

SERJ was established in 2002 by IASE to advance research-based knowledge that can help to improve the teaching, learning, and understanding of statistics and probability at all educational levels and in both formal and informal contexts. *SERJ* presently publishes two issues per year but could move up to three issues per year in coming years, including a special issue of changing themes. The scope of submitted manuscripts represents the growing interest in research and in new knowledge that can inform practice in statistics education.

The *SERJ* organization includes two co-editors who normally serve for four years, an Assistant Editor in charge of copy-editing and production, and an Editorial Board presently comprised of 13 Associate Editors from eight countries. *SERJ* issues and materials are published at http://iase-web.org/Publications.php?p=SERJ. The journal maintains autonomy regarding content and process, although some activities are coordinated with IASE and its parent organization and *SERJ* co-publisher, the International Statistical Institute (ISI). All journal activities are conducted electronically. Board members meet during key international conferences such as ICOTS or the ISI's World Statistics Congress. *SERJ* is a virtual organization and it operates on the basis of voluntary work by all board members and editors.

2. CO-EDITORS' EXPECTED QUALIFICATIONS AND ROLES

The co-editors are responsible for overall management of all journal operations. They manage peer-review and editorial processes, determine the composition of the Editorial Board and the reviewer pool, and initiate and conduct communication with prospective authors, reviewers, associate editors, and external stakeholders. The co-editors are expected to establish editorial policies, set scholarly and quality expectations, and uphold acceptance criteria regarding manuscripts. The co-editors should have a forward-looking vision and initiate new features and structures, if needed in consultation with Board members and others, to enable *SERJ* to respond to the evolving knowledge needs in the dynamic area of statistics education and to raise the scientific impact of the journal in relevant scientific databases and

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indexes. Overall, the co-editors should lead the journal to make an important contribution to research and practice in statistics education. To best achieve this, the co-editors should have strengths in relevant research areas and prior editorial experience, and should possess the skills necessary to work with prospective contributors in a supportive yet critical spirit.

3. NOMINATION PROCESS

Review of nominations will begin after 10 June 2014, but nominations should be submitted as soon as possible. IASE encourages both nominations of suitable candidates and self-nominations from interested individuals. All nominations and self-nominations will be considered by the Search Committee, which can also propose additional nominees. Candidates who self-nominate are asked to send (1) an academic vita/resumé (CV), together with (2) a brief statement describing their vision for continuing the growth and development of the *Journal*, and their qualifications for the position. Candidates might also be asked to respond to additional questions from the Search Committee.

Please send self-nominations (with all supporting materials listed above), suggestions for nominees, or any questions, to the Chair of the Search Committee: Chris Reading <creading@une.edu.au>, **University of New England, Australia.** Questions about the practicalities of the editorship can also be sent to the departing co-editor, Peter Petocz <peter.petocz@mq.edu.au>.