

## Preface

The need for mathematics learning is tremendous and lifelong. However, for many students, learning mathematics is difficult. Because of their difficulties in mathematics, many of these students struggle to earn technical degrees (Moore & Shulock, 2010). Others miss out on employment opportunities because they don't have adequate mathematics understanding. Almost all will have to find alternative ways to navigate the mathematics required in personal finance and daily living. No matter what their issues with mathematics may be, children must understand that (1) math is important to them now and in the future and (2) they cannot let their perceived lack of understanding or their apparent difficulty in math slow them down from achieving financial and numerical independence.

### **“FOLLOW THE LEADERS”: OVERCOMING OBSTACLES TO MATHEMATICAL ACHIEVEMENT**

A young boy struggled with learning to speak and with acquiring early literacy. Socially, he was considered awkward and had few friends. However, rather than letting ridicule or criticism overwhelm him, he focused on his interest in the world of science. Through incredible hard work, determination, and amazing problem-solving skills, he changed the world of physics. This young boy with early learning difficulties was Albert Einstein.

Another youngster struggled with bipolar disorder and a speech impairment that caused a severe stutter. Later in life, he developed epilepsy. However, rather than viewing himself as having disabilities, he focused on his strengths: an understanding of

mathematics and a unique curiosity and inquisitive nature that helped him see things differently than others did. In time, he became a mathematician, a physicist, and even a member of the English Parliament. He is best known for developing the field of calculus and the concept of gravity. This person with disabilities was Sir Isaac Newton.

There are countless other stories of people overcoming difficulties and disabilities to accomplish amazing things. Too often, however, we view disabilities as reasons for failure or as excuses for struggling. But some people, such as Einstein and Newton, use such struggles to help them focus on their strengths. Having a disability or an “at-risk” label cannot be an excuse for failure or justification for complacency with unsuccessful results. Along with increased rigor and determination, effective instruction and focused content can help turn around the mathematics achievement of such students.

We all use mathematics daily. The ability to compute, solve problems, and apply concepts and skills in mathematics influences multiple decisions in our lives. From personal, professional, and societal perspectives, mastering the mathematical skills of number sense, computation, and problem solving is necessary. Calculating expenditures, interpreting student progress monitoring, and developing personal financial planning all require skills in mathematics.

Civil rights leader Bob Moses has argued for decades that the understanding of mathematics is the formula to a child’s success. Working with students who struggled in school, Moses started the Algebra Project, which provided a different avenue of focus, expectation, and hope to students who might have otherwise been excused from learning. In a similar vein, Jaime Escalante, an immigrant high school teacher in East Los Angeles, challenged students to succeed in a subject that too many other students had ignored or incorrectly deemed unimportant. In a short time, his students scored exceptionally high on the Advanced Placement Exam. They went on to careers in business, engineering, and medicine. The story of his passion, his effective instruction, and his students’ resulting successes garnered so much attention that it served as the basis for the movie *Stand and Deliver*.

Moses and Escalante, like many other teachers, used their influence to change the lives of children and the futures of their families through a focus on mathematics. Even if students do not go on to become mathematicians or scientists, the focus and purpose remain the same: to improve the lives of children and help prepare them for a productive and successful future.

## **THE EFFECTS OF MATHEMATICS LEARNING (OR ITS ABSENCE) ON FUTURE ENDEAVORS**

Math is important not only to the future livelihoods of the children we teach, but also potentially to their social and physical well-being. Through the 2011 Skills for Life survey conducted in England (Department of Business, Innovation and Skills, 2012), researchers discovered some important trends regarding the importance of understanding numeracy and general mathematics. When the researchers compared the lives of 34-year-olds with different self-reported levels of numeracy understanding, those with poor numeracy were:

- Twice as likely to have qualified for free lunches at school when they were age 10.
- Half as likely to have had parents who were very interested in their education.
- Twice as likely to have left school at age 16.
- More than twice as likely to be presently unemployed as adults.
- More than twice as likely to report having a chronic illness or disability.

In the same survey, employers of the respondents reported that they were seriously concerned about these employees' inability to spot numerical errors, write in complete sentences, or use correct grammar. A quarter of the employers surveyed reported that they were investing in remedial literacy and numeracy training for their employees.

Although such concerns about numeracy range throughout a person's life, many of these concerns can be addressed early in school. It is important to find answers to this growing numeracy problem and build early pathways to learning mathematics for students, including students with disabilities and students at risk. The earlier we help children understand the importance of, and experience success with, seemingly complex mathematics, the more likely children will be to learn mathematics. As our earlier examples have demonstrated, this will have a positive impact not only on their current achievement, but on their circumstances later in life. It is with these aims in mind that we have written this book.

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—B. S. W.

Our goal continues to be supporting the teachers who teach our students. Our collaboration with each of them enhances learning for all of us. Thank you especially to my husband, Maury, who continues to support my endeavors within education.

—M. E. L.