

From Gal, I. & Garfield, J. B. (editors). The Assessment Challenge in Statistics Education. IOS Press, 1997 (on behalf of the ISI). Pages-preface. ISBN 90 5199 333 1. Copyright holder: International Statistical Institute. Permission granted by ISI to the IASE to make the chapters from this book freely available on the Internet. The References section is a separate chapter and is available on the Internet at <http://www.stat.auckland.ac.nz/~iase/publications/assessbkref>.

Preface

This book discusses conceptual and pragmatic issues in the assessment of statistical knowledge, reasoning skills, and dispositions of students in diverse contexts of instruction, both at the college and precollege levels. It is designed primarily for academic audiences interested in the teaching and learning of statistics and mathematics and for those involved in teacher education and training in diverse contexts.

This project was initiated because we sensed that assessment is a critical issue that has received little explicit attention in the statistics education literature. In developing this volume, we solicited chapters from a variety of authors with expertise in statistics education, mathematics education, assessment, educational research, teacher training, and curriculum development. We sought colleagues able to address both theoretical and applied aspects of teaching and assessing students' cognitions and achievement. We asked our authors to address classroom realities and consider the challenges involved in implementing new methods with students and teachers who study statistics in academic or K-12 contexts.

To make the most out of this book, the following points may be useful:

- Chapter 1 may be a good starting point. It outlines common curricular goals in statistics education that underlie the discussions in all chapters in this volume and contains an overview of the remaining chapters.
- The editorial process ensured that all chapters open with a brief *Purpose* statement that lists the key questions the chapter addresses, and end with an *Implications* section that reiterates key ideas and challenges raised. Readers can examine the *Purpose* and *Implications* sections for a quick determination of the chapter's contents.
- Several chapters address assessment in the context of a specific age or student group (e.g., elementary, secondary, graduate), and examples of tasks and student responses are described in a specific context of instruction. Yet, statistics is a unique subject in that many of the basic topics (e.g., displaying and making sense of data, using summary statistics, or drawing inferences), are presented in much the same way regardless of the level of instruction. Authors were asked to make sure their points are of relevance to a broad range of readers and to discuss adaptations for different age groups where relevant. Therefore, we believe that readers interested in one age group or level of instruction may find much relevant material in other chapters that address a different student population or teaching context.
- Given the international audience for this book, the editorial process attempted to remove country-specific terminology while preserving the authenticity and uniqueness of chapters

couched in different cultural contexts. As a result, readers may perceive the use of different terms that essentially mean the same thing (e.g., scoring, grading, or marking).

A project of this magnitude would have been impossible without the help of numerous individuals and organizations.

Many thanks go to the National Center on Adult Literacy (NCAL), a federally-supported R&D center at the Graduate School of Education of the University of Pennsylvania, and its director, Daniel Wagner, for supporting Iddo's work on numeracy and statistical issues until his move in 1995 to Israel, and for generously hosting two working conferences in 1992 and 1994 on statistics assessment. These meetings, which we co-directed, informed our work as well as the writings of some of those who contributed to this volume.

The National Science Foundation (NSF) funded parts of our work in the area of statistics since 1990, as well as the 1992 and 1994 working meetings, through grants MDR90-50006 and RED-9355860. This funding, part of NSF's long-standing investment in promoting mathematics and science education, has been pivotal in enabling us to sustain our effort through the three years it took to complete this project. (Of course, NSF is not responsible for any ideas and opinions presented here.)

We want to acknowledge the financial help received from the National Center for Research in Mathematical Sciences Education (NCRMSE) at the University of Wisconsin-Madison, and the encouragement provided by its director, Tom Romberg, and by Susanne Lajoie, who served as the co-director of NCRMSE's statistics working group.

The International Statistical Institute (ISI) and its Director, Zoltan Kenneszy, as well as the International Association on Statistics Education and its President, Anne Hawkins, have been instrumental in providing a publishing venue for this book. Daniel Berze, Director of Publications for ISI, has skillfully managed the publication on behalf of ISI and IOS Press. The University of Pennsylvania, the University of Haifa and the University of Minnesota have supported our work and the inordinate amount of copying, faxing and e-mail traffic required.

Most importantly, we would like to thank our many contributors, who remained focused on the goal of sharing their experiences and insights with the educational community, while enduring multiple review cycles and editing demands needed to fit their contributions into a limited space.

Our gratitude and appreciation go to Matthew Seggaard, our technical editor at the University of Minnesota, who under a tight production schedule diligently and ably worked with Joan Garfield on the many large and small editing chores required to prepare a finished camera-ready copy.

Lastly, to Aviva Gal and to Michael Luxenberg, our spouses, and to our children Naama and Danna, and Rebecca and Harlan, our many thanks for bearing with the incessant computer clutter and with the many hours it took to complete this project.

The 19 chapters in this volume by no means exhaust all assessment issues encountered in environments where statistics is being taught. Yet, taken as a whole, the chapters constitute a rich resource that for the first time offers, beyond a conceptual basis for teaching statistics, solid rationales and a wealth of suggestions for assessing students' achievement and progress regarding knowledge, skills, reasoning, and dispositions. We hope that this volume will stimulate a scholarly discourse within the professional community involved in statistics education, and that in coming years additional publications will examine in more detail the many assessment and teaching needs and challenges raised in this volume.

Iddo Gal
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