

INTERNATIONAL ASSOCIATION FOR STATISTICAL EDUCATION
<http://www.stat.auckland.ac.nz/~iase/>

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1. IASE Executive 2005-2007

President	Gilberte Schuyten	Finance, Associate Editor SERJ, Editor IASE Review, ISI Council, General Coordination
President-Elect	Allan Rossman	IASE sessions at ISI-56, Lisboa, 2007
Past-President	Chris Wild	IASE Editor in International Statistical Review, Website
Vice-Presidents	Andrej Blejec	Editor IASE Matters in Teaching Statistics, IASE section of ISI Newsletter, Conferences Officer, Links pages
	John Harraway	ICOTS-7 IPC Scientific Secretary
	Chris Reading	Coordination of IASE Publications, Assistant Editor SERJ
	Michiko Watanabe	Links pages, Attracting new members
	Larry Weldon	Editor IASE Matters in Teaching Statistics, IASE section of ISI Newsletter, Links pages, National Correspondents Network
	Ex-officio	Daniel Berze
Special assignments	Carmen Batanero	Chair IPC for ICOTS-7, Chair IPC for ICMI/IASE Joint Study
	Carol Joyce Blumberg	International Statistical Literacy Project (ISLP), IASE rep. on ISI Publications Committee
	Lisbeth Cordani	LOC rep. IPC ICOTS-7

[Iddo Gal](#)

Co-editor SERJ

[Flavia Jolliffe](#)

Co-editor SERJ

[Susan Starkings](#)

Programme Chair for ICOTS-7, Co-ordinating (with Agnes Herzberg) the ISI publication of Short Book Reviews for statistical education books

2. Communication from the President of the IASE Presented at the IASE General Assembly during the ISI-55 meeting

IASE President Gilberte Schuyten

As this is my first message as IASE President, I wish to thank all those IASE Executive Committee members from the past and all people who have been working on the advancement and improvement of statistics education through IASE.

I wish to thank Chris Wild for all he has done over the past two years as President. Thanks to him, the IASE webpage (<http://www.stat.auckland.ac.nz/~iase>) has become an important source of information about statistics education. As Past-President he will continue doing this so that the IASE webpage will become THE primary source worldwide.

It was amazing to hear from a speaker in the contributed papers session on statistics education at the ISI Biennial Session in Sydney (Australia), that this person became interested in submitting a paper for the conference by surfing the internet and hitting the IASE webpage and the ISLP (International Statistical Literacy Project) webpages (<http://course1.winona.edu/cblumberg/islplist.htm>).

I also wish to thank the four outgoing Executive Committee members Carmen Batanero, Carol Blumberg, Lisbeth Cordani and Susan Starkings and I welcome our continuing collaboration which includes Carmen's, Susan's and Lisbeth's role in ICOTS7 (<http://www.maths.otago.ac.nz/icots7>) next year in Brazil and Carol's role in the ISLP.

I am happy to start my term as President with a smoothly running organisation with devoted and enthusiastic people who share the same objectives: the improvement of statistics education worldwide and the recognition in the academic world of research in statistics education as a research discipline in its own right.

These last years have been very exciting times for statistics educators. More students than ever before are taking statistics courses at the post-secondary level. Graduates in statistics have no problem obtaining jobs. Training of researchers in statistics has made considerable progress in the last 10 years; statistics knowledge of graduates in science, business/commerce/economics, psychology, sociology and education has improved. More emphasis is being placed on statistics education at the primary and secondary levels.

It seems that we are moving in the right direction and all is going fine except the statistical literacy of the modal Helene and John. In our information driven society the level of statistical literacy needed for a sound critical attitude towards public information is increasing. Statistics literacy starts in the classroom at all levels. In too many cases statistics education at primary and secondary schools is a rather dry application of mathematical techniques, despite the improvements to curricula these last years. More statistics has to be included in initial training courses for mathematics teachers. This seems to me to be of the highest priority to

break the vicious circle of teachers and students who know only statistics as a part of mathematics. Over the next years I would like to see the IASE to become a valuable partner in the discussion around these matters.

As the IASE we also want to expand our statistics education community to all parts of the world. Please inform us about people interested in statistics education so that we can combine our efforts.

I encourage all members to take an active part in the Association and to recommend to their colleagues to join IASE (membership form available at <http://www.stat.auckland.ac.nz/~iase/members.php>).

I look forward to working with you to make the next two years productive for IASE and statistics education. I would appreciate any comments or advice that our members may wish to offer.

3. First Announcement of the Joint ICMI/IASE Study “Statistics Education in School Mathematics: Challenges for Teaching and Teacher Education”

Report by IASE President Gilberte Schuyten

In the past three decades a statistics education research community has developed, linking people from various background (statisticians involved in teaching statistics in service courses at University, mathematics educators, and psychologists), leading to the creation of the International Association for Statistical Education (IASE, <http://www.stat.auckland.ac.nz/~iase/>) in 1991, with over 500 members at the time being and to the publication of a research journal SERJ in 2002, a peer-reviewed electronic journal of IASE (<http://www.stat.auckland.ac.nz/~iase/publications>) and the International Statistical Institute (ISI, <http://isi.cbs.nl/>).

Also since the mid-80s, the International Commission on Mathematics Instruction (ICMI, <http://www.mathunion.org/Organization/ICMI/>) has found it important to involve itself directly in the identification and investigation of issues or topic of particular significance to the theory or practice of contemporary mathematics education, and to invest an effort in mounting specific ICMI studies on these themes. In the past few years ICMI became increasingly interested in organising a Study focussed on the teaching of Statistics. Research in statistics education is scarce as compared with other areas within the mathematics education community, while, at the same time the teaching of statistics at school level is carried out as a part of the mathematics curriculum and is receiving increasing attention in new curricula around the world.

Conversations between IASE and ICMI made clear the common interest in organising a joint Study related to current problems in teaching of statistics within school mathematics. It was recognized that, in spite of recommendations to increase the presence of statistics teaching at school level, students enter University with a poor level in statistics. This impedes their progress in learning very basic inferential statistics at University and is causing a general misuse and misunderstanding of statistics by researchers and professionals.

The above facts led the ICMI Executive Committee to invite the IASE to cooperate in a joint ICMI/IASE Study focussed on statistics. This invitation was accepted by the IASE which proposed to merge the Study Conference with IASE's next Round Table Conference to be held in 2008 in Monterrey, Mexico.

Carmen Batanero (past IASE president 2001-2003) will act as chair of the International Programme Committee of the joint Study, whose composition is given below.

The first meeting of the ICMI/IASE Study IPC is planned at ICOTS-7 (July 2006, Brazil <http://www.maths.otago.ac.nz/icots7>) where over 400 statistics educators are expected. The second ICMI/IASE Study IPC meeting is planned at ISI 56th Session (August 2007, Lisbon, <http://www.isi2007.com.pt/>).

The ICMI/IASE Study Conference will be hosted by the Monterrey Technological Institute in July 2008 (Monterrey Mexico).

IASE is convinced that the engagement of both organizations to work together on the issue of statistics education in school mathematics will contribute to the advancement of preparation of youngsters to become statistical and mathematical literate citizens.

Joint ICMI/IASE Study International Programme Committee:

Carmen Batanero (Spain), Chair, batanero@ugr.es
Bernard Hodgson (Canada), Ex- officio, bhodgson@mat.ulaval.ca
Allan Rossman (USA), Ex- officio, arossman@calpoly.edu
Armando Albert (México), albert@itesm.mx
Dani Ben-Zvi (Israel), dbenzvi@univ.haifa.ac.il
Gail Burrill (USA), burrill@mail.msu.edu
Doreen Connor (UK), doreen.connor@ntu.ac.uk
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Joan Garfield (USA), jbg@umn.edu
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Victor Polaki (Lesotho), mv.polaki@nul.ls
Chris Reading (Australia), creading@une.edu.au

Web page: http://www.ugr.es/~icmi/iase_study/

4. Getting More and More Excited About ICOTS 7

Report by International Programme Committee Chair, Carmen Batanero and IASE President, Gilberte Schuyten



Working Cooperatively in Statistics Education

Salvador (Bahia), Brazil, July 2-7, 2006

<http://www.maths.otago.ac.nz/icots7>

Local organisers: Pedro Alberto Morettin, (Chair); Wilton de Oliveira Bussab, Lisbeth K. Cordani, Gilênio Borges Fernandes, Pedro Silva and Clélia Maria C. Toloi.

IPC Executive: Carmen Batanero (Chair), Susan Starkings (Programme Chair), Allan Rossman and Beth Chance (Editors of Proceedings), John Harraway (Scientific Secretary) and Lisbeth Cordani (Local organisers representative).

4.1 Invitation by the IASE President Gilberte Schuyten

Dear statistics educators and statistics practitioners,

It is my pleasure to invite you to the International Conference on Teaching Statistics "Working Cooperatively in Statistics Education", which will be held 2-7 July 2006 at Salvador (Bahia), Brazil;

The International Conferences on Teaching Statistics (ICOTS) are held every four years at different locations around the world. These meetings are planned by the IASE (International Association for Statistical Education) which is a section of the International Statistical Institute (ISI). The major objective of ICOTS is to provide the opportunity for statistics educators and practitioners from all over the world to exchange ideas and experiences, to discuss the latest developments in research and teaching statistics, and to expand the network of statistics educators.

This seventh ICOTS conference is hosted by the Brazilian Statistical Association (ABE). Thanks to all the efforts of our Brazilian colleagues, they will make this statistics encounter in Brazil an unforgettable experience.

The conference theme emphasizes the idea of cooperation, which is natural and beneficial for those involved in the different aspects of statistics education at all levels. Cooperative learning in statistics education, cooperation between statistics teachers and researchers, cooperation between statistical agencies and statistics educators, interdisciplinary research, international cooperation in statistics education, globalization and diversity in statistics education are some examples dealt with during the conference.

A diverse Scientific Program is developed, including Invited Paper Meetings, Contributed Paper Meetings, Keynote Speakers of worldwide reputation, Poster Sessions, Special Interest Groups and Special Sessions will provide a forum for the dissemination and discussion of relevant statistics education issues, covering a wide range of topics in about 70 sessions.

The conference program provides ample time to allow delegates to network, renew old contacts and make new ones in a stimulating environment.

The conference will take place in Salvador – the first capital of Portuguese Brazil until 1763 – along the Bahia de Todos os Santos. A refreshing sea-breeze will cool down the heated discussions at ICOTS 7 going on at the Bahia Othon Convention Centre. And, after having practiced the Capoeira on the beach in the late evening, we can start the next day again with a fresh mind.

We hope that the conference will be of interest for you and that your participation will contribute to the conference's success.

Don't miss this event! It only happens each four years!

We are looking forward to meeting you in Salvador in 2006!

4.2 Central theme and programme of ICOTS 7

The major aim of ICOTS-7 is to provide the opportunity for people from around the world who are involved in statistics education to exchange ideas and experiences, to discuss the latest developments in teaching statistics and to expand their network of statistical educators. The conference theme emphasizes the idea of *cooperation*, which is natural and beneficial for those involved in the different aspects of statistics education at all levels. Some examples are given below.

1. ***Cooperative learning in statistics education.*** Recent trends in educational psychology emphasise the role of student activity and social interaction in learning. These developments are particularly important in the case of statistics where students are taking a more active role in working on cooperative projects and studies.

2. ***Cooperation between statistics teachers and researchers.*** Real life applications generated by working with a researcher in another area help motivate the teaching of statistics. The subject is more enjoyable for students when a teacher can call on such real applications. At the same time, teachers are an essential part of a research team in statistics education, since they collaborate both in collecting data from the students and in helping with the design and evaluation of action-research programmes.

3. ***Cooperation between statistical agencies and statistics educators.*** Statistical agencies need the cooperation of the population at large when collecting their data. They are also interested in improving the statistical literacy of their citizens. Consequently, the agencies are communicating statistical ideas to their populace as well as providing official data for research on different topics, including teaching. Statistical offices and educators collaborate in the development of teaching resources based on official data and set up workshops and conferences on the teaching of statistics.

4. ***Interdisciplinary cooperation for research.*** Interdisciplinary research is natural both in applied statistics and statistics education. Many central statistical concepts and procedures arose from research problems in other subjects. At the same time the researcher, whatever subject he or she is working in, benefits by having problems actually solved. Statistics education is based on many different disciplines, such as psychology, education, epistemology, statistics and sociology, which all contribute in their own unique way to the study and solution of teaching problems.

5. ***International cooperation in statistics education.*** Global communication and increasing interest and respect for complementarity in education are leading to an increasing number of successful international research or educational programmes at different levels: e.g., Large scale statistical literacy comparative studies; Regional, National or International funded projects; International statistical education centres; International training programmes or conferences in statistics education.

6. ***Globalization and diversity in statistics education.*** Cooperation requires both global and local approaches to research and teaching. There is a contrast and a complementarity of global and local approaches in statistics education; e.g., large sample, quantitative studies versus qualitative and ethnographic research; the need to recognise global tendencies, and at the same time being sensitive to specific difficulties or talents of special and gifted students, minorities, etc.

Plenary Sessions:

- Pedro Luis do Nascimento Silva (Brazil): *Statistical Education for Doing Statistics Professionally: Some Challenges and the Road Ahead*. Opening Lecture
- Bryan Manly (New Zealand) *Cooperation and Conflict in Environmental Statistics*.
- Joan Garfield (USA). *Collaboration in Statistics Education Research: Stories, Reflections, and Lessons Learned*.
- Mike Shaughnessy (USA). *Students' Thinking about some Important Concepts in Statistics*.
- Chris Wild (New Zealand). On collaboration, Competition and Making Connections. Closing lecture
- Len Cook (UK). *Training statisticians for working in public affairs* After Dinner Speaker
- Panel Discussion: *The challenges for cooperation in statistics education*. Chair: Pedro Morettin (Brazil). Speakers: Evelio Fabbroni (Panama), Jae C. Lee (Korea), Pilar Martín Guzmán (Spain) and Allan Rossman (USA).

Invited papers

Sixty- three Invited Papers Sessions, classified around nine different topics have been organized, each of them including 3 to 4 invited papers. By now details of speakers, titles and abstracts of all these papers are located at the ICOTS web site. The IASE is very grateful to all these Session Organisers and Topic Convenors for preparing such a varied and interesting Programme. Names and details of Session Organisers and Topic Convenors are also given at the ICOTS web site.

Contributed papers

Contributed paper sessions are arranged in a variety of areas under Topic 10. Those interested in submitting a contributed paper should contact Topic 10 Convenors, Joachim Engel (engel@math.uni-hannover.de) and Alan McLean (alan.mclean@buseco.monash.edu.au). Final deadline for receiving contributed papers is January 1. Guidelines for preparation of papers are available from the web site.

Posters

Those interested in submitting a poster should send an abstract Celi Lopes (celilopes@uol.com.br) before February 1, 2006. Guidelines for preparation of posters are available from the web site.

Special Interest Group Meetings

- SIG1. *Training Mathematics Teachers to Teach Statistics in Spanish and Portuguese Speaking Countries*. Organisers: Margarida Cesar (Portugal), macesar@fc.ul.pt and Teresita Terán (Argentina), teresitateran@hotmail.com (Portuguese and Spanish).
- SIG2. *Young Latin American Researchers in Statistics Education*. Organisers: Cileda Coutinho (Brazil), cileda@pucsp.br and Blanca Ruiz (Mexico), Blanca Ruiz, bruiz@itesm.mx (Portuguese and Spanish).
- SIG3. *International Research Forum on Statistical Reasoning, Thinking and Literacy*. Organisers: Dani Ben-Zvi (Israel), dbenzvi@univ.haifa.ac.il and Joan B. Garfield (USA), jbg@umn.edu (English).
- SIG4. *Curricular Development in Statistics Education in Latin America*. Organisers: Olga Leticia Escudero (México), olgal@sep.gob.mx and Clayde Regina Mendes (Brazil) clayde@uol.com.br (Portuguese and Spanish).

Individuals or groups may submit proposals to establish a Special Interest Group to Carmen Batanero (batanero@ugr.es). Only clearly non-commercial SIGs will be accepted in the scientific programme. The IPC is in charge of reviewing and accepting SIG proposals.

Special Sessions and Administrative meetings

Individuals or groups may submit proposals to run Special Sessions or Administrative meetings should contact Carmen Batanero (batanero@ugr.es). By now a number of proposals have been approved and are listed on the web site.

4.3 Host City and Venue

ICOTS-7 will be held in the city of Salvador, in the State of Bahia. Salvador is a coastal city sitting on a spit of land extending south south-west into the Atlantic Ocean. Salvador has both ocean beaches and calmer beaches located in a large bay, the *Bahia de Todos os Santos*, which is fed by the Paraguaçu river, which opens into the smaller bay of Iguape, which in turn gives way to the principal bay. Although it sits well within the tropics at a southern latitude of thirteen degrees, it receives a refreshing sea-breeze which seldom falters until the wee hours of the morning when things have generally cooled off anyway.



The settlement was founded in 1549 by Thomé de Souza and quickly became the main Brazilian sea port and first capital of Portuguese Brazil until 1763. The city still contains many colonial buildings, including the first cathedral in Brazil, over 350 churches and the nation's oldest medical college, but it has become more famous due to the strong influence of African culture on the city. Salvador is characterized by intense cultural and artistic activity with cheerful, hospitable and proud people.

The city has several universities, including the Universidade Federal da Bahia, Universidade do Estado da Bahia, and Universidade Católica de Salvador. The majority of the population of the city are of African ancestry. The rich mixture of beliefs, traditions and races has led to the development of a vast culture that is manifest in its popular music, dance, art, and cuisine. It is the center of Yoruba Candomblé and the martial dance art of Capoeira. It is a place of famous artists and writers who have gained international reputations. You can learn more about Salvador and Bahia, their history, attractions and people from <http://www.bahia-online.net/> or from <http://www.emtursa.ba.gov.br/>



ICOTS7 will be held at the Bahia Othon Convention Centre and Hotel complex. Situated in Ondina beach, the Bahia Othon Palace Salvador is at easy access from all the means of transportation. It is close to Pelourinho, the historic quarter, and only 5 km from downtown Salvador. It is also within easy reach from all the parts of the town. Bahia Othon also offers rooms for conferences and meetings along with all the conveniences.

More information is available from the ICOTS-7 web site at <http://www.maths.otago.ac.nz/icots7> or from the ICOTS IPC Chair Carmen Batanero (batanero@ugr.es), the Programme Chair Susan Starkings (starkisa@lsbu.ac.uk) and the Scientific Secretary John Harraway (jharraway@maths.otago.ac.nz).

5. Statistics Education Research Journal (SERJ)

Report by Co-editor Iddo Gal

The *Statistics Education Research Journal* (SERJ) is a peer-reviewed research journal of IASE and is published electronically twice a year. SERJ is one of the ISI-sponsored journals and is freely accessible at www.stat.auckland.ac.nz/serj or at the "publications" page of the IASE website: www.stat.auckland.ac.nz/~iase/.

SERJ aims to advance research-based knowledge that can help to improve the teaching, learning, and understanding of statistics, probability, or related quantitative research methods, 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-based, organizational, or societal factors and processes that are related to the development and understanding of stochastic knowledge, or on the development of assessment instruments and research methodologies in such or related areas. In addition, research may focus on how people use or apply information and ideas related to statistics and probability.

The Journal encourages the submission of quality papers, especially reports of original research (both quantitative and qualitative) and integrative and critical reviews of research literature. Papers should be written so as to make a definite contribution to current knowledge and have implications both for researchers and for practitioners interested in teaching/learning processes. Details regarding submission of these and other types of papers of interest, as well as brief reports, are described in the Guidelines for Authors available on the SERJ website. 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.

Editorial board. Tom Short (Indiana University of Pennsylvania, USA) was chosen as the next SERJ co-editor and will start his four-year tenure in January 2006. Tom will replace Flavia Jolliffe, whose term is coming to an end in December 2005, and joins Iddo Gal, who will continue as co-editor until the end of 2007.

Other members of the editorial board are Christine Reading (Assistant Editor), Andrej Blejec, Carol Joyce Blumberg, Joan B. Garfield, John Harraway, M. Gabriella Ottaviani, Lionel Pereira-Mendoza, Maxine Pfannkuch, V. Mokaean Polaki, Dave Pratt, Ernesto Sanchez, Richard L. Scheaffer, Gilberte Schuyten, Jane Watson (Associate Editors).

Contents of Vol. 4, No. 1 (May 2005):

Linda Collins and Kathleen Mittag. *Effect of Calculator Technology on Student Achievement in an Introductory Statistics Course.*

Elena C. Papanastasiou. *Factor Structure of the "Attitudes Toward Research" Scale*

Special Section: Reasoning about Variation (Guest Editors: Joan Garfield and Dani Ben-Zvi)

Katie Makar and Jere Confrey. *"Variation Talks": Articulating Meaning in Statistics*

Bob delMas and Yan Liu. *Exploring Students' Conceptions of the Standard Deviation*

Maxine Pfannkuch (Invited). *Thinking Tools and Variation*

Joan Garfield and Dani Ben-Zvi (Invited). *A Framework for Teaching and Assessing Reasoning about Variability*

Contents of Vol. 4, No. 2 (Nov 2005):

Maxine Pfannkuch. *Characterizing Year 11 Students' Evaluation of a Statistical Process.*

Randall Groth and Jennifer Bergner. *Pre-service Elementary School Teachers' Metaphors for the Concept of a Statistical Sample.*

John Harraway and Richard Barker. *Statistics in the Workplace: A Survey of Use by Recent Graduates with Higher Degrees.*

Ana Serrádo, José M^a Cardeñoso and Pilar Azcárate. (Paper in Spanish, preceded by both a regular Abstract and Extended Summary in English). *Los Obstáculos en el Aprendizaje del Conocimiento Probabilístico: Su Incidencia desde los Libros de Texto / Obstacles in the learning of probabilistic knowledge: influence from the textbooks.*

Claudine Mary and Linda Gattuso. (Paper in French, preceded by both a regular Abstract and Extended Summary in English). *Trois Problèmes Semblables de Moyenne pas si Semblances que Ca! L'Influence de la Structure d'un Problème sur les Réponses des Elèves/ Three similar mean problems: are they really that similar? Research on the influence of the structure of the problem on students' responses.*

Both issues also contain information about past and future IASE conferences and announcements of other future conferences with a statistical education research strand.

Other news

A special issue on research on "learning and reasoning about distributions" is planned for November 2006. Guest editors will be Maxine Pfannkuch and Christine Reading. The SERJ Editorial Board is encouraging SERJ readers to propose topics which can benefit from a focus by researchers as possible topics for future special issues or other journal activities.

We also look forward to ICOTS7 in July 2006, where SERJ will arrange a workshop for prospective authors, similar to that which took place at ISI55 in Sydney in April 2005. There will also be a session on statistics education journals at ICOTS7 similar to one organised at the Joint Statistical Meetings in August 2005. The SERJ editors presented at this meeting a paper which described lessons learned regarding typical problems with submitted papers and provided advice for prospective authors. This paper is available for download at: <http://www.stat.auckland.ac.nz/~iase/publications.php?show=jsm>, together with other papers and presentations from the JSM session.

Inquiries and submissions should be sent to co-editor Tom Short: <tshort@iup.edu>. Guidelines for authors and referees, a template for authors, as well as prior and current issues of the journal can be downloaded from the SERJ webpage: www.stat.auckland.ac.nz/serj.

6. Special IASE thanks to Flavia Jolliffe, original founding member of SERJ

IASE would like to thank our departing SERJ Co-Editor, Flavia Jolliffe for the many years of dedication and work given to SERJ during her tenure.

Flavia's biography is immersed by statistics education and her efforts in recognizing statistics education as a research discipline. .

She has been a member of IASE since its foundation; has participated in all the International Conferences on Teaching Statistics and expects to be at ICOTS 7 next year in 2006. At ICOTS 7 she is the organizer of Session 6C Research on developing statistical literacy and takes part in the panel discussion on journal cooperation. IASE hopes to continue to rely on her ongoing moral support and wide-ranging knowledge and expertise of statistics education

Below are some thank yous from Carmen Batanero, founding member of SERJ, and Iddo Gal, Co-editor of SERJ

I cannot forget your support to the SERJ project from the very beginning when we did not risk to predict the success of the venture, while at the same time we were convinced of the need to have a research journal in statistics education to advance the field.

Flavia and Iddo have done wonders in the last year; each of them contributed in substantial ways to shape what SERJ is now and to the impact is having in fostering academic research in our field.

Carmen Batanero

The Editorial Board of the Statistics Education Research Journal would like to thank Flavia Jolliffe, SERJ's departing Co-Editor 2001-2005, who has been a founding editor of SERJ since 2001, together with Carmen Batanero. Flavia has tirelessly devoted time and energy to SERJ as she handled incoming submissions and managed a continuous flow of correspondence with authors, reviewers, and associate editors. We thank Flavia for giving several years for work on behalf of SERJ and IASE, and for her dedicated service to the statistics education community.

Iddo Gal

7. Report on IASE/ISI Satellite Conference "Statistics Education and the Communication of Statistics", Sydney, 4-5 April 2005

Contributed by Organiser/Chair Brian Phillips and Larry Weldon

The IASE/ISI satellite meetings are always very friendly affairs and the one in Sydney April 4-5, 2005 was no exception. Leigh Wood kindly agreed to arrange for space in the University of Technology, Sydney when our tentative arrangement at the Sydney Conference Centre did not work out. The venue turned out to fit our group of sixty participants perfectly, and the facilities and refreshments were first class.

Twenty-four papers were presented over two days, with some time for discussion and socializing - although some people commented that they would have liked more time for discussion. The cruise to Manly and dinner at the Phoenix restaurant there was well attended - good food, good company, and the very clever song sung by Peter Martin went over very well, especially with the Australians!

The theme of the conference was "**Statistics Education and the Communication of Statistics**". The papers that were submitted covered various approaches to the problem, roughly classified as:

- Writing Reports of Statistical Studies
- The Role of Graphics in Communication of Statistics
- Outreach to Public and Schools
- Understanding the Language of Statistics

The conference opened with a Keynote Address by Stephen Fienberg: "To tell the truth: What we know about lie detection". Stephen reported his experience with a US National Research Council Committee that worked hard to communicate to politicians the uncertainty resulting from administration of a polygraph test. Policies concerning its use for increased security actions depended on a careful understanding of the false positive and false negative rates. This example with such important national implications showed conference participants in a dramatic way the importance of statistical communication in public life, and not only for scientific or social research.

Papers presented by Lipson and Kokonis, MacGillivray, Peck, Francis, Forster, and Prvan addressed the ways in which students could be taught to write better reports of statistical studies. Papers presented by Cumming and Fidler, Cunningham, Green, Henderson, Martin and Weldon focussed on the importance of using graphics to convey statistical results: some techniques were to communicate results to scientific researchers, and others were directed to the public at large. The "Outreach" category included statistics communication problems in the media, by Smith; in high schools, by McGuinness and Hooper, Gattuso, and Holmes-Smith; and in tertiary institutions, by Cunliffe, Milito, Davies and Connor. The last section of papers looked at some details of language: The presentations by Petocz and Reid, Gordon, Niglas, and Schield discussed the various ways in which students misunderstand or misuse the jargon of statistics.

The overall message in these talks was that communication of statistics is a topic that is more important to students than our course outlines usually suggest. We need to raise the profile of communication issues in our statistics courses. We need to help students distinguish between the technical meaning and everyday meaning of the statistical jargon we all use.

The conference site is at <http://www.stat.auckland.ac.nz/~iase/conferences.php?show=iase2005> and the papers are found at <http://www.stat.auckland.ac.nz/~iase/publications.php?show=14> Also, some CD's of the proceedings are available for AUS\$20 from Brian Phillips (bphillips@swin.edu.au).

The Chief Organizers of the conference were Brian Phillips and Kay Lipson. The Proceedings Editors were Brian Phillips and Larry Weldon, and the conference CD was produced by Larry Weldon.

The next Satellite meeting could possibly be in Lisbon, where the next ISI is scheduled. If you have an idea for a theme or a suggestion about the format, please send it to Gilberte Schuyten, at Gilberte.Schuyten@UGent.be.

Papers from IASE/ISI Satellite meeting: Statistics Education and the Communication of Statistics <http://www.stat.auckland.ac.nz/~iase/publications>

Session I - Keynote Speaker

To tell the truth: What we know about lie detection, Stephen Fienberg

Session II - Writing Reports of Statistical Studies

The implications introducing report writing into an introductory statistics subject, Kay Lipson, Sue Kokonis

Helping students find their statistical voices, Helen MacGillivray

There's more to statistics than computation: Teaching students how to communicate statistical results, Roxy Peck

An approach to report writing in statistics courses, Glenda Francis

Teaching students to write about statistics, Mike Forster, David P. Smith, Christopher J. Wild

Enabling students to communicate statistical findings, Tania Prvan, Judith Ascione

Session III - Role of Graphics in Communication of Statistics

Interval estimates for statistical communication: Problems and possible solutions, Geoff Cumming, Fiona Fidler

Using Amos graphics to enhance the understanding and communication of multiple regression, Everarda Cunningham, Wei C. Wang

Grapharti, Hilary Green

Visualising data with dynamic graphics in Excel, Harold Henderson

Enhancing effective communication of statistical analysis to non-statistical audiences, Peter Martin

From data to graphs to words, but where are the models?, K. Larry Weldon

Session IV - Outreach to Public and Schools

Statistics and the media, Wayne Smith

The role of national statistics institutions in the use and understanding of official statistics in the compulsory education sector, Gareth McGuinness, Leslie Hooper

Data analysis or how high school students "read" statistics, Sylvain Vermette, Linda Gattuso, Marc Bourdeau

Communicating student performance data to school teachers, Philip Holmes-Smith

Pilot study into the use and usefulness of instant messaging within an educational context, Rachel Cunliffe

Distance learning: New frontiers for solving old problems, Gianfranco Galmacci, Anna Maria Millito

Helping students to communicate statistics better, Neville Davies, Doreen Connor

Session V - Understanding the Language of Statistics

Servicing students communicating ideas about statistics, Peter Petocz, Anna Reid

How important are communication skills for "good" statistics students? - An international perspective, Sue Gordon

University-level data analysis courses with the emphasis on understanding and communication of statistics - a ten years action research project, Katrin Niglas, Kairi Osula

Statistical prevarication: Telling half truths using statistics, Milo Schield

8. IASE Activities at the 55th Session of the International Statistical Institute, 5-12 April 2005, Sydney

8.1 Report by Chris Wild, Past President and IASE programme Chair for ISI 55



The conference facilities at the Sydney Convention Centre were superb and close to all of the main attractions of Sydney. Though ostensibly late autumn, Sydney turned on beautiful warm sunny weather for us and Sydney Harbour and its environs were gorgeous. Many IASE attendees at ISI 55 had already met and established friendships at our very stimulating IASE satellite conference on the previous two days. The main IASE activities at ISI were our sessions and the IASE General Assembly. The IASE sessions were of high quality, in the main well attended, and stimulated some very interesting discussions. The panel discussion "Statistics for life: what matters most and why?" – which involved three generations of the ISI presidency and two other very provocative speakers – achieved its purposes of drawing in ISI attendees who do not normally attend education sessions, and giving us all a broader awareness of issues that are important in goal setting for statistics education.

The papers from the IASE invited sessions at ISI 55 are available from the Publications page of the IASE webpage, see <http://www.stat.auckland.ac.nz/~iase/publications.php>. The contributed papers and discussions will not be available for several months. We have reprinted the invited programme below. If a talk looks interesting, it might be a good idea to download the paper now before you forget.

At the IASE General Assembly, formal reporting of the 2003-2005 activities of the Association was kept brief as the Report had been posted on the IASE site and members notified well in advance of Sydney. (The IASE Report is included in the "Final Report of the ISI Executive Committee to the General Assembly 2003-2005" available at <http://www.cbs.nl/isi/05session/05report.htm>.)

At the Assembly John Harraway showed a stunning DVD movie about Salvador Bahia and the Orthon Hotel conference facilities that we will have for ICOTS-7 next year in Brazil. For an indication of what we saw, but with annotated still pictures rather than movies, visit these two links

<http://www.maths.otago.ac.nz/icots7/pages/salvadorpics.php>

<http://www.maths.otago.ac.nz/icots7/pages/othon.php>

With a conference site like this we are in for a real treat at ICOTS-7! In general discussion, members contributed many suggestions about how IASE could improve the effectiveness of our National Correspondents system and theme suggestions for the IASE satellite conference to be held in advance of ISI 56 in Portugal in August 2007, and the IASE Round Table to be held close to ICME-11 in Mexico in 2008. Other discussions included possible structures for young statistics educators.

The turnout at the IASE General Assembly was not large. This was in part because of the 7:30am start. Something that only became clear after talking to people later, however, was that many IASE members did not actually realise that they could go to the IASE General Assembly. Not only is it a meeting for all members of the Association, it has a central role in the governance of the association. It is, as our statutes say, "the highest authority of the Association." This is something we will have to communicate better in the lead up to ISI 56. The end of the IASE General Assembly was also the official point in time at which the 2003-2005

Executive Committee passed the baton to the 2005-2007 Executive Committee and Gilberte Schuyten became our new President.

8.2 Papers from IASE invited sessions at ISI-55

IPM 45: Reasoning about variation

From acknowledging to modelling: Tertiary students' consideration of variations, Jackie Reid, Chris Reading

Some aspects of reasoning about variability, Bernard Harris

Statistical thinking from a practitioner's perspective, Alope Phatak, Geoff Robinson

IPM 46: The use of simulation in statistics education

Modern introductory statistics using simulation and data analysis, Larry Weldon

Using Excel to generate empirical sampling distributions, Rodney Carr, Scott Salzman

Statistical simulations in the web, Juha Puranen

IPM 47: Teaching statistics online

Learning statistics teaching in higher education using online and distance methods, Neville Davies, Vic Barnett

Preparing secondary teachers to teach statistics: A distance education model, Roxy Peck, Robert Gould

E-learning for statistics education at Korea National Open University, Tae Rim Lee

IPM 48: Statistics for life: what are the statistical ideas or skills that matter most and why?

Panel participant, Nick Fisher

Panel participant, Niels Keiding

Panel participant, Denise Lievesley

Panel participant, Milo Schield

Panel participant, Stephen Stigler

IPM 49: Research in statistical education

An assessment of computer-based learning methodology in teaching in an introductory statistics hybrid course, Paul Fields, Patti Collins

Potential uses of longitudinal analyses to investigate statistics education outcomes, Sharleen Forbes, Teimuraz Beridze

Teaching confidence intervals: Problems and potential solutions, Geoff Cumming, Fiona Fidler

Student opinions and expectations vs. reality of grading: Use of cluster profiling in statistics education, Mojca Bavdaž Kveder, Irena Ograjenšek

IPM 50: Quality Assurance in Statistics Education

Quality assurance in statistics education: From departmental self-evaluation to accreditation, Abbas Bazargan

The role of statistical education in developing graduate qualities, Brenton Dansie

Criteria, standards and assessment in statistical education, Helen MacGillivray

IPM 51: Promotion of statistical literacy among students (IASE & IAOS)

The role of official statistics agencies in the promotion of statistical literacy among students, Frederick W. H. Ho

Co-operation with educational institutions: A strategic challenge for statistical agencies, Reija Helenius

Policies and tools to make OECD statistics more visible and accessible, Enrico Giovannini, Russell Penlington, Lars Thygesen

IPM 52: Using history of statistics to enhance the teaching of statistics

(IASE & Christiaan Huygens Com. on the History of Statistics)

Probability and statistics ideas in the classroom - lessons from history, David Bellhouse

Taking the fear out of data analysis: Case for history lessons in statistics courses, Irena Ograjenšek

Teaching probability via its history: Reflections on a case study, David Vere-Jones

IPM 81: Ethical Standards in statistics education (IASE & ISI Committee on Professional Ethics)

Making a difference, not faking a difference - learning and using what's good and fair in biostatistics, David Goddard

The client-consultant relationship in medical research: The role of a professional statistician in the research team, Nora Donaldson, Mary Gray

Official statistics and statistical ethics: Selected issues, William Seltzer

IPM 82: Bayesian statistics (Bernoulli & IASE)

An integrated mathematical statistics primer: Objective Bayesian construction, frequentist evaluation, Jose Bernardo

Bayesian model selection: Review and discussion, Kerrie Mengersen, Clair Alston, Sama Low Choy, Petra Kuhnert, Ross McVinish

Bayesian point null hypothesis testing via the posterior likelihood ratio, Richard Boys, Murray Aitkin, Tom Chadwick

IPM 83: Challenges in the teaching of survey sampling (IASS & IASE)

Balancing statistical theory, sampling concepts, and practicality in the teaching of survey sampling, Colm O'Muircheartaigh

Teaching environment for survey sampling based on a textbook and its web extension, Risto Lehtonen

Teaching sampling in a government statistical agency: The Canadian experience, Jack Gambino, Hew Gough

9. IASE Invited Session on "Publishing in Statistics Education Journals: Views from the Editors" at The Joint Statistical Meetings, Minneapolis, Minnesota, USA, 8 August 2005

Report by the Organizer/Chair: Carol Joyce Blumberg

Over the last few years there has been some confusion among those interested in statistics education as to what the goals of each of the major journals in the field are, the audiences they are aimed at, and what types of articles each is willing to publish. The editors of the journals also felt it important to disseminate information on common mistakes made in submitted manuscripts. So, it was decided to propose an invited session at the Joint Statistical Meetings on the topic of statistics education journals.

This session was co-sponsored by the International Association for Statistical Education (abbreviated IASE), ASA (American Statistical Association) Section on Statistical Education and the International Statistical Institute (which is the parent organization of IASE). It was organized by Carol Joyce Blumberg from Winona State University (USA), who also served as the session chair. This is the third time that IASE has been the organizer of a session during the Joint Statistical Meetings. Thank you to Karen McGaughey (USA), Program Chair for ASA Statistics Education Section, for helping with its organization.

The session began by having the representatives from the 3 major journals in statistics education give 15 minute presentations describing their journals and expectation for manuscripts submitted to their journals. The journals and their representatives were:

Teaching Statistics—Neville Davies of Nottingham Trent University (UK)

Journal of Statistics Education---W. Robert Stephenson of Iowa State University (USA)

Statistics Education Research Journal—Flavia Jolliffe of University of Kent (UK)

The discussant for this session was [Gilberte Schuyten](#) of Ghent University (Belgium). She began her remarks by describing the similarities and differences between the journals. She then discussed those areas within statistics education that have been underrepresented in the journals (mostly due to lack of submissions in those areas).

The formal presenters and discussant were then joined by E. Jacquelin Dietz of Meredith College (USA). The presenters and Dr. Dietz each gave a short reaction to Dr. Schuyten's comments. There was then about 30 minutes at the end of the session devoted to questions from the audience and general discussion among the audience and presenters.

Copies of the wonderful PowerPoint presentations of the three presenters and the discussant are on the IASE website at <http://www.stat.auckland.ac.nz/~iase/publications.php?show=ism>. Copies of 6-page papers by W. Robert Stephenson, Thomas Short, & E. Jacquelin Dietz (for Journal of Statistics Education) and by Flavia Jolliffe & Iddo Gal (for Statistics Education Research Journal) are also on the website.

IMPORTANT NOTE: The organizers of ICOTS-7 (International Conference on Teaching Statistics) asked W. Robert Stephenson to organize a similar invited session for that conference. It is Session 1F. More information can be found on the ICOTS-7 website at <http://www.maths.otago.ac.nz/icots7/icots7.php>.

In August 2004, IASE was the main sponsor (with ISI and the American Statistical Association (ASA) Section on Statistical Education as co-sponsors) of an Invited Session on "Training of Government Statisticians". Formal papers (using PowerPoint presentations) were given by Patrick Murphy of University College Dublin (Ireland) on "Teaching a Course on Government Statistics in a University Statistics Department", by Cynthia Z. F. Clark, US Census Bureau, Gia F. Donnalley, US Census Bureau and Roger Tourangeau, University of Maryland (USA) on "The Joint Program in Survey Methodology and Its Impact on the Federal Statistical Agency Workforce" and by Elizabeth Taylor of the Bureau of Labor Statistics (USA) on "The Challenges of Providing International Statistical Training to Government Statisticians". The Discussants were Ivan P. Fellegi, Chief Statistician at Statistics Canada, and Luigi Biggeri, President of the Italian National Statistics Office. The organiser/chair of the Session was Carol Joyce Blumberg (USA). Copies of the papers and PowerPoint presentations are available at the IASE Publications page at <http://www.stat.auckland.ac.nz/~iase/publications.php>.

10. STRL-4 The Fourth International Research Forum on Statistical Reasoning, Thinking and Literacy, New Zealand, 2-7 July 2005

Report by Maxine Pfannkuch

SRTL-4 Website: <http://www.stat.auckland.ac.nz/srtl4/>

The fourth research forum in a series of international research forums on Statistical Reasoning, Thinking and Literacy (SRTL) took place in winter at The University of Auckland in New Zealand. This particular gathering of researchers has played an important role in advancing our understanding of the richness and depth of reasoning about distribution, a key focus of statistics education.

The forum was sponsored by the Key College Press (USA), The American Statistical Association (ASA) Section on Statistical Education, the Department of Statistics, The University of Auckland, the Department of Mathematics, The University of Auckland, and the New Zealand Statistical Association (NZSA).

The focus of SRTL-4 on *reasoning about distribution* emerged from the previous three SRTL conferences. Distribution is a key concept in statistics, and yet statisticians and educators may not be aware of how difficult it is for students to develop a deep understanding of this concept. When students are given tasks involving comparing distributions or making inferences, they often fail to utilize relevant information contained in the underlying distributions. Curricular materials often focus on construction and identification of distributions, but not on what these distributions mean to students and how they interpret them.

Twenty researchers in statistics education from six countries shared their work and discussed important issues in a stimulating and enriching environment. Sessions were held in an informal style, with a high level of interaction. With emphasis on reasoning about distribution, a wide range of research projects were presented spanning learners of all ages, as well as teachers (see abstracts of studies below). These demonstrated an interesting diversity in research methods, theoretical approaches and points of view. As a result of the success of this gathering, plans are already underway for the next gathering (SRTL-5) in 2007.

The programme began with an overview talk by Chris Wild entitled: "A statistician's view on the concept of distribution". Eight presentations of SRTL-4 were thematically grouped into five clusters. A cluster included one or two ninety-minute research presentations to the entire group, small group discussions, and a whole group reflection on the cluster. All presenters showed a small subset of video segments of their research. Optional time was devoted to viewing and discussing the research video-tapes from methodological and interpretive perspectives. In addition, three post-graduate students presented their current research findings in a poster session and a software developer discussed potential research questions to the entire group (see abstracts below). The programme ended with three discussants' reflecting on reasoning about distribution from research, curriculum, and technology viewpoints.

The research forum proved to be very productive in many ways. Several types of scientific publications will be produced including a CD-ROM of the proceedings edited by Katie Makar, papers in refereed journals, and a special issue of Statistics Education Research Journal (SERJ) on reasoning about distribution co-edited by Maxine Pfannkuch and Chris Reading. An additional product of the meeting will be a new SRTL Website hosted by the Department of Statistics, The University of Auckland that will include a variety of resources. These will all serve as a rich resource for statistics educators and researchers.

Maxine Pfannkuch, The University of Auckland, was the local SRTL-4 organiser ably assisted by Ross Parsonage, social programme, Chris Wild, finance, and Stephen Cope, computer technician and webmaster. Beyond the scientific programme, participants took part in a variety of social events and local excursions that helped to build a sense of community amongst the researchers and to enjoy the wild beauty of Auckland and its beaches, bush, and indigenous Maori and Pasifika cultures. A DVD of the scientific and social programme, edited by Pip Arnold, will be available for participants.

For further information please contact the SRTL Co-chairs Joan Garfield (jbg@umn.edu) and Dani Ben-Zvi (dbenzvi@univ.haifa.ac.il).

Abstracts of the SRTL-4 Studies

How Do Primary School Students Begin to Reason about Distributions? Dani Ben-Zvi, University of Haifa, (dbenzvi@univ.haifa.ac.il) and Yael Amir, University of Haifa, (amir@maaganm.co.il)

This study explores the emergence of second graders' informal reasoning about distribution in a carefully planned learning environment that includes extended encounters with open-ended Exploratory Data Analysis (EDA) activities. The current case study is offered as a contribution to understanding the process of constructing meanings, language, representations and appreciation for distributions at an early age of schooling. It concentrates on the detailed qualitative analysis of the ways by which three second grade students (age 7) started to develop views (and tools to support them) of distributions in investigating real data, inventing and using various informal data ideas and representations. In the light of the analysis, a description of what it may mean to begin reasoning about distribution by young students is proposed, and implications to teaching, curriculum and research are drawn.

Using Assessment Items to Study Students' Difficulty Reading and Interpreting Graphical Representations of Distribution Robert delMas, University of Minnesota, (delma001@umn.edu), Joan Garfield, University of Minnesota, (jbg@umn.edu) and Ann Ooms, University of Minnesota, (ooms0001@umn.edu)

This paper describes the analysis of assessment items used in a large scale class testing of high school and college students to learn how students reason about graphical representations of distribution. We focus on the use of items that reveal some consistent errors and misconceptions students exhibit when presented with graphical representations of data. We find that perhaps because of students' early exposure to bar graphs and time plots, they tend to confuse bar graphs and time plots with histograms. In addition, students

have difficulty correctly reading information from histograms and identifying what the horizontal and vertical scales represent. We offer some reasons for why it is important for students to be able to correctly read and interpret histograms, and offer suggestions for how to help develop this type of reasoning.

Using Distributions as Statistical Evidence in Well-Structured and Ill-Structured Problems. Katie Makar, University of Queensland, (k.makar@uq.edu.au) and Jere Confrey, Washington University in St Louis, (jconfrey@wustl.edu)

Research has suggested that understanding in well-structured settings often does not transfer to the everyday, less-structured problems encountered outside of school. Little is known, beyond anecdotal evidence, about how teachers' consideration of distributions in well-structured settings compares with their employment in ill-structured problem contexts. A qualitative study of preservice secondary teachers examined their use of distributions as evidence in four tasks of varying complexity and ill-structuredness. Results suggest that teachers' understanding of distributions in well-structured settings does not imply an understanding in less-structured problems (and vice-versa). Implications for research and teaching are discussed.

Informal Inferential Reasoning: A Case Study. Maxine Pfannkuch, The University of Auckland, (m.pfannkuch@auckland.ac.nz)

In this paper a secondary teacher's reasoning from the comparison of boxplot distributions during the teaching of a Year 11 class is analyzed. Her purpose is to draw evidence-based conclusions from the data using informal statistical inference. A matrix of seven views moderated by two other views is established to describe her reasoning. The nature of the boxplot representation, the methods of instruction, and the difficulties and richness of verbalizing from the comparison of boxplot distributions are discussed. Implications for research, educational practice, and assessment are drawn.

The Emergence of Distribution From Causal Roots. Dave Pratt, University of Warwick, (dave.pratt@warwick.ac.uk), and Theodosia Prodromou, University of Warwick, (t.prodromou@warwick.ac.uk)

Our primary goal is to research thinking-in-change (Noss & Hoyles, 1996) about distribution. Our premise, in line with a constructivist approach, is that thinking about distribution and stochastic phenomena in general, must develop from resources already established. Our prior research has suggested that, given appropriate tools to think with, meanings for distribution might emerge out of knowledge about causality. In this study, based on the second author's ongoing doctoral research, we consider the relationship between the design of a microworld, in which students can control attempts to throw a ball into a basket, and the emergence of meanings for distribution. We suggest that the notion of statistical error or noise is a rich idea for helping students to bridge their deterministic and stochastic worlds.

Reasoning about Variation: A Key to Unlocking the Mystery of Distributions. Chris Reading, University of New England, (creading@une.edu.au) and Jackie Reid, University of New England, (jreid@turing.une.edu.au)

Reasoning about variation and distributions are closely linked by researchers and much of the recent research into reasoning about variation refers specifically to notions of distribution that emerge as students reason. The research being reported here aimed to determine what aspects of students' reasoning about variation provided a foundation for reasoning about distribution. Students in an introductory tertiary statistics course completed minute papers and tutorial questions. Those minute papers coded as demonstrating either weak or developing reasoning about variation were then reanalyzed to disclose any reasoning about distributions. In a case study approach, two pairs of students were videotaped discussing their tutorial questions to allow a more in-depth analysis of their reasoning. Key aspects of students' progression from just describing key elements of distribution to being able to use them in comparisons and inference are discussed. The results provide educators with important considerations to inform the planning and implementing of a curriculum rich enough in experiences with variation, and provide researchers with some clues to better understand students' reasoning about distribution.

The Effect of Distributional Shape on Group Comparison Strategies. Andee Rubin, TERC, (Andee_Rubin@terc.edu), Jim Hammerman, TERC, (Jim_Hammerman@terc.edu), Camilla Campbell, Harvard Graduate School of Education, (Camilla.P.Campbell.01@alum.dartmouth.org), and Gilly Puttick, TERC, (Gilly_Puttick@terc.edu)

Representational tools can influence the models one builds of distributions, including methods for making group comparisons. Research has begun to explore what differences the use of such tools might make, and this work extends that research in substantial ways. In addition, this study examines how different distributional shapes might also influence teachers' analytic strategies when they are using a visualization tool. This research involves clinical interviews with teachers in a professional development/research seminar who had been using the visualization tool Tinkerplots for a year. The interviews involved two group comparison tasks; one involving a symmetrical distribution and one involving a skewed distribution. We examine the comparison strategies teachers used in the light of the characteristics of Tinkerplots and the shape of the distribution they are analyzing.

Developing an Awareness of Distribution. Jane Watson, University of Tasmania, (jane.watson@utas.edu.au)

This presentation will be an informal account of observations about students' developing awareness of distribution as exhibited in responses to tasks used in Tasmanian research over the past decade. The paper will attempt a synthesis of individual studies, most of which have been published task by task to illustrate detailed student performance. Themes will be drawn from the collection of tasks to build an understanding of how intuitions develop before formal ideas of distribution are introduced in the school curriculum. Graphical representations produced by students will be the basis of exploring the development over the years of schooling.

SRTL-4 Poster Abstracts

Investigating a hierarchy of graphical interpretation. Kazuhiro Aoyama, University of Tsukuba, (Kazao@human.tsukuba.ac.jp)

One important aspect of statistical literacy for 21st century is the ability to extract qualitative information from statistical/quantitative information. To achieve this difficult task, students have to understand the title of data, see values and trends, and interpret statistical conventions and contextual meanings of features observed in data. Five different levels were able to be imposed to describe stages of students' graph interpretation.

Distributional puzzles posed by a software developer. Bill Finzer, Key Curriculum Press, (bfinzer@keypress.com)

Development of educational software requires making a great many decisions about how the software should behave and how learners should interact with it. Grappling with the decisions raises a multitude of questions about learning in general and distributional thinking in particular.

Understanding P-value Survey. Sharon Lane-Getaz, University of Minnesota, (SLaneGetaz@msn.com)

A P-value survey was developed based on proper conceptions and 13 misconceptions identified in the research literature. Students in first and second courses in statistics (N=333) responded to the 17 items in fall 2004. Results are reported by course.

Correlation Is Not Causation: A Study On Instructor Perceptions About Student Understanding During A Unit On Bivariate Data. Andrew Zieffler, University of Minnesota, (zief0002@umn.edu)

This survey study of introductory statistics instructors examines instructor perceptions about students' understanding of bivariate data. The survey asked the instructors about their current instructional and

assessment practices, as well as their perceptions of student misconceptions in that unit. Differences in instructor responses are examined.

11. Update on the IASE Publications and Links Webpages

Report by Past IASE Publications Officer, Carol Joyce Blumberg and Chris Wild, IASE Webmaster & Past-President)

In the last year, the publications and links to other sources from the old IASE Publications website and the present IASE website have been combined and updated. The new Publications url is

<http://www.stat.auckland.ac.nz/~iase/publications.php> and the updated Links url is

<http://www.stat.auckland.ac.nz/~iase/links.php>.

The Publications website now contains the following:

- All issues of IASE Matters since its inception in 1992
- Almost all issues of the IASE Component in the ISI Newsletter since 1981 (when IASE was still the ISI Education Committee)
- Newsletter of the International Study Group for Research on Learning Probability and Statistics from 1987 to 1995
- All issues of IASE Review since its inception in 1994
- Complete Proceedings from ICOTS in 1998 (Singapore) and 2002 (South Africa)
- Invited and Contributed papers relevant to statistics education from the ISI Biennial Sessions in 1999 (Helsinki, Finland), 2001 (Seoul, South Korea), 2003 (Berlin, Germany) and 2005 (Sydney, Australia)
- Proceedings from the IASE Satellite Conferences on Statistical Literacy (2001—Seoul), Statistics and the Internet (2003—Berlin), and Communication of Statistics (2005—Sydney). The Proceedings from the 1993 Satellite Conference in Perugia, Italy are presently being scanned and will be available around February 2006.
- Papers and PowerPoint presentations from the IASE-sponsored sessions at the Joint Statistical Meetings on "Using the History of Statistics to Enhance the Teaching of Statistics" (in 2003), "Training of Government Statisticians" (in 2004) and "Publishing in Statistics Education Journals: Views from the Editors" (in 2005)
- Complete Proceedings from IASE Round Tables on Role of Technology (1996—Granada, Spain), Training Researchers (2000—Tokyo, Japan) with the complete Proceedings from the 2004 Round Table on Curricular Development (Lund, Sweden) .
- Statistics Education papers from the International Congress on Mathematics Education in 1996 (Seville, Spain), 2000 (Makuhari, Japan), and 2004 (Copenhagen, Denmark)
- All of the chapters (as separate pdf files) from the 1997 book "The Assessment Challenge in Statistics Education" by Iddo Gal (Israel) and Joan Garfield (USA)
- A listing of Doctoral Dissertations related to statistics education, with many of these dissertations being available as complete pdf files.

We wish to thank Tasfia Ahmed (from Bangladesh and a third year student at Winona State University, USA), Stephen Cope (University of Auckland, New Zealand) and Zaw Win Tun (University of Auckland, New Zealand) for their many hours of help in transferring and adding all the new items to the Publications and Links parts of the IASE website. We also wish to thank the ISI Permanent Office, Iddo Gal, and Joan Garfield for permission to add "The Assessment Challenge in Statistics Education" book to the website and the Università di Perugia (Italy) Dipartimento di Scienze Statistiche for permission to add the 1993 Satellite Conference Proceedings to the website.

In addition, Susan Starkings, Andrej Blejec and Larry Weldon prepared the IASE component for three issues of the ISI Newsletter. Further, Gilberte Schuyten, Andrej Blejec and Larry Weldon prepared three issues of IASE Matters, which appears as an insert to the journal Teaching Statistics. Finally, two issues of Statistics Education Research Journal were published (edited by Iddo Gal (Israel) and Flavia Jolliffe (UK)) and this issue of IASE Review was edited by Gilberte Schuyten (Belgium).

The links page has recently been reconstructed with many new links added. There are now pages of links related to Research, Learning, Assessment, Curriculum Guidelines, Bibliographies, Indexes and Abstracting Services, Discussion Lists, Major Journals in Statistics Education, Other Journals that occasionally publish articles in statistics education, Newsletters, Publishers, Datasets, Java Applets, Software, Statistical Calculators, National Organizations, and International Agencies and Non-Profit Organizations. If you have ideas for additional links, please send them to Andrej Blejec (andrej.blejec@nib.si), Larry Weldon (weldon@sfu.ca), or Michiko Watanabe (watanabe_michiko@nifty.com). Also, the International Statistical Literacy Project webpages (<http://course1.winona.edu/cblumberg/islplist.htm>) provide links to other resources.

The President, Gilberte Schuyten, would particularly like to thank Carol Joyce Blumberg (USA) for the excellent work she has done over the past four years as IASE Publications Officer and Chris Wild, Stephen Cope, and Rachel Cunliffe for the expanded IASE website.

12. Curricular Development in Statistics Education. Proceedings of the IASE Round Table

Report by Gail Burrill, Chair /Editor Round Table, and Chris Wild, Past-President IASE

The Proceedings of the 2004 IASE Round Table on "Curricular Development in Statistics Education" held Lund, Sweden in 2004 are now available from the IASE site <http://www.stat.auckland.ac.nz/~iase/> (see the left-hand panel of the Publications page) or directly at

<http://www.stat.auckland.ac.nz/~iase/publications.php?show=rt04>

The Editors of this 300-page proceedings volume were Gail Burrill (Michigan State University, USA) and Mike Camden (Statistics New Zealand, NZ). The Technical Editor was Glenda Breaux (Michigan State University). From 28 June to 3 July 2004 the International Association for Statistical Education (IASE) held a Roundtable on Curricular Development in Statistics Education in Lund, Sweden. This roundtable provided a forum for 26 participants from nine countries to consider aspects of the statistics curriculum from primary school to the tertiary level and across courses in statistics, mathematics, teacher preparation, and stochastic processes. The backdrop for the papers and discussion was:

- Research - What do we know and what do we need to know?
- Policy - Who is responsible for developing and putting in place a curriculum?
- Practice - What is important to teach, when should it be taught and how?

The proceedings provide a rich resource for those considering issues related to the curriculum for statistics education. The papers span five categories:

1. Curriculum Perspectives and Statistics Education
2. Curricular Approaches to Teaching Statistics
3. Content Issues Related to Teaching and Learning Statistics
4. Statistics Education Research and Implications for Teaching
5. Policy Decisions and Implications for Curriculum Implementation.

Some of the emerging themes were the centrality of technology as an element in designing and delivering curriculum, the need for scaffolding the development of statistical concepts in new and different ways, curricular initiatives designed to address a growing concern evident in many of the papers about students'

inability to apply statistical concepts in meaningful ways despite the fact that they seemed to know the procedures, the role of statistical literacy in the curriculum, and innovative ways to explore and measure student understanding of statistical concepts.

Also included are reports arising from the discussions of Working Groups. The discussion ranged from the development of a statistics curriculum to common issues and promising solutions to questions of how to best construct learning trajectories that will enable all students to make sense of data and to apply statistical reasoning when making decisions based on data. The four reports are:

1. Curriculum and Research in Statistics Education, which addresses implications of research for curriculum development, professional development, and assessment and offers recommendations for future research
2. The Role of Technology in Teaching and Learning Statistics, which offers a set of principles to guide the integration of technology into statistics curriculum development
3. Statistics Curriculum: Content and Framing, which discusses issues to be considered in framing and designing the statistics curriculum
4. Teacher Preparation and Statistics Education, which discusses concerns about the preparation of teachers to teach statistics and makes recommendations to help address these concerns.

The table of contents is just mouse click away at

<http://www.stat.auckland.ac.nz/~iase/publications.php?show=rt04>

(Warning: Several papers have large pdf files because of the photos in them. This has been indicated after the title for papers over 1 Mb)

[*Curricular Development in Statistics Education*](#) can be a valuable resource to many different audiences concerned with improving teaching and learning statistics across the educational spectrum.

13. Update on the International Statistical Literacy Project (ISLP)

Report by Carol Joyce Blumberg

Update on Webpages

Over the past 12 months there have been many new items added to the pages of the International Statistical Literacy Project. A concentrated effort has been made to include more items in languages other than English. Webpages providing listings of (and links to) items in different languages have been added to the website. In addition, all of the webpages have a new, more modern, look. The search engine has been improved with the help of Stephen Cope (The University of Auckland, NZ). The best URL to use to start exploring the ISLP webpages is <http://course1.winona.edu/cblumberg/islplist.htm> .

Further, the webpage dealing with useful datasets has been combined with the datasets page on the IASE website and now is at <http://www.stat.auckland.ac.nz/~iase/links.php?category=4> . Also, at the suggestion of the ISLP Advisory Committee a webpage has been created with links to curriculum guidelines from a variety of countries. This webpage can be found by going to the IASE website webpage on "Links" at <http://www.stat.auckland.ac.nz/~iase/links.php> and then clicking on "Curriculum Guidelines" on the left-hand side of the page.

Thank You

The following people have served as page co-ordinators over the last year and all have agreed to remain for the coming year: General Resources and Definitions (Carol Joyce Blumberg, USA and Ken Shimabukuro, Bolivia); Assessment (Sara Finney, Kenn Barron, and S. Jeanne Horst, USA), Recently Published Articles/Report Useful for Teaching Statistics and Resources for Those Training Teachers (Eunice Goldberg,

USA), Resources for Secondary School Teachers (Philip Boland, Ireland & Jerry Moreno, USA), Training Programs and Learning Materials from National and International Statistical Offices (Reija Helenius, Finland), Listing of Statistical Literacy Projects Around the World (Paola Giacché, Italy), Resources for Journalists (Warren Palmer, New Zealand), Resources for Adult Learners (Iddo Gal, Israel), and Children's Censuses (Neville Davies, UK).

The ISLP has also been aided within the last year by advice from the ISLP Advisory Committee consisting of Beverley Carlson (USA/Chile), Vicki Crompton (Canada), Paul J. Fields (USA), Iddo Gal (Israel), Enrico Giovannini (Italy/France), John Harraway (New Zealand), Lesley Hooper (New Zealand), Soo Kong (Australia), Maria A. Pannone (Italy), René Padiou (France), Enriqueta Reston (Philippines), René H. M. Smulders (The Netherlands) and Christopher Wild (New Zealand). Gilberte Schuyten (Belgium, IASE President), Allan Rossman (USA, IASE President-Elect), Daniel Berze (Director, ISI Permanent Office) and Shabani Mehta (Administrative Projects Officer, ISI Permanent Office) serve as Ex-Officio members of the committee. Martin Podehl (Canada) and Peter Holmes (UK) have retired from their jobs and decided to also retire from the ISLP Advisory Committee. Both of them have added immensely in a number of ways to the success of the ISLP. In addition, Robert W. Spencer (a senior in Computer Science at Winona State University) and Tasfia Ahmed (a junior in Chemistry at Winona State University and a native of Bangladesh) have assisted with the maintenance of the webpages and several other tasks over the last year.

An Appeal

There are two very important needs for the ISLP webpages at the moment. First, in order to find out more about the users of the ISLP webpages and to encourage the users to give suggestions for the improvement of the webpages, a short 3-minute survey has been created. If you have ever used the ISLP webpages, please fill out this survey at <http://course1.winona.edu/cblumberg/survey.htm>. The survey is set-up so that all responses are anonymous (unless the respondents choose to identify themselves). Second, in order to make the webpage on Recently Published Articles/Reports Useful for Teaching Statistics most useful, there is a need for people to continue to send recent articles/reports that they see in their own countries (both good and bad examples of uses of statistics) to Eunice Goldberg at egoldberg@nl.edu.

Further, if you have other resources that you would like to see included on existing webpages, please send them to the appropriate page co-ordinators (see <http://course1.winona.edu/cblumberg/islpcoord.htm> for emails) or to Carol Joyce Blumberg. If you have ideas for additional webpages or other projects that you would like to have the ISLP Advisory Committee consider, please contact Carol Joyce Blumberg, ISLP Coordinator, Department of Mathematics & Statistics, Winona State University, Winona MN 55987-5838; email: cblumberg@winona.edu; Fax: ++1-507-457-5376.

14. Statistics Education in the United Arab Emirates

Report by National Correspondent UAE, Hanah Innabi, School of Education, UAE

New Curriculum makes a Difference

The realization of the importance of Statistics as a subject that helps students use data and information to communicate and make decisions, led the educational system in UAE (United Arab Emirates) to give more attention to teaching statistics and probability at schools. Accordingly, statistics education in the UAE is going through a crucial change stage. Educational reform related to Mathematics and Science curricula and textbooks has been going on since the year 2000 in UAE. Mathematics old textbooks are gradually replaced by new ones set by the Ministry of Education. The new mathematics curriculum are already being used for the 1st, 2nd, 3rd, 4th, and 10th grades and it is expected that in the coming few years, new textbooks will be enforced for all the 12 grades.

In all levels, statistics and probability are parts of the mathematics curriculum. A comparative look at statistics and probability in the old and new mathematics curricula can show a big difference.

Teaching and learning statistics according to the old curriculum are carried out in the traditional way. Statistics for both teachers and students is a 'calculations and rules to be applied'. There is no application on

'real data', and the use of the computers in teaching or learning statistics does not exist in the schools. According to the old curriculum, students in UAE start learning statistics from 6th grade and probability from 11th grade. The weight or the amount of the statistics and probability chapters in each grade is usually less than the other mathematics chapters. The location of the statistics and probability chapters in all the textbooks is towards the end, which usually affect the teaching and learning process as at the end of the year both the students and teachers are tired and just want to finish. The statistical content contains some separate unrelated concepts and generalizations in addition to some applications and the drills depend on theoretical, pre-prepared and unreal data.

However, the new mathematics curriculum promises a better picture where there is emphasis on teaching statistics and probability in a meaningful and practical way using various resources and technology. This promising picture can be justified by considering that 'Data Analysis and Probability' is one of the ten standards that the new mathematics school curriculum in UAE is recently built on. In the new document of mathematics curriculum outlines, one can find a new spirit related to learning statistics and probability. In this document and within the 'Data analysis and probability standard' we find sub standards and performance indicators that relate to statistical thinking such as formulating questions, collecting, organizing, representing, analyzing, and interpreting data, assessing statistical inferences and predictions, and understanding and applying basic concepts of probability. According to the new curriculum students in UAE are studying statistics and probability from the first grade instead of the 6th grade. Many of the statistical ideas that were not presented at all in the old curriculum are present in the new curriculum. Ideas such as sampling techniques and standard error are basic ideas to understand inferential statistics.

A Challenge

Without real and honest execution in the classroom, this bright picture of teaching and learning statistics in the new curriculum will stay meaningless. Obviously this requires well trained teachers that have the proper knowledge, skills, and attitudes.

As we mentioned earlier, statistics is a part of the mathematics curriculum and mathematics teachers have to have a specific preparation in statistics education. Thus, it is very important to offer these teachers a suitable training.

The real challenge that faces statistics education now is how to prepare teachers training programs that consider the following three points:

1. Mathematics teachers' perceptions of statistics as fixed models, procedural knowledge, and direct applications should be changed. Teachers should be aware that statistics deal with real life problems and decisions, and this make teaching statistics not an easy process.
2. Teachers require knowledge about statistics, its history, philosophy, and its relations to other domains of science.
3. An epistemological perspective related specifically to statistics should be provided. Teachers have to know how to organize and implement statistics projects and experiments, how to use various methods, simulations and representations to help students to delve into wider questions, and to obtain knowledge from data in order to understand and apply statistics.

It is hoped that statistics education in UAE will keep improving until the traditional view that statistics is a bunch of data and graphics will change. It is hoped that people will see statistics as a way of thinking that helps us to be more critical thinkers both in our daily life and in professional life.

15. Meetings related to Statistics Education in 2005

From IASE Conferences Officer, Andrej Blejec (Slovenia)

February 17 – 21, 2005, CERME – 4 Congress of the European Society for Research in Mathematics Education, Sant Feliu de Guíxols, Spain

<http://cerme4.crm.es/5.htm> and <http://cerme4.crm.es/Papers%20definitius/5/wg5listofpapers.htm>

April 4 – 5, 2005, IASE Satellite Conference - Statistics Education and the Communication of Statistics, Sydney, Australia

<http://www.stat.auckland.ac.nz/~iase/publications.php?show=14>

April 5 – 12, 2005, ISI-55, The 2005 Session of the INTERNATIONAL STATISTICAL INSTITUTE, Sydney, Australia

<http://www.stat.auckland.ac.nz/~iase/publications.php?show=13>

May 19 – 21, 2005, USCOTS, United States Conference on Teaching Statistics, Columbus, OH, USA, www.causeweb.org/uscots/

July 2 – 7, 2005, SRTL-4, The fourth international research forum on statistical reasoning, thinking and literacy, Auckland, New Zealand,

<http://www.stat.auckland.ac.nz/srtl4/>

July 10 – 14, 2005, ICTMA 12, International Conference on Mathematical Modelling and Applications, London, United Kingdom

www.city.ac.uk/conted/research/ictma12/index.htm

July 10 – 15, 2005, PME-29, Psychology of Mathematics Education, Melbourne, Australia staff.edfac.unimelb.edu.au/~chick/PME29/

July 24 – 28, 2005, EMS 2005, The 25th European Meeting of Statisticians, Oslo, Norway www.ems2005.no

August 4 – 5, 2005, Beyond The Formula IX: A Conference About Teaching Introductory Statistics, "Constantly Improving the Teaching of Introductory Statistics", Rochester, NY, USA

www.monroecc.edu/go/beyondtheformula/

August 7 – 11, 2005, JSM 2005, Joint Statistical Meetings, Minneapolis, MN, USA

www.amstat.org/meetings/jsm/2005/

November 22 – 26, 2005, Kingfisher Delta '05, The Fifth Southern Hemisphere Conference on Undergraduate Mathematics and Statistics Teaching and Learning, World Heritage Fraser Island, Queensland, Australia

<http://www.maths.uq.edu.au/delta05/>

November 25 – December 1, 2005, International Conference of The Mathematics Education into the 21st Century Project: "Reform, Revolution and Paradigm Shifts in Mathematics Education", Johor Bharu, Malaysia

http://math.unipa.it/~grim/21_malasya_2005.doc

December 12 – 16, 2005, ATCM2005, Asian Technology Conference in Mathematics, Cheong-Ju, South Korea

<http://www.atcminc.com/mConferences/ATCM05/>

See the Conferences page of the IASE website <http://www.stat.auckland.ac.nz/~iase/> for upcoming conferences.

16. National Correspondents

The IASE national correspondents help provide communication between local membership in their countries and the IASE. This includes passing on information about the IASE activities to those concerned with teaching and learning statistics as well as letting the IASE know about activities in their countries. Below is a list of the present national correspondents. IASE welcomes two new national correspondents, Hanan Innabi from the United Arab Emirates and James Ntozi from Uganda. We encourage all national correspondents to add news items at the IASE News Webpage <http://www.stat.auckland.ac.nz/~iase/news.php>. If there is no National Correspondent for your country and you feel that you can help us, please contact Brian Phillips at [<bphillips@swin.edu.au>](mailto:bphillips@swin.edu.au).

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17. Becoming a Member of IASE

The most rewarding aspect of IASE membership is participating in an international community of people who believe in the value of statistics education and wish to advance it. Members also benefit from reduced registration fees at IASE conferences and the main ISI conferences. They receive the *ISI Newsletter* and the *IASE Review*. They may subscribe at a reduced rate to statistical journals, for example the ISI flagship journal, the *International Statistical Review*, *Short Book Reviews*, *Teaching Statistics* (with includes the regular insert *IASE Matters*) and may purchase other IASE and ISI publications at a discounted price. An IASE membership application form is available from the IASE Members page at <http://www.stat.auckland.ac.nz/~iase/members.php>.
