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STATISTICS EDUCATION FOR THE INFORMATION AGE

Communication from the President of the American Statistical Association

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It is an exciting time to be a statistician! Data are everywhere. Technology to produce and analyze data is advancing faster than most of us can comprehend (perhaps even faster than we desire). Leaders in business, industry, government, and education are beginning to see that statistics and statisticians can make important contributions to society (although not faster than we desire). More students than ever before are taking statistics courses – even at the school level.

In the United States, the increased emphasis on statistics in the K-12 curriculum, the strong interest in the high school Advanced Placement (AP) Statistics courses, and the increased need for statistics in a wide range of occupations, prompted the American Statistical Association, in conjunction with other statistical societies, to begin promoting the enhancement of undergraduate education in statistics. The Symposium on undergraduate statistics education held in conjunction with the 2000 Joint Statistics Meetings (<http://amstat.org/education/usei.html>) drew 150 enthusiastic participants, and led to expanded efforts on establishing '*Curriculum Guidelines for Undergraduate Programs in Statistical Science*' (http://amstat.org/education/Curriculum_Guidelines.html). This set the stage for exciting advances in statistics education that can be built around the key points of flexibility, innovation, and experimentation. The one-size-fits-all introductory statistics course is no longer sufficient for most undergraduate students. There are many types of undergraduate programs in the mathematical sciences and statistics is flexible enough to fit into all of them. Once students clearly see the value added by taking more statistics, some will decide to major in the subject and the strength of the field could be noticeably improved.

The undergraduate initiative is just one of many being planned for the ASA's Center for Statistics Education (CSE). This Center should be positioned to play a leading role in the unfolding emphasis on statistics throughout the K-12 mathematics and science curriculum, as well as in the undergraduate curricula of colleges and universities. To accomplish this, the CSE is attempting to establish clear goals and guidelines for promoting statistics education at the elementary, middle, and high school levels, and at various levels of undergraduate activity, including the preparation of future teachers of mathematics and science.

At all these levels, improving the skills of teachers is the overarching goal, although the undergraduate initiative goes beyond that. Objectives toward these goals should include intensive workshops for teachers at all levels, sessions at professional meetings of statistics and allied societies, special conferences on aspects of statistics education, innovative use of the web, and serious networking among educational and scientific groups.

There is much work to be done – but it is an exciting time to be a statistician!

International Association for Statistical Education

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IASE web page: <http://www.cbs.nl/isi/iase.html>

FORTHCOMING EVENTS

IASE Sessions at ISI-53 Seoul, Korea, August 22-29, 2001

There are seven sessions to be organised by the IASE alone, with another four being jointly organised with other sections. There will also be a number of contributed paper sessions on Statistics Education.

Here follows a communication of Lionel Pereira-Mendoza, lpereira@nie.edu.sg, who is co-ordinating our section of the programme.

Planning for the IASE sessions and Seoul is reaching the final stages. The speakers are in place and we are looking forward to an exciting conference. The speakers and discussants are from many countries and provide an international perspective on the many issues associated with the teaching of statistics at all levels, school and post-secondary. For example, consider just two sessions. The teaching of statistics in non-statistics degrees is an ever-expanding concern for statistical educators and this session will explore the issues associated with the health sciences. The Internet is an increasingly important tool for all educators, and statistics educators are no exception. This session will include papers on online access, distance learning and classroom experience of using the net for teaching.

The ISI meeting provide an opportunity for colleagues interested in the issues of statistics education to attend sessions both designed for statistical educators as well as sessions geared to issues associated with statistics, per se. The IASE Executive is looking forward to an exciting conference. Some additional details on the speakers for the IASE sections can be found at www.swin.edu.au/math/iase/isi53.html and general details on the conference at www.nso.go.kr/isi2001/

IASE ICOTS-6 Durban, South Africa, July 7-12, 2002

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The preparations for the Sixth International Conference on Teaching Statistics (ICOTS-6) are well under way. The Conference is organized by the International Association for Statistical Education (IASE), the International Statistical Institute (ISI) and the South African Statistical Association (SASA). ICOTS-6 will take place in Durban (South Africa) from July 7 – 12, 2002. The major aim of ICOTS-6 is to provide the opportunity for people from around the world who are involved in statistical education to exchange ideas and experiences, to discuss the latest development in teaching statistics and to expand their network of statistical educators. The conference will include keynote speakers, invited speakers, contributed papers, workshops and forums,

demonstration lessons, roundtable sessions, poster sessions, book and software displays, hands-on computer sessions and many opportunities for the communication and exchange of experiences and ideas. As the conference theme for ICOTS-6 is "Developing a statistically literate society", special sessions on statistical literacy are planned. These will include keynote speakers on statistical literacy and sessions and discussions of the role of statistics in a number of everyday contexts.

By now, all invited speakers have received their formal invitation from their Session Organizers, and submitted the abstracts of their suggested presentations. The ICOTS-6 Executive will post the abstracts in the ICOTS-6 IPC Website <http://www.beeri.org.il/icots6/>, as well as in the second announcement, due in July 2001.

In ICOTS-6 we shall offer the option of a full paper *refereeing process* for those who desire it. Papers for refereed publication will be reviewed by three referees selected from a panel of peers approved by the ICOTS-6 International Program Committee (IPC). The IPC believes that the refereeing process provides a mechanism for peer review and critique and so contributes to the overall quality of statistics education research and teaching. More details about the refereeing process, as well as the general authors' instructions, can be viewed in the ICOTS-6 IPC Website under *Announcements*.

We have also posted in the Website preliminary information regarding registration fees, accommodation, travel and tours. The conference registration fees will be set as low as possible simply to cover costs. IASE member early registration is expected to be less than 350 US Dollars. Full details should be available by the end of April 2001. Further details will be also provided in the South African Local Organizing Committee (LOC) Website <http://icots.itikzn.co.za/>.

There are still some sessions where we would like to have more colleagues presenting papers on the teaching of statistics in their countries and on related research. These include sessions in the topic: "*An International Perspective on Statistics Education*". In this regards, we ask colleagues from the African Countries to contact Fayez Mina (Egypt, fmmina@link.com.eg), from the Portuguese-speaking countries Helena Bacelar-Nicolau (Portugal, hbacelar@fc.ul.pt), from the Spanish-speaking countries Teresita Teran (Argentina, teresitateran@hotmail.com). We also invite colleagues from East Europe to join the Conference, giving us a picture of the teaching of statistics in their countries at all levels.

Proposals can still be submitted for the following: refereed contributed papers until Oct. 1, 2002 and non-

refereed contributed papers until Jan. 1, 2002 (contact: Starkings, starkisa@sbu.ac.uk); posters until Feb. 1, 2002 (contact: Dale, dale@scifs1.und.ac.za); demonstrations, forums and special sessions until Feb. 1, 2002 (contact: Ottaviani, mariagabriella.ottaviani@uniroma1.it). For further details please contact: Maria-Gabriella Ottaviani, IPC Chair, ottavian@pow2.sta.uniroma1.it
Brian Phillips, International Organizer, bphillips@swin.edu.au
Dani Ben-Zvi, IPC Scientific Secretary, dani.ben-zvi@weizmann.ac.il

ISI-54 Berlin 2003 - Proposals Welcome for the IASE Scientific Programme

The IASE Programme Committee for ISI-54, under the chair of Gilberte Schuyten, starts their work in preparing the scientific programme for the Berlin 2003 ISI Session. All IASE members are urged to submit proposals for invited paper meetings to the IASE Programme Committee. These proposals should be sent to Gilberte.schuyten@rug.ac.be

IASE PUBLICATIONS

Training Researchers in the Use of Statistics

IASE Round Table Conference, Tokyo 2000

Carmen Batanero, batanero@goliat.ugr.es.

Edited by Carmen Batanero, ISBN 90-73592-19-4

Published by: International Association for Statistical Education, International Statistical Institute

Available from: ISI Permanent Office, 428 Prinses Beatrixlaan, PO Box 950, 2270 AZ Voorburg, The Netherlands

There is no doubt that the training of researchers in the use of statistics is very important to improve the quality of empirical research and to foster technical and economical development. However, since the logic of statistical inference is difficult to grasp, its use and interpretation are not always adequate and have been criticised for nearly 50 years. Within the International Association for Statistical Education it was felt that there was an educational problem at the root of this dilemma and a *Round Table Conference on The Training of Researchers in the Use of Statistics* was organised at the Institute of Statistical Mathematics in Tokyo, August 7-11, 2000. The Scientific Committee produced a Discussion Document, which is reprinted in this book. The IASE organised a refereeing process with the participation of specialists from different countries to select the papers to be presented at the conference, which was sponsored by the IASE and the ISI, the Institute of Statistical Mathematics in Tokyo and the Japan Statistical Society. The 48 participants who met during five days, included professional and

official statisticians, lecturers, researchers and statistics educators with experience in teaching, research or consultancy in different areas of application. The participants represented different countries of the five continents, as well as developed and developing countries. At the conference, the papers were presented and debated and, after the conference, the papers were revised, taking into account the suggestions and discussions held.

As a result of this process we are happy to present today this book, where the reader will find various analysis of the problems related to this training, and a number of views of ways in which some of these problems might be solved: The controversies on the use of statistics in research; the researchers' attitudes towards statistics; the challenges set by technology; the particular needs of training in specific research fields; the problems of communication among statisticians and researchers are just a few examples of didactical problems that are discussed.

IASE SERN and SERG Statistical Education Research Newsletter and Statistical Education Research Group

The first issue for 2001 of the IASE Statistical Education Research Newsletter, IASE SERN, is now available at

www.ugr.es/local/batanero/sergroup.htm.

This is the second year this group has been a special interest group within the IASE. It is also open to all who share our common interest in carrying out research into the teaching and learning of statistics and probability. The main activity in 2000 was producing the IASE Statistical Education Research Newsletter, SERN. It is the most comprehensive report on what is going on in statistical education around the world and is a wonderful resource to anyone involved in research in the teaching and learning of statistics.

Carmen Batanero (batanero@goliat.ugr.es), Joan Garfield (jbg@tc.umn.edu), M. Gabriella Ottaviani (ottavian@pow2.sta.uniroma1.it) and John & Kath Truran (truranjk@camtech.net.au) are members of the editorial committee. Their aim is to make SERN a tool of potential interest to researchers, and, therefore they are publishing short notes, summaries of papers, dissertations and research works, information about internet resources of interest, past and future conferences and bibliographies on particular research topics. The extent to which a research newsletter is useful depends of the quality and completeness of the information published. We need your collaboration and we encourage you to send any type of information about your research projects and results that you consider of interest for other colleagues to one of the editors listed above.

IDEAS NEEDED FOR THE WORLD NUMERACY PROJECT

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An ISI committee was established in 1994 to stimulate the spread of quantitative skills around the world in areas and populations (especially in developing countries and among the young) that could benefit from increased knowledge of numbers and their applications, with particular regard to statistics. The committee was chaired by Prof. Luigi Biggeri of Italy. Under his chairmanship some very concrete successes were realized.

In 2000, it was decided that this Project would now come under the umbrella of the IASE. I have agreed, as a major portion of my sabbatical year, to work on the development of a working plan for the World Numeracy Project. My first step in developing the World Numeracy Project is to gather information from as many people as possible as to what directions they want the World Numeracy Project to take. In order to do this, I need anyone reading this article to give me suggestions as to what tasks the World Numeracy Project should undertake. Possible ideas that were given in various reports from the ISI Committee chaired by Professor Biggeri are: (1) Promotion of national numeracy programs, (2) Production of a TV series, (3) Survey of International Statistical Training efforts, (4) Survey of National Statistical Training efforts, (5) Register of International Statistical Standards, (6) Hall of fame of great Statisticians, (7) Museum of Numbers, (8) Developing a code and/or booklet on correct data collection procedures, (9) Addressing the needs of teachers, media, and journalists, (10) Addressing the needs of national and local governments, (11) Promoting on a World Statistics Day or World Statistics Month, (12) Assisting with the development of national and international training efforts in statistics and (13) Assisting with the development of national and international training efforts in the teaching of statistics and numeracy.

You may use this list as a starting point for your thoughts. Please send me your ideas and comments to contact me. Thank you very much for your help.

NEWS FROM AROUND THE WORLD

Mathematics Association of America's New Special Interest Group for Statistics Educators

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About years ago in August of 1991, a group of "Isolated Statisticians" met for the first time at the Atlanta Joint Statistical Meetings (JSMs). This

meeting was primarily for statisticians who were isolated from other statisticians by nature of their being the only, or one of two, statisticians in a mathematics department. The 'IsoStaters' have continued to meet at the JSMS, usually with 40 attendees discussing issues related to teaching statistics and to being an isolated statistician. Since then there have also been many regional conferences for isolated statisticians. The benefits reaped by the isolated statisticians at their annual and regional meetings were so positive that Tom Moore of Grinnell College and Don van Osdol of the University of New Hampshire decided to have a meeting of the mathematicians who teach statistics courses, or who are interested in statistics education, at the Joint Mathematics Meetings (JMMs) in January of each year.

At the JMMs in Baltimore in January of 1998, Dex Whittingly organised the first Isolated Teachers of Statistics Meeting (ITSM). The 'IsoTeaStaters' met again in January of 1999 at San Antonio. Our IASE-member Allan Rossman of Dickinson College, Chair of the ASA/MAA Joint Committee on Undergraduate Statistics, drafted a charter for a SIGMAA on Statistics Education which was approved by the IsoTeaStaters at the 2000 ITSM. Last June saw the end of the 'IsoTeaStat-ers' and the beginning of the official SIGMAA on Stat Ed. There are now 170 official members. There are officers, and a web page and newsletter in development. Leaders in this group may be credited with the growing number of sessions on statistics education at the annual JMMs. This year there were two sessions on innovations in introductory statistics as well as a panel on the new ASA Undergraduate Statistics Education Initiative. For more information, please contact SIGMAA chair, Dex Whittinghill whittinghill@rowan.edu

News from other countries including Norway and New Zealand will be given in the next issue.