

D. WALSTON

*Norfolk City Public Schools
Norfolk, VA 23510*

Abstract

In a dramatic move in Summer 2004, the Norfolk City Public Schools (NCPS) allocated funds to place a full-time mathematics resource person in 33 of the district's 35 elementary schools. These teachers function in support of mathematics instruction by: building a presence for mathematics; working collaboratively with individual teachers and/or grade levels; supporting the administration in terms of improving the mathematics program at the building level; and, working with small groups of students on a regular basis. These are not "pullout" programs. The goal for this Teacher Leader program is to positively impact mathematics teaching and learning in the entire school. This step was the culmination of a evolutionary journey that began in 1990-91 with a Mathematics Lead Teacher program, Project Math Lead. In this article, we tell the story of the process and the vision behind it.

The Vision

The vision behind Mathematics Lead Teachers and Mathematics Resource Teachers in Norfolk City Public Schools (NCPS) is simply that a teacher's motivation, knowledge of content, and commitment to continued professional growth are critical to what happens in the classroom, and largely determine the degree to which new instructional practices filter into the classroom. Lack of content expertise and confidence, especially when coupled with inadequate teaching methods, strongly limit the quality of mathematics instruction. There is a need for programs that provide on-site leadership through a peer group of teachers with training in content, a knowledge of how children learn mathematics, and a focus on effective pedagogy.

This view is grounded in recent results in mathematics both from the Virginia *Standards of Learning (SOL)* tests and national measures, such as the 2000 National Assessment of Educational Progress (NAEP) [1]. These test results cite gains in student performance; and on the national level, achievement in mathematics among U.S. fourth and eighth graders is improving. For example, the percentage of fourth grade students performing at or above the proficient level has doubled since 1990; and Caucasian, African-American, and Hispanic fourth and eighth graders had higher average scores in 2000 as compared to 1990. Unfortunately, the achievement gap between Caucasian and African-American students, and between Caucasian and Hispanic students remained large at all grade levels.

Reviewing this data, one must ask what is needed to significantly increase the performance of all students on multiple measures of student achievement? One compelling argument that led to Mathematics Resource Teachers in Norfolk is found in *Closing the*

Achievement Gap: A Vision for Changing Beliefs and Practices [2]. It is that the four critical variables—Content Coverage, Content Exposure, Content Emphasis, and the Quality of Instructional Delivery—are key to providing students with effective opportunities to learn. While numerous external factors that are beyond educators’ control are also important, these four variables are within a school’s purview as a means for increasing student achievement. The quality of the teachers’ instructional delivery affects both what and whether a student learns, and the teacher is the most important change agent in the classroom. Impacting these variables and school culture are the most apparent pressure points for affecting school change and student learning.

Norfolk’s Mathematics Lead Teacher Program

Against that backdrop, Norfolk’s Mathematics Lead Teacher Program began in 1990-91 with Project Math Lead. Using Eisenhower funds and district professional development funds, principals were asked to identify a teacher within their building willing to commit to extensive training in mathematics and pedagogy. These teachers were to act as resources for the school mathematics staff and as liaisons between the school and the mathematics office. The Mathematics Lead Teachers were willing to take nine hours of graduate work in instructional strategies and mathematics content, and attend at least one intensive workshop per year. They were interested in assuming a leadership role at the school, division, and area levels. As a result, these teachers took six to nine hours of mathematics focused on:

- The teaching and learning of geometry;
- The teaching and learning of number sense;
- The teaching and learning of probability and statistics; and,
- Their role in working with adult learners.

Sessions were facilitated by a number of local mathematicians and mathematics educators. While the majority of the sessions were held on Saturdays, teachers were involved in extensive training during the summer as well. Principals supported the Program by encouraging and monitoring teacher participation. The district’s mathematics office committed to fully funding the cost of training and the cost of substitutes for release time provided to the Lead Teacher.

A network of support was provided by Lead Teacher meetings held after school on a quarterly basis. Mathematics Lead Teachers also received release time during the school year (no more than two days) to conduct professional development within their buildings. This release

time was typically spent working with teachers during planning and providing demonstration lessons.

At the end of the first year, 33 out of 35 schools had fully participating Mathematics Lead Teachers. A yearly application process was begun in which the school principal would identify the teacher that would work as a Lead Teacher, as well as indicate their specific in-building needs and rationale for their selection. Each principal received a copy of the rationale in addition to identified responsibilities for the Mathematics Lead Teacher.

For example, the Mathematics Lead Teacher will:

- Provide information for staff within their building about workshops, in-service opportunities, conferences, and information from Lead Teacher meetings;
- Offer suggestions or strategies for implementing lessons, teaching activities, and assist the principal with the ordering of the needed instructional materials in mathematics;
- Provide guidance or present brief in-service experiences for school staff and parents; and,
- Support the enhancement of instruction in mathematics by contributing ideas at faculty, grade-level, and Lead Teacher meetings.

This process generated greater “buy-in” between principal, teacher, and the district mathematics coordinator. Principals were surveyed at the end of each school year to assess the effectiveness of the Mathematics Lead Teacher Program. Principals were overwhelmingly supportive of the Program. At the end of 1993-94, 34 of 35 schools had identified Mathematics Lead Teachers. The Program characteristics and focus remained in effect in 2004; 34 of 35 schools have an effective Mathematics Lead Teacher Program.

The Program’s major drawback was that Lead Teachers were unable to provide consistent daily support to the entire faculty. Mathematics Lead Teachers are full-time classroom teachers who share their expertise. They are as busy as other teachers and they receive no additional financial awards. They are supported by the mathematics office which covers costs to attend local, state, regional, or national mathematics conferences, and they receive extensive specific Lead Teacher training during the school year and summer.

Title I Mathematics Resource Teachers

The Mathematics Lead Teacher Program, while viable, was recognized as limited in its impact on schools, especially schools with greatest need. Working collaboratively with the office of Compensatory Programs, the mathematics office began requesting resource personnel with daily release time in schools of highest need. As a result, federal funds were used to support the cost of a Title I Mathematics Resource Teacher in each Norfolk Public School that is identified as a Title I School. When this process began, there was concern about the impact that these Resource Teachers would have within the building. It was the intent of the mathematics office that the current traditional roles of the Title I Mathematics Teacher change to dramatically impact instructional delivery within the schools. As a result, the Title I Mathematics Resource Teachers are asked to work cooperatively with classroom teachers and principals in providing mathematics instruction (i.e., small group, one-to-one).

These teachers were expected to: work with teachers during grade-level planning in addressing the instructional program based upon identified needs; provide demonstration lessons in mathematics (in the classroom with the teacher present), including those strategies related to the teaching of mathematics; and, provide building-level professional development in the teaching of mathematics. No longer were teachers merely giving demonstration lessons. Rather, they served as both mentor and coach for individual teachers or groups of teachers; i.e., the Mathematics Resource Teacher plans with the individual teacher or group and then they team teach. These responsibilities comprise at least 60% of the Title I Mathematics Resource Teachers' weekly schedule. At the end of 1997-1998, there were nine teachers identified as Title I Mathematics Resource Teachers. All of these teachers were original members of Norfolk Public Schools Mathematics Lead Teacher Program. The number of Title I Mathematics Resource Teachers grew to more than fourteen teachers during the 2000-01 school year.

Funding for the Title I Mathematics Resource Teacher Program is still provided through the office of Compensatory Education. However, these teachers work collaboratively with the mathematics office and Compensatory Education. The Title I Mathematics Resource Teachers attend monthly meetings facilitated by the mathematics office as a vehicle for providing a network of support. These teachers also attend quarterly Mathematics Lead Teacher meetings.

It is through these meetings that ideas are shared and cultivated. Book talks are held so that the Mathematics Lead Teachers may discuss current literature reflecting effective practices,

as well as research on teaching and learning mathematics. The Title I Mathematics Resource Teachers also have eliminated walls within the district. For example, if one Title I Mathematics Resource Teacher needs assistance with the implementation of “Math Menus” in their school, the support system is so strong that they can call upon the expertise of another Title I Mathematics Resource Teacher to assist them.

Because of the success (in terms of student performance of these Title I Mathematics Teachers), the district funded four additional positions in non-Title I schools during the 2002-2003 school year. As a result, the title of the group changed to Mathematics Resource Specialists.

Conclusion

The Mathematics Lead Teacher Program, the Title I Mathematics Resource Teachers, and now the Mathematics Resource Specialists are seen to have contributed enormously in improved student achievement within the NCPS. Their enthusiasm is contagious and they have impacted student achievement by changing the culture of elementary classrooms in terms of mathematics teaching and learning. As a result, in the Norfolk City Public Schools, there are now no elementary schools accredited with warning in mathematics based upon *SOL* scores.

Because of the impact of the work of our Mathematics Lead/Resource Teachers, building-level and district administrators were supportive of funding these positions. Principals and other administrators touted the academic benefits of such positions. As a result, the district allocated funds at the end of the 2003-04 school year for the position of either a Mathematics or Science Resource Specialist for all elementary schools. The primary beneficiaries were schools that did not have a mathematics position funded through the Title I program. As a result, a total of 33 out of 35 of the elementary schools have a “mathematics resource person.”

The newly enlarged group still has monthly half-day meetings. The Mathematics Leaders are supporting the mathematics office by facilitating professional development sessions in the district. A tiered system has been put in place, in which the Level 2 Mathematics Leaders (those with extensive experience) mentor/coach the Level 1 Leaders (those with limited experience). The mentoring/coaching occurs during the school day, and these *sessions* are regularly scheduled. In addition, ten of the current Mathematics Resource Teachers are completing the requirements for the Mathematics Specialist licensure.

Improvements are still needed, but because of the commitment and attention of this group, we continue to improve in a dramatic manner.

—And still we rise.

References

- [1] *Standards of Learning for Virginia Public Schools*, Board of Education, Commonwealth of Virginia, Richmond, VA, 1995.
- [2] B. Williams (ed.), *Closing the Achievement Gap: A Vision for Changing Beliefs and Practices*, Association for Supervision and Curriculum Development, Alexandria, VA, 1996.