



Principles to Guide Doctoral Programs in Mathematics Education

*A joint position statement of the Association of Mathematics Teacher Educators (AMTE)
and
The National Council of Teachers of Mathematics (NCTM)¹*

The National Council of Teachers of Mathematics and the Association of Mathematics Teacher Educators affirm that a core base of knowledge and related experiences are the essential foundations for doctoral programs in mathematics education. As programs are developed, reviewed, and revised, attention should be focused on ensuring that doctoral candidates have opportunities to acquire such knowledge and experiences.

Recommendations: The following statements briefly outline the core knowledge for the work undertaken by most graduates of doctoral programs in mathematics education. Such work could include coursework, seminars, clinical experiences, internships, assistantships, and independent study.

Mathematics Content. Mathematics educators need broad and deep mathematical knowledge both to identify the big ideas in, at least, the pre-K-14 mathematics curriculum and to examine how those ideas develop throughout the curriculum.

Research. Doctoral programs must prepare graduates to conceptualize and conduct research that advances the field's understanding of mathematics learning and teaching and to communicate such results clearly to a variety of audiences.

Educational Contexts. The mathematics educator needs to understand the historical, social, political, psychological, and economic forces shaping education.

Learning. Mathematics educators need to understand fundamental theories of learning mathematics and the distinctions among them concerning the kind of learning they are trying to explain and the theoretical constructs that have proven useful over time.

Teaching and Teacher Education. For those students who are preparing to become teacher educators, doctoral programs should provide mentored clinical experiences that develop expertise in designing and teaching preservice mathematics content and methods courses and organizing professional development experiences for in-service teachers.

Technology. Graduates of doctoral programs in mathematics education should understand and be able to use technology as a tool of inquiry that has implications for teaching and learning mathematics and curriculum development. Graduates must understand the role of technology as an agent of curriculum change.

¹ This position is elaborated in the full version of the joint statement at www.amte.net

Curriculum and Assessment. Doctoral students need experiences in curriculum analysis, design, and evaluation, and they should know the major influences assessment practices have on the intended, implemented, and achieved curricula in mathematics instruction.

A high-quality doctoral program comprises more than a set of courses and a dissertation. Doctoral programs in mathematics education must have a critical mass of faculty with expertise in mathematics education to provide program leadership; research opportunities; and supervised experiences in collegiate teaching, proposal writing, and publication preparation. Equally important is the environment fostered within an institution where students and faculty learn, work, and interact to create support and respect for diverse identities related to culture, ethnicity, race, religion, gender, sexual orientation, and exceptionalities. Finally, adequate physical and technological facilities should be available that support an active learning community of students and faculty.