

Enhancing Instruction in Mathematics & Instructional Quality Toolkit for Mathematics

Student Population:

- 20,759 students
- 86% free/reduced lunch
- 38% limited English proficient
- 9% special education
- 18% mobility rate

Student Diversity:

- 55% African-American
- 31% Hispanic
- 11% Caucasian
- 1% Asian
- 2% Other

District Web Site:

<http://www.nhps.net>

New Haven Public Schools, Connecticut

To improve student achievement in mathematics, New Haven Public Schools (NHPS) implemented Pearson's *Enhancing Instruction in Mathematics* professional development program and the *Instructional Quality Toolkit for Mathematics*. In its first year, the district has deepened teachers' pedagogical and content knowledge, improved the quality of instruction, and achieved the highest mathematics test score gains in the state.

The Challenge

NHPS is an urban district in New Haven, CT. Like many districts, NHPS faced challenges meeting state learning goals in mathematics.

"A key challenge the district faced was poor student performance on the state test," said Ken Mathews, supervisor of mathematics for preK-12 for NHPS. "We also faced challenges with teacher recruitment and retention, and the pedagogical and content knowledge of teaching middle school mathematics."

The Solution

In 2006-07, NHPS partnered with Pearson and implemented the *Enhancing Instruction in Mathematics* professional development program and the *Instructional Quality Toolkit for Mathematics*. The district's goal was to help seventh and eighth grade teachers and math instructional coaches develop the knowledge and skills to support teaching excellence in mathematics.

Enhancing Instruction in Mathematics

Enhancing Instruction in Mathematics is a comprehensive professional development program that deepens teachers' mathematical content knowledge through in-depth exploration of key mathematics topics. In addition to expanding their repertoire of successful teaching strategies, teachers learn to analyze their own instructional practices and identify evidence of student understanding to adjust their instruction methods.

“We wanted teachers to feel very comfortable in this process,” said Mathews. “We wanted to increase teachers’ content knowledge, and improve their pedagogy and assessment strategies. Through the *Enhancing Instruction in Mathematics* program we had wonderful trainers engaging our teachers, giving them new ideas to think about and new work to do with their students.”

Enhancing Instruction in Mathematics consists of several content-focused modules, aligned to NCTM standards. In 2006-07, NHPS teachers received training in three modules:

- Perspectives on Problem Solving
- Ratio and Proportion
- Statistics, Data Analysis, and Probability



According to Mathews, teachers learned a more student-focused approach to planning mathematics lessons. They developed the ability to predict and address student misconceptions about mathematics, and adjust their instruction accordingly.

“Everybody is now speaking a common language about mathematics, and teachers are using the ‘Big Ideas’ to connect mathematical understandings,” he said. “Another big change is that teachers no longer feel like they’re working in silos. They have camaraderie and are sharing ideas and bouncing lesson plans off each other. They’re implementing the strategies they’ve learned and getting peer feedback, which is very helpful.”

Instructional Quality Toolkit for Mathematics

NHPS began using the *Instructional Quality Toolkit for Mathematics* in January 2007. The *Instructional Quality Toolkit for Mathematics* is a suite of diagnostics, reporting tools and training modules designed to help teachers and instructional leaders define, monitor, and continuously improve the quality of student learning and teaching in every classroom.

Through their partnership with Pearson, participating schools utilize the following *Instructional Quality Toolkit for Mathematics* diagnostic tools to gather data:

- The Evidence of Quality Teaching™ tool is used to gather instructional data from observations in mathematics classrooms. It includes six categories, aligned with NCTM standards.
- The Instructional Practices Survey™ is administered to faculty members to determine their perceptions of specific instructional issues. Questions are directly aligned with the Evidence of Quality Teaching categories.
- The Evidence of Quality Work™ tool is used to examine student work utilizing research-based indicators. Fully aligned with the Evidence of Quality Teaching, the Evidence of Quality Work provides additional data on instructional quality, as evidenced in students’ work.

“In NHPS, the Evidence of Quality Teaching tool is used by math instructional coaches to observe classroom instruction. The instructional coach’s role is to assist the classroom teacher in improving lesson planning and delivery, student assessment, and other areas,” said David Cicarella, president of the New Haven Federation of Teachers and a former NHPS instructional coach.

According to Cicarella, prior to the *Instructional Quality Toolkit for Mathematics* training, math department meetings often consisted of, in part, roundtable discussions about what areas of instruction were most important and how coaches could assist math teachers. While there was some consistency among math coaches, there were also many differences about what constitutes good instruction and the math coaches’ role in this process. The district recognized a need to improve the coaches’ ability to be consistent in their observations.

“The purpose of the *Instructional Quality Toolkit for Mathematics* program is to effectively train instructional coaches so they’re able to consistently and uniformly identify evidence of quality teaching when observing math instructors,” said Cicarella. “The key word here is observing, not evaluating. They are not evaluators. They are mentors and colleagues. The underlying premise of this training is to make certain that all instructional coaches are determining if evidence of quality teaching exists, and that the observations are completed in an objective, consistent manner.”

In 2007, NHPS conducted three Evidence of Quality Teaching walkthroughs. “We can start using the data from the Evidence of Quality Teaching walkthroughs within two weeks, which is very valuable,” said Mathews. “Teachers appreciate the feedback and our coaches feel very comfortable using the Evidence of Quality Teaching protocol.”

In spring 2007 the district leadership team, consisting of the school and district coaches, analyzed all the *Instructional Quality Toolkit for Mathematics* data gathered to date, with the assistance of Pearson consultants. Based upon overall trends and district issues discussed by the coaches, three areas of priority were identified: differentiated instruction, student learning, and curriculum and assessment. Based upon these





discussions, district goals, action steps, and recommendations for professional development were outlined within a district action plan. Additionally, discussions focused on making connections between the evidence observed within the classrooms using the *Instructional Quality Toolkit for Mathematics* tools and the *Enhancing Instruction in Mathematics* training.

While examining the *Instructional Quality Toolkit for Mathematics* data, the district also identified strengths such as positive classroom climates, and students engaged and on task.

“Implementing the *Instructional Quality Toolkit for Mathematics* was really helpful,” said Cicarella. “Before, our math coaches had somewhat different ideas as to what constituted good teaching. Some looked more heavily at the classroom environment, while others looked at the lesson representation and how students were grouped. The *Instructional Quality Toolkit for Mathematics* showed us which indicators to look for in quality instruction and gave us a consistent way of recording what we observed.”

“To ensure a smooth implementation from the beginning, it is critical to inform teachers about the observation process and make them aware that the people who will observe them have been trained to do so,” said Mathews. “Teachers should be told specifically what the training consists of, what type of rubric will be used in the observation, and how that information will be used to improve teaching and learning.”

Results

Through their work at both the school and district levels, NHPS has learned to integrate multiple measures of instructional quality in conjunction with student achievement data to improve student learning.

“We test kids every six weeks with our district benchmark tests, and the scores are higher than they have ever been,” said Mathews.

Student performance in mathematics on the *Connecticut Mastery Test (CMT)* has improved as well. In 2007, NHPS posted the highest gains in the state in mathematics on the CMT. The largest gains were in grade seven, where scores increased 9 percent, from 50 to 59 percent.

TRANSFORMING THE CULTURE OF TEACHING

At Pearson, our mission is to improve teaching, as we believe this is the most effective way to improve student learning. To facilitate improvement, we collaborate with districts and schools to ensure they are ready for change, have the framework in which transformation can take place, and have the tools to change the learning environment to impact student achievement. Our professional development services transform the culture of teaching to achieve better student outcomes, district wide.

CONTACT US
800-463-9618
info@PearsonAchievement.com

LEARN MORE
www.PearsonAchievement.com

PEARSON

Because the state, for the first time, required school systems to test all students from grades three through eight, NHPS is now able to track the same group of students from year to year. From 2006 to 2007, NHPS students demonstrated proficiency gains in math cohorts. The largest math gain was a 5 percent increase in grade seven to grade eight, from 50 to 55 percent.

In addition, individual schools posted dramatic gains as well. For example, Katherine Brennan School and King/Robinson Magnet School showed gains of 34 percent in grade seven math.

As the 2007-08 school year begins, the district is excited about expanding upon their success. "I'm looking forward to teachers continuing to elevate their level of professionalism with regard to content knowledge, pedagogy, and assessment," said Mathews. "I'm also looking forward to teachers having the opportunity to meet together on a regular basis and letting that collegial sharing continue throughout their careers."

