

IDEA PUBLIC SCHOOLS

Putting the power of advanced analytics in the hands of teachers

ESSENTIALS

Challenge

Put the power of big data and predictive analytics to work for teachers to help inform instructional decisions that improve student outcomes

Dell EMC Services

- Big Data Vision Workshop
- Proof of Value Lab for Analytics
- Analytics Operationalization
- Program Management

Results

- On-schedule launch of actionable dashboards that leverage near-realtime predictive and prescriptive analytics
- Teacher insight into student performance and learning patterns for making intervention and instructional decisions
- Reduced learning curves and teacher workloads with highly visual, timely insight into hidden and seemingly unrelated information
- Continued educational innovation and leadership as the first K-12 district to leverage cutting-edge data analysis methodologies and technologies
- Solution in place for ongoing development of advanced analytics

IDEA Public Schools is a fast growing network of tuition-free, K-12 public charter schools serving more than 24,000 students in 44 schools from low-income families in the Rio Grande Valley, Austin, and San Antonio, Texas. For nine years, the non-profit school district has succeeded in achieving 100 percent college acceptance.

The success of IDEA's students has generated high demand—with more than 20,000 students applying for 5,300 available spots in the most recent school year. Rapid expansion and the opening of new schools have made the continued recruitment, training, and retention of high-quality teachers a high priority.

INDIVIDUALIZED LEARNING

IDEA credits a culture of high expectations for staff and students and a program of rigorous individualized learning for its results. Teachers choose from a wide range of resources and interventions to improve student performance. Students are instructed in homogeneous groups inside and outside the classroom, individually assessed every 5 to 10 lessons, and advanced as soon as they demonstrate mastery—with the progress of each student meticulously tracked by teachers and captured in a data warehouse. In addition to classroom work, students spend part of each day using adaptive learning technologies in math and reading labs. The tools, which adapt to the student's learning patterns, strengths, and weaknesses, are another source of data that can help teachers improve student progress.

Race to the Top-District Award

IDEA has shown that its individualized blended learning approach accelerates learning in all students—including gifted students and those with learning disabilities. To further deepen and refine this model, IDEA competed for—and was subsequently awarded—a U.S. Department of Education Race to the Top-District (RTT-D) grant.

Under one of the programs funded by the grant, IDEA is creating cutting-edge predictive and prescriptive analytics to help teachers put data to work to make decisions that positively impact student outcomes. "Essentially, we are working to create a Decision Support System for teachers—a 'Netflix for Teachers' if you will—to empower them in their instructional decision making," says Cody Grindle, Director of Software Development at IDEA, who is leading the analytics program. "Teachers, especially those who are new in the district or the profession, can benefit from analytics that help inform decisions, reduce workloads, and build confidence."

"With the wide variety of individualized learning opportunities at IDEA, our teachers have more decisions to make and more data available to them than teachers in traditional public school districts," says Jana Carter, Business Intelligence Project Manager at IDEA. "With the right prescriptive and predictive analytics, in the right format, at their fingertips—they can make full use of that data to improve student outcomes."

FROM VISION TO IMPLEMENTATION

While IDEA recognized the promise of analytics, it needed a strategic partner to help turn that promise into reality. After talking to a number of consulting and data analytics firms, IDEA selected Dell EMC. “Dell EMC has the data science and business analytics expertise, experience in education, and open, flexible approach to partnering we were looking for,” says Grindle.

With Dell EMC, IDEA has full access and transparency and owns all of the analytical IP developed during the program, explains Grindle. “It is helpful for us to understand what is behind the analytics. Not all vendors work this way.”

“The Dell EMC methodology and the discipline it brings to the process have proven unique and invaluable. But what has really validated our choice of Dell EMC as our partner is the shared sense of discovery, excitement, and interest that everyone we’ve worked with at Dell EMC has shown in seeing what we can do with this work.”

- Cody Grindle, Director of Software Development, IDEA Public Schools

Big Data Workshop

Dell EMC recommended that IDEA begin with a vision workshop with executives, administrators, teachers, and other stakeholders to explore possibilities, brainstorm ideas, and build consensus on goals and next steps.

“We’re big fans of selecting groups of principals, teachers, and instructional leaders and involving them in development,” says Grindle. “On the other hand, as an organization we tend to be skeptical of outside consultants. We’re unsure of their ability to relate to our work. That was not the case with Dell EMC.”

In preparation for the workshop, Dell EMC consultants had conducted interviews across IDEA to understand diverse needs and points of view. They created sample analytics, outputs, and dashboards using actual IDEA data to give participants a sense of the possible, relevant to them. For example, Dell EMC combined data from IDEA and external sources to show that, although most grades at IDEA are not standardized, there is no grade inflation. “That was interesting to us, because it went against our intuition—and it showed us the kind of insights that could be gained,” says Grindle.

Dell EMC also showed IDEA how it could go beyond data analytics to enable teachers to take action; for example, to re-group students in the right breakout and study groups, based on their analysis of student data. “They pushed our thinking in terms of what the application could do,” says Grindle.

By the end of the workshop, stakeholders agreed to move forward on four well-defined use cases. “The workshop was extremely grounding and provided us with an excellent foundation to move forward,” says Carter. “Everyone was very engaged. It wasn’t too technical. Anyone in our organization could have participated and walked away with a good understanding of all of the details.”

“Dell EMC brought discipline to the process,” says Grindle. “They helped us take a big, not fully formulated idea and break it down into concrete parts until we all agreed: this is exactly what we’re going to do.”

Proof of Value

With initial use cases identified and prioritized, the next step in the Dell EMC big data and analytics consulting methodology is a Proof of Value Lab, in which pilot analytics are built and tested for quality of output and viability.

“We know that wonderful things can be done with analytics, but we also know that we have to work within the confines of reality and how messy and crazy data can be,” says Grindle.

Within weeks, Dell EMC consultants had deployed analytics prototypes in a sandbox environment where they could be tuned and tested using real data for informatics feasibility, including data fitness-for-purpose and predictive power.

At the end of the Proof of Value Lab, two use cases proved out for Phase 1 implementation: actionable dashboards with the analytics to help middle school teachers make intervention grouping and individual learning pathway recommendations.

“The Proof of Value Lab enabled us to see just how strong of a business case we could build for each of the use cases,” says Grindle. “It gave us confidence that the analytics were possible, viable, and something we could execute and expand to other grade levels and subject areas.”

Design & Implementation

With the go-ahead to implement, IDEA and Dell EMC began work to operationalize the analytics at scale. The Dell EMC team combined expertise in data science, analytics, database, visual user interface (UI) design, and program management to help IDEA gather and document requirements, design the solution, and plan the implementation.

To avoid any technology or platform lock-in, the solution architecture was designed to use standard R-based analytics packages running on standard laptop hardware and to be extensible to any analytic, rubric, metric, or visualization.

“Dell EMC’s approach was completely vendor-neutral,” says Carter. “They were willing and able to adopt the database technologies we had implemented. When we were trying to decide between the Python and R programming languages, Dell EMC supported both as solid choices, but provided information specific to our situation that helped us choose the better fit for us. Their neutrality was important to us, because we knew their recommendations were not biased.”

Now IDEA and Dell EMC are working side-by-side, along with third-party data visualization vendor Logi Analytics, and blended learning suppliers to implement the solution. IDEA will develop the SharePoint business intelligence (BI) application, using Logi Info, a commercial off-the-shelf (COTS) tool, as the presentation layer to create and make business intelligence reports available to teachers within the familiar SharePoint framework.

Dell EMC will build the analytics model and database, as well as the end-user portal for consistent access. Dell EMC provided a single UI framework for the data visualization and SharePoint development teams, and will also integrate analytics with the SharePoint BI application and Logi visualization tool. A Dell EMC project manager is overseeing coordination of the multiple workstreams and teams.

“Dell EMC made sure we were all on the same page from the very beginning, by bringing all the groups together during the requirements gathering,” says Carter. “For the first two weeks of design and development, the Dell EMC team was onsite, working face-to-face and hands-on with my team to get everything set up and rolling in the right direction.”

“Going into this kind of uncharted territory, you expect challenges,” says Grindle. “With Dell EMC, we’ve been able to approach the challenges together in a very constructive manner. The flexibility shown by Dell EMC has been remarkable.”

ACTIONABLE DASHBOARDS

The four-month development and implementation phase is now underway and on-schedule to provide teachers with new actionable dashboard tools shortly after the start of the new school year.

The first group of teachers will have access to highly visual, easy-to-use actionable dashboards, leveraging new sources of student, teacher, and course data and advanced analytics. The dashboards will enable easier, timelier student grouping interventions (e.g., after-school tutoring, classroom breakouts) and prescriptive individualized learning pathway recommendations to proactively address gaps in student achievement.

“The predictive analytics and dashboards we are building with Dell EMC will enable us to continue to innovate—and bring in other technologies, which could be, but are not being leveraged, into the K-12 space,” says Carter.

“The Dell EMC methodology and the discipline it brings to the process have proven unique and invaluable,” says Grindle. “But what has really validated our choice of Dell EMC as our partner is the shared sense of discovery, excitement, and interest that everyone we’ve worked with at Dell EMC has shown in seeing what we can do with this work. It’s one of the best partnerships I’ve had in six years of working at IDEA and as a former IT director.”

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