

Foreword

Writing this book began with our conviction that communication is key to the teaching and learning of mathematics. Communication involves talking, listening, reading, writing, demonstrating, and observing. It means participating in social interaction, sharing thoughts with others, and listening to others share their ideas.

Communication helps children construct understandings of mathematical ideas and develop connections between their informal knowledge and the abstract symbolism of mathematical concepts. Communication makes mathematical thinking observable, thus making mathematical talk critical to the assessment process and to learning itself. Teachers find out what students understand or are confused about by listening to their ideas. And communication encourages students to reflect on their own knowledge and can help students clarify their ideas or change their thinking, especially when they hear others' points of view. Communicating about mathematical ideas is therefore important to both the teacher and the student.

While communication is important to mathematical learning, it can also increase inequity for English language learners (ELLs). If math instruction and modes of communication are in English, students who are English language learners may not have equal access to classroom discussions unless teachers provide extra support. The equity principle in *Principles and Standards for School Mathematics* (NCTM 2000) states that all students, regardless of their personal characteristics, backgrounds, or physical challenges, must have opportunities to study and learn mathematics.

Equity in math instruction does not simply mean that everyone receives the same math lesson. Equity means that English language learners deserve the opportunity to be as successful as their peers who grew up speaking English. For many English language learners, especially those not given a chance to learn in their primary language, the

assumption has existed that they will acquire English just through immersion in an English-speaking classroom. Likewise, ELLs are expected to learn math content just by being present for the math lessons. Ignoring the role of student participation and communication in math lessons can lead to inequity in the education of this population.

This is not to say that ELLs aren't as capable as their peers or are somehow lacking in what is needed to achieve in school. Students who speak another language bring a unique linguistic experience with them to school. Many times it is just a language barrier that prevents them from demonstrating the depth of their understanding of the content presented. They are in no way deficient. In fact, the opposite is true. They bring the diverse cultural traditions of their home with them to school and help educate us about acceptance, tolerance, and respect of differences.

The language of instruction is transparent to teachers who are native English speakers. Not so for English language learners. English, as all languages, has a complex structure that native speakers begin learning early in life and later use effortlessly and automatically. Our hope is, with this book, you will see some of the hidden pieces of language that seem so obvious to those of us who speak English as a native language. By providing your students with ongoing explicit language instruction, even during math, you are giving them an opportunity to learn both English and content matter. Language and thought are connected; we can't have one without the other. And thinking is what we hope to facilitate with each math lesson. Therefore, in order to provide an equitable education for our ELLs, we are obligated to recognize their needs and make modifications in our instruction in order to provide the richest experiences in education for all students. Our interest in designing those modifications to support teachers is what led us to write this book.

Working with English language learners, while rewarding, is not easy. The fact that teachers conduct their instruction in a language that some students do not yet use fluently forces teachers to rethink the most basic element of their work, the medium of instruction. Many politicians are ready to point fingers at teachers for the gap in achievement between English language learners and their native English-speaking peers. But few of these critics are ready with concrete suggestions as to how to modify the very medium of instruction in order to improve the success of ELLs. As teachers ourselves, we know that time is one of the most valuable commodities in education. Adding a curricular goal, namely

English language development, only puts more demands on instructional time. When designing the lesson modifications proposed in this book, we sought to find ways in which math content goals and language development goals could be met at the same time. We also held to the philosophy that the best intervention is effective first teaching. By actively involving English language learners in math lessons *and* in language development simultaneously, we increase the learning that takes place in each and every lesson and reduce the amount of time needed to provide individualized or small-group instruction. Language development will always take time; we offer suggestions to make sure it's time well spent.

As teachers, as university faculty, and as instructional coaches, we collaborated over lesson plans, in the classroom and at the computer, to create a resource that would promote communication in the instruction of mathematics, provide equity for students learning in their second language, and support teachers in accomplishing the goals of content instruction and language development.