

**Mathematics Specialists
Teacher Specialists
&
Coaches**

Where is this going? What do we know?

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Westminster, MD

&

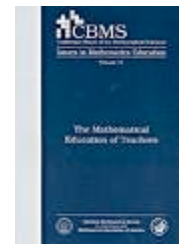
Past President
National Council of Teachers of Mathematics

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Washington, D.C.
April 22, 2009*

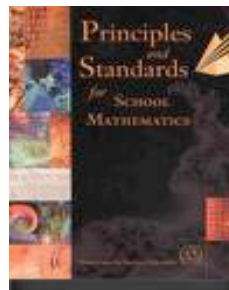
Where have we been?

Policy initiatives which shape...

- Principles and Standards for School Mathematics (NCTM, 2000)
- Mathematical Education of Teachers (CBMS, 2001)
- Adding it Up (NRC, 2001)
- Foundations for Success – Report of the National Mathematics Advisory Panel (US Dept of Education, 2008)



Because of the increasing mathematical sophistication of the curriculum in grades 3-5, the development of teachers' expertise is particularly important. Teachers need to understand content and students' mathematical thinking. However, elementary teachers are usually called upon to teach much more than mathematics. Many (if not most) elementary teacher education programs require minimal content background in mathematics...



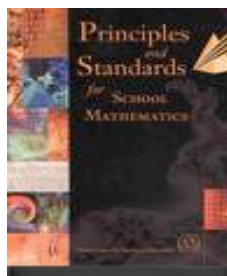
PSSM, p. 146



From PSSM

- “...some elementary schools identify a **mathematics teacher-leader** and then support that teacher’s continuing development and create a role for him or her to organize professional development events for colleagues.”
- “Other schools use **mathematics specialists** in the upper elementary grades. These are elementary teachers with particular interest and expertise in mathematics who assume primary responsibility for teaching mathematics to a group of students...”

NCTM, 2000, p. 146



Mathematical Education of Teachers

- Mathematics in middle grades (5-8) should be taught by mathematics specialists.
- Having mathematics specialists, beginning in middle grades, both reduces the educational burden for those teaching mathematics in these grades and provides opportunities for prospective teachers of these grades who like mathematics to specialize in it.



CBMS, 2001

Mathematical Education of Teachers

This recommendation mirrors similar recommendations by a number of other groups seeking to improve U.S. school mathematics instruction. Middle grade mathematics teachers must know the high school mathematics curriculum well and understand the foundation that is being laid for it in their instruction. As concepts like fractions and decimals enter the curriculum, **teaching mathematics well requires subject matter expertise that non-specialists cannot be expected to master. Having mathematical specialists beginning in middle grades both reduces the educational burden for those teaching mathematics in these grades and allows prospective teachers for these grades who like mathematics to specialize in it.**



CBMS, 2001

Adding it Up

- Implicit in the recommendations for mathematics specialists is the notion of the mathematics specialist in a departmental arrangement.
- Departmentalization is most often used in the upper elementary grades (4-6).
- The building specialist - resource for other teachers in the building.
- The constraint on all of the models for mathematics specialists is the limited number of teachers, especially at the elementary level, with strong backgrounds in mathematics.

NRC, 2001



Keys to Math Success

Maryland Mathematics Commission

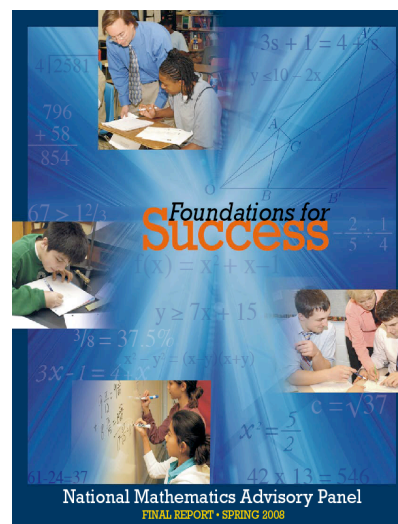
- **Recommendation:** Establish an elementary mathematics specialist certificate.
- ...because of the increasing mathematical sophistication of the curriculum, particularly in grades 3-5, the development of teacher expertise is essential.
- Specialists could help direct the mathematics component of school-wide intervention programs.
- In short, such specialists represent a critical cadre of elementary classroom teachers with mathematics education expertise.

MSDE, 2001

and more recently...

- The Panel recommends that research be conducted on the use of full-time mathematics teachers in elementary schools – elementary mathematics specialist teachers.

NMAP, 2008



Testimony

Committee on Labor & Education

- “...while the terms math specialist and math coach are not always clearly or consistently defined, there is potential in this movement.”
- “...I would add that at a time of teacher surplus at the elementary school level, it is perhaps time to scrap the model of elementary teacher as generalist. Why not have specifically trained elementary mathematics specialists starting from day one of their career? Our country can’t wait until such specialists are graduate students.”

May 21, 2008



President's Message

The Time Has Come for Pre-K-5 Mathematics Specialists

Johnny W. Lott



The No Child Left Behind Act calls for "highly qualified mathematics teachers" in all classrooms by 2005. To meet this requirement, teachers for the early grades would need both a bachelor's degree and state certification. In reality, the call for student proficiency in mathematics and science demands more than this. I suggest that although there has been a traditional unwillingness to consider the need for mathematics specialists in elementary schools, it is an idea whose time has come.

Why Are Specialists Needed?

Consider the arguments in favor of specialists in other fields:

- Art—"Teacher education programs demand minimal preparation in the arts. ... How can one course teach all that is needed to successfully conduct an arts program? ... With an arts preparation that is bound to be incomplete (Boardman 1996), it is no wonder that elementary teachers have feelings of inadequacy when they address the arts curriculum. Under these conditions, as we have seen with other subject areas, teachers tend to rely on traditional activities that they experienced as students" (Passe 1999, pp. 168-69).
- Physical education—"Nonspecialists' activities have been identified as less effective in developing skills and promoting higher levels of activity..." (Dewey [1904] 1970).

Now, consider the needs of students in mathematics. Similar arguments to those above have been made in favor of mathematics specialists, including the following:

- "Teacher decisions about curriculum and instruction are more likely to be based on teachers' personal classroom experiences as students than on teacher education courses and in-service training (Lortie 1975)" (quoted in Passe 1999, p. 156).
- "Because they are not trained as specialists, elementary school teachers tend to have limited knowledge of mathematics" (Hyde 1989).
- "Teachers whose mathematics program consists of endless drill may be disguising their lack of mathematical prowess. They could be hesitant to teach for conceptual understanding because they do not possess it themselves. Under such stress, the traditional approach is appealing because it emphasizes correct answers instead of mathematical reasoning and communication" (Passe 1999, p. 57).

It's unfortunate that so many teachers of mathematics are teaching the subject without the requisite knowledge to teach it. Isn't it time for that to change? Mathematics specialists would do just that and could help improve mathematics learning by students in elementary school.

What Makes a Teacher a Mathematics Specialist?

The type of coursework and training that specialists should have was addressed in *The Mathematical Education of Teachers Part I* (Mathematical Association of America 2001, pp. 7-8):

- *Recommendation 1.* Prospective teachers need mathematics courses that develop a deep understanding of the mathematics they will teach.
- *Recommendation 2.* Although the quality of mathematical preparation is more important than the quantity, the following amount of mathematics coursework for prospective teachers is recommended.
 - (i) Prospective elementary grade teachers should be required to take at least 9 semester-hours on fundamental ideas of elementary school mathematics.

"Fundamental ideas of elementary school mathematics" must reach beyond what is taught to students at that level. The fundamental mathematics must be taught with understanding. Why algorithms work, why classifications are necessary for young children as they learn mathematics, and why it is necessary to learn the rudiments of mathematical language in such a way that they do not have to be relearned later are all ideas that may enter the fundamentals of mathematics for teachers. Understanding, not just mechanics, is a key here. A mathematics specialist at the elementary school level must have a basic understanding of mathematical concepts in each of the five content areas: algebra, geometry, measurement, number and operations, and data analysis and probability.

The mandate for higher-performing students is nationwide. We are being pushed to consider different and better models for teaching. Evidence shows us that students of more knowledgeable teachers do score higher on tests. Therefore, I believe the time has come for a mathematics specialist for the elementary grades.

Watch the NCTM Web site (www.nctm.org) for an online chat with Johnny Lott on this subject.

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President's Message

We Need Elementary School Mathematics Specialists NOW

Francis (Skip) Fennell



In 1984, an article appeared in the *Arithmetic Teacher* that asked an important question—"Elementary School Mathematics Specialists: Where Are They?" This was written by John Dossey, who later served as NCTM president. Now it is 2006, and I am again asking, where are the mathematics specialists? We need you NOW in elementary schools and at every other level in prekindergarten through grade 12 mathematics education.

Many school systems are exploring ways to ensure that their students receive mathematics instruction from teachers who have a deep understanding of mathematics content and pedagogy; however, some still see this problem as being less important at the elementary school level. Major reports—including *Principles and Standards for School Mathematics* (NCTM 2000), *Adding It Up* (National Research Council 2001), and the *Mathematical Education of Teachers* (Conference Board of the Mathematical Sciences 2001)—have called for mathematics specialists. In 1981 the NCTM Board of Directors recommended that state certification agencies provide for a mathematics specialist endorsement on teaching credentials for elementary school teachers. Some states, such as Virginia and Massachusetts, have taken the challenge seriously and now offer graduate-level certification for mathematics specialists. However, the requirements of the No Child Left Behind Act for school accountability in mathematics achievement have probably done the most to draw attention to the need for mathematics specialists in our schools.

Why do we need mathematics specialists at the elementary school level? A student's view of what it means to know and do mathematics is shaped in elementary school; yet in the United States, elementary teachers are, for the most part, generalists. Their preservice teacher education typically includes two or three courses in mathematics content and one course in the teaching of mathematics. Their teaching load generally consists of a full range of subjects, with particular attention to reading or language arts in a self-contained classroom. A mathematics specialist is needed because the preservice background and general teaching responsibilities of elementary teachers do not typically furnish the continuous development of specialized knowledge required for teaching mathematics today.

What do mathematics specialists do? A number of specialist models are used in school districts in this country and Canada. The most common models are the lead teacher model and the specialized teacher model. The lead teacher model typically involves a teacher in the role of mathematics resource person for a single staff. Sometimes called a specialist or coach, such teachers mentor others in the school in planning and teaching. They assist staff in interpreting data and designing approaches to improve students' achievement and instruction and help ensure that mathematics instruction is aligned with state and local curricular frameworks.

They facilitate teachers' use of instructional strategies, including differentiated instruction for diverse learners, and they work with families and community leaders to foster school-based partnerships focused on learning mathematics. In addition, they provide schoolwide and, to a lesser extent, districtwide professional development for teachers. Variations of this model may include intervention with small groups of children. Some lead teacher/specialist/coach models emanate from the school district office, where the teacher specialist is responsible for more than one site. The specialized teacher model gives one teacher the primary responsibility for teaching mathematics. The specialized teacher typically has responsibility for a single grade—often at the upper grade levels (e.g., grades 4 or 5). Although the specialized teacher cannot have the same impact as a lead teacher or districtwide specialist, this model allows the school district to focus professional development and related initiatives on a targeted teacher cadre. This model has economic advantages because it does not require additional teachers, just a redistribution of teaching responsibilities.

As school districts determine their need for mathematics specialists and find ways to support them, the selection and continued support of mathematics specialists becomes very important. Who is selected? Why? Should the specialist be the best mathematics teacher in the building? The teacher who knows the most mathematics? The teacher who would be the best fit in working with other teachers? These considerations—content background, teacher expertise, and the potential for leadership—are all important. Equally important are recognition and support from the principal and local school district supervisor, who share the responsibility for delivering high-quality mathematics instruction to all children.

Although my focus here has been on the crucial need for a teacher leader/specialist at the elementary level, there are similar needs at the middle and high school level. Call them department chairs. Call them building specialists. Their roles, as mentors and as bridges between teachers and building administrators, are essential at all grade levels. Middle and high school mathematics teachers need ongoing content and pedagogical assistance as well. We all do.

Now more than ever, teachers need support. Schools and school districts are beginning to recognize the important role of the mathematics specialist. Over the years, the ExxonMobil Foundation has helped to provide a variety of mathematics specialist models around the country. We need to build on this work and the work of other mathematics leadership initiatives. Mathematics specialists can make a difference in improving mathematics instruction. We need you—NOW!

Ω

What Do We Know about the Use of Mathematics Specialists and Coaches in Schools? Clip

(PDF)

Many schools and districts are using mathematics specialists and coaches to improve instruction and student achievement; yet, there is a lack of abundant research on their effectiveness. Preliminary results from the few existing studies suggest:

- There is too little research on mathematics specialists to indicate their effectiveness
- Preliminary research on mathematics coaches have indicated the potential for improving instructional practice
- The design of the mathematics coaching program are an important factor
- Researching the impact of specialist and coaches is difficult because these professionals are often part of a larger professional development program. Isolating the impact of just this component is difficult.

Overall, more research is definitely needed before confident statements can be made about the effectiveness of mathematics coaches and specialists.

Maggie McGatha
NCTM, 2009

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Based on Mathematics Specialists and Mathematics Coaches: What Does the Research Say?

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Mathematics Specialists and Mathematics Coaches: What Does the Research Say?

THE National Mathematics Advisory Panel (2008) reported that across the country, many schools and districts are using mathematics specialists or coaches in an effort to improve instruction and learning in mathematics, even though little research exploring their effectiveness exists. Depending on the state or district, there are varying roles and responsibilities for these leadership positions, as well as a variety of implementation models. For the purposes of this Research Brief, I will use the term *mathematics coaches* to refer to those who work directly with teachers, since this terminology is more widely used in the literature and in school districts across the United States. I will use the term *mathematics specialists* to refer to those who work directly with students. The research discussed here includes published studies or studies from paper presentations since 1990.

Research on Mathematics Specialists

Research on the effects of mathematics specialists (those who work directly with students) is virtually nonexistent. McGrath and Rust (2002) studied the effectiveness of departmentalized mathematics at the elementary level. The study compared gain scores in achievement test data from students in self-contained classrooms and departmentalized classrooms in grades 5 and 6. For the mathematics subtest of the achievement data, there were no significant differences in student achievement gain scores between departmentalized and self-contained classes. However, Gerretson, Bosnick, and Schofield (2008) found that using mathematics specialists at the elementary school level allowed teachers more time to effectively plan lessons and focus their professional development. In addition, teachers in this study reported gains in student achievement as a result of using mathematics specialists. Research is needed to determine the effectiveness of mathematics specialists.

Research on Mathematics Coaching

The research on mathematics coaching is more abundant but includes just seven studies that provide preliminary insights. The studies focus on improving instructional practices, designing coaching programs, and improving student achievement.

Improving Instructional Practices. Campbell (1996) and Race, Ho, and Bower (2002) studied the role of mathematics coaches as one component of large-scale professional development programs. Campbell reported that 40 percent of the teachers significantly changed their instructional practice by actively engaging students so as to build conceptual understandings of mathematics. Similarly, Race et al. found that participating teachers increased the frequency of best practices (e.g., hands-on learning, higher-order thinking, and addressing a variety of learning styles) and used a greater variety of instructional formats (e.g., activity-based lessons, investigations, and discussions). The researchers acknowledged that all aspects of the professional development programs affected the teachers but claimed that without the support of the coaches, teachers likely would not have persisted in making significant changes to their instructional practice.

Becker (2001) and McGatha (2008) studied mathematics coaches who worked with teachers but were not part of large-scale professional development programs. Teachers in these studies also experienced positive changes in their instructional practices, such as (a) focusing more on the “big ideas” of mathematics rather than treating topics as being isolated and unconnected; (b) emphasizing problem-solving over skill-based instruction (Becker 2001); (c) using students’ work to inform instruction; and (d) allowing students’ to think for themselves, which resulted in significant increases in students’ mathematical thinking and communication (McGatha 2008). With varying results and to differing degrees, all four studies indicated the potential for coaches to have positive impacts on teachers’ instructional practice.

Designing Coaching Programs. Mangin (2005) compared mathematics coaching programs in five school districts to determine the most effective design components. All districts were focused on improving teachers’ mathematics instruction through mathematics coaching, but each district designed the coaching position differently. Mangin found that programs that had mathematics coaches working in one subject area and in one school were more effective than the programs that had coaches working in two or more subjects or schools. Another effective component of the more successful programs was broad communication about the role and responsibilities of the mathematics coach so everyone (supervisors, princi-

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One State - Maryland



- Elem Specialists (school based, non-teaching – 366.5
- Elem Specialists (school based, intervention) – 83
- Overall – 653.5 (includes middle and high school; 24 county school districts)

Brookhill Foundation Project

- Providing annual summer seminars focusing on mathematics content, pedagogy, and leadership issues for elementary mathematics specialists within the region and state (begin summer 2010, plan during summer 2009).
- Session follow-ups at MCTM and NCTM conferences
- Establish Clearinghouse. See www.mathspecialists.org

Elementary Mathematics Specialists and Teacher Leaders Project



We need elementary school mathematics specialists, elementary classroom teachers who know and understand mathematics and can effectively



About the Project mathspecialists.org

The major goals of the [McDaniel College](#) EMS&TL Project are to fully establish a graduate program leading to an MS degree in elementary mathematics teacher leadership, to develop a clearinghouse relative to elementary mathematics specialist programs nationally, and to ensure the continuing professional development and mentoring of a cadre of mathematics teacher-leaders and elementary school mathematics specialists in Maryland. Additionally, the project seeks to determine the impact of mathematics specialists and mathematics teacher specialists on student achievement and school and school district improvement regionally, statewide, and potentially, nationally.

This is a proposed multi-year project, with the formal establishment of the

Issue – who are you?

Elementary Mathematics Specialists

Titles

- Mathematics Specialist
- Mathematics Teacher Leader
- Mentor Teacher
- Math Coach
- Mathematics Resource Teacher
- Coordinator
- Facilitator
- Others?

Building-based, multiple
buildings...

How did you get this job anyway?



Issues in the Selection of Teacher Leaders

- Content and Pedagogical Background
- Teaching Experience
- Genuine Interest in Doing This!
- Acceptance
- Ability to Lead
- Ability to work with Parents
- Administrative Commitment
Sustaining/Replacing

What do you (they) do?



How Time is Spent...

Mentoring new teachers	16%
Mentoring experienced teachers	10%
Working with individual students	11%
Co-teaching demonstration lessons	11%
Curriculum and/or assessment development	7%
Providing professional development - school level	30%
Working with parents or community members	3%
Other (Attending/teaching courses, data analysis, meetings)	12%

What might an elementary mathematics specialist do?

- Work one-on-one with a variety of students
- Teach demonstration lessons
- Interact with parents about mathematical tasks, topics, or approaches
- Participate in school improvement projects
- Facilitate professional development
- Advise in the selection of curriculum materials
- Analyze results from high stakes achievement tests
- Assist in the development reporting systems

Other Roles of the Mathematics Specialists/Leaders

- Score assessments
- Chair school mathematics committee
- Coach
- Create and implement Monthly Math Challenges
- Data analyst
- Develop and share instructional materials/resources
- Informal teacher observations
- Maintain schoolwide database
- Oversee before/after school tutoring program
- Plan and implement Family Math Programs
- Professional development courses/workshops for administrators, teachers, instructional assistants at school/county levels
- Teach demonstration lessons

**Wait a minute, you didn't tell me
about...**

What works best for you in working with resistant colleagues?





- It really depends on the teacher(s) and why they are being resistant. Sometimes it is leaving him/her alone...talking with him/her outside of the session.
- This is my 2nd year in 9 new (to me) buildings, so the process of building rapport is slow and agonizing. I work hard to establish rapport with the teachers in my buildings.
- Give teachers time to vent first. Look at their concerns and try to problem solve together.
- It's important to first build relationships with the teachers. It's important that they trust and respect you. I try to find out what they need and work from there.

Leadership – An elusive but important quality...

Teacher Leadership

- In very informal ways, teachers are leaders by virtue of their many individualized efforts to bring about change among their colleagues and communities.
- **Note:** Leadership, like any other professional capacity, requires cultivation, practice, and reflection.

Loucks-Horsley et al. 1998, Lambert 1998

Think about...

- Being a good teacher of children does not make one a good teacher of peers/administrators/parents, etc.
- There are unique skills and processes involved in being a leader.

Denise Mewborn, 2008

Leadership Issues...

- Developing expertise
 - The importance of leader content and pedagogical background.
 - What to look for – mentoring teachers and considering content and pedagogy.
- Working with the larger community
 - Working with parents
 - Policy makers and their role and impact policy
 - Mathematics leaders and the media
- Budget issues for mathematics specialists and leaders
- Working with other colleagues (including reluctant ones!)
- Working with administrators
- Change
 - How do you know when you are ready for it?
 - How do you know when you are there?

Leadership for Specialists

- “Go-to” people for math-related things
 - Building/district committees
 - Textbook adoption
 - Redeploy professional development
 - Ordering and organizing manipulatives
 - Parents
 - ELL, gifted, special education...



Knowledge/experience needed

- Models of coaching—e.g., content-focused coaching, differentiated coaching
- Adult learning
- Conflict resolution, negotiation
- Collaboration strategies



MCDANIEL
COLLEGE



University of Michigan – Modules - MKT and Pedagogy
McDaniel College – Modules - Leadership Issues



Mathematics Specialists

Background
Certification
Graduate Initiatives

National Program Standards?

- NCATE/NCTM Standards for Nationally Recognized Programs – Initial Certification only
- National Board for Professional Teaching Standards (NBPTS) - Advanced Programs
- NCSM Leadership Standards



Elem Specialists,
Initial Cert only!



Virginia Specialist Certification

- 3-years of teaching
- Content
 - Number systems and number theory
 - Functions and algebra
 - Geometry and Measurement
 - Statistics and Probability
- More...
 - History of mathematics
 - Curriculum studies and trends
 - Role of technology
 - Instructional materials and resources
 - Assessment and diagnosis
 - Diverse learners
 - Learner and leadership issues
 - Understanding of and proficiency in grammar, usage, and mechanics and their integration in writing.



Ohio's P-6 Mathematics Specialist

Program Components

- Mathematical Content Knowledge and Knowledge of Curriculum
 - Content and Process Standards
 - Use Standards to Evaluate Math Curricula
- Knowing Students as Learners of Mathematics
- Instructional Strategies and the Use of Materials and technology
- Assessment, Diagnosis, and Evaluation
- Research for the Teaching and Learning of Mathematics
- Professional Development

Statewide endorsement, post baccalaureate, three years of teaching – Brad Findell,

University of Georgia

- Math Endorsement – Preservice and Inservice
- Content
 - Arithmetic and Problem Solving (u/g)
 - Geometry and Problem Solving (u/g)
 - Algebra and Problem Solving (u/g)
- Pedagogical Content Knowledge
 - Children's Mathematical Thinking (u)
 - Mathematics Curriculum for PreK-5th Grade (u)
 - Mathematics Learning in PreK-Grade 5 (g)
 - Mathematics Methods for Early Childhood Education (g)



AND

University of Georgia program

- 2 courses
 - 3-credit hour course on coaching
 - *Supervised* 3-credit hour internship
 - Student teacher
 - First-year teacher
 - Team leader
 - Math specialist/coach
 - Supervisor *coaches* the intern

University of Georgia

- 2 courses, part of masters and specialist programs for preK-5 and 4-8 teachers.
 - Course on mentoring (3)
 - Mentoring project internship (3) 30 hours of mentoring activity





University of Arizona

Curriculum – Required minimum of 33 units of graduate courses

College Core (3 units):

Introduction to Educational Research

Major Core (6 units):

Recent Research on Teaching and Schooling

Curriculum Theory and Policy

Supporting Coursework (24 units)

a. The following TTE mathematics education courses are required (9 units):

The School Curriculum: Mathematics

Curriculum Issues and Practices: Mathematics

Math Diagnosis and Remediation

b. Three of the following 3-unit courses offered by the Mathematics Department are required (9 units):

MATH 500 - History of Mathematics for Elementary School

MATH 501 - Arithmetic and Number Theory through Problem Solving

MATH 506 - Geometry for Elementary School

MATH 510 - Algebra for Elementary School Functions

MATH 560 - Probability and Statistics for Elementary School through Activities and Games

c. Electives: 6 additional graduate credits to be approved in advance by an assigned advisor.

Supervised Field Experience (6 units)

TTE 593

Internship (6 units)

Required of students who do not have at least 2 years of teaching experience by the completion of the MA degree. These units are beyond the minimal 33 required units.

Thesis Option (4 units)

Portfolio

The student begins a portfolio before completing the 12th graduate unit and maintains it throughout the degree program. A 2-person committee supervises the portfolio.

Exit Requirement

Oral Defense of Thesis - The oral defense of the master's thesis constitutes the exit requirement for those students who take this thesis option.

Comprehensive Examination - All students not completing the thesis option must take a comprehensive examination. The master's examination has two parts :

Part I consists of four questions, two related to each of the major core courses. Students are required to respond to one question related to each course. Part II consists of responding to two of four questions that test the content of the six mathematics and mathematics education courses.

Impact?



- Student Achievement?
 - By grade level?
 - Across topics?
 - Class by class?
- Teacher Performance?
 - How measured?
- Other?



McDANIEL
COLLEGE

Describe a situation where your work caused a positive outcome or change in a school, with a teacher or with a group of teachers.





- I have a teacher who would constantly ask me questions about teaching math, but would not like my answers to her questions. Once I realized this, I began to answer her with, “You are not going to like the answer, but...”. Since then she has made great strides and is trying very hard to make positive changes.
- We scheduled team meetings early in the morning. Teachers weren’t happy about the meetings. We figured out a way to schedule where other people cover and we have a weekly team meeting. Sometimes, it’s those little things that really count.

School District: Howard County (Maryland) Public Schools

Contact and Title: Kay B. Sammons, Elementary Mathematics Supervisor, provide phone and email contact

Title of Support Teachers (e.g. Mathematics Specialist, Coach, etc.): Math Support Teachers

Number of Schools Impacted: 18

Duties of Specialists:

- Mentoring other teachers (65%)
- Leading school-based professional development (15%)
- Leading district-wide professional development (10%)
- After school tutoring coordination (5%)
- Curriculum writing and assessment support (5%)

Approximate Number of Students Impacted: 7,500

Summary of Program: One paragraph

Program Impact and Research:

- Achievement Data one paragraph
- Teacher Data one paragraph

How do YOU grow in your position as a mathematics specialist/leader?



How do you grow in your position as a mathematics specialist/leader?

Reading, study, involvement with trends, issues, programs (e.g. Lenses on Learning, Lesson Study)	45%
Meeting with others in my position	23%
Communicating with my supervisor for feedback and ongoing professional development	16%
Conferences	11%
Getting into classrooms	5%

Not enough!!

**Proposal – Affiliate Group
EMS&TL**

Finally

- Be on the “look out” for:
 - Title I funding for support
 - Current and future initiatives
 - State certification

Questions?

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<http://ffennell.com>

www.mathspecialists.org