



International Electronic Journal of  
**Mathematics Education**

Volume 2, Number 3, October 2007

[www.iejme.com](http://www.iejme.com)

---

**SPECIAL ISSUE: EMERGING RESEARCH IN STATISTICS EDUCATION**

**Carmen Batanero, Guest Editor**

Longstanding efforts by different researchers who were pioneers in the field of statistics education has led today to the introduction of statistics in school mathematics in many countries. Simultaneously, the teaching and learning of statistics has turned into a research area of increasing interest for mathematics educators, as shown in the two recent survey chapters by Jones, Langrall and Money (2007) and Shaughnessy (2007) and also in the existence of journals such as *Journal of Statistics Education*, *Teaching Statistics* and, more recently, *Statistics Education Research Journal*, specifically focused on statistics education research.

The increased research in this area might not have been noticed by mathematics educators, as statistics education receives contributions not only from them but from many other different disciplines. Research into stochastic thinking, teaching, and learning started during the 1950s with the pioneering work by Piaget and Inhelder (1951) on the growth and structure of children's probabilistic thinking and has always had an interdisciplinary character. Because psychology is an experimental science that heavily relies on statistics, the efforts to justify the scientific character of this field led psychologists to examine the validity of their research paradigms, including the use of statistics in empirical research. An amazing observation was that statistical inference and particularly significance tests were found to be misunderstood and misused by psychologists and experimental researchers at large over 30 years ago, and that the situation still persists in spite of strong debates ever since (Morrison & Henkel, 1970; Harlow, Mulaik, & Steiger, 1997; Batanero, 2000). Moreover, researchers in the field of reasoning under uncertainty suggested more than 20 years ago that, even after statistical instruction, students and professionals tend to continue to make erroneous stochastic judgements and decisions (Kahneman, Slovic, & Tversky, 1982).

Statistics is one of the most widely taught topics at university level, where many service course students meet advanced stochastic thinking without any prior or concurrent experience of advanced algebra or calculus, so that didactical problems still persist at University level (Artigue, Batanero, & Kent, 2007). The diffusion of psychological research results and the increasingly easy access to powerful and user-friendly computers and statistical software, which save teaching time previously devoted to laborious calculations and allow a more intuitive approach to statistics (more real data, active learning, problem solving, and use of technology to illustrate abstract concepts through simulation) led statistics lecturers to increase their attention towards didactical problems (see, e.g., Moore, 1997). Consequently, an increasing number of statisticians or lecturers of statistics with different professional backgrounds started to develop educational research with a specific interest in creating curricular materials and to evaluate the teaching and learning of statistics at university level. The influence of the *International Association for Statistical Education* (IASE), created in 1991, helped to establish links among the different communities interested in statistics education and to support a more systematic research program, particularly through its conferences and publications.

Copyright © 2007 by GOKKUSAGI

ISSN: 1306-3030

I am consequently very pleased to introduce this special issue of the *International Electronic Journal of Mathematics Education (IEJME)* on *Emerging Research in Statistics Education* that can help expanding knowledge about the state of the art in this field among mathematics educators. The issue will present some of the Invited Papers dealing with research that were presented at the *Seventh International Conference on Teaching Statistics (ICOTS-7)*, Salvador (Bahia), Brazil, 2006, <http://www.maths.otago.ac.nz/icots7>. The ICOTS conferences are the most important means of interchange that the IASE offers to the community of statistics educators and were started 24 years ago by the *International Statistical Institute (ISI)*. ICOTS-7 was successfully held in Brazil, with over 550 participants representing about 50 different countries. The more than 220 invited papers, 120 contributed papers, 120 posters, keynote lectures, panels, and special sessions gave a synthesis of the main tendencies and developments in statistics education.

Selecting ICOTS-7 papers for this special issue was not an easy task, given the enormous number of contributions. We then focused, as a first step, on those invited papers dealing specifically with empirical research in themes that could be of interest to the IEJME audience. We, secondly, considered only those papers that had passed the double blind refereeing process in ICOTS (since refereeing was optional for invited papers). Taking into account these restrictions we selected a sample of papers that include a variety of research topics and nationality of authors, as well as both young and experienced researchers. The papers in this issue analyse probability, distribution and conditional probability, variation, statistical graphs, statistical literacy, sampling distributions, informal inference, multivariate data and teachers' views about teaching statistics. It combines qualitative and quantitative research with methods including interviews, open-ended tasks, paper-pencil and computer based questionnaires, Rasch or factor analysis. Students in the samples range from primary school level to University, including prospective in-service teachers. The studies focus on students or teachers' conceptions, assessment, instruction, use of technology or research methods.

I hope this variety reflects the state of research in statistics education and increases the readers' interest to know more about what is going on in this area; hopefully some of them will decide to undertake new research. In closing, I want to thank the contributors into this issue for the interest they put in improving their papers as well as the many referees, who accepted the challenging role to help this special issue achieve high scholarly standards.

Acknowledgment: Preliminary versions of papers in this special issue were first published in Rossman and Chance (2006). Permission for publication of these expanded versions has been granted from the IASE and ICOTS-7 organizers.

## REFERENCES

- Artigue, M., Batanero, C., & Kent, P. (2007). Mathematics thinking and learning at post-secondary level. In F. Lester (Ed.), *Second Handbook of Research on Mathematics Teaching and Learning* (pp. 1011-1049). Greenwich, CT: Information Age Publishing, Inc., and NCTM.
- Batanero, C. (2000) Controversies around significance tests, *Mathematical Thinking and Learning*, 2(1-2), 75 – 98.
- Jones, G. A., Langrall, C., & Mooney, E. S. (2007). Research in probability: Responding to classroom realities. In F. Lester (Ed.), *Second Handbook of Research on Mathematics Teaching and Learning* (pp. 909-955). Greenwich, CT: Information Age Publishing, Inc. and NCTM.
- Kahneman, D., Slovic, P., & Tversky, A. (1982). *Judgment under uncertainty: Heuristics and biases*. New York: Cambridge University Press.
- Harlow, L. L., Mulaik, S. A., & Steiger, J. H. (1997). *What if there were no significance tests?* Mahwah, NJ: Erlbaum.
- Moore, D. S. (1997). New pedagogy and new content: the case of statistics. *International Statistical Review*, 65(2), 123-165.
- Morrison, D. E., & Henkel, R. E. (Eds.). (1970). *The significance tests controversy. A reader*. Chicago: Aldine.
- Piaget, J. & Inhelder, B. (1951), *La genèse de l'idée de hasard chez l'enfant* [The origin of the idea of chance in children]. Paris: Presses Universitaires de France.
- Rossmann, A., & Chance, B. (2006). *Proceedings of the Seventh International Conference on Teaching Statistics*, Salvador, Brazil: International Statistical Institute and International Association for Statistical Education. Online: <http://www.stat.auckland.ac.nz/~iase/>.
- Shaughnessy, J. M. (2007). Research on statistics learning and reasoning. In F. Lester (Ed.), *Second Handbook of Research on Mathematics Teaching and Learning* (pp. 957-1009). Greenwich, CT: Information Age Publishing, Inc. and NCTM.

Authors : **Carmen Batanero**

E-mail : [batanero@ugr.es](mailto:batanero@ugr.es)

Address : University of Granada

Facultad de Educación, Campus de Cartuja 18071

Granada, Spain

Phone : 34 958243950

Fax : 34 958246359