Doubling Student Performance at the Advanced Level: Monroe, Wisconsin[1]

For the 2005-06 school year, Monroe School District had approximately 2,500 students in its seven schools: one high school, one middle school, three elementary schools, and two charter schools, one of which is a virtual charter school. Monroe is a small town, home to approximately 10,000 residents, located in southern rural Wisconsin, about 45 miles from Madison. In the year 2000, the median household income was $36,922, and the median housing value was $90,100. In the 2005-06 school year, 95 percent of students in the district were White, while the remaining students came from a variety of other ethnic backgrounds, including Hispanic, Black, Asian and American Indian. Twenty-three percent of students participate in the free and reduced-price lunch program, 16 percent are eligible for special education services and one percent are English language learners.

The focus of this case study is on the success of the instructional interventions in math at two of the district's elementary schools, Seaside and Yellowstone; the demographics of both schools are shown in Table 1. Although some changes were made at the middle and high school level, the most intensive interventions were focused on the elementary schools. These interventions included an analysis of test score data, extensive research culminating in the selection and implementation of a new curriculum, and school-based instructional coaches.

Table 1
Student Demographics at Northside and Parkside Elementary Schools

	District	Northside	Parkside
Enrollment	2,501	418	355
Grade Span	4K-12	4K-Grade 5	4K-Grade 5
Percent FRL	23%	19%	36%
Percent Special Ed	16%	16%	24%
Percent ELL	1%	0%	2%

Improving Test Scores in the District. In the 2000-2001 school year, 68 percent of Monroe's 4th grade students scored at the proficient or advanced level on the math portion of the Wisconsin Knowledge and Concepts Examinations (WKCE), compared to 65 percent statewide.[2] At the 8th grade level, 37 percent were proficient and advanced compared to 39 statewide, and at the 10th grade level, the district's students scored at the statewide average of 46 percent proficient and advanced in math. The district decided to improve these scores, so starting in the 2002-03 school year the district implemented a new curriculum, *Everyday Math*, and placed a full-time mathematics instructional coach in each of the elementary schools to help teachers use the new curriculum effectively. Figure 1 displays four years of math test score data for the entire district, from November 2002 through November 2005, with the three different lines representing the three grade levels tested. As stated previously, the interventions were most intensively focused on the elementary schools, and the most impressive growth in student

[1] This case was researched and written by Sarah Archibald.
[2] The focus of the improvement efforts documented in this case study is math; see Appendix A for WKCE scores on other subjects for 2000-2001 as well.

performance occurred at the elementary level with an aggregate rise of 12 percentage points from 75 percent at or proficient or advanced in 2002-03 to 87 percent in 2005-06.

District leaders believed that having a strong foundation in elementary school mathematics would help raise test scores at the middle and high school levels. Not enough time has lapsed since these elementary math interventions to determine the extent to which that carryover to middle and high schools will occur. However, the test score rises at the elementary level portend large possible increases in student performance at the middle school in the future.

Since most of the student achievement growth occurred at the elementary level, it is most useful to examine the improvement seen in Figure 1 at the school level. Figure 2 shows the overall improvement in test scores, where the percent proficient and advanced are added together. Yellowstone went from 74 percent in 2002 to 93 in 2006, a rise of 19 percentage points, and the scores at Seaside rose by 24 percentage points from 74 to 98 percent.

Figure 1

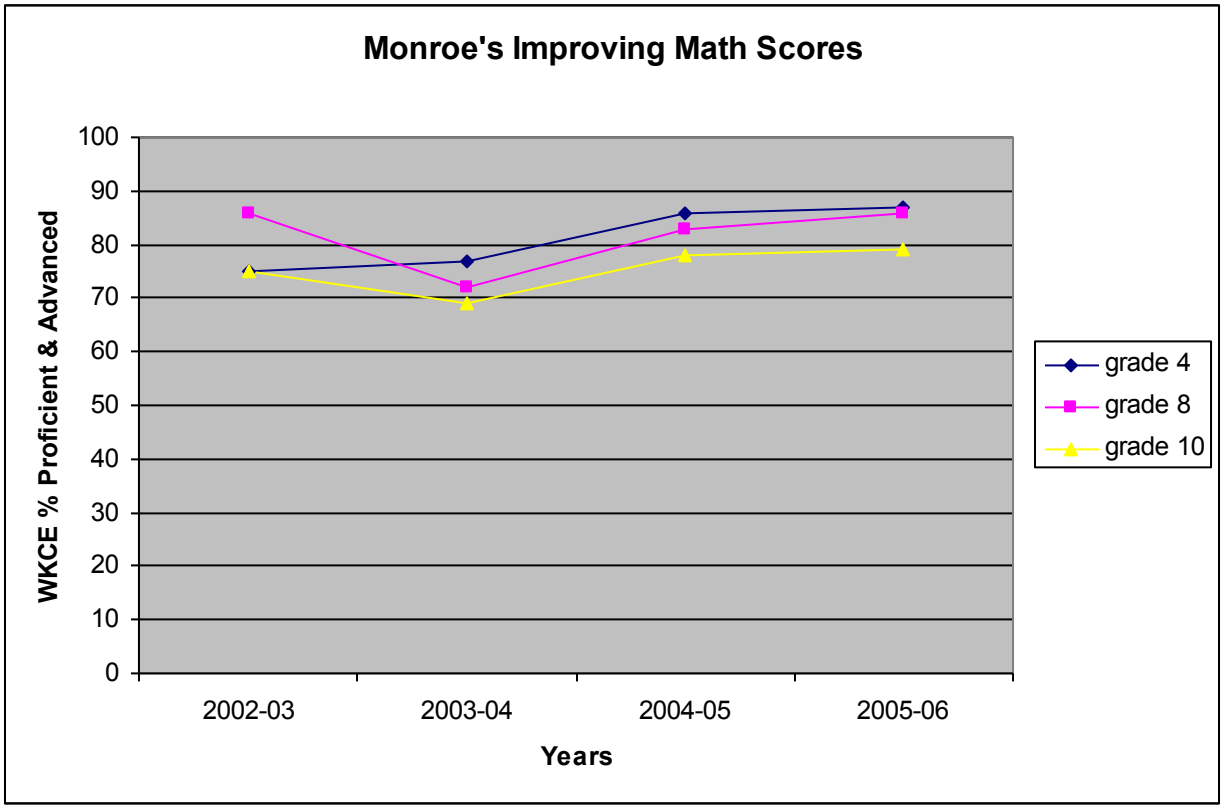
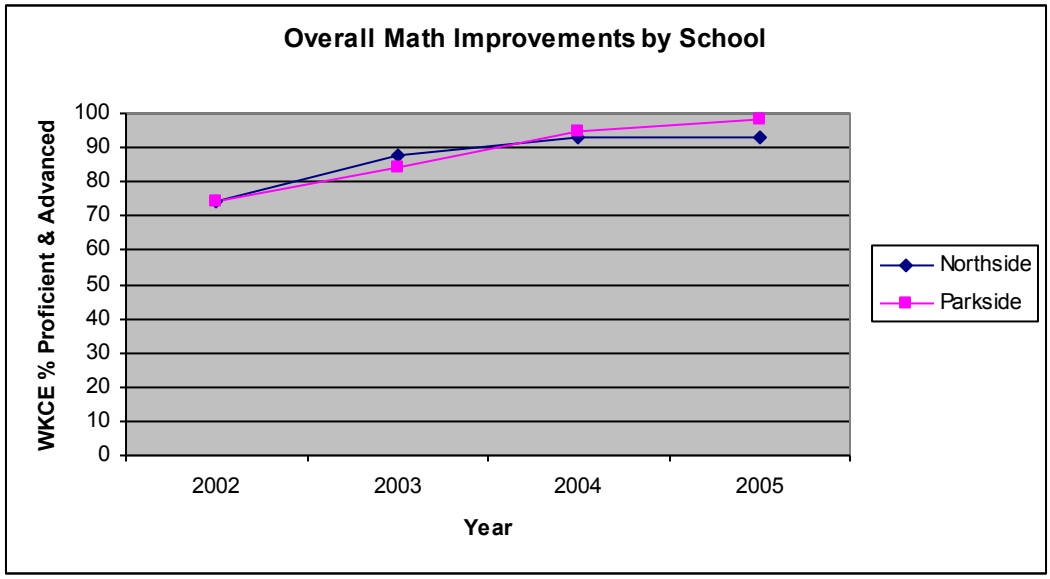
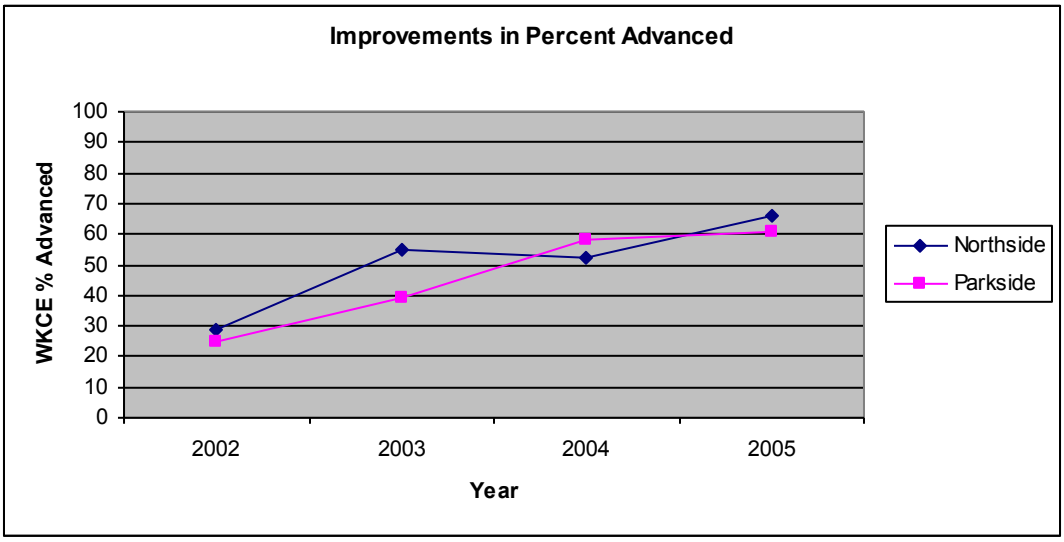


Figure 2



However, combining the scores at proficient *and advanced* levels masks the most impressive improvements. Indeed, the growth in elementary school mathematics achievement in terms of the percent scoring at the advanced level is even more dramatic. Figure 3 shows that the percent scoring at the advanced level at Yellowstone rose from 29 percent in 2002 to 66 in 2005, and the percent advanced at Seaside soared from 25 to 61 percent – *both more than doubled*! The results show that a sustained focus on improving student performance in the thinking and problem solving domains can produce dramatic improvements in student performance at the advanced levels, the ultimate objective for many Wisconsin students. Other Wisconsin districts could produce similar increases if they followed the strategies used by Monroe.

Figure 3



Monroe school district improvement process. In the summer of 2001, the Monroe school district hired a new curriculum director. The curriculum director position was part of the administrative team, which also included the superintendent and the building principals. The new curriculum director led the administrative team in a review of the district's test scores. In terms of the percent proficient and advanced, the district's math scores were lowest, so the district made the decision to focus on improving its math instruction as the strategy for improving their students' mathematic achievement and test scores. Coincidentally, the district had recently put in place a rotating, seven-year replacement cycle for instructional materials, and it was time to purchase new mathematics materials. The curriculum director then formed a math curriculum committee and charged it with examining math test scores in more detail and researching and selecting a new math curriculum. This committee was comprised of 10 math teachers, carefully selected to ensure that all categories of teachers had a "voice" on the committee – new teachers, veteran teachers, teachers from each school, special education teachers, Title I teachers – as well as building principals and the curriculum director, who served as the committee chair. The following paragraphs, separated into themes, describe the improvement process.

Educational leadership. Although the superintendent had been with the Monroe School District for many years, the district made what proved to be an important change in educational leadership by hiring a new curriculum director in the summer of 2001. This person had extensive experience with data analysis, which the district had not used in a strategic way up to that point. Her leadership in this area on the administrative team as well as on the math curriculum committee was instrumental in focusing the effort on research-based practices *and* the specific instructional needs of the district. The carefully selected math curriculum committee was also a result of her knowledge of the change process, how to get teachers to feel that their voices are being heard, and how to get teachers to embrace the new curriculum and feel energized about the work involved in teaching in more powerful ways.

After the implementation of the new program, the principals in the two successful schools also proved vital to the improvement process. They made such essential changes as shifting the focus at staff meetings to math discussions led by the instructional coaches. The school leaders also conducted all formal evaluations during math classes for the first year of the program, which were essential to their success with *Everyday Math*.

Setting new goals. When the new math program was adopted, the district set a goal of 90 percent of the students scoring at proficient or advanced. The district believed 90 percent was a high, but attainable goal. What they found in the process of implementation was that an even more ambitious goal was attainable – doubling the percentage of students achieving at the advanced levels.

Choosing a new curriculum. After disaggregating the math data and performing an item-level analysis of the district's strengths and weaknesses in teaching mathematics, the math curriculum committee determined that the district's math teachers were succeeding at teaching number computations but they were not as successful at teaching students how to reason algebraically or understand mathematical processes. With these shortcomings in mind, the members of the committee reviewed the state and national math standards, read books and journals articles, attended a national mathematics conference, tried textbooks, and visited other

districts. Through this process, the committee decided that the district needed a new and more powerful mathematics curriculum program. They selected *Everyday Math*, because it was the curriculum that most closely matched the list of best practices identified in their review of the literature. Some of these best practices include a focus on thinking, problem solving and application, encouraging students to use multiple strategies to solve problems, and using multiple assessments throughout the school year.

Professional development. The curriculum director also knew the vital importance of professional development in supporting changes to classroom instruction, and realized that school-based instructional coaches were the key, although expensive, factor that could significantly impact change in classroom instructional practices that would be linked to student learning gains. Coming up with the money to fund school-based instructional coaches meant reallocating district and Title I resources to provide instructional coaches to each elementary school instead of certified math tutors during the first year of implementation. The curriculum director provided the rationale for and research on the effects of instructional coaches, and convinced the administrative team that school-based instructional coaches were necessary to support teachers during implementation in order to help them integrate into their ongoing classroom practice the strategies they were beginning to learn through professional development sessions on *Everyday Math* in the summer prior to implementation. Another key element was common planning time for teachers to have collaborative discussions about mathematics instruction. This, and the other professional development necessary to prepare for and implement the new curriculum, is summarized below:

a. Introduction to New Program/Textbook:

- ½ day in-service in spring 2002 (1 ½ hours DPI math consultant overview of math education, 1 ½ hours Everyday Math consultant)
  Cost to District: $2,000 Everyday Math consultant, including mileage & hotel, plus teacher time, included in the contract
- 1 day in-service in August 2002 with Everyday Math consultants
  Cost to District: $300 for consultant plus teacher time, included in the contract

b. Planning/Collaboration Time:

- 1 day in-service in August 2002 for planning and collaborating with grade level colleagues
  Cost to District: teacher time, included in the contract

- 2 hours/month per grade level to meet and have common planning time
  Cost to District: $6,318 – this time was outside the contract

c. Additional Support:

- 1 differentiation and follow-up in-service with Everyday Math consultants regarding how to meet the needs of all students in the classroom
  Cost to District: $4,000 ($1,500 for grades 3-5, $1,000 for grades 1-2,and $750 for kindergarten plus mileage and hotel)
- 3 Instructional Coaches (1 per building)
  Cost to District: $180,000 (60,000 per coach for salary and benefits)

- 3 Day Training in Chicago for Instructional Coaches
  *Cost to District: $1,500*3= $4,500*

Total Cost (for one year), excluding teacher time already in the contract: $197,118

Developing a common language around good math instruction. As a result of the ten teachers on the mathematics curriculum committee reading the research on math instruction and presenting it to colleagues, followed by regularly scheduled[3] grade-level meetings where this same language was used and mathematics instruction was discussed, the district developed a common language with which to talk about math instruction. This language was based on a research-proven curriculum, and the teachers had all seen the data that proved to them that they needed to try different strategies to get their students to learn to the standards.

Building a professional community. An essential piece of ongoing professional development has been the regularly scheduled grade-level team meetings for teachers that totaled two hours per month. Since the teacher contract did not include time that could be used for such purposes, district leaders decided to pay teachers an additional stipend to ensure that teacher meetings around instruction took place. After the first year of implementation, each building principal built collaboration time into the school day. The amount of collaboration time varies by grade level and building, but the intent is to continue discussing how to best meet the needs of all the students.

Lessons Learned. Several elements were critical to the dramatic improvement in Monroe's math scores at these elementary schools:

- New district leadership, with training in data-driven decision making, was an important stimulus for change in the district
- Another important step was to set high, but achievable goals, which in this case was the goal of having 90 percent of students in the district proficient or advanced in mathematics. The district and its elementary schools might have made even more progress at the advanced levels if improvements in students achieving to this higher level had been more explicit.
- The extensive analysis of math test scores, including an item-level analysis of where, specifically, math instruction in the district was weak, to help create an understanding that change was needed, to help focus the search for a new mathematics curriculum to one that focused on higher level mathematics and problem solving, and to aid the search for a new curriculum
- The careful selection of a representative group of teachers to serve as the math curriculum committee, ensuring that all teachers in the district had at least one teacher on the committee to whom they could relate
- The data-driven and research-based selection of a new curriculum, *Everyday Math*, to specifically meet the needs of the students in this district
- Providing the initial training necessary for teachers to learn about the new curriculum

[3] Some grade levels met one half hour weekly, some met 1 hour every two weeks, and some met 2 hours monthly.

- Placing instructional coaches in the schools to help teachers implement the new curriculum in their classrooms; although a shortage of resources necessitated reallocating teachers from tutoring students to coaching teachers, this was a vital part of their success
- Placing teacher tutors in the schools to help struggling students stay with the core curriculum
- Providing regularly scheduled time for grade-level teams to meet and discuss mathematics instruction using the common language created by the improvement process, and
- Principals who shifted the focus of staff meetings to mathematics instruction, providing the necessary leadership to help shepherd the reform.