SUMMARY

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Chapter 1 states there are two “pillars” that support a successful education system: well-qualified, mathematically prepared teachers who partake in professional development and a “challenging, world-class curriculum”. In order for a teacher to be well qualified and mathematically prepared, they must have an understanding of their students’ prior knowledge and how they will apply this new knowledge in future grades.

Teachers need to understand the consequences of the mathematical choices they make regarding numbers, manipulatives, or the contexts of the problems they ask. They also need to be able to understand when definitions should be given, and how to explain both correct and incorrect student answers.

This chapter ends by discussing the high level of expertise needed for teachers to be effective. Standards to become an educator need to be raised, and current teachers should aim for constant improvement through meetings with fellow teachers and mathematics specialists. Professional development is essential for maintaining this high level of expertise and therefore improving the effectiveness of educators.

Chapter 4 specifically discusses elementary teachers, specifically those who teach grades K-5 (despite grade 6 being included in many states as “elementary”) and the need for these teachers to become immersed in the mathematics they teach. That is, educators need a holistic understanding of
not just their respective grade level but of those both before and after as well as a deep conceptualization of the concepts they will teach their students in order to understand questions or frustrations their own students may develop.

Common Core State Standards (CCSS) outline the specific mathematical skills and concepts students should develop and master at each grade level. CCSS aim at creating connections between the student and the content to allow for a deeper understanding of mathematics. Also, teachers need to start giving their students ample time to think about, discuss, and practice new mathematical ideas to further this deep understanding because math should be taught as a “sense-making business”, not a bunch of random rules and facts to be memorized. The chapter follows with “Essential Ideas for Teachers” which breaks down various mathematical topics and methods teachers can use to deepen their students’ understanding of the material.

This chapter discusses both collegiate programs for aspiring teachers and professional development ideas for current teachers to maximize teacher effectiveness and total mathematical comprehension. For example, prospective teachers should be exposed to more credit hours worth of CCSS mathematics in replace of and in addition to current college mathematics requirements. Once they begin teaching, elementary teachers need to continually immerse themselves in mathematics-related professional development as they gain first-hand experience with their students and understand what information and tools students need to succeed.

The chapter continues by discussing the challenges of implementing these changes to the education system. Many educators are hesitant and even resistant to these changes because they “do not think there is anything else for them to learn about the content of elementary school mathematics” or they “may not be familiar with all of the content and practices in CCSS”. Also, those who create collegiate programs in education are not primarily focused on mathematics and
therefore do not give much attention to the subject. Many schools have begun utilizing mathematics specialists to enhance the mathematical comprehension of both teachers and students.

Finally, the chapter closes by discussing the importance of mathematics in early childhood classrooms as well as those with “special populations”. A thorough understanding of the mathematics being taught in either classroom is crucial because these students deserve the same holistic, comprehensive instruction as those in a mainstream classroom to set a strong foundation for future mathematics curriculum.