



Hamilton County Department of Education:

Deeper student insights leave a deep impact



— Dr. Kirk Kelly,
Hamilton County
Department of
Education, Director
of Accountability
and Testing

On a recent Monday morning in the leafy northern suburbs of Chattanooga, Tennessee, the executive leadership of the Hamilton County Department of Education was having its usual weekly meeting to address issues big and small. While the group of eight was there to discuss business, there was a certain levity to the proceedings that comes from hearing good news. For on this very morning, Chattanooga's largest daily newspaper ran a front-page story chronicling a 10 percent rise in the state's high school graduation rate—and how those of selected Hamilton County schools rose even higher.

Dr. Kirk Kelly, the department's Director of Accountability and Testing, is one of many players on the Tennessee education scene whose efforts have helped boost graduation rates over the past few years. For Dr. Kelly and the rest of his colleagues, this upbeat reaction to the news is not a "mission accomplished" moment, but rather an expression of the simple human satisfaction that their efforts—and those of the department's 600 other employees—are having an impact that will resonate for years to come. "Keeping our kids on track academically is an ongoing challenge," says Kelly. "We've seen a significant payoff from the path we've taken, and our aim is to push it even further."

Leadership Spotlight

The signs are clear that Hamilton County's efforts to improve student performance and reduce the dropout rate are paying off. But to Dr. Kirk Kelly, who has driven the county's "educational intelligence" initiatives from the beginning, the best is yet to come—and he's working diligently to get that message out to teachers, students and the community.

How the Hamilton County Department of Education got smarter


For Hamilton County, the essence of educational intelligence is insight through granularity. By leveraging analytics and advanced modeling tools, the county's teachers, counselors and administrators have a better understanding of how adverse patterns develop and can now step in earlier to keep students on the right track. That's one reason the county's graduation rate increased by 8% last year. The fact that Hamilton County is extending the use of intelligence and predictive analytics to adapt the curriculum and create performance-based incentives for teachers lays the groundwork for more good news in the future.

Looking for insights

That path is in the direction of what Kelly calls “educational intelligence.” It started a few years ago, when Hamilton County began looking into why its students were consistently scoring below state benchmarks on standardized tests. Administrators didn’t get far before realizing they lacked the kind of detailed, granular data that would be necessary to understand the factors that contributed to the poor performance, much less act on the problem. What little performance data Hamilton County had been receiving came from state scoring reports (as part of No Child Left Behind), which provided a lumpy, aggregated measure of whether the county’s 40,000 students were on track.

The other key indicator Hamilton County tracked on its own was the share of its students that graduated from high school. Kelly and his colleagues realized all too well that dropout rates and student performance were affected by many of the same factors—in some ways, two sides of the same coin. But most of all, Kelly’s experience—gained as a teacher and a principal earlier in his 18 years in the Hamilton County system—taught him that beneath the numbers were children, and that solving tough problems like dropout rates and lagging performance required the county to address these problems on the individual student level.

But that meant first finding the students who needed help, and doing so before their problems led them to drop out of the Hamilton County school system. At the end of the day, there’s no one better positioned to sense when the student is in academic trouble than a teacher or counselor with whom students have a direct relationship. The trouble is, warning signs are often complex and cumulative in nature, thus escaping the notice of frontline educators and administrators. Add to that the everyday challenges of running a classroom, and it’s all the more understandable how problem students can fly “under the radar” until it’s too late.



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The benefits of Hamilton County's performance tracking solution

- For Hamilton County, an 8% increase in the graduation rate through the ability of teachers, counselors and staff to intervene with at-risk students before they drop out
- For the Howard School of Academics and Technology, a 200% increase in the graduation rate over the last six years, capped off by a nearly 10 percent increase in the last year
- Increase in test scores due to curriculum and teaching changes enabled by the solution's metrics
- Ability to deploy teacher performance incentive programs

Using built-in algorithms, the model determines which factors are the strongest predictors of a student failing or dropping out.



Leadership is:
Taking the message of educational intelligence to the grassroots level

Dr. Kirk Kelly recognized that for the culture and practices of educational intelligence to take hold at the grassroots level, strong transitional support was required from the top. To achieve this, Kelly and his team conducted nearly 100 on-site meetings per year with school-level leadership teams to evangelize the value of proactively working to improve student performance.

Lessons learned:
Identifying is one thing, connecting is another

Lead Counselor Hilary Smith recognized the challenge of identifying which students were most at risk. But she also knew firsthand that actually locating and reaching out to them was in many ways an equal challenge. “Since a lot of [at-risk students] are transient—moving or have their phones disconnected—it can be really hard to locate them. I use Facebook to reach out to them because I know that’s where they are.”

— Hilary Smith, Lead Counselor,
Hamilton County Department
of Education

Reading the warning signs

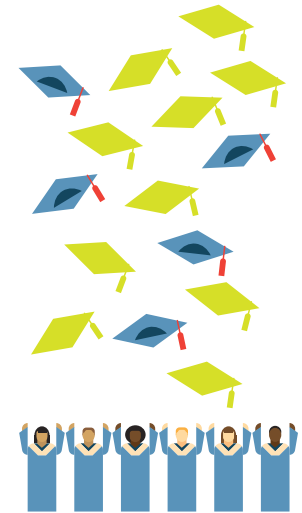
Kelly recognized that early detection of at-risk students required a more multidimensional view of their progress, performance and path through the Hamilton County school system. To accomplish this, Kelly developed a performance modeling tool that extracts individual student data from the county’s 78 schools and uses it to create predictive profiles, which help to flag those students in need of proactive intervention by teachers or counselors. Using built-in algorithms, the model determines which factors are the strongest predictors of a student failing or dropping out. Based on the outcomes of the model, each student is placed into one of four performance categories. Identifying those students labeled “fragile” or “off-track” is just the beginning of a process whose ultimate aim is the success of the student.

Hilary Smith is a key part of that process. Based at the Howard School of Academics and Technology in Chattanooga, some 15 miles away from the home office, Smith is the Department of Education’s Lead Counselor. Howard is an inner-city school, long seen as epitomizing the kinds of problems—such as high rates of dropping out and disciplinary problems—that Hamilton County is trying to address. When Smith first came to Howard seven years ago, it graduated just one in four students, a far lower graduation rate than the county as a whole.

In the business of study success

In the “student success” business, there’s a palpable sense that Smith cares a lot about getting results. If Kelly’s focus is on identifying at-risk students, Smith’s aims are to keep them in the system and get them back on the road to graduation—and she’ll go to just about any lengths to achieve them. While a big part of this is bending over backwards to make herself accessible to students, she explains, the fact that some students can essentially “drop off the radar” requires her to be pragmatic and resourceful. “Since a lot of [at-risk students] are transient—moving or have their phones disconnected—it can be really hard to locate them,” says Smith. Her answer: “I use Facebook to reach out to them because I know that’s where they are.”

Smith sometimes thinks of certain students who didn’t graduate and wonders what—if anything—she could have done differently. But to a much greater extent, it’s the students who did make it because of her energy and impact that inspire her efforts. That’s why she’s excited about the student intelligence initiative that Kelly is spearheading. “Anything that allows us to be more proactive in engaging with at-risk students improves our chances of setting them back on a better path—and keeping them there,” says Smith. “The work Dr. Kelly is doing with predictive analytics is going to help us make even more of a difference in our students’ lives.”



Hamilton County Department of Education: The parameters of educational intelligence

Instrumented

Student performance data from 78 schools—across all grade levels—is uploaded to Hamilton County’s data warehouse.

Interconnected

Hamilton County’s administrators can track student performance across their educational life cycle, enabling them to better understand the leading indicators of future performance problems.

Intelligent

By compensating teachers based on their ability to beat data-driven benchmarks, Hamilton County is using predictive analytics to encourage performance improvements for both teachers and students.

Analytics is enabling Hamilton County educators to better understand how these adverse patterns form over the student’s academic life cycle—and what they can do to correct them.



For Hamilton County as a whole, that difference is already apparent in a graduation rate that has increased by more than 8 percentage points in the last year, to nearly 80 percent. Over the past few years, standardized testing scores have also increased by more than 10 percent for both math and reading. At the Howard School, progress has been even more dramatic, with the graduation rate tripling over six years, culminating in a nearly 10 percent increase in the last year. “We went from one in four graduating to three in four graduating. You can’t ask for better than that in six years,” says Howard principal Paul Smith. “Though we’re not satisfied until we’re at 100 percent, we’re happy with the progress.”

While educational intelligence has largely been directed toward identifying and helping individual students, Hamilton County is also incorporating predictive analytics into day-to-day teaching and learning activities. Educators have always known that the roots of poor performance and drop-out behavior in high school often reach back far into a student’s early grades. Analytics is enabling Hamilton County educators to better understand how these adverse patterns form over the student’s academic life cycle—and what they can do to correct them. It’s seen in the way Hamilton County teachers have formed networks to more intensively interact with each other both across grades (e.g., high school and middle school) and within grades (e.g., a math teacher interacting with a social studies or English teacher) in the interests of individual students. A comprehensive and dynamic view of the student—crossing educational boundaries—is what makes this possible.



Teaching practices leverage intelligence

Hamilton County is also leveraging analytics to create innovative teacher incentive programs. By looking at the historical relationship between eighth-grade test scores and high school exams, the county is able to predict, in effect, a baseline performance benchmark for each student. By compensating teachers based on their ability to beat this rigorous benchmark, Hamilton County is using predictive analytics to encourage performance improvements for both teachers and students.

Analytics is also providing Hamilton County administrators with the means to pinpoint opportunities to adjust the curriculum to meet the needs of a specific subset of the student population. For example, when analysis showed that male students were scoring below females on the state's writing assessment test, Hamilton County responded by implementing a system-wide approach to address the needs of male students and close the performance gap.

On their way home at night, both Kelly and Smith stand a decent chance of seeing a former Hamilton County student whose life they may have touched through their efforts. The sighting won't be in person, though, but on one of the 17 roadside billboards—spread across the county—that profile Hamilton County graduates who went on to attend college. To Kelly, whose three daughters are currently enrolled in college, the stories told on the billboards reinforce the importance of his mission. "We owe it to our students to do all we can to help them succeed," says Kelly. "With the help of educational intelligence, we're making real progress."

Hamilton County's smart performance tracking solution is...

Software

IBM® SPSS® Modeler, IBM SPSS Statistics, SPSS Data Collection; SPSS Text Analytics for Surveys

For more information

Please contact your IBM sales representative or IBM Business Partner.

Or visit us at:
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