



Wisconsin Mathematics Council
Position Statement
Mathematics Specialists
(Approved June 25, 2012)

The Wisconsin Mathematics Council (WMC) supports the joint AMTE, ASSM, NCSM and NCTM position of “The Role of Elementary Mathematics Specialists in the Teaching and Learning of Mathematics”¹ with the supporting rationale and the NCTM position of “Intervention”².

WMC Position

The WMC recommends the utilization of Mathematics Specialists at all grade levels in order to enhance the teaching, learning, and assessing of mathematics to improve student achievement. We further advocate that every school district have access to Mathematics Specialists. The Wisconsin Department of Public Instruction (DPI) and Institutions of Higher Education (IHE) in Wisconsin, in consultation with Wisconsin school districts, should work collaboratively to create advanced certifications for Mathematics Specialists and rigorous programs that prepare Mathematics Specialists. With the advent of Common Core State Standards for Mathematics (CCSSM) and Response to Intervention (RtI), Mathematics Specialists need an extensive knowledge of mathematics content, the leadership to advocate for the use of research based instructional practices, and the ability to support efforts that help every student learn mathematics.

Rationale

The Wisconsin Mathematics Council:

- recognizes the need for in depth knowledge and expertise with regard to teaching and learning mathematics, specifically prekindergarten through eighth grade level teachers who are often generalists.
- acknowledges the importance of teaching mathematics with coherence, precision, and reasoning at all grade levels.
- believes Mathematics Specialists will have extended understanding of mathematical content, specialized knowledge of teaching mathematics, and expertise in how children learn mathematics.
- believes Mathematics Specialists will serve as teacher leaders who are responsible for *supporting* effective mathematics instruction and student learning.

Mathematics Specialists are a vital component for student success in mathematics due to

- the increased rigor of Common Core State Standards for Mathematics.
- the increased need for interventions that both remediate and enrich.
- the increased need for analysis of formative and summative assessments.
- the increased need for advocated implementation of quality mathematics curricula.
- the increased need of pedagogical practices that actively engage students via meaningful tasks.

¹ www.nctm.org/about/content.aspx?id=26069

² www.nctm.org/about/content.aspx?id=30506

NCTM Position Statement

The Role of Elementary Mathematics Specialists in the Teaching and Learning of Mathematics

A joint position of the Association of Mathematics Teacher Educators (AMTE), the Association of State Supervisors of Mathematics (ASSM), the National Council of Supervisors of Mathematics (NCSM), and the National Council of Teachers of Mathematics (NCTM) in response to the release of *Elementary Mathematics Specialists: A Reference for Teacher Credentialing and Degree Programs* (AMTE, 2010).

NCTM Position The AMTE, ASSM, NCSM, and NCTM recommend the use of Elementary Mathematics Specialists (EMS professionals) in pre-K–6 environments to enhance the teaching, learning, and assessing of mathematics to improve student achievement. We further advocate that every elementary school have access to an EMS. Districts, states or provinces, and institutions of higher education should work in collaboration to create (1) advanced certification for EMS professionals and (2) rigorous programs to prepare EMS professionals. EMS professionals need a deep and broad knowledge of mathematics content, expertise in using and helping others use effective instructional practices, and the ability to support efforts that help all pre-K–6 students learn important mathematics. Programs for EMS professionals should focus on mathematics content knowledge, pedagogical knowledge, and leadership knowledge and skills.

Who are elementary mathematics specialists?

Elementary mathematics specialists are teacher leaders who are responsible for supporting effective pre-K–6 mathematics instruction and student learning. The specific roles and responsibilities of EMS professionals vary according to the needs and purposes of each setting, but their expertise and successful experience at the elementary level are critical. At the classroom level, an EMS professional may teach mathematics to elementary students in one or more grade levels or work with particular groups of students to provide remedial or enrichment support services. At the school or district level, EMS professionals may work primarily with teachers as coaches, in a professional development capacity or targeting school-wide improvement in mathematics. In this role, EMS professionals build capacity by strengthening teachers' understanding of mathematics content and helping them develop more effective instruction and assessment. The development of curriculum, assessment, or policy may also be the responsibility of EMS professionals. Whatever the setting or responsibilities, EMS professionals need (1) deep and broad understanding of mathematical content, including the specialized knowledge needed for teaching, (2) solid knowledge of the elementary context, (3) expertise in using and helping others use effective instructional and assessment practices that are informed by knowledge of mathematical learning trajectories, (4) knowledge and skills for working with adult learners, and (5) leadership skills necessary to influence and support educational efforts to improve the teaching and learning of mathematics.

Why are EMS professionals needed?

Most elementary teachers are generalists—that is, they study and teach all core subjects—and as a result may find it difficult to develop in-depth mathematics knowledge and expertise in teaching elementary mathematics. Over the past two decades, research has examined the need for EMS professionals in predominantly two capacities (while recognizing that some EMS professionals serve in both): (1) professionals who work primarily with teachers and (2) professionals who work primarily with students.

NCTM describes the importance of EMS professionals working with teachers in this way:

Teacher-leaders can have a significant influence by assisting teachers in building their mathematical and pedagogical knowledge. Teacher-leaders' support on a day-to-day basis ranging from conversation in the hall to in-classroom coaching to regular grade-level and departmental seminars focused on how students learn mathematics—can be crucial to a teacher's work life.

NCSM also advocates for EMS professionals working with teachers to build knowledge, capacity, and skills:

A single mathematics education leader can have an incredible impact on the development and effectiveness of others.... Leaders in mathematics education at all levels of the school or district organization ... are crucial for ensuring attainment of high-quality school mathematics programs.

The National Mathematics Advisory Panel notes the important role of EMS professionals working with students: The use of teachers who have specialized knowledge in elementary mathematics teaching could be a practical alternative to increasing all elementary teachers' content knowledge (a problem of huge scale) by focusing the need for expertise on fewer teachers.

Evidence of impact of EMS professionals

Although the need for EMS professionals has been recognized for more than two decades, only a few states and provinces currently offer advanced certification for EMS professionals. As a result, research on the impact of EMS professionals is still emerging. However, the available research indicates that EMS professionals have a positive impact on teachers and students. A number of studies describe positive changes in teachers' practice as a result of interacting with an EMS professional, including actively engaging students, emphasizing reasoning and problem solving over skills-based lessons, using students' work to inform instruction, and effectively planning lessons. Studies also support the finding that as EMS professionals gain experience, their work has a significant positive impact on student achievement. As states and provinces move to more widespread use of EMS professionals, additional research will need to be conducted to document the impact on the teaching and learning of mathematics.

(May 2010)

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A Position of the National Council of Teachers of Mathematics Intervention

Question

What are the roles of intervention in mathematics teaching to support individual students in meeting grade-level goals?

NCTM Position

Without identifying specific interventions, we endorse the use of increasingly intensive and effective instructional interventions for students who struggle in mathematics. Teachers must use a variety of formative assessments to target strategic instructional techniques that are tailored to meet individual students' needs. When implementing appropriate interventions for all mathematics learners, teachers must possess strong backgrounds in mathematical content knowledge for teaching, pedagogical content knowledge, and a wide range of instructional strategies.

Early and appropriate identification is important for students at all levels of achievement. Any student may require intervention as he or she works with mathematics. Even students who excel in one topic may require the support of intervention in others. When students are struggling, teachers should use various assessments to identify areas of need, and they should use the data that they obtain to choose interventions that can move the students in targeted and structured ways to greater success with important mathematical ideas.

Interventions have many models and are flexible in nature. They can be carried out in the classroom as well as in tutoring or tiered support sessions. Regardless of the model, intervention should focus on supporting students' understanding through explicit instruction based on diagnostic assessments. Intervention should strengthen conceptual and procedural knowledge to close an existing gap so that students can move smoothly to and make connections with other mathematics. The long-term goal of intervention should be to help students gain independent strategies and take responsibility for their own learning. This approach to intervention leads to an emphasis on bigger ideas in mathematics and their applications so that important skills do not become trivial, isolated, or fragmented.

Every intervention model relies on teachers' knowledge of mathematics content and evidence-based teaching strategies, ensuring that those who deliver interventions can take advantage of students' prior mathematics knowledge. A teacher who uses multiple models and ways of sequencing or structuring topics can present rich adaptations of the mathematics content to support students' needs effectively.

Decisions about the duration and type of intervention are often based on the results of progress monitoring and formative and summative assessments. Any assessment instrument or process should identify conceptual and procedural strengths and weaknesses so that decisions on intervention strategies build on what the student knows and does well. Assessments, including diagnostic interviews, can capture information relevant to conceptual and skill development to determine the pace, structure, and length of interventions.

All teachers of mathematics, especially those who work with students with disabilities, need to have certification and training in mathematics to lead effective instruction. This training should include mathematics content and mathematics methods courses to ensure that teachers are able to implement effective instructional practices with fidelity.

(July 2011)