

President's Message

Statistical Literacy and the 2013 International Year of Statistics

Our students have grown up in a world in which they are constantly bombarded with data. Data that will affect the decisions they will make as consumers, in their careers, and in everyday life.

As 21st century educators, we have an obligation to ensure that our students possess the statistical reasoning skills they will need to survive in a competitive, global market. Statistical literacy can no longer be viewed as a skill needed by a select few; it is essential knowledge required by all that must be developed beginning at an early age and built on throughout one's school years.

The Common Core State Standards (CCSS) devotes substantial attention to statistics, but not starting until grade 6. This is in conflict with the strong stance NCTM took on the importance of including statistics and probability throughout the K–12 school years in its *Curriculum and Evaluation Standards for School Mathematics* (1989) and *Principles and Standards for School Mathematics* (2000). NCTM continues to advocate for including statistics and the importance of statistical reasoning throughout the K–12 years as part of the CCSS.

To reach the goal of a statistically literate citizenry, it is crucial for teachers at all levels to be statistically literate themselves and to possess the pedagogical tools necessary to provide quality learning experiences that develop and deepen their students' statistical understanding. This mandate poses a challenge for many teachers, since statistical reasoning and literacy has not traditionally been a significant part of their past education or teacher training. One excellent resource for elementary and middle school teachers is the recently published book *Bridging the Gap Between Common Core State Standards and Teaching Statistics (BTG)* which consists of 20 investigations in statistics and probability for grades K–8 with real world activities to help students see statistical reasoning and sense making as a necessary part of their everyday lives. *Bridging the Gap* follows both the Common Core State Standards and the *Guidelines for Assessment and Instruction in Statistics Education (GAISE): A Pre-K-12 Curriculum Framework*, produced in 2005 by the American Statistical Association/NCTM Joint Committee on Curriculum in Statistics and Probability.

The GAISE framework views statistical problem solving as an investigative process that involves four components:

- I. Formulate Questions
 - clarify the problem at hand
 - formulate one (or more) questions that can be answered with data
- II. Collect Data
 - design a plan to collect appropriate data
 - employ the plan to collect the data
- III. Analyze Data
 - select appropriate graphical and numerical methods
 - use these methods to analyze the data
- IV. Interpret Results
 - interpret the analysis
 - relate the interpretation to the original question

In addition to outlining the statistical problem solving process, a second dimension to the GAISE framework delineates the three levels of statistical development (Levels A, B, and C) which students must progress through to develop statistical thinking. An excellent resource for high school students which follows the GAISE framework, also produced by the ASA/NCTM Joint Committee, is *Making Sense of Statistical Studies*. It includes a set of statistical investigations that support both the NCTM and Common

Core State Standards for the statistical reasoning necessary for all high school graduates. The GAISE Report can be found at <http://www.amstat.org/education/gaise/>.

In August I had the good fortune to attend the 2012 Joint Statistical Meetings in San Diego. The American Statistical Association sponsored a full-day workshop on *International Census at School*, a project which began in the UK in 2000 to promote statistical literacy in schoolchildren using their own real data. US Census at School, sponsored by the American Statistical Association with support from the Population Association of America, is a classroom activity for students in grades 4-12. Students answer an online survey and use it to answer statistical questions, analyze their class results, and compare their class with random samples of students in the United States and other countries. Census at school can be used to support curricula that follow the Common Core State Standards in Mathematics and can be accessed at

<http://amstat.org/censusatschool/>. You can find ready to use activities for Census at School at STEW (Statistics Education Web) at <http://amstat.org/education/stew/>.

The American Statistical Association has put together an extensive list of resources for celebrating the *International Year of Statistics*, a collaboration among schools, colleges, societies and other organizations around the globe whose purpose is to promote the importance of statistics, with a specific emphasis on promoting the importance of statistics to young people.

Rebecca Nichols, the Director of Education for the American Statistical Association notes that there are numerous ways a school might participate: bringing in local experts to speak about statistics at the high school, entering statistics poster and project competitions, participating in the International Census at School classroom project, using information from the website in lessons, etc. The flyer available at <http://www.amstat.org/education/pdfs/EducationResources.pdf> describes additional free K-12 statistics education resources. ASA hopes to build a network of schools and organizations who can share resources and activities in support of the International Year of Statistics.

To sign up for the International Year of Statistics newsletter, please visit www.statistics2013.org.

Immediate Past President of NCTM, J. Michael Shaughnessy, remarked in the August issue of *NCTM Summing Up* that he has been increasingly impressed by how important statistical literacy has become for all of us around the globe and that statistics will only continue to become more critical in the future. “Statistical literacy has risen to the top of my advocacy list, right alongside numeracy, and perhaps even ahead of “algebra for all.” I hope that you and your students will take part in the *2013 International Year of Statistics* celebrations and that statistical literacy will also rise to the top of your advocacy list.

Ruth Carver