



Knowing and Teaching Elementary Mathematics: Teachers' Understanding of Fundamental Mathematics in China and the United States (Studies in Mathematical Thinking and Learning Series)

By Liping Ma

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Chinese students typically outperform U.S. students on international comparisons of mathematics competency. Paradoxically, Chinese teachers receive far less education than U.S. teachers--11 to 12 years of schooling versus 16 to 18 years of schooling.

Studies of U.S. teacher knowledge often document insufficient subject matter knowledge in mathematics. But, they give few examples of the knowledge teachers need to support teaching, particularly the kind of teaching demanded by recent reforms in mathematics education.

This book describes the nature and development of the "profound understanding of fundamental mathematics" that elementary teachers need to become accomplished mathematics teachers, and suggests why such teaching knowledge is much more common in China than the United States, despite the fact that Chinese teachers have less formal education than their U.S. counterparts.

The studies described in this book suggest that Chinese teachers begin their teaching careers with a better understanding of elementary mathematics than that of most U.S. elementary teachers. Their understanding of the mathematics they teach and--equally important--of the ways that elementary mathematics can be presented to students, continues to grow throughout their professional lives.

Teaching conditions in the United States, unlike those in China, militate against the development of elementary teachers' mathematical knowledge and its organization for teaching. The concluding chapter of the book suggests changes

in teacher preparation, teacher support, and mathematics education research that might allow teachers in the United States to attain profound understanding of fundamental mathematics.

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