

A TALE OF TWO FIRST-YEAR MATHEMATICS SPECIALISTS

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Introduction

The two Mathematics Specialists have been teaching together for over twelve years, and in fact are considered a “package deal,”—a “buy one, get one,” if you will. We were both accepted into the Mathematics Specialist training program funded by a National Science Foundation (NSF) grant, and began our training in 2003, obtaining the Mathematics Specialist endorsement in 2007. Since then, we have been asked to act as master teachers for various NSF-MSP grant-supported institutes offered by Virginia Commonwealth University (VCU), University of Virginia (UVA), and Norfolk State University (NSU). We were asked to join the first Middle School Mathematics Specialist cohort.

Our school district provided the NSF grant committee with information from which two control schools and two treatment schools emerged with comparable demographics. Treatment schools would receive a Mathematics Specialist and the control schools would not. Doug Floyd was placed at Hugo Owens Middle School (HOMS) and Jamey Lovin at Great Bridge Middle School (GBMS).

Doug Floyd and Mike Perez at Hugo Owens Middle School

My journey began on an early August morning when I met with my new principal, Mike Perez. The start of the school year was still a few weeks away, but I wanted to establish a rapport with him before everyone returned. I did not know anyone at Hugo Owens Middle School, and was a bit apprehensive about venturing into uncharted waters. I was soon put completely at ease when I met Mr. Perez. He greeted me with an enthusiastic handshake, and was very excited

about being selected to receive a Mathematics Specialist. It was fortunate that he had been going over the results of the previous year's SOL assessment results. We talked about my role as a Mathematics Specialist and went over some expectations for the upcoming year. Having gone through some of the summer sessions for principals, Mr. Perez and I found ourselves on the same page. He understood that my role was not evaluative in nature, but rather that of a mentor. He was eager to see a cultural change in the school where classrooms shifted from the traditional teacher-centered to a more student-centered approach. One particular concern was the sixth grade performance on the state assessment. Historically, the school had performed well in the past, achieving scores in the high middle range for the district's ten middle schools. The current scores were in the lower third of the middle school scores.

Principal's First Meeting with the New Mathematics Specialist

I was excited to meet with my new Mathematics Specialist, after having gone through the NSF Principals' Institute offered through the Middle School Mathematics Specialist grant, and because Doug Floyd's former principal told me how good he was at teaching math. I knew the SOL math data was not good in specific areas, but I also knew that I had a staff of very good teachers. That is the conundrum that I shared with Doug because I did not understand how such good teachers were getting such poor results in certain areas. I needed his help in finding out why. He shared his insights on what he thought might be some of the reasons, and we agreed that he would begin with my introduction and then spend time observing teachers teaching, planning, and assessing students.

Mike Perez Reflection

The reference to assessing in Mr. Perez' reflections frightens me a little since it is not clear what it refers to—assessing the teachers, assessing the students? The scores were partially a result of a change in the assessment itself. The Commonwealth had increased the rigor of the questions, as well as added technology-enhanced items. These items consisted of questions without a multiple-choice answer. Instead, students had to drag and drop their responses in appropriate categories, answer free-response questions, select multiple correct answers, and manipulate graphs and charts. The principal felt that we needed to focus our attention on the sixth grade to ensure that the students received a strong foundation in both the mathematics and the testing strategies. He provided me with a stack of disaggregated data from the assessment,

showed me my new office, and welcomed me to the staff. I left the school feeling a bit overwhelmed but excited about my new responsibilities.

The first day of teacher pre-service week began as most do. Excited teachers renewed friendships and shared tales of their summer vacations. The staff had a breakfast provided by the PTSA, and then it was time for the administration to start the meeting. Mr. Perez welcomed everyone back and introduced the new staff members to the group. I could see some questioning looks from a few of the staff, and I recalled how I always felt when a stranger arrived with the task to “help improve instruction.” I was the unknown quantity, and I’m sure many of them were wondering what made me the “expert.”

Later in the day, Mr. Perez had scheduled a meeting of all mathematics teachers and special educators to formally introduce me to that staff. He did a great job of explaining the role of a coach and what I could do for mathematics instruction in the building. People were friendly, but I could sense skepticism on the part of many.

Introducing the Mathematics Specialist to the Mathematics Department

My main objective in the first meeting with Doug and the mathematics department was to make sure they all knew that he was there to help the teachers through staff development and collaboration which, in turn, would improve student achievement. I emphasized that I knew they were good teachers and that Doug was not there to evaluate them, but to help show them new ways to teach certain skills, including technology enhanced items (TEIs). I showed them some video highlights of the 1992 US Olympic Men’s Basketball “Dream Team.” The team included some of the best basketball players in the world on one US team, including Michael Jordan and Magic Johnson. I then showed them some video of their coach. The point was that the best players in the world benefit from having a coach and the Mathematics Specialist was designed to be their coach. This showed them that it was not punitive, and that they should embrace the opportunity to have the assistance of a Mathematics Specialist.

Mike Perez Reflection

As the year began, I decided that the best way to reach the teachers was to build relationships. I attended all planning meetings, offered ideas when appropriate, and took on administrative tasks to lighten their load. I also started dropping by classes to observe the learning taking place. As my familiarity with the staff increased, I started to be more assertive when presenting instructional ideas and best practices. Grade-level content planning meetings were held twice a week. After a few weeks of the school year, I took on a more assertive role in the meetings and shared my ideas on some best practices to use when presenting new material to the students. I developed lesson plans and activities they could use in their classrooms. My suggestions were well received, but not always implemented.

Just such an example occurred in late October when the pre-algebra teachers started a unit on proportions. I asked them how they taught the concept and their response was surprising. They explained that they teach the students an algorithm using the calculator. I explained that, while it may be expedient to teach it that way, the students are not gaining any understanding of what a proportion is and its importance in mathematics or in real life. I demonstrated a method of teaching proportions that develops understanding, as well as providing the students with easy access to the solutions. One of the teachers was adamant that her students would never take the time to set up the problems my way. I modeled the process several times, explaining how each step would enable the students to develop their understanding of proportionality and help them reach a solution more easily. Proportionality is such an important concept in the middle school curriculum, I just could not let the teachers' reluctance to try a new process inhibit the proportional understanding of their students.

I left the meeting a bit dismayed, and decided that I needed to take action. I wrote a lesson plan and forwarded it to each of the teachers with a schedule of when I would be coming to their classroom to present it with them. I was taking a big risk and hoped that it would not backfire. I worried that the progress I had made in developing relationships could be ruined, but I hoped that they could see my passion and would allow me to proceed. When I sensed that a couple of the teachers appeared to be a bit disconcerted by my approach, I felt that I should inform Mr. Perez of my actions. I did not want him to be caught unaware if questions came his way. I told him why I had taken the radical approach, and asked him if he thought I was pushing too hard. His response made me smile. To paraphrase, he said, "If you want to make a cake, you have to crack a few eggs!" I left his office very appreciative of his support. Armed with the support of the administration and a confidence that I had done the right thing, I proceeded with my plan. The lessons went well and the students had great success solving proportional

relationship problems. After seeing the lesson, the teachers agreed that it had worked well and incorporated it with their calculator strategy. A week later, the students were being tested on the unit. In the afternoon, the teacher that was most adamant that her students would not take the time to employ my strategy stopped me in the hall. She explained that her students were asking her if they could have extra scrap paper so they could solve the problems using “Mr. Floyd’s way.” She then told me that the scores were the best she had seen in years—I had won an ally!

The news of her success spread quickly through the mathematics department. Soon, I was getting requests from teachers at all grade levels to help them develop activities for their classrooms.

Mathematics Specialist Makes a Difference

The positive change was evident early on in the first few weeks of school. I received positive feedback from the mathematics department chair and from some of the more vocal teachers. Then, I would see the students recognizing Mr. Floyd from his being in their classrooms observing, co-teaching, and teaching as he modeled lessons for the teachers. Students would also shout as they saw him, including one day by the cafeteria when an entire class shouted at Doug, “Hey, Mr. Histogram Man.” The icing on the cake came when one of the most skeptical teachers who initially said, “My [students] won’t be able to do that,” then later exclaimed, “Oh my goodness, not only did they do that, but they scored the best on this unit test than any class I have ever had.”

Mike Perez Reflection

Grade 6 teachers were the most enthusiastic group. They knew that their previous state assessments were a concern and were eager to find ways to reach their students. The problems on which their students had done poorly involved the concept of finding mean as a balance point. The teacher had read the standard, but still did not understand what it meant. They asked for my help, and I developed an interactive whiteboard lesson for the teachers to try. I used the coaching model in each of their classrooms where I taught the lesson to the first bell; students, followed by the teachers, then took a larger role in successive bells [1]. Eventually, I was just an observer. The lesson was a huge success! Not only did the students grasp the concept, but the teachers understood the standard for the first time.

Mathematics Specialist's Work with Teachers Impacts Students' Test Scores

I knew from NSF Principals' Institute presentations that the expected increases in student achievement were expected to come after three years; but, I also knew that Doug was having a huge impact and predicted immediate and significant improvements in standardized mathematics test scores. The test results showed that was indeed the case. The Mathematics Specialist built relationships with staff and students so they knew he was there to help. He helped in planning, lesson and activity development, devising common assessments, co-teaching, and modeling new ways to teach skills. I am a big believer in the Mathematics Specialist program, and I am willing to pilot the program at the high school level.

Mike Perez Reflection

After many such successes, I found that there were not enough hours in a day to keep up with all the requests from the staff. As the year came to a close, I could feel a shift in the mathematics teaching culture of the school. Classrooms were becoming a bit more student-centered, teachers were regaining lost excitement for the subject, and our scores on the state assessment saw a marked increase. In fact, the sixth grade scores increased by over 20%. It truly was the “spring of hope!”

Jamey Lovin and John Cavanaugh at Great Bridge Middle School

I arrived for my initial interview with Craig Mills, Principal of Great Bridge Middle School (GBMS), confidently armed with awesome questions straight from my Lucy West textbook, a steno pad, a freshly sharpened pencil, and a second for backup [1]. I did not get a chance to ask many questions as Mr. Mills had prepared information and questions for me. He began by sharing his vision of mathematics for the school. He recognized our SOL scores were great; the best in the city, as a matter of fact. He called my attention to the disparity in performance among certain gap groups, and encouraged me to start there. Additionally, he invited me to work on changing the perception of mathematics in the school. He knew students did well in mathematics at GBMS, but he had *never* heard *anyone* say they liked it. Also attending the meeting was Mr. John Cavanaugh, assistant principal and building administrator in charge of mathematics instruction. He would help formulate the details of the vision and be the

person with whom I had daily contact. Mr. Cavanaugh had the reputation of having been an extraordinary mathematics teacher in our district and one the students loved. No pressure!

Mathematics Specialist's Challenge to Be Accepted

Before even meeting Jamey, I had already assumed that our new Mathematics Specialist would meet initial resistance from our staff. This is by no means an indictment of our mathematics teachers. We have an excellent staff with a wide range of teaching experience. Rather, it would have been unrealistic to expect our staff (or any staff) to begin taking direction/suggestions from someone that they did not know. Our new Mathematics Specialist was going to have to "establish her credentials," and I expected it to be a slow process.....kind of a grass-roots movement. I presented this theory to Jamey when we met initially to discuss her role.

John Cavanaugh Reflection

Mr. Cavanaugh's marching orders were to work with the grade 8 teachers. He encouraged me to start with two he had chosen. One was the teacher of a group of at-risk students in a mathematics prep class, the makeup of which reflected the gap groups Mr. Mills had referenced. The second was a teacher new to the profession and new to the school. The conversation continued with him discussing what he thought I would be able to accomplish. I left with a full steno pad and two dull pencils.

Mathematics Specialist Supporting Teachers

As Jamey mentioned, I did discuss two teachers in grade 8 that I wanted her specifically to work with at the start of the school year. One of the teachers was brand new to teaching. Common sense dictated that if we have a Mathematics Specialist in the building, that person should be providing support to a new teacher. The second teacher was a veteran teacher that was teaching our Mathematics Prep class. Each student in this class had not passed their Mathematics 7 SOL Test the previous year. They were enrolled in this class so that they could receive additional support beyond the Mathematics 8 instruction. I felt that these students needed to have mathematical concepts presented to them in a different way, and that Jamey would be able to provide support in this area. While the teacher of this class was an excellent teacher, I believed that Jamey and this teacher would work well together, which would ultimately benefit the students.

John Cavanaugh Reflection

As I left the meeting, I was reminded of a leadership class activity, during which we were asked to complete the simile: “Being a Mathematics Specialist is like [fill in the blank].” Although I had been unsure how to finish that sentence just two months before, I realized in that moment that I would say, “Being a Mathematics Specialist is like being a master juggler.” Where was I going to start? I knew that I needed to plan a space in my schedule to grow Professional Learning Communities (PLCs), help teachers develop more student-centered lessons, and facilitate collaboration and cooperation among the teachers.

My first step was easy. Mr. Cavanaugh saw that I had a well-appointed room where I set up a welcoming environment with coffee, water, and snacks. We would be able to meet there to plan lessons, model new ideas, arrange coaching sessions, share activities, design common assessments, and compare data. I felt like I had created an environment where PLCs could flourish.

My second step started off slowly. I had thought the best way to engage students and excite them about mathematics was to implement more student-centered lessons in the classrooms, and I sought to incorporate at least one into every unit. To aid in this, I set up learning centers in my room for the teachers. Each center was replete with best lessons from a variety of sources, including those from the Virginia Department of Education (VDOE) “Enhanced Scope and Sequence Sample Lesson Plans” [2]. Each lesson was directly aligned to the grade-level pacing guide (Math 6, 7, 8, Algebra and Geometry). The lessons were ready-to-go, cut out, laminated, and included a copy of all reproducible manipulatives and teaching notes. Teachers could check them out to use in their classrooms and if assistance was needed, sign up for me to join them for a day. These days were the highlight of my position. After a planning session, I would spend the entire day with the teacher, modeling the lesson during our first session with the students. The teachers would follow along with provided teaching notes or notes we had made in our pre-conference, then modifying them as they observed the students, jotting down questions I used to illicit certain student responses, and documenting moves I made to push on student understanding. Most importantly, they would highlight areas they thought they could teach on their own during our second session with students following a co-teaching model. During this session, the teacher would teach the portions of the lesson they felt most comfortable with and I would teach the others. Additionally, we worked out signals for me to support them should they need assistance during a portion they had previously selected to teach alone. Most of the time, we would meet for a few minutes before the final session in which the teacher would teach the lesson alone and I would act as an observer.

At first, my schedule was free and full of opportunities to work with the at-risk students. We joined in the stock market game and consistently placed in the Top Three of our division. As word spread and student interest increased, other teachers became interested in participating in the coaching sessions.

By January, I felt a buy-in on the part of most of the teachers on the grade level. By February, other teachers from other grade levels began to invite me into their classrooms. One teacher attended a stock market game meeting with me and then enrolled her class. In the end, my schedule was so full I had to leave one class a few minutes early to arrive in the next a few minutes late. I travelled the halls carrying my appointment book so people could book me on the run. I was happily *overbooked*!

Mathematics Specialist Supports Professional Learning Communities

Jamey's first year with us coincided with our implementation of Professional Learning Communities (PLCs). We had recently shifted from having one subject area meeting per week to two per week. Now, our focus was to change the nature of these meetings. Jamey played a tremendous role in this transition. The PLCs were held in Jamey's room twice a week. I would on occasion visit the meetings, and I was able to see how these meetings evolved as the year went on. I was particularly impressed with the evolution of the grade 8 PLCs. What had started out as discussions of "Where is everybody in the pacing guide?" morphed into discussions about effective strategies, knowledge sharing, and data analysis. Whether they realized it or not, the grade 8 mathematics teachers had become the model for what a PLC should look like. Jamey's role in this evolution cannot be overstated. Jamey discussed effective instructional strategies in the PLC, and modeled/co-taught lessons in their classrooms. The frequency of her classroom participation was minimal initially. However, once the teachers began to hear how effective Jamey was in the classroom, her invitations to model/co-teach became more frequent.

John Cavanaugh Reflection

The final step proved to be the most difficult as the majority of the staff were veteran teachers with great success rates. It was hard to ask them to change something that had appeared to work for a number of years. There was no problem adding a student-centered activity or two, or developing a common assessment per quarter, *but* all of this sharing and togetherness required collaboration and compromise. One teacher worked on warm-ups, one teacher searched for activities, one teacher brought together a collection of paper-and-pencil practice to support learning, while one searched for technology to reinforce classroom lessons. The revealing moment came during a grade-level meeting when one teacher said, “How can *this* collection of everyone’s ‘stuff’ be better than mine?” She stopped—then finished, “Oh, did I just say that?” We all laughed in acknowledgement of the concessions we had made for the purpose of community and increased student learning.

Success with the Hard-to-Reach

Revisiting my decision to pair Jamey and my Math Prep teacher: of the twenty students in the Math Prep class, ten of them ended up passing their Math 8 SOL. While a 50% pass rate for a class might not sound impressive, it must be remembered that the *entire class roster consisted of students that had failed the previous year’s SOL test*—in fact, a significant number of the students had never passed a Math SOL. I viewed this as a success story, and the collaborative efforts of Jamey and the Math Prep teacher had a significant impact.

John Cavanaugh Reflection

All in all, it was a great year. Several teachers scheduled meetings with me for the summer so we could get a head start on the new school year! We exchanged phone numbers, addresses, and summer e-mails. It really was “*the best of times*.”

ferences

- [1] L. West and F.C. Staub, *Content Focused Coaching: Transforming Mathematics Lessons*, Heinemann, Portsmouth, ME, 2003.

- [2] “Enhanced Scope and Sequence Sample Lesson Plans,” Virginia Department of Education, Richmond, VA, 2009; Internet: http://www.doe.virginia.gov/testing/sol/scope_sequence/mathematics_2009/index.php.