INTERNATIONAL ASSOCIATION FOR STATISTICAL EDUCATION

UPDATE

IASE subscription rates (in Dutch Guilders) are again being held constant, although there may be some small fluctuations in the various currency equivalents supported by the International Statistical Institute. The package of benefits remains just as high. As well as receiving a number of ISIJIASE publications free, members can still take advantage of concessionary rates on conference registrations and on the purchase of other ISIIIASE books and journals.

1996 has been a very busy year for members of 'ASE. There have been an unusually large number of conferences covering statistical education issues. Some reports are included in this issue of *JASE Review*. Others will be appearing in other 'ASE publications over the next few weeks. Clearly there has been an increase in the number of research reports, dissertations and publications addressing issues in statistical and probabilistic understanding. A good starting point for keeping track of these is the *Newsletter of the International Study Group for Research into the Learning of Probability and Statistics.* After a number of years as editor of this newsletter, Joan Garfield handed over earlier this year to Carmen Batanero (University of Granada, batanero@goliat.ugr.es). The newsletter is freely available from http://www2.ncsu.edulncsu/pams/statlinfo/infopage.htrnl, the *Journal of Statistics Education Information Archive,* along with a range of other materials of interest to statistical educators and IASE members in particular. The archive also has a number of 'hot-links' to other useful sites.

KEEPING IN TOUCH

Your nearest point of contact may be one of IASE's National Correspondents (See list on pages 9-10) and he or she should be able to put you in touch with other members of IASE. Alternatively, you can obtain a list of the full membership of IASE from the *JSE Information Archive.* Yob may be surprised by the number of people in your region who are interested in statistical education and who would like to interact with you. Why not **make contact with them? If** your country d6es not appear to have a National Correspondent, why **not offer to take on the role?** It can be interesting and rewarding.

Members of your Executive Committee are here to serve you of course. If you need information, or you have any ideas about how you think that IASEcould be more effective, please do not hesitate to contact any or all of its Officers.

ELECTION of 1997-9 EXECUTIVE COMMITTEE

A Nominating Committee is being formed to oversee the election of the next Executive
Committee. if you wish to put forward anyone's name as a potential candidate, please
contact Anne Hawkins who will see to it that it is passed on to the Nominating
Committee.

There has been some confusion over the exact meaning of the Bye-laws, particularly
paragraphs 6.3, 6.4 and 6.9 concerning consecutive periods of office. ISI Permanent
Office has advised that 'Vice-President' and 'President-Elect' are *different* officers within
the Executive Committee. It would, therefore, be possible for someone to be elected to
serve twice as a Vice-President, and then to be elected as President-Elect and go on
(without further election) to serve as President. This would be a total of eight

consecutive years of service, and not the four years implied in paragraph 6.4, which specifically relates to re-election to the *same* office (the only possibility for this being that of Vice-President).

If you wish to comment on this interpretation of the Bye-laws, please send your observations to Anne Hawkins. The matter has already raised considerable discussion and it is clearly something about which member -are not necessarily-in agreement.

KEEPING INFORMED

The expansion of the Internet means that there is an increasing number of special interest groups and networks for statistical educators to join. Some of these operate on an international basis, while others attract more localised subscribers. It is clear that opportunities for people to keep informed are increasingly *via* electronic means. IASE is keen, however, that people who lack access to the Internet should not find themselves marginalised. It is therefore striving to keep its members in touch by a *variety* of means, including hard-copy publications. Make sure that you receive the ***International Statistical Review, Short Book Reviews,*** and the ***Annual Review of International Statistics.*** These ISI publications are available free to all members of IASE.

Rolf Biehler is now the IASE Editor for the ***International Statistical Review.*** This is a publication that goes to *all* ISI members, and therefore it provides a splendid opportunity for IASE members to communicate with statisticians in all areas of application. If you have something to contribute, Rolf will be pleased to hear from you. [Institut fur Didaktik der Mathematik, Universitat Bielefeld, Postfach 100131, 33501 B ielefeld, Germany. E-mail: rolf.biehler@ hrz.uni-bielefeld .de]

In addition to publications which the membership receive because 'ASE is a Section of 181, some publications are specifically aimed at IASE members; ***IASE Review,*** an occasional publication that goes to all 'ASE members; the 'ASE section of the ***ISI Newsletter,*** published 3 times a year; and ***IASE Matters,*** comprising the centrefold of *Teaching Statistics.* Published 3 times a year, *Teaching Statistics* is itself a valuable resource for statistics educators, particularly those concerned with students aged 9 to 19 years. 'ASE members can subscribe to this journal at reduced rates. [Contact Peter Holmes, RSS Centre for Statistical Education, The University of Nottingham, Nottingham, NG7 2RD, UK. Tel: +44 (0)115-9514911, Fax: +44 (0)115-9514951, ph@maths.nott.ac.uk for news of special offers for new subscribers.]

RAISING THE NETWORK

One of IASE's priorities is to unify people across national boundaries and discipline specialities in order to ensure the visibility of statistical education initiatives and the dissemination of research findings in areas related to statistics teaching and learning. Expanding our communication network is therefore extremely important for 'ASE. The President-Elect, Gabriella Ottaviani, is contacting the IASE National Correspondents to enlist their help in campaigns to raise awareness of IASE and to recruit more members; as well as to encourage a range of local initiatives.

Gabriella has also sent a personal letter to the President of each of the National and International Statistical Societies listed in the 181 Directory. The Societies were not only invited to join IASE as institutional members, but also they were asked to assist with positive action in their country or region. It is clear that such Societies can often contribute by disseminating 'ASE information *via* their own regular newsletters or other publications. They can also help IASE to acquire knowledge about local statistical education initiatives or research projects, and about reviews and other literature relevant to the particular region. By introducing 'ASE to statistical educators (or to those with an interest in the field) and *vice versa,* these Societies can assist 'ASE to enlarge its existing network of contacts and hopefully encourage two-way communication with colleagues all over the world.

The initiative is already bearing fruit. Some Societies in South America have agreed to pass on IASE information in their Bulletins. This is encouraging, but it cannot be the end of the story. Abdelmegid Farrag will shortly be helping Gabriella to start an IASE campaign particularly focused on the African continent. It is a large undertaking, however, and it is not only in Africa where we have relatively few members. Asian colleagues, too, are under-represented. Gabriella is keen to hear from any IASE members, especially in these locations, who are willing to act as intermediaries with their National Societies or in any other way to support-the IASE-initiatives; **This is your chance to get involved** and, by giving some help, you could play a very important role in the development of statistical education in your own region. [Contact Gabriella Ottaviani, Dip di Stat, Prob e Stat Appl, Universita "La Sapienza', P le A Moro 5, 00185 Rome, Italy [Tel: +39 6-49910561, Fax: +39 *6-4959241]* ottavian @pow2.sta.uniromal.it

UP-COMING IASE CONFERENCES

(See also item on the Buddy System, Page 4)

IASE sessions in the 151's 51st biennial meeting, Istanbul, 1997

There are seven sessions planned for 181-51. Some are co-organised with other 1S1 Sections.	*The Role of Bayesian Methods in Statistical Education - Jeff Witmer* [Jeff_Witmer@qmgate.cc.oberlin,edu]
Research on Teaching and Learning Statistics - Mike Shaughnessy [MIKE@fpa.lh.pdx.edu]	*Data-centred versus Mathematics-centred Training in Statistics* - Shir Ming Shen [hrntssm@hkucc.hku.hk]
Research and Teaching of Probability and Statistics in the Physical Sciences - David Vere- Jones [David.Vere-Jones @ isor.vuw.ac.nz]	Assessment and Measurement in Education – Abbas Bazarghan [bazargan@rose.ipm.ac.ir]
Teaching and Training Statistics with Sample Surveys - Guiseppe Cicehitelli [Pino@stat.unipg.it]	Technology in Teaching Statistics ("Teachware") - Ene-Margit Tut [etiit@madli.ut.eej

Fifth International Conference on Teaching Statistics, *ICOTS-5, Nanyang Technological University, Singapore, June 21-26,1998 www.nie.ac.sg:8OOO/~wwwmath/icots.html*

Chair IPC, Brian Phillips (bphillips@swin.edu.au, Fax + 61198190821)

Chair LOC, Teck-Wong Soon (twsoon @ singstat.gov.sg)

Singapore contact, Lionel Pereira-Mendoza (pereiraml @am.nie.ac.sg)

The ICOTS-5 theme is Statistical Education Expanding the Network. If you are interested in presenting a paper you are asked to submit an abstract (3-500 words long) now, either to the relevant topic convenor whose name and email is listed below or to the 'PC Chair. You will then be put in touch with the appropriate session organiser.

Topics

1. Statistical education at the school level (Elementary level, secondary level, teacher training,local teachers) Lionel Pereira-Mendoza [pereiraml @am.nie.ac.sg]

2. Statistical education at the post-seconda~ level (Introductory statistics, mathematical statistics, design and analysis of experiments, regression and correlation, Bayesian methods, categorical data analysis, sample survey design and analysis) Richard Scheaffer [scheaffe@ stat.ufl.edu]

4. *Statistical education and the wider society (Statistical Societies, statistical literacy, publications, legal contexts, journalists, informed society) Anne Hawkins [ash@maths.nott.ac.ukl*

5. *An international perspective of statistical education (African region, Asian region, Spanish speaking countries, Other developing regions) James Ntozi [isae@mukla.gn.apc.org]*

6. *Research in teaching statistics (Junior levels, senior school levels, post-secondary levels, probablity) Joan Garfield* [Ubg@maroon.tc.umn.edu*]*

7. The role of technology in the teaching of statistics (Software design, teaching experiments, graphics calculators, visualization,.research,.multi-media and WWW)RoIf Biehler lrolf.biehler@post.uni-bielefeld.de]

8. *Other determinants and developments in statistical education (Cultural/historical factors, learning factors, assessment, gender factors, projects/competitions) Giuseppe Cicchitelli [pino @stat.unipg.it]*

9. *Contributed papers Shir-Ming Shen [hrntssm@hkucc.hku.hkj*

10 *Poster sessions Peng Yee Lee [leepy@am.nie.ac.sg]*

3. Statistical education for people. in the.workplace(Statistical consultancy, continuing education, *distance education, total quality)Kerstin Vannman [kerstin.vannman @ies.luth.se]

Anyone who wants to run an additional session such -as a- special interest group discussion or a demonstration or training *session should contact the IPC. Chair with their proposal.*

THE BUDDY SYSTEM & ICOTS-5
Do You NEED HELP, OR COULD *You* HELP?

Are you interested in attending ICOTS-5 but are not sure about the problems that you may face in traveling to Singapore? Are you new to the idea of attending a large international conference and uncertain about what will be expected of you when they get to ICOTS-5? Would it help if you had a particular person that you knew would try to answer questions you might have about ICOTS, how to get to Singapore and what you are likely to encounter when you get there? Perhaps they could help you to trouble-shoot travel and lodging arrangements or. provide practical advice on obtaining currency and official travel documents? Maybe all that you would need is the opportunity to share information-gathering with someone else in a similar situation to yours? Perhaps your concerns are about how sessions are organised at ICOTS-5, and how much opportunity there will be for discussion and seminar sessions as-opposed-to more formal presentations? Or perhaps you want to know more about the other people who you will meet at ICOTS-5, so that you can form a clearer idea of what to include in any presentation that you might be giving, and how to make it appropriate for your audience?

For the first time, at the suggestion of Gail Burrill, the 'ASE Executive Committee is hoping to introduce a Buddy System to link up potential new-comers with more experienced conference attenders, with a view to providing moral support for those who need it. The system is. *not* one of financial sponsorship, but maybe two heads would be better than one for finding cheaper travel deals, sources of funding, etc. The scheme can therefore be really beneficial to both 'mentor' and 'mentee'.

People who are thinking about attending ICOTS-5 and who would like to take part in this experiment (whether they see themselves in the role of 'mentor' or 'mentee') can get in touch with Anne Hawkins, Gabriella Ottaviani or Brian Phillips. Alternatively, you can contact your local National Correspondent (see the list on pages 9 and 10). All the National Correspondents have been asked to act as Buddies themselves and to help find Buddies for others. Certainly, the National Correspondents should be able to provide information and advice specific to your own area.

ISI WORLD NUMERACY PROJECT

Discussions at the 50th 151 Session in Beijing confirmed that the IASE would be a natural Section to have a major involvement in the World Nume racy Project. The Advisory Committee, of which IASE President Anne Hawkins is now a member, is chaired by **Luigi Biggeri.**

The World Numeracy Program of the International Statistical Institute (ISD aims at spreading quantitative skills all over the world, especially in developing countries. It is analogous to UNESCO's world literacy effort, even though it is on a more modest scale. As the international academy of statisticians, 181 has been promoting the development of statistical science and scientific data collection practices since its beginnings in the 19th century. In view of the weaknesses observed in quantitative skills in many parts of the world (especially in the developing countries), in addition to its more traditional tasks, 181 wishes to mobilise its elected members (about 1800 persons) and Section members (about a further 3200 persons) for the World Numeracy Program. If you would like to be involved, contact Luigi Biggeri, Professore di Statistica Economica, Dipartimento Statistico, Universita degli Studi di Firenze, Viale Morgagni, 59-50134 Firenze, Italy (Tel: 055-4237225, Fax: 055-4223560,   Biggeri @ stat.ds.unifi.it).

NEWS OF RECENT MEETINGS

IASE/lASC Conference, June 2-8, 1996, Tartu, Estonia.
Co7nputational Statistics and Statistical Education

In early summer, in the old university city of Tartu (Estonia), the first collaborative conference of IASE and IASC (International Association of Computational Statistics) was held. It was hosted by the Institute of Mathematical Statistics, and attracted some 60 delegates, including 35 drawn from 19 other countries.

The conference addressed four main topic areas;

- Problems of Computational Statistics
- Visualisation methods
- Development of Statistical Education
- Methodology of teaching statistics using statistical software

The invited lecturers from IASE were Anne Hawkins (Nottingham), who spoke about general problems of statistical education, *Statistical Education - How far have we come? Do we know where we are going?* and Rolf Biehler (Bielefeld), who described the requirements for software to support student's learning.

IASC was represented by members- -of the council Peter-Naeve (Bielefeld)-who discussed how to use *S-Plus* as an environment for communicating ideas, and Jaromir Antoch (Prague) who described the experience of making MATLAB, MAPLE and MATHEMATICA environments for teaching computational statistics.

Very interesting lectures about visualisation were given by William Eddy (Carnegie Mellon, USA and Jaan Pelt (Tartu), and Seppo Mustonen and Kimmo Vehkalahti (Helsinki) told about their experience of using SURVO as an environment for research and teaching.

During four days of the main conference, about 40 reports were made concerning different problems of computational and applied statistics and about teaching statistics at different levels, including the training of computational statisticians. One of major recurring themes was the use of software in the teaching of statistics, especially the methodological problems encountered in this area.

During the conference some software firms including SAS, SPSS and MATHEMATICA demonstrated their products. Representatives of SURVO gave a free copy to all interested people, as did the author of the Estonian school-oriented package STATKOOL.

The last day of the conference was reserved for a workshop entitled *Statistics at School.* This was especially directed towards teachers from Estonian schools, of whom about 25 attended. The programme included presentations by Anne Hawkins, Tibor Nemetz (Budapest), and also local researchers from the University of Tartu (K. Velsker et al) and Tall inn Pedagogical University (Katrin Niglas).

The reports of the conference will be published as Proceedings. Selected papers will also be published in Estonian for teachers. *Ene-Margit Tut, Institute of Mathematical Statistics, University of Tartu, J. Luvi 2, Tartu EE2400, Estonia [Tel: (37) 27465 488, Fax: (37) 27433 509, etiit@madli.uLee]*

IASE Round Table, July 23-26,1996, Granada, Spain.
Research on the role of technology in teaching and learning statistics

Thirty-six researchers from 13 different countries and 6 continents met to discuss issues involved in using technology to help students learn statistics. Innovative software programs were demonstrated and research papers were presented on uses of technology at different educational levels and its impact on student learning.
After the opening presentation by Anne Hawkins, who discussed some myths concerning the role of technology in statistics education, papers and discussions were arranged into five sections, each briefly described below. For a more detailed summary of individual papers please refer to the article by Carmen Batanero in the Autumn issue of *JASE Matters.*

How Technology is Changing the Teaching of Statistics at the Secondary Level

Papers addressed not only how computers and graphing calculators-are-changing-the-statistical content in secondary education, but also how they affect the content being taught and the ways in which student learning is assessed.

Developing Exemplary Software

A number of software programs were demonstrated, accompanied by descriptions of how and why they were developed and how they have been or might be evaluated. Discussions emerged regarding requirements for ideal software tools needed to improve the teaching and learning of statistics.

What we are Learning from Empirical Research

Examples were presented of empirical research into the use of technology in different educational settings. The generalisability and methodological problems of these research studies were debated.

How Technology is Changing the Teaching of Statistics at the College Level

Papers described innovative ways in which computers are being used in undergraduate and graduate statistics courses and 'their impact on how 'these 'courses 'are 'being 'taught.' Uses 'of 'technology 'included combinations of software with new curricular approaches or internet resources.

Questions to be Addressed on the Role of Technology in Statistics Education

This last section of papers focused on some important problems related to teaching statistics in developing countries and the use of distance learning systems.

During the course of the conference, four broad issues emerged;

1 *The need for information on existing software so that users know what is available and developers can avoid re-inventing the wheel.* Common frameworks were needed for evaluating software, taking into account whether it was primarily a) for demonstrating concepts, b) for analysing data, or c) tutorial or CAL (computer-assisted learning) software. What constitutes appropriate interaction between students and technology for each of these uses needs to be further elaborated and explored.

2. *The changing role of classroom teachers, including their 'replacement' by technology in certain con texts. and their training needs with respect to the use of technology.* Information is needed on the best ways to integrate technology into classroom settings and instructional processes as well as how best to prepare and train teachers to use technology.

3. *One of the biggest challenges in conducting research on the role of technology is the need for appropriate assessment methods to evaluate student learning.* Much of the current research has been done using interviews or in small-scale settings, procedures that do not transfer well to large-scale contexts. Assessment methods are needed which can reliably measure and monitor students changes in understanding as they interact with technology.

4. *The scarcity of good empirical research on the role of technology in statistics education indicates a need for some agreement on appropriate methodology.* Different

theories of learning and teaching underlie research as well as the construction of technology and its use by teachers. It was agreed that it is important to make these theories explicit along with assumptions about what is most important for students to learn about probability and statistics. Many areas were identified as needing research, to provide us with a deeper understanding of statistics learning and thinking processes in technological settings, and to tell us how different strategies best promote understanding. There was also a shared concern about how to disseminate the findings so as to ensure their application in the classroom practices of teachers. Furthermore, participants saw that it was essential to establish better collaboration among educators and the technical experts who develop software tools.

By the end of the five-day-conference, a -strong-sense -of community-bad-emerge& among participants. Many expressed a shared vision of the research that needs to be done and an enthusiasm for new collaborations and research networks. All who participated in the roundtable appreciated the magnificent efforts of the local organisers, Carmen Batanero, Juan Godino .and their colleagues, who made sure that everyone had a wonderful experience in Granada.

A publication containing the edited papers and summaries of discussions will be published by IASE in

1997. Joan Garfield, Associate Professor; Department --of--Educational-Psychology,- - University Minnesota, 332 Burton Hall, J78 Pillsbury Drive £E., Minneapolis, MN 55455 [Tel: 6]2-625-0337, Fax:6]2-624-824, jbg @maroon.tc.umn.edu]

ICME-8 July 14-21, 1996, Seville, Spain, Working Group 14
Linking mathematics with other subjects   -
WG14 Organiser: Fred Goifrey, Organiser Statistical Education Stream:
RoIf Biehler

The following were among the papers presented in this section.

Building a Theory of Graphicacy: Where Are We Now?
Frances R Curcio, New York University [curcio@is2.NYU.EDU], Susan N Friel, University of North
Carolina-Chapel Hill, George W Bright, University of North Carolina-Greensboro

Teaching statistics to reluctant learners
Sue Gordon Carslaw Building, F07, University of Sydney, NSW 2006, Australia [Tel: +61 2 351 4061, Fax: +61 2 *35-1-5797-,* sueg@extro.ucc;su.-OZ.AU]

Bringing the Real World in to Statistics Assessment
Sharleen Forbes P.O.Box 2922 Wellington New Zealand [Tel: 04 495 4600, Fax: 04 495 4740, sdforbes@stats.govt.nz]

Student Analysis of Variables in a Media Context
Jane M. Watson, Jonathan B. Moritz University of Tasmania, GPO Box 252C, Hobart, Tasmania 7001, Australia [Jane.Watson @educ.utas.edu.au]

ICME-8 Topic Group 9 - *Statistics aud Probabihty at the Secondary level*
Organiser:Brian Phillips
The paucity of time given to Statistical Education within the overall ICME programme meant that some of the presentations in this Topic Group were given in two parallel streams, one being focused more on probability and the other on statistics. This situation was not felt to be ideal because of the separation that it implied between these two interrelated areas. A comment to this effect has been relayed to the ICME Programme Committee. Fortunately the last session was a plenary which allowed a synthesis of perspectives.

The following list indicates the areas covered within the Topic Group. It is intended that the complete texts will be edited and available free by the end of the year from Brian Phillips [bphillips@swin.edu.au], courtesy of The School of Mathematical Sciences, Swinburne University of Technology, Australia.

Probability at Secondary level - an international survey
Tibor Nemetz [nemetz@math-inst.hu, Manfred Borovenik [manfred.borovcnik@uni-klu.ac.at]
Views on probability as reflected by student-teachers
Yasar Ersoy [yersoy@tutor.fedu.metu.edu.tr]

Statistical Independence - One Concept or Two?
John & Kath Truran Utruran@arts.adelaide.edu.au]
Report on 20th Psych logy of Mathematics Education meeting (PME-20, Valencia, Spain, July, 1996)
Robert Peard [r.peard@qut.edu.auj
An international overview of data analysis within the mathematics curriculum
Susan Starkings [starkisa@vax.sbu.ac.uk]
Curriculum issues in United States Schools
Gail Burrill [gburrill @macc.wisc.eduj
Data analysis in secondary education in Hong Kong curriculum, examination and projects
Shir-Ming Shen [hrntssm@hkucc.hku.hk)
An Argentinian experience of statistics teaching for masters of high school
Teresita Teran [maverick@rosario.com]
Emerging Issues for Research on Teaching and Learning Probability & Statistics
Mike Shaughnessy [mike@fpa.lh.pdx.edu]
Assessing students' inte rpretations of data: Conceptual and pragmatic issues
Iddo Gal [iddo@research.haifa.ac.il]
Teachers of Statistics - Needs and impediments
Anne Hawkins.fash@maths.nott.ac.uk]
Tech no logy and the teaching of statistics
Kay Lipson [ldl@stan.xx.swin.oz.au]

A forum, chaired by Peter Holmes [p.holmes@sheffield.ac.uk], with panel discussants Carmen Batanero [batanero @ goliat.ugr.es] and Rolf Biehler [rolf.biehler @ hrz.uni-bielefeld.de], addressed the question: *How can statistics and probability best be*

incorporated into the overall school program? A general discussion ensued focused around the following issues raised by the two panelists;

The extent to which probability can be understood when it is based only on a frequentist approach; Whether or not the new curricular proposals for probability are realistic; The appropriate age for complementing experimental approaches with underlying mathematical concepts; The *real* difficulties that students have with EDA; The possibility, desirability (or otherwise) of looking at statistical problems divorced-from notions-of chance and probability. [Carmen]   -

(I) Do we have a software problem? - a lack of adequate programs? - for doing statistics? - for learning statistics? What are our ideals? (When) do we expect progress? (2) Software use tends to bring in more/different graphs, more variables, more complex problems and results - (How) can we cope with these aspects? (3) Which patterns of software use do students develop? How does software use influence their statistical thinking? Are there cultural or gender differences? (4) How can we balance authentic real data analyses and carefully designed constrained activities? [RoIf]

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