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The virginia mathematics specialist initiative: Collaborative effort among all components of the VA mathematics community

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ABSTRACT

The Virginia Mathematics Specialist Initiative (VMSI) is an ongoing collaborative effort among all components of the mathematics and mathematics education community of Virginia spanning more than two and a half decades. This paper describes the use of extensive collaborations to reach shared beliefs about teaching and learning mathematics with the goal of improving student learning; accomplished by preparing and supporting school-based mathematics specialists to coach K-8 teachers. A foundation built on shared beliefs enabled community members to reach consensus on this goal and continues to fuel the accomplishments of the VMSI. Several accomplishments are discussed including identification of the role of K-8 mathematics specialists, the attainment of a Virginia licensure add-on endorsement; and development of a model for a Virginia Mathematics Specialist Preparation Program (VMSPP). Also discussed are the annotated syllabi for core mathematics content and leadership courses in the VMSPP and tools to sustain and extend the VMSI.

The Virginia Mathematics Specialist Initiative (VMSI) has been an ongoing collaborative effort among all components of the Virginia mathematics community spanning more than two and a half decades. The VMSI collaboration efforts involve the Virginia Mathematics and Science Coalition (VMSC), the Virginia Council of Teachers of Mathematics (VCTM), school teachers and school system mathematics supervisors, university mathematics and mathematics education faculty, and the Virginia Department of Education (VDOE) and Board of Education. Financial support was provided by the National Science Foundation (NSF) as well as the ExxonMobil Foundation and the United States Department of Education through the VDOE. As will be described in this paper, the extent of the engagement by all components greatly exceeded that of typical educational initiatives. Each participating group was committed to the initiative and no one viewed the work as led by the school systems, the K-12 professional organizations, the universities, or by the Department of Education. Each component was fully committed and recognized the critical contributions of the other contributing parties.

Under the broad umbrella of the VMSC, the VMSI (initiative) has: defined the role of mathematics specialists; developed a statewide understanding of what mathematics specialists can accomplish; and informed the creation of a state department of

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education mathematics specialist add-on endorsement. Furthermore, the initiative has created a model Virginia mathematics specialist graduate level preparation program (VMSPP); prepared more than 640 teachers to serve as mathematics specialists; and helped principals effectively make use of mathematics specialists in their school buildings. As part of the ongoing effort, contributors to the VMSI initiative facilitated randomized treatment and control studies and case study research to measure the impact of specialists. They also supported the development of resources for use by specialists and other school leaders with the creation of a professional organization led by and dedicated to supporting mathematic specialists as a key contribution in sustaining the VMSI efforts.

As understood within the VMSI, a mathematics specialist is a school-based teacher leader, with released time, who supports all aspects of the mathematics program within an elementary or middle school. The primary, but not exclusive, responsibility of a mathematics specialist is to serve as a coach for all of the mathematics teachers in the school.

This paper describes the extensive collaboration among the mathematics community and how those collaborations fueled the accomplishments of the VMSI. It describes the lessons learned and ways in which the early efforts in teacher-leader preparation foreshadowed the comprehensive VMSI. The discussion also addresses the foundational work for the initiative and the process that led to a VMSPP model. Also, the efforts to sustain and extend the VMSI will be discussed: details of the mathematics specialist preparation program of one university and the tools and products that have been developed to share the work of the VMSI and that are available to other programs and institutions.

1. Early collaborations that foreshadow the VMSI

Initially, the VMSC encouraged higher education institutions to partner with each other, school systems, and teachers to improve student learning. Early grant supported efforts provided opportunities to build collaborations among members in the mathematics community. As the partnerships matured the collaborations strengthened and expanded, and efforts to identify grant funds increased. The path followed to the formulation of the VMSI and advancing of the VMSI efforts was anything but linear. For example, the first efforts were to prepare part-time mathematics teacher leaders instead of full-time mathematics specialists. Moreover, courses to prepare specialists were developed and offered before the role of the mathematics specialist was clearly defined. In addition, master degree programs were established before the requirements for the add-on endorsement were officially established.

1.1. Collaborative efforts lead to first visions

The VCTM adopted an official position statement in support of placing mathematics lead teachers in elementary schools (VCTM, 1992). This statement addresses the perception that many elementary school teachers need additional preparation in mathematics content and content pedagogy. The statement proposed that designated classroom teachers provide in-school professional development as a means to address this situation. VMSC endorsed the position statement, and with the support of the coalition, mathematics lead teachers became a central component of the successful 1992 Virginia State Systemic Initiative NSF proposal, V-Quest. The buy-in of the k-12 professional organizations, university mathematicians, university mathematics educators and the state department of education to achieve the financial support and then to successfully carry out the preliminary work lead to what ultimately became the long-lasting bonds among all components of the mathematics community. It is noteworthy that this award was to the VDOE; although much of the leadership role devolved to the school systems, professional organizations and universities, the education department viewed the initiative as one that it helped start and continued to nurture. The V-Quest project enabled numerous teachers and school administrators to witness the positive changes that could result from high-quality, school-based teacher professional development and curriculum leadership. Subsequently, there were numerous anecdotal reports of the positive impact of lead teachers.

Support from the ExxonMobil Foundation enabled some school systems to support lead teachers after the conclusion of V-Quest. It also enabled some leaders to participate in the Developing Mathematical Ideas institutes (MLP, n.d.) and networking conferences hosted by Mount Holyoke College. As a result of the opportunities supported by ExxonMobil, partnerships developed among certain school systems and universities in their region to cultivate school-based mathematics leaders. With support through the VDOE, a variety of conferences and workshops were led collaboratively by K-12 and university leaders across Virginia to share ideas and experiences and to introduce others to the concept of a lead teacher. Successes and challenges were noted. While there were many positive outcomes, an understanding developed that classroom teachers serving as lead teachers, in addition to their regular classroom responsibilities, had a difficult time providing enough support to other classroom teachers. On the other hand, a consensus was developing and a vision was articulated, that in-school professional development to classroom teachers provided by *full-time*, well-prepared teacher leaders had the potential to greatly impact student understanding and achievement.

This work in Virginia paralleled national developments. For example, the National Council of Teachers of Mathematics (NCTM) *Principles and Standards for School Mathematics* (2000) stated: "there is an urgent need for mathematics teacher-leaders who can assist with the improvement of mathematics education" (p. 375). Similarly, in 1996 the VMSC stated that the coalition's highest priority was to begin a sustained initiative, to eventually be called the VMSI. Developing the concept of lead teachers and the understanding of the training and support that the lead teachers would need to be effective (Pitt, 2005, p. 25) was the first step.

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