



Smart is...

Understanding the true impact of intervention activities on students at risk of under-performing.

How can education professionals get an accurate, up-to-date view of the effects of their programs and activities on student achievement? The Hamilton County Department of Education (HCDE) wanted to push analytics and delivery of student information to the next level, better equipping teachers, social workers, and other stakeholders to help students reach their full potential.

Instead of time-consuming manual generation and distribution of quarterly reports, HCDE can now provide education professionals with role-based access to self-service reporting – delivering information on demand. A new mobile solution enables users to both view and enter data while on the move, and text analytics will also help to yield valuable new insights.

Hamilton County finds the secret to student success

Enhancing student attendance, behavior and performance by turning Big Data into insight

How can educational authorities keep up with dynamic, fast-changing school environments to help students get the best education possible?

The Hamilton County Department of Education (HCDE) had already taken the first steps in understanding the signs that a student is at risk of under-performing – or even dropping out of the school system completely.

Now, it wanted to transform its ability to deliver this information to teachers, social workers and others – giving them the right data to make daily decisions that will help their students achieve a brighter future.

Supporting the entire student community

As the fifth-largest K-12 school system in the state of Tennessee, HCDE oversees 78 different schools. HCDE's 6,700 employees work towards a common goal – helping all 42,000 students in the District of Hamilton County succeed by reaching graduation and then moving into post-secondary education, the workforce, or alternative training.

One of the key tools in HCDE's toolbox is analytics. By identifying common risk factors that indicate a student is at risk of under-performing or dropping out of the school system, teachers and educational authorities can proactively intervene to help get them back on track.

Managing data for 42,000 students and 2,800 teachers means processing up to five million records per day, which is a significant challenge. But as Dr. Kirk Kelly, Director of Accountability and Testing at HCDE explains, the results achieved through analytics have been worth the effort.



Business benefits

- Pre-emptively identifies students at risk of under-performing or dropping out, so that intervention activities can be taken. Graduation rates have risen by more than ten percentage points since the solution was introduced in 2009.
- Produces year-over-year improvements in behavior and attendance.
- Cuts manual workload by up to 25 hours per report, helping boost productivity for users as well as HCDE employees.
- Replaced cumbersome quarterly reports with daily updates and provides near real-time mobile access.

“Introducing analytics has already brought us a lot closer to our goal of raising graduation rates to 90 percent – over the last three years we’ve seen a rise of more than ten points, and we’re now just over 81 percent. To close that gap even further, we realized we needed to do more. It seemed a natural next step to give control of the information to the people who most need to use it.”

Information on demand

HCDE chose to build on its existing IBM® SPSS® Statistics and Modeler solutions by enhancing its reporting capabilities. The department worked with IBM Business Partner DecisionEd Group to integrate the existing environment with IBM SPSS Collaboration and Deployment Services and IBM Cognos® Business Intelligence.

Now, a diverse user base of 3,600 people (including teachers, social workers, guidance counselors, school and district administrators, psychiatrists and researchers from the University of Tennessee) can log in and access their own personal dashboards in Cognos Business Intelligence, enabling them to view and drill down into student data as required.

“Offering users such as teachers and social workers information on demand is a real game-changer,” comments Dr. Kelly. “Rather than constantly playing ‘catch-up’ with old data, they are given an up-to-date daily view of students and teaching, equipping them to make better decisions. Role-based access means that users see only the information that they are authorized to view.”

Seeing the results

Schools can now log in and check on the attendance and progress of their students, offering the chance to pre-emptively intervene with those who are under-performing. Social workers, who often work across a number of schools, can look at a cross-school list of students with attendance under a certain level.

Smarter Education

Enhancing graduation rates with predictive analytics



Instrumented



Interconnected



Intelligent

Student data on attendance, test scores, behavior and demographics is collected and merged with teacher-related data from staff records and professional development systems.

Role-based access to information is available to 3,600 professional staff, including 2,800 teachers, via any device that can connect to the internet.

Allows educational stakeholders to assess and predict which intervention activities will have the optimal impact on students – helping to raise graduation rates by more than ten percentage points since the solution was introduced.

Solution components

Software

- IBM® Cognos® Business Intelligence
- IBM SPSS® Collaboration and Deployment Services
- IBM SPSS Data Collection
- IBM SPSS Modeler
- IBM SPSS Statistics

IBM Business Partner

- DecisionEd Group, Inc
-

“The sky is really the limit with analytics for HCDE. Supported by innovative IBM software, we are gaining a deeper understanding of how best to help our students succeed.”

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

“We are already seeing the positive effects of giving teachers and social workers the opportunity to identify students with declining attendance and performance as soon as possible,” adds Dr. Kelly. “Our attendance figures are generally increasing every year, while the number of infractions and suspensions per month has been dramatically reduced.”

The enhanced analytics and reporting capabilities are not restricted to tracking student data: information on professional development and teacher performance is also made available to schools. Dr. Kelly comments: “By integrating information on the impact of various activities with student attainment levels, we can gain a deeper understanding of what works well for which students, and divert resources to where they will have the biggest effect.”

Previously, HCDE manually generated huge, detailed reports for schools each quarter. The department was spending about 25 hours compiling hundreds of pages of charts and analysis for a single report in PDF format; but only a few pages were actually relevant to any individual school or teacher.

Now, the combination of IBM SPSS Modeler, SPSS Collaboration and Deployment Services and Cognos Business Intelligence software enables HCDE to automatically produce these reports within two hours overnight. As a result, both in-school staff and HCDE employees are given the tools to work more productively.

Round-the-clock access to data

Recently, HCDE has launched a mobile solution for its “lead teachers”, who are responsible for professional development programs within the schools. Information is collected using IBM SPSS Data Collection and analyzed by IBM SPSS Modeler, and reports are then generated using Cognos Business Intelligence. The solution enables the lead teachers to both view and input data while on the move.

“Our lead teachers are now able to access and enter relevant information using any device that connects to the internet,” says Dr. Kelly. “Giving them this sort of flexibility helps them work a lot more effectively and efficiently.”

Looking to the future

HCDE has also begun using text analytics, providing the opportunity to gain unexpected insights from unstructured data – the Department’s first move into the world of “Big Data” analytics.

Dr. Kelly explains: “Big Data isn’t just about the amount of information or the speed at which it’s generated – it is also about the need to deal with different types of data in different ways. With unstructured text, we know that the insights are there – but extracting them can be like

trying to find a needle in a haystack. IBM is right at the forefront of Big Data analytics, and our SPSS software provides the tools we need to start coping with this challenge.”

He continues: “We have about 23,000 text-based surveys and other data sources from the last school year, which contain a wealth of untapped information. Text mining gives us the chance to get a handle on this mass of data and find out what we’re missing by showing us trends and correlations we might not have even considered before. This summer, we will start linking lead teacher activities to test scores, and using SPSS to find patterns and assess the effect that these activities are having on student performance.”

The plans for the future do not stop there: HCDE is embarking on a project to integrate mapping technology into its reporting environment to analyze college attendance among its high-school graduates. Analyzing the proportion of graduating students who go to college within the state of Tennessee, for example, can yield valuable information for university financing.

Dr. Kelly concludes: “The sky is really the limit with analytics for HCDE. Supported by innovative IBM software, we are gaining a deeper understanding of how best to help our students succeed.”

About IBM Business Analytics

IBM Business Analytics software delivers data-driven insights that help organizations work smarter and outperform their peers. This comprehensive portfolio includes solutions for business intelligence, predictive analytics and decision management, performance management, and risk management.

Business Analytics solutions enable companies to identify and visualize trends and patterns in areas, such as customer analytics, that can have a profound effect on business performance. They can compare scenarios, anticipate potential threats and opportunities, better plan, budget and forecast resources, balance risks against expected returns and work to meet regulatory requirements. By making analytics widely available, organizations can align tactical and strategic decision-making to achieve business goals.

For more information

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