



## Hamilton County Department of Education

*Achieving record school graduation rates and helping students progress with predictive analytics*

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### Overview

#### The need

With limited funds available, public schools must invest their professional development dollars wisely. How could Hamilton County decide which activities would most benefit its teachers – and its students?

#### The solution

By extending its highly successful analytics program, the County used data-mining and text analytics to assess different types of teacher training against subsequent student progress and performance.

#### The benefit

Improved teaching methods contributed to a record-high 84.5 percent graduation rate in 2013. The County was also rated in the top 5 percent for performance and the top 10 percent for progress, state-wide.

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Professional development can be a chore. It can also be an inspiration, providing new skills and perspectives that can transform an organization's performance. Either way, it requires both employees and coaches to devote significant time and effort to the development process.

Hamilton County Department of Education (HCDE) wanted to know where its professional development dollars – and its teachers' valuable time – would best be invested. The answer came from analytics, and the results are helping the County raise teaching standards, drive student progress and performance, and achieve record-high graduation rates.

### Top of the class for analytics

As the fifth-largest K-12 school system in the state of Tennessee, HCDE oversees 79 schools. HCDE's 6,700 employees work towards a common goal – helping all 43,000 students in the District of Hamilton County succeed by reaching graduation and moving into post-secondary education, the workforce, or alternative training.

Over the past five years, HCDE has enthusiastically adopted IBM analytics technologies, which it uses to track student performance and provide teachers, social workers and administrators with the insight

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*Public schools are busy places, and teachers are busy people. "There's not much time for professional development, so you have to make it count.*

*Predictive analytics has shown us how we can focus on the types of training that make the biggest difference in the classroom," says Dr Kirk Kelly, Director, Accountability and Testing, Hamilton County Department of Education.*

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## Solution components

### Software

- IBM® Cognos® Business Intelligence
  - IBM SPSS® Collaboration and Deployment Services
  - IBM SPSS Data Collection
  - IBM SPSS Modeler
  - IBM SPSS Statistics
  - Esri Maps for IBM Cognos
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they need to predict when students are at risk of underperforming or dropping out, and proactively intervene. (For more detail on HCDE's success in these areas, please visit <http://bit.ly/1ijfgkh>)

Dr Kirk Kelly, Director, Accountability and Testing, Hamilton County Department of Education, comments: "Since we began with analytics, we have seen a rise in graduation rates of 13.6 percentage points.

"But we're not done yet. We see analytics as an ongoing journey, and we're constantly working to introduce new capabilities. The first phase was predictive modeling of student performance. Then we moved on to giving all 3,600 teachers and administrators access to that student performance data via dashboards on their iPads or Android tablets. And now we're using text analytics and data-mining techniques to look at professional development too."

### Who should teach the teachers?

With limited time and budget available for teachers' professional development, HCDE knew that it was crucial to hire the best coaches and focus on the most effective training activities.

"We had to find a way to measure the value of different types of training, and we realized that a combination of our existing analytics tools and some new techniques could give us what we needed," says Dr Kelly. "We already had a sophisticated method of assessing improvements in student performance at a classroom level – a metric we call 'growth'. By looking at changes in growth following different types of training, we would be able to see which methods worked – and which did not."

HCDE performed text analytics on the training notes written by the professional development coaches and classified training activities into different categories. By logging the amount of time teachers spent on each category, it derived a detailed picture of the influence that different types of training had on each class. And by comparing these results with growth rates – which map the change in a class's performance on a bell-shaped curve – the County gained insight into which types of training were most effective in promoting growth.

"The study revealed that instructional behavior is the most important focus for teacher training, because it has by far the greatest influence on how well students perform," says Dr Kelly. "Aligning teaching practices with the latest research about how children learn is vital, and we are now making it our primary focus for professional development."

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*“We’re so proud of what we have achieved – not just in the past 12 months, but over the last five years. Analytics has played a major part in our success, and we’re keen to continue that trend by introducing new and innovative types of analysis.”*

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

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### **A+ for progress and performance**

These enhancements in teacher training, combined with HCDE’s existing analytics-led approach to continuous improvement, have contributed to a record year for the County. It is now rated in the top five percent of Tennessee school systems for performance (which is a measure of overall student attainment), and in the top ten percent for progress (which is based on overall growth rate).

“Schools that reach the top five percent for either performance or progress are designated by the State of Tennessee as ‘Reward Schools,’” explains Dr Kelly. “Last year we had six Reward Schools in Hamilton; this year we have 14, which makes us the fastest-growing county in the State.”

HCDE also achieved a 1.8-point improvement in graduation rate this year, taking it to a record 84.5 percent – the highest in the County’s history.

“We’re so proud of what we have achieved – not just in the past 12 months, but over the last five years,” comments Dr Kelly. “Analytics has played a major part in our success, and we’re keen to continue that trend by introducing new and innovative types of analysis.

“Our next project is to introduce location analytics, which will open up many possibilities. For example, we have a lot of hills here in Hamilton, and we’re not well equipped to handle snow. We want to combine mapping technology with data from the Department of Transportation to look at road closures and make better decisions about whether schools need to be closed. We also foresee benefits for zoning schools, to make sure we’re treating students fairly when we change the boundaries between schools.

He concludes: “It’s an exciting time to work in educational analytics. We’re looking forward to building on our partnership with IBM and pushing the boundaries for analytics in the public school sector.”

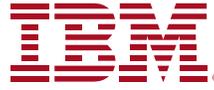
## About IBM Business Analytics

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

For further information please visit [ibm.com/business-analytics](http://ibm.com/business-analytics)



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