



# 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 guidelines for authors are available at: <http://www.stat.auckland.ac.nz/serj>

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Manuscripts must be submitted by email, as an attached Word document, to co-editor Tom Short <tshort@iup.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: <http://www.stat.auckland.ac.nz/serj>

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## EDITORIAL

This last August I was fortunate enough to be able to attend several meetings, including SRL-5 (the fifth forum on Statistical Reasoning, Thinking, and Literacy, at the University of Warwick, UK), the IASE Satellite meeting on Assessing Student Learning in Statistics (Guimarães, Portugal), and ISI-56, the biannual meeting of the International Statistical Institute (Lisbon, Portugal). Information about all of them appears in the “Past IASE Conferences” section at the end of this issue.

It was exciting to chat informally and hear presentations regarding a very wide range of studies, projects, and professional activities related to statistics education. Clearly, the international community interested in research on the learning, teaching, and understanding of statistics and probability, is growing and diversifying. From the many topics I came across, I would like to briefly highlight one that deserves special mentioning in the context of a research journal such as *SERJ*, related to the types of research data and types of evidence we encounter, and their implications for research publishing and for teaching/learning.

We often speak of “quantitative research” versus “qualitative research.” Although it is recognized that both types are needed in research of an educational nature, sometimes we see researchers leaning towards one or the other. There is a somewhat tenuous relationship between quantitative and qualitative research in an area whose subject matter, statistics, is based on quantitative information, and where some of the researchers and teachers (as well as manuscript referees...) are mainly trained in quantitative methods.

However, I have now come across a number of situations where neither of these two traditional labels is sufficient, and perhaps we should refer to a third (hybrid?) kind, “Dynamic data.” The need to rethink the traditional division of research into quantitative and qualitative became obvious to me this summer when listening to reports about classroom activities and studies where learners and teachers used dynamic software such as Fathom, Tinkerplots, or interactive applets such as probability simulators. In such and related cases, the data being collected by researchers (i.e., information about what students did, what they looked at, and how they thought during an activity or interpreted the results) was more complex than ever before, and sometimes quite slippery. The data accumulated over time and involved a dynamically changing mix of elements such as utterances and conversations among students or among students and teacher, different types of graphical displays, multiple “what if” trials with different aggregations or data views that the students looked at in the course of their work, results of trying different kinds of simulations, and more.

Of course, the need to collect, describe and integrate data from multiple sources, both quantitative and qualitative, has existed before the emergence of dynamic software. However, listening to reports from different studies, it became apparent that researchers are challenged by the need to capture and describe the additional fast-changing and multi-faceted data generated when dynamic software is an inherent part of the teaching/learning environment and when students are given enough time to use it in an exploratory manner. The nature of what students look at, work with, refer to, or think about is becoming more complex and harder to document, as it rapidly changes over time. Of course, all these realities place additional burden and present new demands to teachers working in a “dynamic data” environment, and have

implications for the forms of needed assessments. Further, researchers need new tools, methods, terminology, or conceptualizations in order to analyze and interpret such data, and probably so do teachers. The need to report in a concise and coherent manner what transpires in a teaching/learning episode involving dynamic data in turn presents new challenges to researchers trying to write a compact manuscript for publication in a journal such as *SERJ*.

It follows that new technology-based developments offer brave new worlds for educators, learners, and researchers alike, and promise to make learning more fun, interesting, and deeper in nature. Yet, such developments also make life more complex for all involved. Certainly, as more researchers would want to report the results of research using “dynamic data” as described above, research journals such as *SERJ* may need to consider “dynamic reporting” of data, such as in the form of links within documents to mini-videos or dynamic screen-shots so that readers can appreciate the nature of the information being analyzed and reported by researchers.

While the observations and ideas presented above are tentative in nature, certainly they may cause us to think where our field is moving. Next year, in 2008, several important meetings will take place where such and related developments can be further examined and discussed, and they are listed in the “Forthcoming Conferences” section in this issue. I refer in particular to two Topic Study Groups, #13 and #14, to be held as part of ICME-11 (International Congress on Mathematical Education), which will deal with research and development in the teaching and learning of probability, and of statistics, respectively. In addition, prior to ICME, the special “Joint ICMI/IASE study on statistics education in school mathematics” will be another forum where tensions and responsibilities emerging due to new technologies can be further explored.

This issue of *SERJ* is the last that I will be co-editing, having reached the end of my four-year term. It is a pleasure for Tom and me to announce that Peter Petocz was appointed as co-editor for *SERJ* for the years 2008-2011 by the IASE Executive Committee, following the unanimous recommendation of the IASE search committee. Peter is Associate Professor in the Department of Statistics at Macquarie University, Australia. He is a very innovative and effective statistics educator, and also an accomplished researcher who has published on pedagogical issues in statistics and mathematics education. Peter will soon begin working with Tom Short, who continues as co-editor through 2009, and I wish both of them a good time ahead.

In closing, I would like to express my gratitude to the many dedicated members of the *SERJ* Editorial Board and to the journal’s many referees who continue to invest time and effort in helping to improve research publishing and contribute advice and support to authors and educators alike. The growth *SERJ* has experienced over the last four years has been also helped by the support and understanding of the IASE Executive committee and its former and current presidents. All this goes to show that a journal such as *SERJ* develops in a dynamic environment that is sometimes slippery, yet full of promise. I am certain that the new editorial team will continue to find ways to maintain quality in published manuscripts, yet at the same time enable *SERJ* readers to benefit from new opportunities for developing research-based knowledge in our evolving field.

IDDO GAL, for TOM SHORT