

COMMENTARY

Charlotte-Mecklenburg Schools (NC): Developing a Data Dashboard to Promote Transparency, Communication, and Reform

by Peter Gorman

Originally published in *District Management Journal*, v.5, Fall 2010

We wanted the indicators to provide clear snapshots of district progress on our Strategic Plan 2010 [and] to be easily understood by the public: clear measures, clearly stated in everyday words and numbers.

Charlotte-Mecklenburg Schools:

DEVELOPING A **DATA DASHBOARD** TO PROMOTE **TRANSPARENCY, COMMUNICATION, AND REFORM**

| PETER C. GORMAN

In the 1990s, Charlotte-Mecklenburg Schools (CMS) earned a reputation as a national leader with innovative programs and outstanding results. But, by 2005, it was clear to the Charlotte-Mecklenburg Board of Education and many parents that the district had hit a plateau. Test scores were no longer climbing. Achievement was eroding at many schools. A state judge had found several CMS high schools so ineffective that he said “academic genocide” was occurring. Across the district, public distrust was palpable. Would Charlotte-Mecklenburg Schools continue to be a national leader, or would it fall behind others who were moving ahead more quickly? The vision statement of the Board of Education, first adopted in 2006, provided an unequivocal answer: it wanted the district to provide “all students the best education available anywhere.”

CHARLOTTE-MECKLENBURG SCHOOLS
FINALIST FOR THE 2010 BROAD PRIZE FOR URBAN EDUCATION

As I began work with the members of the Board and with district leadership after my arrival in July 2006, it became clear that data—reliable, accessible, transparent information about the district—would be critical to any successful reform plan. The Board of Education recognized this need, too. In October 2006, the Board passed Policy AEC, part of its Reform Governance Policies, requiring the district to create a data dashboard to make CMS more transparent. The policy read, in part:

“In order to help CMS attain and maintain excellence in all key areas, the Charlotte-Mecklenburg Board of Education establishes a ‘data dashboard’ that is aligned with the Board’s management oversight responsibilities and the School Accountability Policy. The data dashboard will consist of a limited number of indicators selected by the Board of Education (analogous to the dials on a car dashboard) for which data are gathered and analyzed by CMS staff, under the direction of the Superintendent, and presented on a regular basis to the Board of Education and the public... The indicators will enable the Board of Education and public to see, at a glance, whether current improvement efforts are on track and to respond appropriately when problems arise. The indicators will enable CMS to effectively and clearly communicate its priorities and progress to the public.”

Board members, parents, and employees needed to have accurate, timely information about CMS and its results in order to rebuild broad public trust and support. Accurate, timely data could be used to drive instructional decisions as well as operational ones. The need for this data extended beyond a single project, such as the Dashboard—it was also reflected in our *Strategic Plan 2010: Educating Students to Compete Locally, Nationally and Internationally*, which we launched in November 2006. That plan set some specific goals for district and student achievement that required accurate data about a variety of district operations, and it also provided an important framework for how data was arranged and reported in the dashboard.

Designing the Data Dashboard

Work began on the data dashboard in October 2006. The work was challenging and instructive—it laid an important foundation for us. It also led to a district-wide examination of data governance and stewardship, including many important conversations and changes in how data is collected in the district and in its accuracy, reliability and timeliness. In all, the CMS Data Dashboard took just under two years to complete, with an 18-month

development period for the dashboard itself. The effort within CMS was led by a team of executive staff and members of the Accountability Department. We hired an outside business-intelligence firm to build the platform and the software for us. The data dashboard was launched in September 2008. Now, almost two years later, it has become clear that the dashboard’s value extends beyond the original intent of the work. It has helped bring about a culture change in the district, making us more aware of, and reliant upon accurate and timely data.

“Our first task was to establish which indicators would be on the dashboard’s opening ‘at a glance’ page... We wanted the indicators to provide clear snapshots of district progress on our Strategic Plan 2010. We wanted the indicators to be easily understood by the public: clear measures, clearly stated in everyday words and numbers.”

Our first task was to establish which indicators would be on the dashboard’s opening “at a glance” page. These indicators would also be used throughout the dashboard to allow parents to compare results for schools, areas, or groups of students. We wanted the indicators to provide clear snapshots of district progress on our *Strategic Plan 2010*. We wanted the indicators to be easily understood by the public: clear measures, clearly stated in everyday words and numbers. And, we wanted the public to be able to use the dashboard as an interactive tool to answer questions about specific schools or learning communities within CMS and to compare test scores across areas, schools, or groups of students. We also, however, needed to balance the public’s right to information with students’ and employees’ right to privacy. We wanted the dashboard to give information about specific schools and grade levels, but it could not be used to identify individual students, classrooms, or teachers. ▷

Over the next few months, we worked to choose the indicators. The data dashboard team—our chief accountability officer, our director of assessment, and the project manager—met with executive staff, area superintendents (who oversee groups of schools), and principals. We knew that the framework for the indicators would be the 2010 strategic plan, which included some very specific measurements of success that were easily adaptable. Each of the plan's seven goals had from two to 13 measurements and the plan had 39 such measurements in all. Under High Academic Achievement, the first goal, we had 13 specific targets we wanted to hit by 2010, and all were measurable. Creating measurable goals was a requirement in drafting the plan. One of the 13 targets, for example, was that "80% of schools will make expected or high growth on ABCs." Starting from the 2006 baseline of 54%, we exceeded the target ahead of schedule, with 89.6% of our schools making high or expected growth in 2008-2009. Such specific measurements were easy to turn into indicators. The issue, in fact, wasn't finding things to choose—it was limiting the number of indicators because the strategic plan had so many. Because we wanted a single "at a glance" page to summarize the data dashboard, and because we didn't have unlimited money for this project, it was imperative that we limit the number of indicators. We created a draft of the indicators and took it to the Board of Education for final approval.

By March 2007, we had chosen 12 Key Performance Indicators in two categories: School Operations and Student Achievement (Figure 1). The School Operations category had seven indicators: Buses on Time, Passing Safety Audits, Fully Staffed, Financial Audit Opinion, Construction Within Budget, Construction on Schedule, and Parents Believing School is Responsive. These Key Performance Indicators aligned with the goals of the 2010 plan. Each indicator included what our 2010 target for the indicator was and a curved or linear gauge showing our present status on the indicator. For Buses on Time, for example, the 2010 target was 90% and the gauge confirmed that we had met that goal with almost 95% of buses on time.

The Student Achievement category had five indicators. Three had multiple parts. For the state tests in End-of-Grade Reading, Math and Writing (given in elementary and middle schools), there were indicators showing the percentage of students with passing scores, the ethnic gap in those scores, and the economic gap. For the state End-of-Course tests (given in middle and high schools in ten subjects), there was an indicator giving the composite score for the district. There was also a graduation-rate indicator demonstrating the percentage of students who graduated on time.

Where possible—where we had three years of data valid for comparison—we indicated the trend. If student scores in fifth-grade reading, for example, were showing an upward progression over three years, we added a green line to show that we were on track to meet our goal. If scores were going down, there was a red line. A yellow line signaled an area of uncertainty, with mixed results.

Compiling trend data on state tests can be problematic, we learned. Each time a state test is changed—in North Carolina, for instance, the reading test was made more rigorous two years ago—it makes year-over-year comparisons invalid until there are three years of data for the new test. As a result, not every indicator can have trend data all the time.

In addition to accessing the "at a glance" page on the dashboard, we wanted parents and others to be able to compare the results of individual schools or groups of students with regard to the Key Performance Indicators. Were students in their child's school performing below the district average? How many students at their school passed the End-of-Course tests in reading and math? Were buses at their child's school later than the district average? The dashboard needed to answer these questions and many others, allowing users to go in-depth with the Key Performance Indicators.

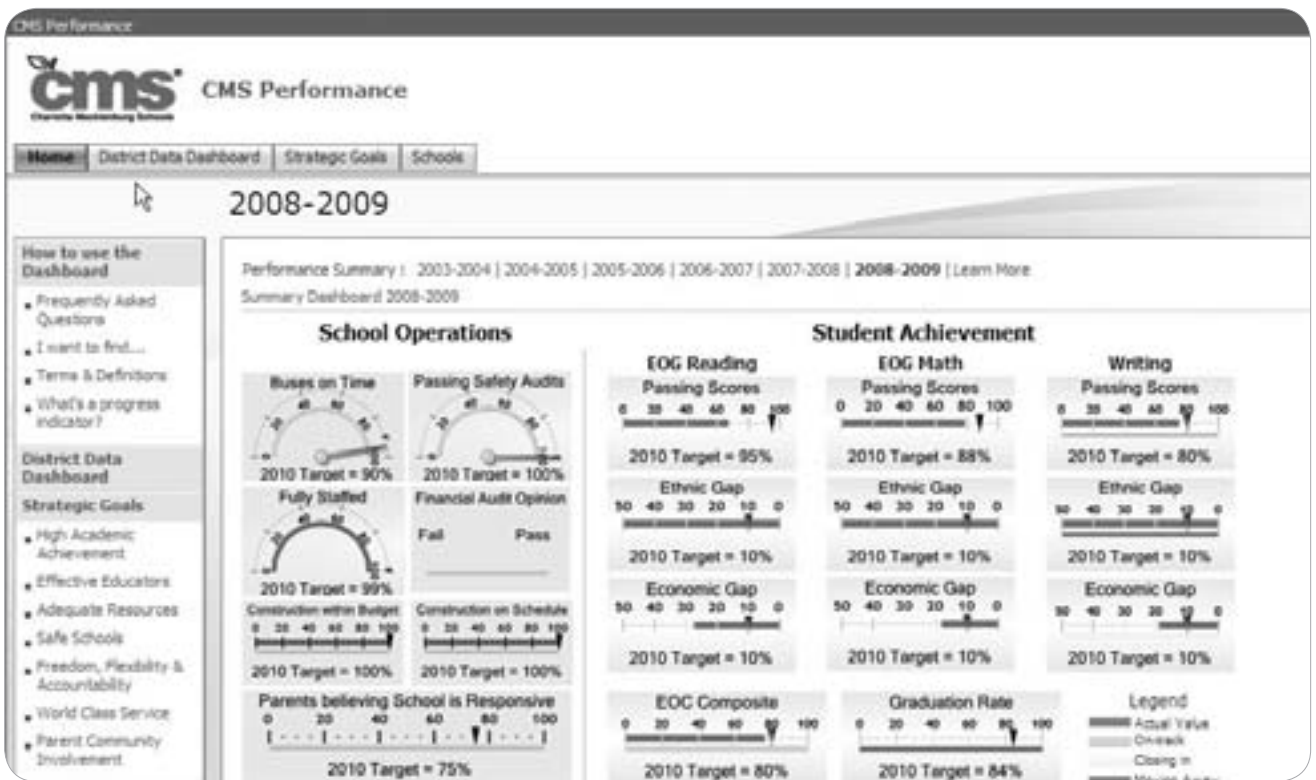
We decided to use a scorecard format for the dashboard on pages other than the opening "at a glance" page to show district progress toward the seven goals of the strategic plan, identifying key metrics for each goal.

Building the Dashboard

With the Key Performance Indicators established and the scope of the work settled, we were ready to begin building the dashboard. We had already selected an outside partner—a local company that I had first heard about on the radio. Driving to work one morning and listening to our local NPR affiliate, I heard one of the sponsors, Mariner, described as a business-intelligence firm with expertise in building data dashboards. That caught my attention! We followed up, and Mariner turned out to be a Charlotte-based consulting firm that has worked with school districts across the country and was indeed knowledgeable about the kind of dashboard we wanted to build.

We brought Mariner on board for the final indicator-selection process. A three-person team, led by the firm's Education Group Vice President David Fitzgerald, began analyzing the Key Performance Indicators to determine what district data was needed to build the dashboard.

FIGURE 1



CMS Data Dashboard's "At A Glance" page

Fitzgerald had a special interest in the project—his child attends CMS and he follows the district closely, even watching the broadcasts of Board meetings. For each measure on the opening page and the scorecards, the Mariner team and CMS accountability staff calculated what data points it would include. For the academic measures, the indicators would be based on state test results. For the operating indicators, a variety of data from many CMS departments would be required.

Assembling state test data was more complex than it first appeared. Although the results were sent to us by the state and then vetted by our own accountability staff for accuracy, moving them into the Dashboard posed some challenges. The data from the state tests was stored in the district's data warehouse, but needed to be massaged—"translated" might be one way to describe it—into a form that Mariner's Microsoft-based software platform could recognize and pull into the dashboard for placement in the appropriate indicator field.

Each indicator required programming to execute a four-step process: choose which data to include, find the data in the CMS warehouse, figure out what to do with it, and determine where to put it in the dashboard. Every

indicator required its own data architecture and algorithms to perform this process and populate the dashboard. The data also had to have formidable privacy screens—the individual student scores that made up the aggregates in each indicator of student achievement could not be disaggregated by dashboard users.

For the operations indicators, the task of assembling the data turned out to be even more complex in some instances than the state test data had been. For some parts of the indicators for school staffing, for instance, the data was not collected in electronic form—the Human Resources department was manually filling out paper spreadsheets for some of its recordkeeping. This meant that the data had to be entered into a computer program before it could be processed. Other indicators required harvesting composite data from several questions on parent surveys given each year by CMS. In some cases, the information needed for the indicator was not collected for analysis by the department that managed it.

We also found instances where the data was not accurate—either out-of-date or incomplete. This turned out to be an important benefit of building the dashboard: it helped CMS identify data deficiencies and close some gaps in >

data collection. By bringing into clear focus what data we needed, we were able to see what data was missing and begin collecting it for the dashboard. This has proved to be an ongoing process that continues today as we begin our second strategic plan and improve our business operations. As Mike Davis, one of the key players in developing the dashboard, puts it, “There’s nothing like transparency to help clean up data issues—people took the extra step to be sure what they were sending was accurate!” That the information was going to be public was indeed a powerful motivator to get the right data out there.

We also were able to define and resolve some important governance issues about data. Clear definitions and protocols in collecting and assembling data require precision—and that can improve district operations and employee performance. For example, we wanted to include data about student attendance in the dashboard. We found that our data, however, didn’t distinguish between excused and unexcused absences. To get meaningful data, we had to develop a clear set of guidelines for the schools to use when collecting absentee data so that absences for field trips were not lumped in with unexcused absences. Bus arrival and departure times also turned out to have many layers. We created a set of status definitions that specifically defined early, optimal, marginal, and late times for morning and afternoon bus arrivals. For example, early was more than 30 minutes before the morning bell. Optimal was 10 to 30 minutes before the bell. Marginal was 0 to 10 minutes before the bell, and late was any time after the bell. This kind of data management can lead to clearer focus and increased understanding of district operations, as well as clearer standards for employees.

The second part of the building process for the dashboard involved data integration. Mariner describes this part of the operation as “extract, transform and load”—extract the data from the source, transform it into information that the dashboard software could recognize, and load it into a table in the dashboard structure so that it could be accessed by users. Once the architecture and algorithms were built, the Mariner team then began work on the interface, building out the platform so that the indicators could be used as an interactive tool.

The actual building of the dashboard took about 18 months. CMS paid Mariner \$600,000 for the project, using money from our annual operating budget. Collecting and quality-checking the data involved the work of many people in various departments across the district and substantial involvement from the Technology and

Accountability departments. It also required strong support from the executive leaders of every department, each of whom made the data collection and availability a priority for their staffs.

Unveiling the Dashboard

The introduction of the data dashboard to the Board of Education was a happy moment for almost all involved. Nearly every member of the Board, a diverse group with a wide range of sometimes opposing opinions, applauded at the conclusion of the presentation. The dashboard was also presented to local media the next day, with a briefing held in a library with computers so that members of the press could try it out with assistance from Mariner and CMS staff.

In its first five days, the dashboard had between 1,000 and 3,000 hits a day from users. Since its launch, the data dashboard has received more than 93,000 hits, with monthly averages as high as 1,500 daily hits. Of the district’s seven overarching goals, users are most interested in academic achievement (41%), effective educators (13%), and safe schools (10%).

The dashboard went on to win several awards, including a 2009 TDWI (The Data Warehousing Institute) Best Practices award. Mariner was also recognized by Microsoft for the dashboard work. On a broader scale, the data dashboard was an important part of building communication and public trust, and our public surveys have reflected this. The various reforms the district had been working on were resulting in a rise in test scores and an improvement in school performance. The data dashboard helped us to measure and communicate this to parents and the public. Our *Strategic Plan 2010* specified targets for us to make on state tests, for example, and the dashboard provides that data to parents and the community, making it available long after the press release and the media briefing have been held. The dashboard, unlike the state education site, also allows users to compare and contrast the performance of schools using data on test scores, school performance, and operations.

Lessons Learned About Building a Dashboard

In reflecting on the experience of building and maintaining our dashboard, several practical lessons come to mind. Sustainability needs to be a key concern as you design the dashboard. The data dashboard was constructed by an outside contractor and it is being maintained by that contractor. Eventually, I hope our staff will have the



Superintendent Peter Gorman discusses *Strategic Plan 2014: Teaching Our Way to the Top*.

capability to maintain, update, and change the dashboard. The best way to assure this is at the front end of the project when the job specifications are written for the contractor. It also requires close shadowing of the contractor throughout the process, so district employees understand the architecture and the algorithms used in the data platform.

Another key lesson we learned was the importance of creating protocols for updating data. These protocols need to be built into the initial data-collection process. Like a lot of districts, we have had significant budget cuts in the last two years, and we expect them to continue for a while. Our data dashboard team has been going back to departments for updates and finding in some cases that the employee who gathered the data is no longer with the district and no one has been assigned to collect the data. A protocol for each department's gathering of data should include a spreadsheet of the data owners so that each department routinely designates someone to collect the data. These issues about data ownership are part of an overall data-governance system that every school district needs in order to effectively manage and leverage data. Any data-driven system is only as good as the data it collects. The data dashboard has led to many meaningful conversations across CMS about data quality, reliability and validity—and those conversations have improved district operations in many areas.

Beyond Measuring: The Many Benefits of the Data Dashboard

Our experience with the data dashboard has proved to be rewarding in ways that we anticipated—making the district more transparent—and in many ways that we hadn't fully anticipated. The dashboard has helped drive a very significant cultural shift in CMS. We are now focused on

measurable results. Data has become a central component of conversations and decisions across our district, and has become something that is automatically included in everything from program evaluations to environmental upgrades. Some key examples are as follows:

- Three years ago, we began training teachers and school leaders in Data Wise, the Harvard-based methodology for understanding and using data to increase student achievement. Starting with our Achievement Zone, a group of 11 struggling schools, we sent teachers and principals to Harvard to learn about Data Wise. Then we expanded the training to include two of our geographic learning communities. Now all of our schools have received Data Wise training. This program has helped our schools and our teachers become comfortable with data as part of the assessment process.
- Data has led us to make small changes in a program—or end it altogether. We use DIBELS (Dynamic Indicators of Basic Early Literacy) in our K-3 intensive reading program and data recently showed us that we were misusing it slightly. DIBELS measures students' fluency in reading, and we were using that as an indicator of how well our students might do on the state's End-of-Grade (EOG) reading test. But, it wasn't predicting how our students did on the test very well. We looked at our data and analyzed the test—and it became clear that DIBELS measures fluency, or reading speed, while the state tests measure comprehension. Students who read quickly don't necessarily retain everything that they read. So, we now use other, better predictors for EOG success.
- Data was also critical in our decision to end the extended school day. We tried adding an extra hour to the school day at one of our high-poverty elementary schools to see ▶

if student achievement would improve. It did not—the extra hour didn't help our students learn more. So, we discontinued the extended day. Had the data shown significant increases, we would have looked at putting an extended day into practice at other schools. To help us analyze this kind of data, we use our in-house Center for Research and Evaluation. This small but expert group of highly degreed number-crunchers has analyzed data to help us assess reading programs, the effectiveness of teachers and school leaders, and student learning in specific areas and in major initiatives.

“Any data-driven system is only as good as the data it collects. The data dashboard has led to many meaningful conversations across CMS about data quality, reliability and validity—and those conversations have improved district operations in many areas.”

o We also relied very heavily on data to create one of our most successful initiatives: Strategic Staffing, which puts some of our most successful principals and teachers into some of our most struggling schools. Data figured into every aspect of the Strategic Staffing Initiative. We used achievement and trend data to select the schools for the initiative, and to choose the principals to lead these schools. (An interesting aside: this was an initiative by invitation only; we chose the principals we thought could be effective and asked them to take on a particular school. To date, not one principal selected has said no, despite the challenges of taking on a school with a history of academic struggle.) We are using data to measure the results, and the results have been remarkable. This program began in 2007 with seven schools and now is in place at 20 of our most academically challenged schools; student achievement in some schools increased by more than 20 percentage points on state tests in a year.

Strategic Staffing is based on five tenets:

- A great leader is needed—a principal with a proven track record of success in increasing student achievement. Also, great teachers will not go to a troubled school without a great leader as principal.
- A team with a track record of success needs to go to the school so that a person is not alone in taking on this challenging assignment; there is strength and support in numbers.
- Staff members who are not supportive of reform need to be removed from the school.
- Principals must be given the time and authority to reform the school, and be freed from the district list of “non-negotiables” that constrain autonomy.
- Not all job assignments are equal in difficulty and compensation should be varied to match.

Strategic Staffing has brought dramatic improvement to these schools. Sterling Elementary is a good example. Student performance there had fallen dramatically over the preceding two years. By the end of 2008, only 29% of students at Sterling tested at proficient or above in both reading and math compared to 52% in 2006. Sterling also had enrollment challenges. Nearly 90% of students were categorized as economically disadvantaged and the number of students with Limited English Proficiency was increasing. Furthermore, surveys showed the school's teachers were becoming increasingly unhappy with their jobs and with the school. A year later—in spring 2009—the picture was very different. Sterling was moving in a new direction. The percentage of students scoring at proficient or above on EOG tests had risen dramatically, far exceeding average district increases in math and reading: a 23% jump in math and a 14% jump in reading (without retesting). The school had become orderly, with smooth transitions between classrooms and sparkling facilities. Teachers tracked student progress and sent reports to parents, and the teachers were using twice-weekly, 90-minute planning periods to write common assessments, review data, and discuss what needed to be done to help students achieve even more.

Strategic Staffing is a prime example of how using data at every stage of decision-making can strengthen the process overall. It also illustrates how use of data has become an important part of every decision at CMS.

The Next Phase

The process of building the data dashboard helped us to focus on key performance metrics, the data needed to support them, and the importance of clear data-governance processes for every part of the district's operations. The dashboard also helped us focus on the importance of individual departments and schools in overall district performance. Together, these changes have helped us improve our instructional practices and our operations. Moreover, the emphasis on data and performance established by the dashboard has guided the development of our second strategic plan, which focuses on measuring principal and teacher performance, as well as the performance of all employees.

While the dashboard was, and continues to be, a success story, I believe that we learned the most important lessons from the things it does *not* do. That knowledge has laid the foundation for the data structures we are building now to improve performance in our schools.

The data dashboard put a spotlight on the biggest deficiency of state testing data: it's autopsy data. The tests are given at the end of the year, or at the end of a course. Several months pass before the final scores are available for review and analysis. These summative tests don't give us the opportunity to make changes that will improve student learning through the year. To improve delivery of instruction, we need formative assessments and we need to get the results into the hands of teachers and principals quickly so that they can guide instruction.

The data dashboard has provided us with the expertise and the knowledge to build a portal for teachers and principals that will deliver formative data fast. We have learned what we need to do, what structures and data-collection tools are required in order to create a data system with teacher portals—a place where teachers can find and analyze student data quickly and easily. And that's what we're building now: a series of portals for our teachers, principals, and administrators to give them access to real-time formative test data. The platform will use data from formative tests that we're developing. It will allow teachers to disaggregate data to see who's flailing and who's flying. This platform is a key element of our *Strategic Plan 2014: Teaching Our Way to the Top*, which is focused on improving teaching and managing employee performance. We are leveraging the experience we gained with the dashboard to build these teacher portals so they will provide accurate and timely data to our teachers and principals. This data will allow our schools to adjust

instruction and improve instructional delivery. We believe that is the key to improving student achievement, which remains our biggest district goal.

We are working on Data Dashboard 2.0, which will realign the metrics with our 2014 goals and reset the algorithms needed to do that. It will also establish and designate data owners to streamline updates to the dashboard and re-examine our use of internal and external resources in maintaining the dashboard. We will also reassess the dashboard's scope and requirements. We hope to launch the new dashboard in the summer of 2011.

With the benefit of a little hindsight, it's now clear that the data dashboard helped launch some critical conversations at CMS. It helped us learn to use measurable, quantifiable data to evaluate progress in the classroom and elsewhere. It also helped position us for the next phase of performance measurement—the tide of reform now sweeping American public education, driven in part by the federal government's focus on student outcomes in assessing the quality of instruction and leadership. Finally, the dashboard helped all of CMS, not just schools, recognize the need for accurate, timely data in our daily operations. Whether it's the new GPS systems on our buses or the formative-assessment platform we're building for our teachers, there is a district-wide understanding that access to solid data is essential for us to operate efficiently and, ultimately, to increase student achievement. □



DR. PETER C. GORMAN IS THE SUPERINTENDENT OF CHARLOTTE-MECKLENBURG SCHOOLS, A CITY-COUNTY DISTRICT SERVING CHARLOTTE AND MECKLENBURG COUNTY, NORTH CAROLINA. THE DISTRICT HAS 137,000 STUDENTS FROM PRE-KINDERGARTEN THROUGH

GRADE 12, 19,000 EMPLOYEES, AND AN ANNUAL OPERATING BUDGET OF MORE THAN \$1 BILLION. CMS HAS BEEN NAMED A FINALIST FOR THE 2010 BROAD PRIZE FOR URBAN EDUCATION. DR. GORMAN HAS BEEN SUPERINTENDENT OF CHARLOTTE-MECKLENBURG SCHOOLS SINCE JULY 2006.

A NATIVE OF DEARBORN, MICHIGAN, DR. GORMAN BEGAN HIS CAREER IN EDUCATION IN ORLANDO, FLORIDA AFTER GRADUATING FROM MICHIGAN STATE UNIVERSITY WITH A BACHELOR'S DEGREE IN ELEMENTARY EDUCATION. HE WORKED AS A TEACHER, PRINCIPAL, AND ADMINISTRATOR IN ORANGE AND SEMINOLE COUNTIES BEFORE BEING NAMED SUPERINTENDENT OF SCHOOLS IN TUSTIN, CALIFORNIA. DR. GORMAN HOLDS A MASTER'S IN BUSINESS ADMINISTRATION FROM ROLLINS COLLEGE IN WINTER PARK, FLORIDA, AND A MASTER'S AND DOCTORATE IN EDUCATION FROM THE UNIVERSITY OF CENTRAL FLORIDA.