

Preface

The *International Statistical Review (ISR)* has a tradition of publishing landmark papers in statistical education, particularly discussion papers. This issue contains a suite of educationally focussed papers which should be of interest to practitioners and technophiles as well as academics and other educators. A basic theme of the papers is how to give students experience commensurate with the practice of professional statisticians to a much greater degree than has been possible in the past. This is done by using technology to collapse the time scale needed for instruction. The main areas used as illustrations are the design of experiments and multivariate analysis. Although these are relatively advanced topics, many of the ideas discussed can be applied at any level of statistical education.

Darius et al. lead off with a discussion of the issues involved in students learning to design experiments by actually designing and conducting a significant number of experiments themselves. This is in stark contrast to learning to analyse data from experiments designed and performed by others which is the reality of most experimental design courses. The technology that makes this achievable in a timeframe that is realistic within a single course is a series of virtual environments, such as a greenhouse, where students can formulate an experimental plan and lay out the experiment with a great deal of freedom of choice. The environment then generates the data.

Nolan & Temple Lang begin with a broad discussion of deficiencies in statistical education, and then offer a technology called “dynamic documents” that can help us overcome some of them. The setting in which their arguments are advanced allows students to experience more of the complexity of the data analyses performed during a substantial investigation. Their illustrative document combines a rational linear presentation of the analysis of data that reveals some of “the answers” with an account of the journey, its turnings and wrong turnings, allows students to explore all of these pathways and even modify the analyses and head down new pathways. Dynamic documents include all the control features usual in dynamic content such as sliders, decision boxes and so on, but also live and modifiable computer code. The system that allows such documents to be produced efficiently can harness the full power of R for graphics and analysis. Although the paper has been written entirely in terms of statistics education, the system it describes provides a potent infrastructure for communication in many other contexts. A likely area of application is enabling statistical consultants to produce sophisticated decision-support documents for their clients based upon the consultant’s data analyses. Such documents would enable clients to explore, dynamically, very complex scenarios—varying environmental assumptions, projections, inputs and business strategies.

Other authors, from a wide variety of backgrounds but with expertise that touches aspects of *Darius et al.* and *Nolan & Temple Lang*, have been invited to use these papers as points of departure for papers drawing on their own experiences at the interfaces between statistics education, educational research and technology. *Wild* discusses the exciting new possibilities that are opened up by virtual environments together with cognitive and pedagogical imperatives to be addressed to ensure that environments actually do teach the lessons they were designed to teach. *Cobb*, a leading educator and author of an innovative book on experimental design,