

## **COLLABORATIVE PROFESSIONAL DEVELOPMENT: DESIGNING YOUR OWN**

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### **Introduction**

For the first twenty-four years of my career, I taught elementary school in Bedford County, Virginia. Bedford County is geographically the third largest county in the Commonwealth. It is a rural area between Lynchburg and Roanoke, made up of three different attendance zones, with each zone containing five elementary schools, a middle school, and a high school. There are approximately ten thousand students in our school division. The Town of Bedford is located at the center of the county. Our central office, the technical vocational school, and our alternative school are located there.

At the fourteen-year mark in my career, I began to study mathematics and why students struggle with learning mathematics. This prompted me to seek out a Master's in Curriculum and Instruction and the graduate mathematics coursework to obtain the licensure endorsement as a Mathematics Specialist. In 2006, I was hired by my school division to work in the fully funded Title I elementary schools as a division Mathematics Specialist. After four years in this position and another Master's in Administration and Supervision, I became the Supervisor of Mathematics, Science, and Gifted Education. I had pursued the administrative degree because first as a Specialist and then as a supervisor, I worked in every building in my school division. I felt that it was really important for me to know all of the things that a principal knew. In my roles as a Mathematics Specialist and a division-level administrator, I was able to collaborate with talented and committed educational leaders to do some amazing things to promote the success of all students. Two years ago, my former principal decided to retire. I applied for and returned as the principal of the school in which my career began. I am excited to continue on this journey to create a professional and instructional climate that supports student learning and teachers' professional growth.

### **Partnering to Support Professional Development Opportunities**

Through my training to become a Mathematics Specialist, it became more and more apparent to me that to be a successful instructional leader, a principal must encourage teachers to

improve their content knowledge. One of the biggest challenges to teaching mathematics well is having teachers feel comfortable with the content. To be effective, teachers must know and understand the mathematics they are teaching, and be able to draw on that knowledge as they skillfully choose their teaching tasks. Professional development must provide teachers with curriculum goals and the big ideas across the content. Teachers also need to focus on how students learn and use a variety of techniques and materials to meet individual student needs. Teachers need to view mathematics as connected and coherent. They must encourage and enjoy the questions that their students ask, recognizing that they can find the answers and help students connect their own understanding over time. Working together, the building principals, central office administrators, and the Mathematics Specialist can provide leadership and support for the school's mathematics program by providing ongoing opportunities to teachers for mathematics professional development.

In my years serving as the district Title I Mathematics Specialist and the Division Mathematics Supervisor, I worked with several principals to promote effective mathematics professional development in their buildings in different ways. Having a building principal who encourages consistent and sustained mathematics professional development is one of the fastest ways to improve teacher knowledge, as well as teacher confidence and competence. Since Title I funding supported my salary as a Specialist, I was not able to work in many elementary schools during the day. To bring professional development after school for these teachers, one principal and I collaborated to run a mathematics course. Since I work as an adjunct professor for the University of Virginia, we facilitated for-credit coursework in the evenings. Thirteen of her teachers, several teaching colleagues from another school, and I studied two of the *Developing Mathematical Ideas* books [1, 2]. We read cases that explained how students thought about mathematics; then, the teachers returned to their classrooms and tried out the problems from the cases. They brought back student work to share all that their students could do, and we watched videos from classrooms across the country that showed real teachers posing problems to real students. The cases prompted discussions on how to get students to discuss their ideas, questions, and strategies. Teachers found evidence of students collaborating to explain thinking and defending mathematical arguments. These teachers learned to listen to the ideas of students and were amazed at what they could do. They shared this excitement for student learning weekly with their colleagues and in the reflective papers that they wrote. These opportunities to reflect on and refine their instructional practices led to changes in the decisions they were making in the classroom. Many more teachers are asking our central office staff to continue to offer this professional development coursework.

Another principal in whose building I worked weekly as a Title I Mathematics Specialist designed her master schedule so that grade-level teams of teachers had common daily planning time. This allowed for consistent professional development time for me to work with the members of every grade-level team. This creative scheduling gave classroom teachers, the special education support team, and the building's mathematics Lead Teacher forty minutes at least twice a month. This time was used to solve a mathematics problem using a new manipulative or mathematics tool, discuss the common errors that they would expect their students to make, share student work done since the previous mathematics session, and talk about areas where their students were struggling mathematically. Working with teams in these bimonthly grade-level meetings allowed me (the Mathematics Specialist) to know how to help individual classroom teachers with lesson support, manipulatives, modeling, and planning. It also provided insight into the next problem or tool that the principal and I would use in grade-level meeting time together. The principal and I met weekly to discuss the data we generated as we worked to give all students access to quality mathematics instruction that aligned with the standards. This data was also used at the monthly leadership team meetings to discuss schoolwide expectations for best practices.

During my last year as a division Mathematics Specialist and continuing through my tenure as the division Mathematics Supervisor, I regularly attended mathematics department meetings at one of our high schools. Collaborating with colleagues regularly to discuss teaching practice and student thinking is a powerful form of professional development. I worked with the department chair and the principal to design sessions of problem solving, with rich mathematical tasks given to partner pairs of teachers who did not teach the same course. After teachers found a solution and two different ways to explain the mathematics, they discussed the connections from this problem to the course content that they taught. Over time, these teachers began discussing how rich problems, a positive learning climate, and access to different representations help students learn. Sharing the different strategies and representations used in the problems solved during these departmental meetings gave teachers other ideas and the means to have students demonstrate their understanding. This helped to promote engaging strategies in mathematics classrooms. The teachers talked about remediation strategies that would support learners who were struggling at every level. This vertical teaming across teachers of all levels of coursework helped to promote trust and respect across the department, lessened a sense of working in isolation among colleagues, and focused on using teaching practices that would increase every student's achievement. As the division-level Mathematics Supervisor, this vertical team

problem-solving collaboration became our quarterly model of professional development for all teachers of mathematics in our division.

### **From Mathematics Specialist to Principal: Applying Lessons Learned**

Since becoming a principal in an elementary school, I have used my knowledge of best practices from my Mathematics Specialist coursework in many ways. Since I do not have a Mathematics Specialist who works daily in my building, I use many of the tools that are available on the Virginia Department of Education (VDOE) website to foster daily conversations about teaching. The Student Look-for observation tool uses the attributes of the process goals to observe what students are doing in classrooms [3]. This tool has helped me facilitate conversations about lesson design for student engagement and differentiation. The videos are posted on the VDOE website [4]. They are great to use at the end of a faculty meeting to discuss best teaching practices for a specific strand of mathematics. These ten-minute video clips generate rich conversations about best teaching practices, and give immediate tools and strategies that can be used in classrooms the very next day. Since I show them to my entire faculty, all staff is involved in these conversations of how students learn mathematics.

Since we have started this practice of using videos to discuss teaching practices, beaded number lines and fraction games began to appear in all of our classrooms, and the conversations during grade-level meetings about building number sense have increased. Fractions were earmarked as a struggle for several grade levels, and the music teacher got involved by creating lessons with quarter note and sixteenth note rhythms that students could beat on drums, see in measures, and sing. Students started exercising in gym class to skip counting multiples that helped to improve their multiplication and division fluency. Snowflake folding, cutting, and measuring in art class directly correlated to the 6, sixty degree angles in a  $360^{\circ}$  circle. This art activity is one where finding the center matters, and has sparked rich conversations with students about other places where the center matters. Ownership for student learning across all staff has increased in our building, and is supported in lesson plans and conversations that occur daily. There are many wonderful resource libraries of videos that a principal can use to target the needs of their specific faculty. A Mathematics Specialist working with the principal who shows videos can help to support the connections made in the follow-up conversations so that all faculty is encouraged to support mathematics learning.

My experiences as a Mathematics Specialist and as a supervisor have shown me the significant influence that principals have as they collaboratively lead professional development in

their buildings. When principals open up their building to the support that a Mathematics Specialist can give, they move the learning opportunities from one of using “activities that work,” to one of analysis of teaching practice. The positives from the collaborative support of a Mathematics Specialist are found in the daily conversations that occur, the boost from in-classroom coaching opportunities, and the expectations for regular grade-level or department learning that is focused on student learning and evidenced in student work samples. These are crucial to improving mathematics teaching and student achievement in any building.

## References

- [1] D. Schifter, V. Bastable, and S.J. Russell, “Number and Operations, Part 1: Building a System of Tens,” *Developing Mathematical Ideas*, Dale Seymour Publications, Parsippany, NJ, 1999.
- [2] D. Schifter, V. Bastable, and S.J. Russell, “Number and Operations, Part 2: Making Meaning of Operations,” *Developing Mathematical Ideas*, Dale Seymour Publications, Parsippany, NJ, 1999.
- [3] “Sample Student ‘Look-fors’ Based on Virginia’s Process Goals for Students in Mathematics,” *Facilitating Students’ Mathematical Understanding through a Focus on Process Goals for Students*, Virginia Department of Education, 2011; Internet: [http://www.doe.virginia.gov/instruction/mathematics/professional\\_development/institutes/index.shtml#2011](http://www.doe.virginia.gov/instruction/mathematics/professional_development/institutes/index.shtml#2011).
- [4] “Mathematics Instructional Videos for Teachers,” Virginia Department of Education, Richmond, VA; Internet: <http://www.doe.virginia.gov/instruction/mathematics/resources/videos/index>.