Daniel Solow Author's Award

This annual award recognizes the author or authors of undergraduate mathematics teaching materials (textbook, lecture notes, computer software, web-based learning materials, video lectures, and others, as approved by the Council on Prizes). The primary criteria for selection will be by the material's impact on undergraduate education in mathematics and/or the mathematical sciences (operations research, statistics, computer science, applied mathematics).

Ethan Bolker and Maura Mast

Common Sense Mathematics, Second Edition. AMS/MAA Textbooks, vol. 63, 2021.

Common Sense Mathematics is a textbook in quantitative literacy that prepares students for meaningful decision making in the future. Drawing upon real-world scenarios inspired by the news and using real data, the authors have written a truly lovely book that reveals both the power and the relevance of mathematics to students. The book contains a rich collection of applications spanning finance, climate change and public health, and students use search engines, calculators, and spreadsheet programs to explore patterns and to grapple with topics that matter to them in their everyday lives. Instructors find the exercises in the text to be incredibly meaningful because they place students into decision-making roles, priming them to think deeply about the challenges we face in our current world. As one nominator expressed, "the current COVID pandemic has laid bare many things about our society, including a widespread lack of understanding of the mathematics needed to make informed decisions: exponential growth, the statistics of medical testing, and error rates (including both false positives and false negatives). *Common Sense Math*, with its clear, informative coverage of these topics and more, expertly covers exactly the mathematics I want everyone, including every voter, to understand. Though we will never know for sure, the text probably saved lives—and could have saved thousands more. Is there any more ringing endorsement of a mathematics textbook than that?"

Professors who have used the book appreciate the fertile foundation it provides for engaged problem solving and rich discussion in their classes. While the problems are sometimes sobering, nominators celebrate the exposition in *Common Sense Mathematics*, which they describe as clear, accessible, and engaging. The book strikes an effective and inclusive balance in that it neither assumes that students should already know the material nor that they do not know any of it. Many of the exercises are open-ended, and students are challenged by the messiness of realistic questions. Some exercises are purposefully missing necessary information, requiring students to supply the missing information through research or by making reasonable assumptions. Indeed, *Common Sense Mathematics* is preparing students to be better thinkers, better problem-solvers and better decision makers for tomorrow's world.

Nominators characterize their experience teaching with *Common Sense Mathematics* as immensely rewarding. On witnessing her students develop into resourceful thinkers, one explains that while students "…may be frustrated at the beginning of the semester by the open-ended nature of the problems, by the end of the semester they are the ones posing open ended problems, making informed assumptions, and drawing valuable conclusions using the tools from the textbook." Another nominator expressed great appreciation for the transformation he saw in his students' attitudes toward mathematics and learning. "Students are often challenged by the messiness of realistic questions, but being able to clearly see the relevance of what they are doing encourages them to engage, persevere, and learn. For me, the most rewarding part of teaching the course has been the times students have described to me how it has awakened their curiosity. No longer can they read a statistic or hear a quantitative claim and simply gloss over it; they now feel compelled to investigate the mathematics of the situation. I believe it is that attitude of curiosity and investigation that forms the core of quantitative reasoning."

The MAA is happy to recognize Ethan Bolker and Maura Mast for writing a textbook that sends the clear message that mathematics is relevant to everyone, and that everyone can do it. Congratulations to both on being the 2022 recipients of the Solow Award.

Response from Ethan Bolker

I am honored and delighted to share the Daniel Solow Author's Award for Common Sense Mathematics. I'm pleased that this award is for the piece of my work that will mean the most to non-mathematicians. I thank the MAA three times: first for enthusiastically publishing the first edition, second for encouraging the second, now for this award. Thanks also to coauthor Maura Mast for her willingness to start in on what might have seemed a folie a deux, to colleagues at UMass Boston and elsewhere who taught from drafts, to the student subjects of those experiments and to Steve Kennedy, who helped rescue us from the shoals of the publishing-industrial complex and steer us safely to the MAA. My wife, Joan, would be thrilled to celebrate with me. It was she who, when I was choosing, in the spring of 1959 between medical school and graduate school, asked me how I would feel if I never did more mathematics. That simple question led me to this place.

Response from Maura Mast

I was completely surprised by this recognition and am quite humbled to receive this award! I want to convey my heartfelt thanks to UMass Boston for giving me and Ethan the flexibility to pursue this project and to Fordham for ongoing support; the MAA for offering so many resources for professional development; SIGMAA-QL for nurturing space for discussing quantitative reasoning teaching and learning; Dr. Solow for endowing the award; and the selection committee for their consideration. My motivation for developing this book and approach to teaching was three-fold. First: my students. They have taught me so much and always pushed me to reflect on what and how I teach. This book is designed especially for those students who asked me when they would use math in real life. I hope that they now have some ideas about that! I'm also motivated by social justice (or, more accurately, injustice). All people deserve access to mathematics, deserve to experience success in mathematics, and deserve to be learn how to use mathematics to change the world. Now more than ever, our democracy needs individuals who can apply critical, quantitative thinking to society's challenges, inequities, and injustices. The third motivation is quite personal. My parents Cecil and Mary Mast saw the mathematician in me well before I saw it. They challenged—and supported me—in my mathematical journey. My dad's dedication to his students was an inspiration; late in his career teaching math at Notre Dame, he developed a course to help students see the power and beauty of math. This work honors his legacy. Finally, I am deeply grateful to my husband Jack Reynolds for his unwavering belief in me and his incredible support. I am so fortunate to be with him and our children Brendan, Maeve, and Nuala.

Biographical Sketches

Ethan Bolker, professor of mathematics emeritus at UMass Boston, earned his doctorate under Andrew Gleason. He taught mathematics at Bryn Mawr College before coming to UMass where computer science joined his portfolio for a while. In the years before he retired he returned to his first love.

Dr. Maura Mast has served as dean of Fordham College at Rose Hill since August 2015. She is the first woman— and first mathematician— to be dean of the college. Before joining Fordham, she held tenured positions at the University of Massachusetts Boston and the University of Northern Iowa, as well as visiting positions at Northeastern University, Wellesley College, and the University of Notre Dame.