

## as a Field of Inquiry

Mathematics teachers are educated in diverse ways, depending to a great extent on the context in which the education occurs. Typically, pre-service teacher preparation occurs at the baccalaureate level, while in-service education occurs at the graduate level or is conducted by the local school systems in which the teacher is employed. There are, however, some pre-service programs in which participants acquire a masters' degree prior to beginning their teaching career.

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In preparation for teaching at the elementary level, most undergraduate students take two mathematics courses that are either part of the institution's core liberal arts program or are designed specifically for elementary teaching majors. Additionally, it is likely that prospective elementary teachers will have one or two courses that deal specifically with the teaching of elementary school mathematics. Concerns that teachers at the elementary level need more background in mathematics have resulted in recent trends toward upgrading the mathematical education of prospective elementary teachers. Secondary teachers typically have a major in mathematics, or a closely related field, with an additional course (or courses) in mathematics education. Smaller programs are more likely to offer only a single course in mathematics education. The





# The Nature of Mathematics

Different segments of society possess different views about what constitutes mathematics. Some think of mathematics as a collection of rules and procedures to be learned and applied for basic living. From this perspective, the teaching of mathematics relies on those methods best suited to promote the acquisition of skills. Others see mathematics as a basis for developing critical thinking and problem-solving skills. From this second perspective, which is closely aligned to the NCTM Standards, teacher education encourages reflection and promotes attention to problem solving and critical thinking. How a community defines mathematics affects what, and how, mathematics gets taught in the local schools. It can also have an impact on how teachers are trained to teach in those schools.





# The Intent of Teacher Education Programs

There is always a certain tension between the intellectual preparation of teachers and the practice of teaching as manifested in student teaching. Those from outside the field of mathematics education often take the position that teacher education should be modeled after an apprenticeship program. That is, one learns mathematics and then works in the schools to acquire the necessary pedagogical skills to be a successful teacher. This type of program tends to promote the status quo, as young teachers model those methods of teaching that they experienced as students. Teacher educators, however, usually take the position that a greater part of the program should be devoted to transforming the teaching of mathematics from a "teaching is telling" approach to an inquiry-based teaching style that is student





The preparation and education of mathematics teachers, like any educational endeavor, exists in a sociopolitical environment that ultimately shapes the enterprise. Conditions of the workplace also shape what transpires in classrooms. These circumstances affect mathematics teacher education programs as well. Schools today are run much as they were in yesteryear, thus perpetuating a certain conservatism with respect to reform. This approach strengthens the position of those who advocate an apprenticeship form of teacher education. Evidence suggests that the United States is experiencing, and will continue to experience, serious teacher shortages, particularly in mathematics. Such shortages usually preclude more extensive training in favor of short, intense programs that are less demanding on the schools' staffing resources.

