CENTER FOR DIGITAL EDUCATION'S

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CENTER FOR DIGITAL EDUCATION

The Education Dashboard

from the publisher

This Special Report focuses attention on how schools and colleges can be more effective in their everyday tasks. We are spotlighting a process that will enable better decisions through the application of relevant, just-in-time data. Although the term dashboard has been used for some time in the private sector, it is relatively new to education. As we are defining the term for this report, we are speaking of it as a process as much as any data display tool or specific application.

Educational dashboards can be applied to almost any function in both K-12 and higher education. They can be designed to address business operations as well as used for learning and assessment applications. The beauty of the dashboard is that it improves our efforts by getting users relevant information delivered to them effortlessly to enable them to perform better.

Students can see how they are progressing and what they need to improve upon; teachers can access performance and trending data that can enhance student learning; and administrators can get timely information in which to make decisions that offer the biggest impact.

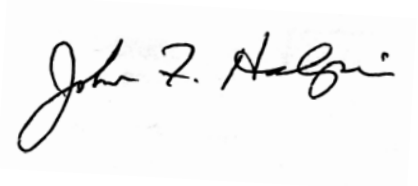
We are pleased to offer this peek into the world of the dashboard. We are hopeful you not only find it an interesting read, but can take away from it some ideas that will help your schools and institutions for the better.

Real, usable dashboards are an inescapable part of the new normal for K-12 and higher education institutions at all levels. For many years, collections of statistics have been arriving to the executive suite in incomprehensible formats like giant spreadsheets and thick folios compiled from sometimes flawed basic data points. This information gets passed on to overworked executives who must make a show of using the data to make serious decisions while, usually, still feeling like they are only making educated guesses.

Dashboards are more than a nifty way to "see" things. They are drivers of changed organizational processes as well. Executives that use dashboard functionality can operate on statistical facts, penalizing the poorest results and rewarding the high-producing innovators. Historians may someday say this technology was the turning point of American education.

Empowerment down to the individual job level is the newest facet of dashboards, and in my opinion, brings a vitally needed opportunity for personal responsibility into the picture. My advice is not to neglect this capability.

We hope you enjoy this *Converge* Special Report and share it widely!



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INTRODUCTION

A growing number of K-12 schools and districts and institutions of higher education collect and archive enormous amounts of data in data management systems, such as the student information system (SIS), learning management system (LMS), enterprise resource planning system (ERP), and many others. Many of them, especially in higher education, are using advanced analytics applications and reporting functions to evaluate programs, make evidence-based decisions, predict program outcomes and future directions, and communicate results with constituencies.

Simultaneously, the United States has fallen farther behind other countries in producing college graduates, and our high school graduates are less prepared to enter college or the workforce. Educators and education leaders are under immense pressure to improve student outcomes, reduce costs, and improve operational efficiency and employee productivity. Data management systems and data reporting lends itself well to this challenge, because federal and state funding initiatives increasingly require schools and districts to collect data and submit results to prove compliance and increase accountability and transparency.

A new tool in the data analytics toolbox enables education organizations to improve student performance; increase teacher effectiveness; manage operations more efficiently and cost-effectively; and better communicate results to students, teachers, parents, the public, and state and federal education agencies: the education dashboard.

Education dashboards aren't exactly a new tool, but their use isn't widespread. The dashboard is now emerging from the shadows of its sibling — advanced data reports — because education leadership increasingly needs to provide information to everyone, not just data experts. While data reports consist of column after column of statistical analysis contained in complicated tabbed spreadsheets, education dashboards provide a simple visual representation of meaningful metrics and indicators for student and school achievement. They enable anyone to understand and evaluate the performance of students, schools, districts, universities, colleges and university systems.

This Special Report examines the emergence of education dashboards and how they are transforming the way that schools measure, evaluate and predict results for

students, programs, schools, districts and institutions of higher education. The first part of this report lays the groundwork for building a dashboard that meets the unique needs of your school, district or higher education institution by reviewing some of the fundamental considerations of data-driven decision-making; outlining how dashboards are used; and addressing the key drivers of dashboard-based information.

In the second half of this report, we review the different types of data management systems currently in use, the kinds of data they collect and how they are used and stored. We also provide examples of well-received dashboards that are already in use, and discuss some key technology considerations for building a dashboard. Finally, we provide a short list of considerations to help your organization get started down the path of implementing an education dashboard.

Dashboard technology is not a passing fad. Providing easy-to-understand data to multiple internal and external audiences is becoming an imperative for both K-12 and higher education organizations. Dashboards can have a tremendous impact on the way we educate students and manage programs and departments. They allow us to excel by giving our audiences the tools to monitor, measure and evaluate performance.

DASHBOARD TECHNOLOGY IS NOT A PASSING FAD. PROVIDING EASY-TO-UNDERSTAND DATA TO MULTIPLE INTERNAL AND EXTERNAL AUDIENCES IS BECOMING AN IMPERATIVE FOR BOTH K-12 AND HIGHER EDUCATION ORGANIZATIONS.

DATA-DRIVEN DECISION-MAKING: A PRIMER

The increase in federal and state initiatives that require schools and districts to collect data and submit results to prove compliance — combined with technology advancements — has resulted in a veritable data deluge.

Some argue that data collection requirements impose a costly, bureaucratic data burden on teachers, schools and districts: data on its own is not knowledge. However, careful analysis using the appropriate tools and resources eliminates data burden. Data might not be knowledge, but it can be used to gain knowledge and critical business intelligence that can drive decisions to transform learning, increase school efficiency and improve financial management.

Data-driven decision-making in K-12 and higher education is fueled by the growing need for accountability and transparency (see next section), along with the coming-of-age of technologies that enable collection and analysis of immense amounts of data. Data-driven decision-making depends on data analysis that happens frequently enough for real-time interventions, and information dashboards that make it easy to access and communicate results. A data-driven decision is made only after data analysis shows evidence of a trend or problem.

BUSINESS INTELLIGENCE AND DATA ANALYTICS

The most basic and frequently used educational data comes from state standardized test scores, a summative benchmark collected too late in the school year to use for real-time adjustments. True data-driven decision-making relies on much more than test scores, borrowing the principles of business intelligence and data analytics from the business world:

- *Business intelligence* is a broad term that encompasses data collection, archiving, sorting, analysis and evaluation to identify patterns, verify theories

and establish relationships that enable more informed business decisions.

- *Data analytics,* the science of examining raw data to create actionable business intelligence, involves manipulating large data sets using statistical analysis methods and algorithm-based predictive modeling.

Typically, a school district collects data from multiple education data management systems used to administer student and operations data, including:

- *enterprise resource planning (ERP) systems,* which consolidate payroll, purchasing, facilities, accounting and other business and fiscal data;
- *student information systems (SIS),* which provide student performance data such as test scores, grades, attendance and disciplinary actions;
- *learning management systems (LMS),* which administer, document, track and report on classroom training, programs and content;
- *assessment systems,* which allow educators to create and administer tests and monitor student progress in real time to improve instruction; and
- *longitudinal data systems (LDS),* which track student performance and other relevant information over multiple years and multiple schools.

Other sources of data are library records, student admission and registration systems, event management information, and any other system that collects student-, teacher- and school-related data. Each information management system archives data in a separate database and is capable of generating system-specific reports. The best results, however, are obtained from more complex comparisons of data extracted from multiple systems and compared and analyzed using statistical software, which generates mathematical models to compare various data points based on pre-determined criteria.

The data can be used for advanced reporting and decision-making. Or, the system can be programmed to trigger a certain action if values derived from the data analysis results meet a certain level. For example, a school can combine performance indicators from the SIS (academic performance, demographics and aptitude test scores) with CMS metrics (student interaction with peers via discussion board) to predict the probability of student success in a particular course. This probability model triggers an e-mail congratulating one student on his performance and participation; another gets a request for a meeting with her advisor.

COMPARISON OF DATA-DRIVEN DECISIONS IN BUSINESS AND EDUCATION

Business User	Data-Driven Decision
Credit card company 	Provide business intelligence about spending patterns to prevent fraud and identity theft
E-commerce website 	Make product suggestions based on a shopper's prior purchases
Internet search engine 	Present targeted ads to Internet users based on search patterns

Education User	Data-Driven Decision
Teacher 	Identify at-risk students, evaluate learners, communicate results to parents, make real-time curriculum interventions based on results
School and district administrator; state education agencies 	Evaluate and make decisions about teachers, programs, schools and districts; communicate results to constituencies; allocate financial and human resources
Higher education 	Adjust student recruitment policies, develop new programs and classes, develop alumni giving opportunities

CONSIDERATIONS FOR USING DATA IN EDUCATION

The use of data analytics to support data-driven decision-making and business intelligence introduces a number of issues that educators must understand and be prepared to manage.

DATA MISINTERPRETATION

When examining data trends, it is not uncommon to make false assumptions about cause and effect, such as confusing correlation with causation. For example, we know that people with higher incomes have more years of education; income and education are correlated. But we can't prove causation — we don't know if more education leads to higher income, or if those with higher incomes simply have the opportunity to attend school for a longer time.

Some additional statistics-related pitfalls:

- Analytics tools are most effective if used frequently and consistently. Otherwise, emerging patterns may appear to indicate nonexistent trends.
- Data for small groups of students may not be applicable to larger cohorts.
- Analysis programs are based on inferences, so even the most well-planned models and algorithms can result in misleading results.
- Results can be manipulated unintentionally, due to researcher bias.

DATA OWNERSHIP, SECURITY AND PRIVACY

A student's right to education records privacy is protected by the federal law known as the Family Educational Rights and Privacy Act (FERPA). Data must be used responsibly and archived securely to ensure privacy and anonymity.

This issue seems simple, but it's blurred by the issue of data ownership. Who owns the raw data? Who owns the results of a statistical analysis? Can anyone use the data as they please? Who decides who can use it, and who can access the results? Who decides what data to collect?

ETHICAL ISSUES

Predictive modeling involves creating student profiles that help educators predict student success or failure. This could create biases toward certain students. Can data provide a complete picture of a student's potential, without taking into consideration all possible (non-quantifiable) causes of success or failure? Is profiling harmful, or is an educator obligated to act on this conclusion? Is it appropriate to share this information with other faculty?

RESISTANCE TO TRACKING

Data analytics efforts may be viewed by some students, parents and community members as tracking or spying. Organizations may need to consider obtaining consent and providing an "opt-out" option.

FINANCIAL RESOURCES

Data archiving technology and analytics expertise may strain the budgets of educational institutions. Although many government grants and other funding sources are available for data analysis, institutions will have to be creative about funding these projects.

DIVING INTO THE DASHBOARD: A DEFINITION

Education dashboards are software-based solutions that help manage — and make comprehensible — the mountains of data that schools and districts collect. They are graphical reporting tools that provide real-time, or near real-time, representation of meaningful metrics and success indicators for school and student achievement. Teachers and administrators use dashboards to make more informed decisions and improve school and classroom efficiency in real time. Public dashboards meet requirements for transparency and accountability in public education, spurring parental and community involvement in educational decision- and policy-making.

Behind the education dashboard's simple user interface lie the complicated tools of the data analyst. It is designed to be intuitive and simple, to expand access to learning and business intelligence from highly trained data analysts to "casual users." Dashboard functionality can be customized based on the role of the user, and access can be tailored to ensure student privacy and data security. Teachers, for example, need access to data regarding classroom and student management such as lesson development, scheduling, attendance, disciplinary action, test content, assessment and standards. On the other hand, school and district administrators also require a broader view of student achievement data to track trends and compare performance of teachers, schools and districts; in addition to operational data, such as financial and human resources. Higher education administrators want insight into information about workforce development and research. And state education agencies can use dashboard technology to develop statewide dashboards that give the general public a high-level view of state trends, comparative data for schools and districts, and birds'-eye views of individual schools. Students and their parents are concerned primarily with individual student performance.

PROVIDING ACCOUNTABILITY AND TRANSPARENCY

When Louis Brandeis wrote that "sunlight is said to be the best of disinfectants" in the early 20th century, he referred to printed reports and records. Today, accountability and transparency efforts are focused on online availability and ease of access to reams of electronic data.

In public education, expectations for accountability and transparency have steadily increased during the four and a half decades since the introduction of the Freedom of Information Act (FOIA). As new federal education programs come to fruition and data analysis techniques and technology mature, the pressure for school districts and state education agencies to meaningfully measure and communicate student learning outcomes intensifies — particularly among federal funders and the taxpaying public.

Is Education Data Being Used Effectively?

According to the Data Quality Campaign (DQC), a national collaborative effort that supports the availability and use of data to improve student achievement, states are not using education data effectively. The DQC found that too few states have:

- Fully committed to the national longitudinal data systems program that requires states to link K-12, early childhood, post-secondary and workforce data
- Given teachers, students and parents access to student longitudinal data
- Provided educator preparation institutions with teacher impact data
- Integrated statewide data literacy programs into teacher preparation programs[1]

Many school districts have responded to accountability and transparency measures by collecting data, yet they struggle with delivering meaningful analyses and providing access. For example, in many districts data is available to employees in a cumbersome format; in others, district policies or technology restrictions limit data access and usage to only a few analysts.

Education dashboards span the gap that lies between accumulated data and accessibility and utility. They help education organizations meet the challenges of accountability and transparency by providing a data-driven feedback loop that enables teachers, schools, districts and states to assess performance, determine which efforts are having the desired impact, and if necessary, change course to ensure continuous improvement.

Education dashboards make it easier to monitor, manage and meet goals related to educational standards, student outcomes and financial efficiency. They help bring the highest levels of transparency and accountability to public education by making data accessible to government, corporate and private funders, as well as students, parents and taxpayers.

FEDERAL INITIATIVES

The Obama administration has developed a plan for improving education through technology, and supports it with numerous programs and billions of dollars in funding. Success of these initiatives depends on providing transparency and ensuring accountability by correctly and efficiently assessing, compiling, comparing and communicating student outcomes and school, district and state results.[2]

THE PLAN: LEARNING POWERED BY TECHNOLOGY

The National Education Technology Plan (NETP) is the Obama administration's vision for the future of education and the foundation for all of its technology-based education initiatives. NETP calls for the application of advanced technologies to all aspects of the education system in support of the president's goal to lead the world in the proportion of college graduates by 2020. This requires raising the percentage of two- and four-year college degree holders from today's rate of around 41 percent of the U.S. population to 60 percent[3] — a bold objective that will rely heavily on easy-to-access program data and metrics.

To improve learning, assessment, teaching, infrastructure and productivity, the NETP advocates for leveraging "everyday technologies" such as the Internet, wikis, blogs and digital content, as well as tools for inquiry, visualization, graphics and 3-D modeling.[4] The plan promotes universal broadband access in homes and schools, at least one Internet access device for every learner and teacher, cloud-based computing technologies, openly licensed education resources, and open source technologies to improve teaching and learning.

The NETP notes that technology should be used for both summative assessment (grading and accountability), and formative assessment (diagnosing and modifying instruction and learning conditions), a critical part of enabling in-the-moment student improvement.[5] For example, the report recommends researching the use of technologies such as games and virtual worlds to engage and assess learners, because they allow students to view their performance in real time and take corrective action in the moment.

Other assessment- and measurement-related goals that ensure transparency and accountability include:

- ensuring that assessment systems and tools accommodate all users and capture appropriate measurements (i.e., understanding and knowledge versus physical abilities such as vision, hearing, language, mobility, etc.);

- developing more relevant and meaningful measurements of student outcomes, school and district productivity, and educational attainment;
- improving data collection, sharing and analysis, decision-making, and school and district productivity by developing interoperability standards that eliminate barriers to accessing student and financial data;
- updating privacy and security policies so that every student's electronic learning record can be stripped of identifiers, allowing data to be aggregated across classrooms, schools, districts and states without compromising privacy; and
- developing more useful metrics for technology use, shifting from purchase records, numbers of computers and Internet connections to data on how and when technology is used.

QUID PRO QUO: FUNDING FOR SHOWING IMPROVED STUDENT OUTCOMES

The ambitious agenda set forth in the NETP requires political muscle and funding to succeed. An unprecedented amount of money — billions of dollars in the American Recovery and Reinvestment Act (ARRA) and other federal grants and hundreds of millions more in private and corporate endowments — has been made available since 2009 to fund innovative new education programs and initiatives. But the funds inevitably have strings attached — in this case, the ability to meet expectations for transparency and accountability by quantitatively measuring and proving program success.

To support states in their efforts to measure and prove student outcomes, the Obama administration has provided countless funding opportunities that help states effectively collect and use longitudinal data to improve student performance.

- *Race to the Top (R2T)* — R2T provided $4.35 billion in grants to help state educational agencies achieve reforms in four areas,[6] including the development of "data systems that measure student growth and success, and inform teachers and principals about how they can improve instruction."[7] The president's 2012 budget request proposes additional funding to expand the Race to the Top program to the district level.
- *Statewide Longitudinal Data System (SLDS) Grants* — The president's 2012 budget request proposes SLDS grants to encourage states to "design, develop, and implement statewide, longitudinal data systems to efficiently and accurately manage, analyze, disaggregate and use individual student data … to improve data quality, promote linkages across states, promote the generation and accurate and timely use of data for reporting and improving student achievement, and facilitate research to improve student achievement and close achievement gaps."[8]
- *IDEA Grants* — The Individuals with Disabilities Education Act (IDEA) authorizes formula grants to states, and discretionary grants to institutions of higher education and other nonprofit organizations. The president's 2012 budget request proposes nearly $12 billion for IDEA grants, which includes millions of dollars in technical assistance to improve states' capacity to meet data collection requirements.[9]
- *Additional Programs* — Funding has been provided, or requested in the 2012 budget, to incorporate better data collection and analytics techniques into a slew of federal educational programs, including the Carl D. Perkins Career and Technical Education Improvement Act of 2006 (Perkins IV); Title I College and Career-Ready Students (CCRS) Program; Enhancing Education through Technology (ESEA II-D); the Presidential Teaching Fellows; the Early Learning Challenge Fund (ELCF); the Fund for the Improvement of

Postsecondary Education (FIPSE); Head Start and Early Head Start; and the Workforce Data Quality Initiative (WDQI).[10]

STATE INITIATIVES

In addition to federal programs, a host of state measures for improved transparency and accountability in public school districts, colleges and universities are driving the use of education dashboard technologies. Driven by deep budget cuts at the state and local levels and strained bottom lines, these and other similar initiatives are designed to show students, parents and the public how schools spend taxpayer dollars.

• *Arkansas* — The Arkansas Financial Transparency Act, which mandates that state agency spending be posted on the Internet, passed the senate in April 2011. The state's school performance report already provides a searchable online database of statistical performance information to students, parents and the general public.

• *California* — Ed-Data is a collaborative effort between government and nonprofit agencies that provides access to fiscal, demographic and performance data on California's K-12 schools.

• *Knox County, Tenn.* — The county received funding to develop an education management information system (EMIS), a secure data warehouse that holds 15 years of academic, demographic, human resource, financial and statistical data. The data archive will eventually include more than 40,000,000 data points.

• *Louisiana* — The Louisiana Department of Education provides a searchable database of statistical information on public schools, including student demographics, course enrollment totals, financial information and student achievement.

• *New Mexico* — In March 2011, legislation requiring schools to post financial information such as yearly operating budget and salaries became effective.

With the expiration of state and local ARRA funding in 2012 and federal agency budgets on the chopping block, calls to bring greater transparency and accountability in schools, districts and states will continue to increase.

MANAGING CAMPUS AND DISTRICT ADMINISTRATIVE FUNCTIONS

Driven by disruptions such as Y2K and the introduction of the euro, businesses began migrating towards the model of integrated administrative systems management in the mid- and late-1990s. Because legacy information management systems were not equipped to manage such disruptions, they were replaced with newer systems that included a cross-functional, integrated software application that encompassed mission-critical systems such as manufacturing, procurement, supplier management, sales, customer service, customer relationship management (CRM), finance and accounting, maintenance and human resources.

The integration of these internal and external management systems across an entire organization came to be known as enterprise resource planning (ERP). ERP software is modular, so an organization might use ERP to manage finance, manufacturing and customer service while outsourcing other functions, such as human resources. Data may be accessible through an ERP system's own ad hoc dashboard, or through separate dashboard software that provides a broader view of other functional (non-operational) areas.

FROM THE BOARDROOM TO THE CLASSROOM

Like businesses, higher education institutions must carefully manage revenue and profitability. Accordingly, many have followed the lead of their corporate contemporaries and implemented ERP systems to manage administrative data across their organizations. For K-12 institutions, whose performance is measured on the success of their students and teachers, administration and operations data is only infrequently collected and analyzed to support the decision-making process.

It becomes more and more critical for both K-12 and higher education organizations to gain control of their operational processes. They face similar challenges as businesses, including increased calls for accountability and transparency; an ongoing economic downturn;

and growing budgetary concerns that force them to compete for government, corporate and foundational funding. The current climate requires fast answers — backed up by hard data — to questions about spending.

Businesses found that data management systems facilitate better organizational information flow, which in turn improves productivity and reduces expenses. By implementing systems that collect and analyze operational data, education organizations will also discover that shining a light into their administrative processes will lower costs and improve decision-making and productivity.

ELIMINATE EMOTION FROM ADMINISTRATIVE DECISION-MAKING

Education dashboards can be used in concert with the data from ERP systems to provide an integrated view of financing and accounting, budgeting and forecasting, purchasing and procurement, human resources, investment and real estate management, development and other administrative areas.

Many types of administrative data can be integrated into an education dashboard:

- ✓ *Financing and accounting,* such as accounts payable, accounts receivable, assets, liabilities, revenue, expenses, budgeting, forecasting, curriculum and departmental expenses
- ✓ *Human resources,* such as payroll, training, benefits, 401K or other employee retirement/savings plans, timecards and attendance, recruiting, faculty and staff advancement, salaries, diversity management, recruitment and employee retention
- ✓ *Student management,* such as admissions, enrollment, registration, fees, billing, financial aid, scores, attendance rates, application counts, letter generation and labels, academic history, graduation rates, transfers, advising, retention, graduation rates and post-graduation career tracking
- ✓ *Research,* such as funding trends, faculty and department comparisons, awarded and outstanding grants, grant applications, grant compliance and research infrastructure investments
- ✓ *Revenue,* such as grants, foundations, endowments, donors, potential donors, investments, capital campaigns and tuition

- ✓ *Alumni relations,* such as annual campaign reporting, class gifts and pledges
- ✓ *Purchasing and procurement,* such as suppliers, equipment, inventory, RFPs, procurement cards, petty cash and food services
- ✓ *Facilities and real estate management,* such as energy consumption and costs, lighting control, building security, real estate and building valuation, and building maintenance
- ✓ *Geographic information,* such as demographics of faculty, staff and students related to multiple success factors; illness tracking (such as flu epidemics); public and school transportation; location of campus "safety zones"; and emergency equipment
- ✓ *Information technology,* such as system administration, security, audit trails, asset auditing and management, reporting, hardware and equipment, mobile devices, document management, enterprise content management, printer management, software licensing and ROI
- ✓ *Governance*, such as open records and open meetings compliance, board meeting materials, meeting minutes and recommendations

Education dashboards with access to operational data support administrative staff in the quest to manage their school, campus or district effectively by providing real-time insight into data collected from

administrative processes. Implementing dashboard software and solutions to improve decision-making in both higher education and K-12 institutions can inject consistency into the decision-making process, and eliminate emotion and intuition.

ENSURING TEACHER EFFECTIVENESS

It is critical to accurately and objectively measure teacher effectiveness, because teacher satisfaction and performance have an enormous impact on student outcomes. Teacher effectiveness is at the heart of many state education reform legislation proposals. Policy-makers, educators and administrators continue to be vexed by questions of how to fairly evaluate teachers, measure their effectiveness, reward high achievers and weed out poor performers.

Education dashboards can help district leaders measure teachers' performance and compare results to their school, district and state colleagues or to other teachers with similar student populations.

VALUE-ADDED ASSESSMENTS

In the past, the absence of actionable data led to evaluations and measures of effectiveness based on subjective criteria such as seniority and educational credentials, which have historically been more influential than performance measures. Most principals deliver similar positive rankings for all teachers, making it difficult to discover and take action to correct performance problems.

We are now experiencing the repercussions of this system as calls to reform teacher evaluations grow louder and more heated. Many of these efforts have been driven by data collection and analysis, which has led to the development of new systems for measuring and evaluating teacher performance and promoting teacher effectiveness.

These types of analyses do more than indicate poor individual achievement. For example, when low performance exists across a school or district using a common curriculum, it might indicate curriculum issues. Qualities and qualification of successful teachers can be analyzed for others to model. Tracking teacher absenteeism may help administrators to develop an understanding of job satisfaction issues. And teacher assessments help educators direct their professional development efforts. Indeed, teachers can improve their own performance by using data to plan learning activities, engage students, monitor student progress, modify instruction in real time and assess students.

Many education researchers and organizations have called for the use of value-added teacher assessments — those that employ multiple sources of data to provide richer feedback beyond simple year-over-year comparisons of standardized test scores.[11,12] Districts and states are encouraged to seek funds to develop evidence-based evaluation systems, train administrators and staff in their use, and create appropriate indicators and an equitable evaluation process.[13]

Policy-makers seeking to develop fair proposals for teacher evaluation can integrate measures of student performance such as standardized test scores and grades with other important criteria such as teaching environment, parent and student surveys, resource availability, portfolios of work and classroom observation. A systematic collection of evidence about teacher performance and student outcomes could include assessments and comparisons at multiple points in time such as initial licensing, professional licensing and advanced certification.[14]

A BLUEPRINT FOR REFORM

The federal government, too, encourages districts and states to improve teacher evaluation and effectiveness using objective, data-driven criteria. For example,

MANY EDUCATION RESEARCHERS AND ORGANIZATIONS HAVE CALLED FOR THE USE OF VALUE-ADDED TEACHER ASSESSMENTS — THOSE THAT EMPLOY MULTIPLE SOURCES OF DATA TO PROVIDE RICHER FEEDBACK BEYOND SIMPLE YEAR-OVER-YEAR COMPARISONS OF STANDARDIZED TEST SCORES.

in a policy letter on productivity to state governors, Secretary of Education Arne Duncan emphasizes the need to develop "more meaningful and fair evaluation systems that include both student learning gains and other measures."[15] Accordingly, many grant programs, including Race to the Top, Improving Teacher Quality State Grants, the Teacher Incentive Fund, and School Improvement Grants will provide funds for strengthening teacher and principal evaluation systems.

Data-driven decision-making is critical for improving teacher effectiveness, as outlined by the Obama administration in "A Blueprint for Reform," its proposal for the reauthorization of the Elementary and Secondary Education Act (ESEA). Published in 2010, the blueprint outlines the administration's priorities as it works with Congress to revise ESEA and replace No Child Left Behind (NCLB).

The administration proposes overhauling ESEA to meet its goal of leading the world in college graduates by the year 2020, which requires a shift from NCLB's focus on raising standardized test scores to a new objective: giving high school graduates a better chance to succeed by ensuring their college- and career-readiness.

Improving the effectiveness of teachers and principals is key to achieving this goal. The blueprint recommends an evidence-based, multi-pronged approach for improving teacher performance:

1. Elevate the profession and focus on recruiting, preparing, developing and rewarding effective teachers and leaders.
2. Focus on teacher and leader effectiveness in improving student outcomes.
3. Ensure equitable distribution of effective teachers and leaders in high-need schools by enacting bold reforms to increase the number of effective teachers and leaders, and strengthening pathways into teaching and school leadership positions.[16]

ELEVATE THE PROFESSION

States and school districts are encouraged to implement strategies for better recruitment, preparation, development, evaluation and rewarding of effective teachers and leaders. This includes creation of career ladders, improved certification and retention policies, and training and support.

The report is clear: measuring and reporting the effectiveness of teachers, leaders and preparation programs will be a requirement for receiving federal funds under the revised ESEA. It calls for states and districts to establish the following policies and systems:

- ✓ *Define "effective" and "highly effective."* Recognizing the difficulty in meaningfully measuring and defining a "highly qualified" teacher or principal, as characterized by NCLB, the blueprint recommends the development of statewide definitions of "effective" and "highly effective" teachers and principals, based on measurable student improvement and other indicators, such as classroom observations.
- ✓ *Provide better information on preparation programs.* The ESEA overhaul will require states to develop data systems that will link information on teacher and principal preparation programs with data on job placement, student growth and retention outcomes of graduates.

- ✓ *Develop better evaluation systems*. Districts should create evaluation systems that make a meaningful distinction between teachers, principals and other staff by different performance levels of effectiveness, consistent with state definitions of "effective" and "highly effective." Teachers, principals and other staff should be given meaningful feedback to improve their practice and inform professional development.

It notes that access to "meaningful information" can help those being measured learn about their performance and take the necessary steps to improve performance:

> *Our proposals will ask states and districts to put in place the conditions that allow for teachers, principals and leaders at all levels of the school system to get meaningful information about their practice, and support them in using this information to ensure that all students are getting the effective teaching they deserve.*[17]

By providing teachers and school and district administrators with easy access to metrics for teacher and principal improvement, education dashboards can help schools, districts and states establish and maintain compliance.

RELATE TEACHER EFFECTIVENESS WITH STUDENT OUTCOMES

The blueprint notes that teacher effectiveness and student outcomes are not currently linked to compensation and promotion systems. In most districts, pay is tied to educational attainment and seniority, instead of measures of student success or the difficulty of the teaching assignment (such as teaching in a rural school).

The Obama administration urges districts to modify reward systems to emphasize excellence and teaching in high-need schools or subject areas. Such programs should be accompanied by transparency in measurement and reporting:

> *We will require transparency around the key indicators of whether students and schools have effective teachers and principals and whether teachers have the professional supports they need. Both states and districts must publish report cards at least every two years that provide information on key indicators, such as teacher qualifications and teacher and principal designations of effectiveness; teachers and principals hired from high-performing pathways; teacher survey data on levels of support and working conditions in schools; the novice status of teachers and principals; teacher and principal attendance; and retention rates of teachers by performance level. States will also be required to report on the performance of teacher and principal preparation programs by their graduates' impact on student growth and other measures, job placement, and retention.*[18]

In his policy letter to governors, Secretary Duncan notes that "Better evaluation systems can ensure that effectiveness information is a core part of all human capital decisions."[19]

Dashboard software that provides access to key indicators of teaching performance can make it easy for school and district administrators to track and manage teacher and principal effectiveness in relationship to student outcomes.

EQUITABLE DISTRIBUTION OF EFFECTIVE TEACHERS

To ensure that high-need schools have equal access to teaching and leadership talent, states and districts will be rewarded for:

- ✓ implementing innovative programs that identify, recruit, prepare, develop, retain, reward, and advance teachers and school leaders in high-need schools, subjects, areas and fields; and
- ✓ strengthening traditional and alternative pathways into teaching for candidates in high-need schools, subjects, areas and fields.

USING DASHBOARDS, ADMINISTRATORS CAN GAIN SHORT-TERM SNAPSHOTS OF PERFORMANCE AND PROFICIENCY AS WELL AS THE LONG-TERM PICTURE OF INDIVIDUAL STUDENT GROWTH AND SCHOOL PROGRESS OVER TIME.

Education dashboards can help educational programs identify promising candidates to help turn around low-performing schools. They can also be used by districts and states to track and measure the effectiveness of such teachers and leaders, which, as part of the ESEA overhaul, is a planned requirement for receiving funds for this purpose.

DATA-DRIVEN TEACHER ASSESSMENTS IN HIGHER EDUCATION

In higher education, teaching performance has historically depended on student rankings. They are ubiquitous in institutions of higher education and serve as the basis for many performance-based decisions such as receiving tenure or dismissal. There is much debate on their value and they are unpopular among most faculty.[20]

In spite of this, student evaluations are seen by most experts as a reliable source of evidence for teaching evaluation, though there is general agreement that they should not be the only source of assessment data. This has led to a movement in the last 15 years to develop and integrate measures such as peer and supervisor evaluations, self-evaluation, student test scores, and other indicators.

To create a reliable assessment system using multiple indicators, higher education administrators must work with faculty to select appropriate success criteria, design and implement a data collection system, and report the results accurately. The use of education dashboards can aid in this process by making it easier to access and understand the underlying data.

IMPROVING STUDENT PERFORMANCE

Upon the release of a research report on student assessment by the international economic organization OECD (Organization for Economic Cooperation and Development) in 2009, Education Secretary Arne Duncan said in a statement:

"[These] results show that America needs to urgently accelerate student learning to remain competitive in the global economy of the 21st century. More parents, teachers, and leaders need to recognize the reality that other high-achieving nations are both out-educating us and out-competing us. Our educational system has a long way to go to fulfill the American promise of education as the great equalizer.

Being average in reading and science — and below average in math — is not nearly good enough in a knowledge economy where scientific and technological literacy is so central to sustaining innovation and international competitiveness."[21]

The same federal funding programs that require greater teacher effectiveness also call for dramatic improvements in K-12 student outcomes. Student performance is the foundation of the NETP, A Blueprint for Reform and ESEA reauthorization, and related legislation and funding, including ARRA, Race to the Top, Improving Teacher Quality State Grants, the Teacher Incentive Fund, School Improvement Grants, and many more. In particular, the pending reauthorization of ESEA is an opportunity to address fundamental alignment problems with standards and assessment and accountability systems.

Dashboards at a Glance

… How much more do you now know about these institutions than your own?

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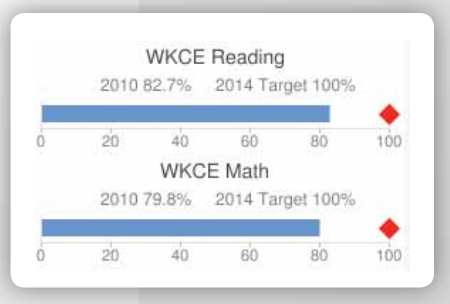

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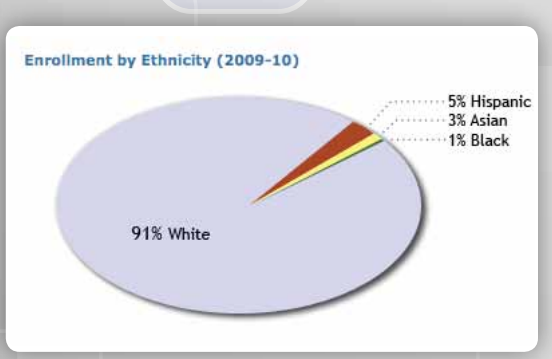

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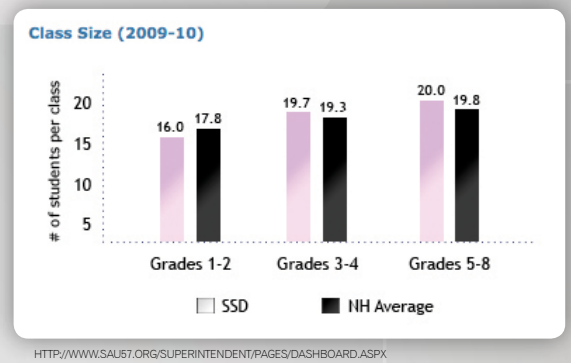

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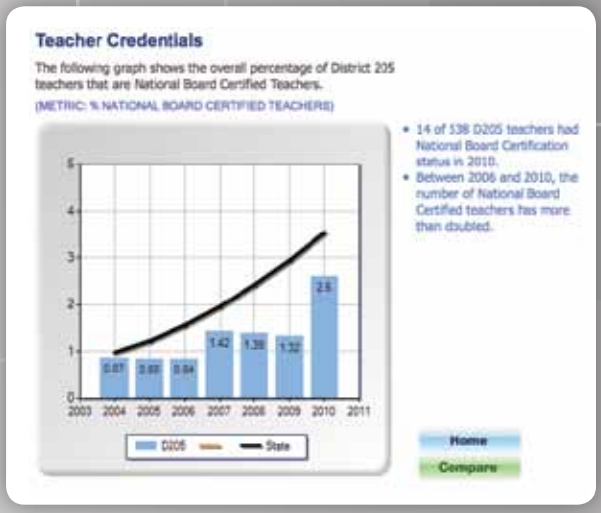

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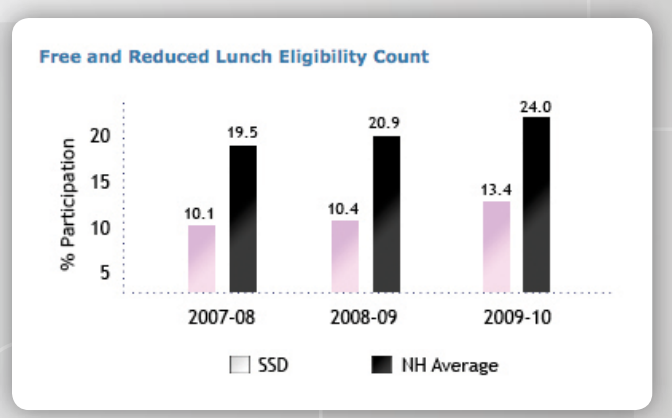

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Post-secondary Education

	Prior	Current	Progress
Tuition and fees as a percent of median family income:			
Universities	12.5%	15.9%	↓
Community colleges	3.5%	4.0%	↓
Community college students who require developmental courses**	59%	61%	↓
Community college retention rate**	72%	74%	↑
University first-year retention rate	80.3%	81.1%	↑
Community college completion/graduation/transfer rate**	46%	47%	↑
University six-year graduation rate	59.7%	60.4%	↑
Population with bachelor's degree or higher (25+ years old)	24.7%	24.6%	↓

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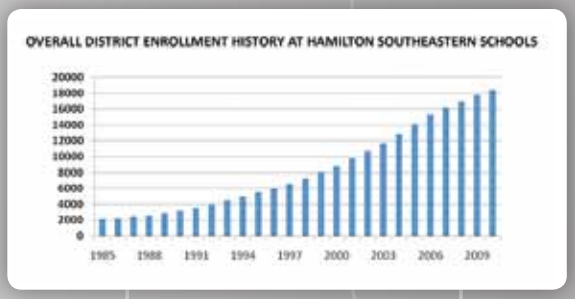

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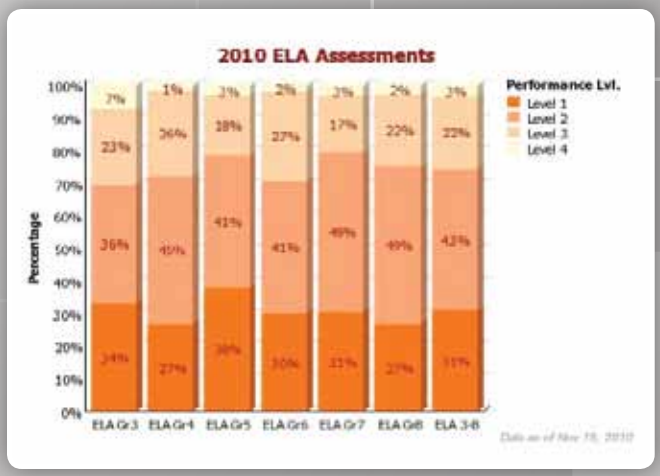

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The Department of Education has placed focus on raising high school graduation rates and improving student assessment and retention. To meet these goals, federal policies promote the collection and use of data to drive improvements. Teachers can use data to implement formative student assessments and real-time course corrections. And the implementation and integration of education dashboards with student performance data can help schools, districts and states measure and audit performance to ensure compliance with federal requirements. Dashboard-accessible student data can also help university and college administrators improve student outcomes.

RAISE GRADUATION RATES

The October 2008 Title I regulations require each state to establish a single graduation rate goal and set annual targets that reflect continuous and substantial improvement from the prior year toward meeting its goal. The Department of Education worked with each state education agency to help it develop goals that are in compliance with this regulation. For example, Utah is tasked with increasing its graduation rate by two percentage points from the previous year; Kentucky is to aim for a graduation rate of 86.75 percent with the goal of increasing 2.25 percentage points each year, or a two percentage point increase from the previous year.[22]

In addition to Title I requirements, the Obama administration, as previously noted, is driven by the aggressive goal of increasing the percentage of college graduates (two- and four-year degrees) from the current rate of about 41 percent to 60 percent, or 8 million students, by 2020. Further, high school students should graduate from high school with the tools to be successful in college and a career.

As part of measuring a school's ability to meet the standards for college- and career-readiness, principals, teachers and schools will be held accountable for student outcomes, while states and districts will be held accountable to provide schools, principals and teachers with appropriate support. Progress and success will be rewarded while low performing schools will require interventions.

Accountability requires that states implement and maintain systems to gather data and measure individual student success and school and district progress, including achievement and growth in sciences, English language arts, and mathematics. Data can be parsed using dashboard technology to view and analyze trends in race, gender, ethnicity, disability status, English learner status and family income. Other critical information could include student, teacher and school leader attendance; disciplinary incidents; or student, parent and school staff surveys.

Education dashboards can help teachers determine individual student progress toward graduation and college- and career-readiness. At the most basic level, administrators can view graduation and college enrollment rates. However, dashboards can provide more complex analyses by comparing graduation rates to performance targets, based on achievement and growth schoolwide and within demographic groups.

For example, using dashboards, administrators can gain short-term snapshots of performance and proficiency as well as the long-term picture of individual student growth and school progress over time. And using early-warning indicators and risk factors, educators can perform interventions when students are not on path to graduate.

IMPROVE RETENTION

Student retention challenges administrators in both K-12 and higher education. In K-12, 7,000 students drop out of high school every day.[23] To meet Title I goals for

IMPROVED DATA-DRIVEN ASSESSMENT SYSTEMS ALIGNED WITH ENHANCED COMPETENCY STANDARDS CAN HELP DETERMINE WHETHER STUDENTS HAVE ACQUIRED THE SKILLS TO BE COLLEGE- AND CAREER-READY AND ARE BETTER AT MEASURING HIGHER-ORDER THINKING SKILLS.

increasing state graduation rates, district and state leaders must harness the power of student data to reverse this trend.

There is no single reason that students drop out of school, yet there are many early warning signs. For example, studies have shown that more than one-third of dropouts leave school in the ninth grade. Further, lack of student engagement is an important predictive behavior for future dropouts. Demographic factors are also present. More than half of the nation's dropouts are students of color. And students in the lowest quartile of family income are about seven times more likely to drop out of high school than those in the highest quartile.[24]

Early school behavior can identify students at risk for dropping out of high school well in advance. One study showed that Fall River, Mass., students who dropped out of school between the seventh and ninth grades generally earned marks of C- or lower and ranked in the 25th percentile of their class as early as fourth grade.[25] And Philadelphia sixth-graders who failed a math or English course, received an "unsatisfactory" behavior mark, and had an attendance rate of less than 80 percent had a 75 percent chance of dropping out of high school.[26]

Student longitudinal data systems that collect and analyze such data can be a powerful decision-making tool for schools and teachers. Dashboard software makes the data available in these systems accessible in a few mouse clicks. Educators can easily identify at-risk students, develop guided interventions, and provide support for the students that need it the most. Administrators can create prevention strategies and use early warning data to identify under-performing schools and districts and target resources as necessary.

Student retention is also a pressing issue for institutions of higher education. Besides the personal and financial impact that failing to graduate has on a student, there are economic and societal consequences. High student dropout rates have tremendous financial implications for the institution, and may negatively affect student body diversity. Yet only about half of freshmen at four-year institutions achieve their bachelor's degree, and the percentage for two-year colleges is even lower.[27]

To reverse this trend, colleges and university leaders must work with their institutional research departments and data experts to carefully analyze and understand their student population. Dashboard software can make it easy to move beyond basic analyses such as cohort graduation rate, to examine the retention and transfer rates for key student populations such as students of color, students from specific geographic areas, residents, commuters, Pell grant holders or other important groups. Besides retention rates, higher education institutions can collect and analyze data such as why students are leaving the institution, compiled from exit interviews.

Armed with such information, college and university retention specialists can identify at-risk students and design programs to help them succeed during their critical freshman transition year and beyond.

IMPROVE ASSESSMENT

Just as federal funding programs call for better teacher evaluation, improved student assessments are a top priority. Better student assessment systems are needed to determine whether students have acquired the skills needed for success in college and in careers.

Assessment is closely linked to competency standards, where the Obama administration places much of the blame for current student performance problems. Current competency standards do not reflect the knowledge and skills needed for post-high school success in higher education or in a job, and twenty years of standards reform have done little to influence dismal graduation and proficiency rates.

The Department of Education is now asking states to follow the lead of the National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers (CCSSO), who in 2009 introduced the internationally benchmarked Common Core State Standards to ensure consistent education quality in English language

arts and mathematics across schools, districts, states and the nation. To date, all but six states have adopted the standards.

States must also continue to include statewide standards and assessments in science and other subjects they deem necessary. They must develop and adopt statewide English language proficiency standards for English learners that reflect the language levels needed to master content standards.

Improved data-driven assessment systems aligned with enhanced competency standards can help determine whether students have acquired the skills to be college- and career-ready and are better at measuring higher-order thinking skills. They add a greater immediacy to formative assessment by helping teachers develop real-time response to teaching and curriculum challenges.

For example, an assessment system may evaluate student responses and instantly prepare feedback that allows the educator to re-teach a concept or add more information on a topic. Or a district leader may move immediately to make adjustments when she notices that all seventh-grade students using a certain history curriculum are faring poorly compared to seventh graders in the same demographic that use a different curriculum.

Detailed formative and diagnostic assessments can provide a wealth of useful information on how to improve student learning outcomes. Data can be used to support development of customized approaches to student improvement. Imagine a classroom where educators use data collected from an assessment system to break free from the whole-classroom teaching approach. Instead of moving all students ahead regardless of whether they had mastered the material, students could be moved to the next level based on individual achievement and comprehension.

THE DATA BEHIND THE DASHBOARD

Without data, education dashboards are meaningless. The educational dashboard application only becomes a functional management tool if it consolidates information from multiple campus data management systems, including student/instructional data and administrative/operational data. In this section, we review the myriad campus data systems in both categories that can be used to populate the education dashboard to provide the most meaningful administration tool.

Many applications manage a single function while some, such as enterprise resource planning systems and student information systems, handle multiple tasks. Modular systems allow the user to add different levels of functionality by purchasing add-on modules. Regardless, all of these data systems are designed to improve workflow and productivity and reduce paperwork in their respective functional areas. Most provide some level of ad hoc reporting and dashboarding capability but are far more effective when integrated with other systems into an all-encompassing dashboard application.

STUDENT/INSTRUCTIONAL SYSTEMS

Student or instructional data systems manage academic data, including all aspects of the learning process, student services and student relationship management.

STUDENT INFORMATION SYSTEM (SIS)

One of the most critical campus data management systems, student information systems allow education institutions to easily and effectively manage student data. They are also known as student information management systems (SIMS) or student records systems (SRS).

Student information systems provide data on multiple aspects of student performance. In a timely

manner, education dashboards bring to educators' desktop the ability to slice and dice student data in meaningful ways, allowing them to make real-time decisions about correctional interventions and instructional support. Administrative leaders can view and compare student achievement data at the district and state level.

In K-12, schools and districts use SIS data to link curriculum, instructional practice and assessment to improve student instruction and therefore, student outcomes. In higher education environments, student information systems drive the adaptation of teaching and learning to current technology such as handheld devices and mobile phones, to improve efficiency, student outreach and digital communications and learning.

The SIS includes multiple components; many are available as stand-alone software solutions. Elements of an SIS include:

- ✓ *Attendance and disciplinary action software* helps school leaders track and gain control of tardiness and attendance, as well as violations of dress code, conduct code, cell phone use, etc.
- ✓ *Grading,* including records of examinations, assessments, marks, grades and academic progression.
- ✓ *Admissions and enrollment management* helps increase recruitment rates of targeted students. It provides strategic insight into the admissions pipeline and helps administrators anticipate enrollment changes and track progress towards meeting enrollment goals.
- ✓ *Special education management* tools ease the process of collecting and reporting special education data required by federal and state regulations, and usually include tools to develop, track and measure individual education plans (IEPs) that are customized to address the needs of individual students with disabilities.
- ✓ *Registration management software* automates student registration and handles information about course offerings and schedules, student registration for classes, transfer credits, grades and transcripts.
- ✓ *Retention management tools* leverage SIS data to allow institutions to identify and target at-risk students and implement a retention program that can help improve these students' chance of succeeding.

Student/Instructional Data Systems

Student/instructional systems that can be integrated into the educational dashboard application include:

- Student information systems (SIS)
- Learning management systems (LMS)
- Student portfolio systems
- Longitudinal data systems (LDS)

- ✓ *Financial aid management* automates the financial aid process and delivers data that can help institutions model various financial aid scenarios to enable better decision-making.

LEARNING MANAGEMENT SYSTEM (LMS)

Teachers use LMS software to centralize and automate classroom-based or online instructional programs, events and content. They can rapidly assemble and deliver standards-aligned or traditional lessons and content; create, manage, document and track assignments; report results; follow the progress of projects; create assignments; and collect learning resources. Learning management systems also allow for personalization and reuse of lesson plans and supporting content and assignments.

Assessment tools are built in and are tightly integrated with curriculum, instruction and learning standards, but they can be supplemented by integration with separate systems. These tools provide real-time, standards-based assessment data for informed decision-making. By analyzing assessment data, teachers and administrators can measure impact of instructional strategies, manage curriculum at the class, school and district level and make necessary adjustments customized for each student.

Using LMS software, students monitor classroom activity and assignments, find library materials and store content such as instructional videos and digital textbooks. If desired, students can self-register for classes,

self-serve content and self-guide lessons. In higher education, the mobility of students and the variety of digital content requires that LMS be easy for students to use and access from any location.

STUDENT PORTFOLIO SYSTEM

Digital or electronic student portfolios are valuable assessment and learning tools. Students assemble and manage evidence of learning and mastery of material such as text reports; presentations; video; multi-media; and student-developed blogs, applications or websites to demonstrate their abilities, reflect on their learning experience or serve as a record of achievement over time. Access may be granted to faculty, other students, parents, or potential employers depending on the purpose of the portfolio.

Portfolios can have other uses besides monitoring and evaluating student performance. They can be used as a job search tool, or to help teachers appraise and plan educational programs, curricula and courses. An assessment portfolio can be linked to the assessment tools and the student's electronic learning record so that it feeds data into those systems.

STATE LONGITUDINAL DATA SYSTEM (SLDS)

Much like an electronic health record is a long-term view of a person's healthcare information, a growing number of policy-makers are advocating for a long-term student learning record. Student longitudinal data systems are created at the state level to track student information over multiple years in multiple schools and archive performance data and outcomes. The federal government is encouraging the development of state longitudinal data systems by providing start-up capital in the form of an SLDS grant program. The systems must collect student data from pre-K through college graduation.

State longitudinal data systems are not an assessment tool per se, but instead support policy purposes. They allow state and district leaders to evaluate districts, monitor progress and perform benchmarking, predictive analysis, and program diagnosis and intervention. They reduce the burden of data analysis and collection when state and federal agencies, researchers, and private funders request district or school information.

They are complicated systems that require coordinated design and integration with multiple vendors, systems and data types. Considerable resources and talent are needed to develop the supporting technology infrastructure and to ensure data security and student anonymity. User training is critical to the success of the SLDS.

ADMINISTRATIVE/OPERATIONAL SYSTEMS

Administrative systems handle all operational data. Because the primary benefit of these systems is to cut costs and boost efficiency, they are currently used less frequently in K-12 organizations than in higher education institutions, whose goals are more profit-oriented.

ENTERPRISE RESOURCE PLANNING (ERP)

Today's ERP systems evolved from manufacturing, production, and back office systems and processes of the 1990s such as finance and accounting, supply chain, human resources, purchase orders, quality control and customer relationship management.

Recognizing that the needs of the education segment are much different, many vendors have developed ERP systems customized for the education market. Specialized ERP systems for education institutions may include finance and accounting and human resources at the most

basic level. A more encompassing ERP would include multiple administrative systems such as admissions, registration, financial aid, fiscal management, document management, development and alumni relation, and even academic systems such as those found in a SIS.

FISCAL MANAGEMENT

Accounting, financial and budget activities are easier to administer using fiscal management systems. Users can develop budgets, forecasts and numerous reports based on the diverse and large amount of data collected. Fiscal management may be a separate system or part of a broader ERP, and can be managed at both the administrative and the departmental/business unit level. Data gathered and tracked by financial systems includes:

- ✓ *General ledger,* the primary accounting record that shows individual credit and debit transactions
- ✓ *Accounts receivable,* including invoicing and tracking of tuition, fees and other student billing, as well as other sources of revenue such as print shops, student stores, athletic departments and food service
- ✓ *Accounts payable,* such as cutting checks and vouchers, vendor tracking and credit summaries
- ✓ *Payroll processing,* including salary, pension and 401K management; benefits, taxes and other payroll deductions; W2 statements; and vacation and sick time tracking
- ✓ *Budgeting,* including forecasting and managing expenses for curricula, departments and business units
- ✓ *Bank account reconciliation*, including transaction sorting and reporting
- ✓ *Purchasing,* including issuing and tracking purchase orders; RFP development and management; and managing suppliers, equipment and inventory control in areas such as the student store, athletic department, food service and print shops

GRANTS MANAGEMENT

Designed for effective management of grants in research-intensive institutions, grants management systems track pending proposals and active awards, including data related to pre-award, post-award, billing, accounts receivable and financial reporting.

These systems help collect, track and measure pre-award information such as budget and project period start and end dates, sponsor and submission deadlines, sponsor information, award and proposal type, total cost and cost sharing. Proposal development tools and the ability to monitor proposal development are often included. After the award is made, grant management systems enable daily grant tracking, including project status and schedules, project accounting, time reporting, personnel, budgeting and cost sharing. They are also used to monitor compliance with standards, board or other sponsor requirements, reporting and certification.

ENTERPRISE CONTENT MANAGEMENT (ECM)

Schools, colleges and universities have massive amounts of records and documents that need to be organized and managed. ECM systems serve as a centralized repository for an institution's digital content, encompassing document, records and digital asset management, and document scanning and capture. In support of transparency, open records and open meetings compliance, ECM can also include management of governance documents such as board meeting materials, meeting minutes, and board recommendations.

Administrative/Operational Data Systems

Administrative/operational systems that can be integrated into the educational dashboard application include:

- Enterprise resource planning (ERP) system
- Fiscal management system
- Grants management system
- Enterprise content management (ECM)
- Facilities and real estate management
- Geographic information system (GIS)
- IT management system
- Talent management system
- Media/library management system
- Social media management system

dashboard examples at all levels

Institutions looking to create their own dashboard don't have to start from scratch and can instead look to other organizations who have had successful dashboard implementations. The dashboards displayed show the type of data that can be tracked at various levels in the education system and what questions the dashboards can help answer. These dashboards can easily be replicated to get a dashboard started at your education institution.

NATIONAL DASHBOARD

U.S. Department of Education,
http://dashboard.ed.gov

Answers these questions, and more:

- What are the positive and negative trends for important indicators of educational progress?
- How is my state doing compared to the rest of the country?
- How are we doing at eliminating education gaps?
- What are the areas where progress is slow, where we need to focus additional resources and reforms in order to achieve our goals?

STATE DASHBOARD

New Mexico, http://nmped.datacation.net/

Answers these questions, and more:

- How are my district and school performing compared to the others in the state?
- Do all students have access to the same resources, regardless of demographic subgroup?
- Are teachers at my child's school highly qualified?
- Are students in my district meeting target proficiency scores in reading and math?
- Are my child's high school and district achieving target graduation rates?
- Are my child's school and district achieving improvements on a year-over-year basis?

DISTRICT DASHBOARD

Charlotte-Mecklenburg Schools,
http://pmd.cms.k12.nc.us/District%20Data%20Dashboard/Performance%20Summary/2008-2009.aspx

Answers these questions, and more:

- How well is each school doing compared to the CMS goal?
- Are there enough teachers employed at CMS to fill every school?
- Does my child's school have comparable staffing to another?
- Is the technology at my child's school equal to others in CMS?
- How safe were CMS schools this year compared to last year?
- Is my child's school making the same yearly progress as other schools?
- Are the buses at my child's school more prompt than at other schools?
- Did the CMS budget receive a favorable audit this year?

HIGHER EDUCATION DASHBOARD

Minnesota State Colleges and Universities,
http://www.mnscu.edu/board/accountability/index.html

Answers these questions, and more:

- Is my school's enrollment up or down?
- Is the tuition at schools in the Minnesota State Colleges and Universities (MNSCU) system a reasonable percentage of median income?
- What is the status of the facilities at MNSCU colleges and universities?
- How is the MNSCU system performing financially?
- Do a significant amount of students at my college drop out before earning their degree?
- Do most graduates obtain employment in their field?

ECM allows content to be reused and repurposed, ensuring consistent messaging and version control across the organization, and allows for record sharing and collaboration among multiple departments. In both K-12 and higher education, ECM helps an organization manage student document and record lifecycle by streamlining document management processes and workflow.

FACILITIES AND REAL ESTATE MANAGEMENT

Building automation systems (BAS), computerized maintenance management systems (CMMS) and real estate management systems help education organizations administer and maintain their facilities and real estate efficiently and consistently by streamlining such tasks as lighting control, building security, building maintenance and property lease management. These systems provide a wealth of operational data including energy consumption and costs and real estate and building valuation.

Building automation systems provide centralized control of mechanical and lighting systems, including heating, ventilating and air conditioning (HVAC), lighting and security in multiple buildings. They can be a powerful reporting and tracking tool because they allow institutions to automate, view, monitor, track, trend, diagnose and report environmental conditions, which can result in significant cost savings. Computerized maintenance management systems help organizations manage core maintenance activities, including asset and equipment, inventory, maintenance staff scheduling, vendors, work orders and repairs and inspections. Real estate management systems (often called computer-aided facility management or CAFM systems) allow tracking and managing of space allocation, real estate costs and revenue, and total cost of occupancy. They can be used to improve the efficiency of real estate holdings, develop space and cost forecasts, and allocate real estate costs to departments or functional business areas.

GEOGRAPHIC INFORMATION SYSTEMS (GIS)

GIS data includes mapping, geographic and demographic data from multiple sources that can be analyzed to help educational institutions provide better services, gain valuable insight into their constituencies, and manage resources and facilities.

GIS is used for campus and resource mapping (such as safety zones, parking facilities and emergency equipment); faculty, staff and student demographics related to various success or risk factors; illness tracking; student transportation routing; district boundary mapping; emergency preparedness and response; student recruiting; alumni tracking; and facilities management, including room capacity and technology infrastructure.

IT MANAGEMENT

This can include a number of diverse separate or integrated systems for managing IT services, equipment and users. Data collected from these systems can be used to create dashboards to provide a window into IT efficiency. Some key systems relevant to education organizations are:

- *Identity management systems* help institutions ensure system security by controlling IT system user identities and access.
- *Software asset management systems* make it easy to update and administer software versions, track usage, automate license management and enforce license compliance.
- *Application performance management tools* monitor performance of applications and user experience.
- *Hardware asset management tools* facilitate the life cycle management of hardware assets from acquisition to disposal.

SOCIAL MEDIA HELPS STUDENTS COMMUNICATE WITH EACH OTHER AND CONNECT WITH THEIR SCHOOL, AND IS PARTICULARLY USEFUL AS AN ADAPTATION TOOL FOR HELPING INCOMING COLLEGE FRESHMAN TRANSITION FROM HIGH SCHOOL BY CREATING A SENSE OF COMMUNITY WITH THEIR FUTURE ROOMMATES, TEACHERS AND ADVISORS.

TALENT MANAGEMENT

These systems improve educator, principal and administrative performance by helping educational institutions attract, develop and retain employees. Some colleges and universities use talent management tools, but they have not yet been widely adopted in K-12. An enormous opportunity exists for K-12 institutions to use talent management systems to meet federal requirements for tracking teacher effectiveness and ensuring that talent is distributed equitably among high performing and at-risk schools.

Talent management systems can be used to identify and develop career paths for high performing educators and potential administrative leaders and for leadership succession planning. They can also be used to track and measure employee performance, identify skills and performance gaps, and create training and professional development plans.

ADVANCEMENT/DEVELOPMENT

Education institutions need advancement/development solutions to help prepare and manage fundraising efforts and results, develop campaigns and measure their progress. These solutions support event management; telefundraising; annual giving programs, class gifts, pledges and capital campaigns; alumni relations; proposal development and tracking; stewardship activities; corporate and foundation relations; planned giving and major gifts; and donor, foundation and endowment management.

Data from advancement management tools is used to track campaign results and ROI, understand trends, predict outcomes and improve future development efforts. To help advancement administrators understand what works and what doesn't, campaigns can be dissected based on metrics for pledges, gifts, and matching gifts and analyzed by donor, campaign, assigned staff and funding purpose. They can categorize and track potential donors, and track development staff assignments and success rate for more effective pairing of staff with prospects.

MEDIA/LIBRARY MANAGEMENT

Managing library resources in the age of digital media is much more challenging than it was in the age of traditional books and periodicals. Media and library management systems help library administrators take control of both traditional and digital resources, including textbook management.

Library management systems allow librarians to easily manage licenses, sharing and other copyright issues. They can use resource usage and statistics to analyze and fine-tune content subscriptions. Digital content can be aligned to state standards and curriculum, so that students and educators can select resources based on their objectives and level of mastery.

SOCIAL MEDIA MANAGEMENT

Social media's role in communicating to students, prospective students and alumni cannot be undervalued. Many studies have shown that lack of student engagement is a risk factor for dropping out in both K-12 and college undergraduate environments.[28] Social media helps students communicate with each other and connect with their school, and is particularly useful as an adaptation tool for helping incoming college freshman transition from high school by creating a sense of community with their future roommates, teachers and advisors.

Many education institutions understand this and have worked to develop a dynamic, branded social networking presence using Facebook, Twitter and other tools. Data can be collected from these sites and used to quantify levels of student engagement. In addition to branded sites whose content is controlled by the institution, third-party social sites such as RateMyProfessors can be gleaned for information on educator rankings, course ratings and campus reviews.

HOW DATA IS TRACKED: KEY PERFORMANCE INDICATORS

As we have seen, so many different types of data can be collected — how does an education institution know which performance metrics to benchmark and track? These performance metrics, known as key performance indicators (KPIs), can be likened to a person's "vital signs." They are measurements or combinations of measurements that indicate the health of an organization's student/instructional and administrative/operational systems. They can be compared to a predetermined benchmark or serve as a simple notification.

KPIs will vary based on institutional and departmental or business area goals and end user role. Some users, such as state and district administrators, will need a macro-level view; others, like teachers, students and parents, will require micro-level information.

K-12 schools and institutions of higher education have very different KPI requirements. K-12 schools are focused on student outcomes because their funding and reputation depends on student performance and community satisfaction. Higher education institutions are also concerned with student performance, but additional emphasis is placed on revenue, fiscal management and advancement.

Here are some general guidelines on what data should be included in dashboards, but bear in mind that every organization will develop KPIs based on its unique needs and goals.

K-12

- ✓ Student performance, including grades, tests, standardized assessments, attendance, and comparison of demographic and geographic groups
- ✓ IEP tracking for special education students
- ✓ Notification of at-risk students, including grades, attendance, disciplinary action, demographics, evidence of engagement such as log-ins to school websites, participation in events and online interaction
- ✓ Usage statistics for media and library resources
- ✓ Degrees awarded, number of dropouts or students not receiving degrees
- ✓ Teacher effectiveness indicators, including student outcomes compared to other teachers in the school, district or state
- ✓ Measurement of educational climate, including student, teacher, parent and community satisfaction
- ✓ Students entering 4-year and 2-year colleges or workforce upon graduation from high school
- ✓ Percentage of students proficient in subject area standardized tests by demographics, schools, districts or states
- ✓ Dollars spent per student in schools, districts or states
- ✓ Status of state and federal funding initiatives
- ✓ Student health services statistics, including illness tracking by location
- ✓ HR statistics, such as promotions, raises, monthly payroll, status of top recruits, distribution of talent at at-risk schools, performance evaluations, status of individual professional development plans or identification of performance gaps
- ✓ IT usage statistics, such as network and application performance, system efficiency, heavy users of resources, equipment lifecycle or IT security and identification issues
- ✓ Notification of safety issues, emergencies or infrastructure problems

HIGHER EDUCATION

- ✓ Student performance, including grades, tests, comparison of demographic and geographic groups
- ✓ Recruitment, admissions and enrollment goals and demographics; status of recruits; admission offers accepted and denied; and the relationship between enrollment and financial aid offers

- ✓ Notification of at-risk students, including grades, demographics, evidence of engagement such as log-ins to school websites, participation in events and online interaction
- ✓ Usage statistics for media and library resources, campus documents and other content
- ✓ Number and types of degrees awarded, and number of students enrolling but not receiving degrees
- ✓ Students entering graduate school or the workforce upon graduation from college, student career choices by degree
- ✓ Resource utilization, such as staff, rooms, buildings, energy, lighting, paper, print toner, equipment, IT resources and parking permits
- ✓ Departmental/business area expenses and revenue compared to forecast
- ✓ Financial indicators such as general ledger, accounts payable and receivable
- ✓ Student health services statistics, including illness tracking by location
- ✓ Notification of important course registration information (empty and full sections, scheduling, etc.)
- ✓ HR statistics, such as promotions, raises, monthly payroll, status of top recruits, tenure information, employee performance or performance evaluations
- ✓ Purchasing information, such as status of purchase orders and notification of inventory problems
- ✓ Research information, such as status of grants and awards, or budget tracking
- ✓ IT usage statistics, such as network and application performance, system efficiency, heavy users of resources, equipment lifecycle or IT security and identification issues
- ✓ Notification of safety issues, emergencies or infrastructure problems
- ✓ Status of pledges, telefundraising, funding proposals, and campaigns; and alumni giving by school, department or career field

EDUCATIONAL DASHBOARD TECHNOLOGY IMPLEMENTATIONS

At its most basic level, education dashboards are implemented by installing dashboard software; it may also be called business intelligence (BI) or analytics software. However, as we have seen, dashboards are nothing without data: your institution must have a robust technology infrastructure for collecting and archiving data, including software applications for managing various student/instructional and administrative/operational data systems (described previously).

Dashboard software augments existing data systems by rolling up data from all functional business areas and departments into a single, centralized view that can be customized to provide individual users with role-based access to information from across the entire institution.

There is no typical installation. Campus technology infrastructure and capabilities are influenced by its existing enterprise data systems and personnel and resource needs. For example, a large district that has patched together a variety of homegrown solutions may need to upgrade all of its legacy data management applications and add dashboard functionality; a public university may need to implement a new SIS and deploy a campus-wide dashboard. A community college with a small IT staff may benefit from a hosted solution, while larger campuses may choose to deploy dashboards after migrating multiple databases to an on-site data warehouse.

Here are some common implementations, but again, these will be customized to your organization's particular situation. Currently, the majority of schools and universities that are using dashboards are employing one of the two on-site solutions. The use of hosted services may increase as colleges, schools and districts with fewer resources begin to launch dashboard or business intelligence initiatives.

Following this discussion of common dashboard deployment schemes are some examples of school districts and higher education institutions that are successfully using dashboards to enhance data-driven decision-making in their organizations.

SIMPLE ON-SITE DASHBOARD SOLUTIONS

Small schools or districts may need a dashboard solution that is easy to develop and install. There are a few simple options. The easiest option is to use an ad hoc dashboard solution — basic reporting tools with pre-configured dashboards are almost always bundled with individual data management applications, particularly SIS, LMS and ERP systems.

This option has the least functionality because ad hoc

Simple On-site Dashboard Solutions

Benefits:

- Easy to install and use right out of the box
- Do not overburden IT personnel
- Very cost-effective
- Provide enough functionality for many schools or districts, depending on size and capabilities of data management system

Use it when:

- Developing a single-purpose dashboard, such as a simple dashboard for public or parents
- Budget or IT staffing limitations limit the ability for more extensive systems
- Your school or district doesn't have many data management applications, and doesn't need to integrate dashboards with data reports or run reports using data from more than one system

dashboards may only work with data produced by the system they're bundled with, and may not be customizable. However many schools and districts will appreciate the insight they provide, because the primary systems (SIS, LMS, ERP) collect so many types of data.

Another fairly simple application of dashboards requires the user to purchase dashboard or analytics software and integrate it with existing data sources from multiple data management application databases. This type of implementation might work for organizations that are satisfied with the reporting tools that are included with their existing data management applications, but want to add uniform dashboard capability to diverse data sources.

Dashboard software is compatible with multiple types of databases or even spreadsheets. It may require a new "master database" to be added to the existing departmental or system data stores.

ON-SITE DATA WAREHOUSE

A more complex implementation would involve extracting data from disparate data management systems and their separate databases into a data warehouse. The dashboard/business intelligence software might be bundled with the data warehouse, or it could be a separate application that must be integrated with the data warehouse.

Organizations use a single data warehouse instead of multiple databases because overall, a data warehouse provides greater functionality. However, they are more expensive than simple dashboard solutions, and extracting data from databases and formatting it for use in the data warehouse is a complex process that makes for a longer start-up — the process could take months or even years, depending on how many systems need to be integrated and how much data needs to be migrated.

The data warehouse is capable of relating all the organizational data as a whole, whereas a database can only work with data from a single application. This does not necessarily improve the dashboard application, but it does allow data analysts to produce advanced, institution-wide analyses and reports in addition to dashboards. And because of its focus on analysis and comparison, the data warehouse is meant for long-term data archiving; databases, on the other hand, are more transactional in nature and were not designed for long-term archiving and analysis of trends over time.

On-Site Data Warehouse

Benefits:

- Greater functionality than simpler options because it can compare data from all areas of the organization
- Allows extensive reports and dashboards
- Better than databases for long-term data archiving and long-term analysis of trends

Use it when:

- Budget is sufficient
- In-house IT resources or consultants are available to manage complicated implementation process
- Project does not require immediate implementation

Data Center Hosted Services

Benefits:

- Turnkey solutions are very easy to implement yet still provide high functionality
- Very high reliability and performance
- Leasing and licensing costs decrease the cost of entry
- Access to "best-in-class" components and software

Use it when:

- Lacking one or more appropriate resources such as IT support, capital budget, or physical space
- Data management applications are already being managed in a data center

DATA CENTER HOSTED SERVICE

Using the client-server computing model, data center servers host data management applications, the dashboard software and the organizational data. A small application that uses client system memory and CPU for processing is required on the client system. Institutional users access the application from a server at the data center via a secure network connection, and must provide a software licensing key.

Several variations of the data center hosting model exist. In a common usage, data center hosted services are implemented as a turnkey solution that is managed and maintained by a technology vendor for a monthly subscription fee plus user software licensing fees. The vendor hosts the hardware and software infrastructure at its data center, which includes a high-performance Internet connection, world-class security, maintenance, back-up, disaster recovery, monitoring and service. Business intelligence and data applications may be hosted on dedicated servers or on servers shared with the vendor's other customers. Depending on the terms of the data center contract, the organization may own or lease the equipment.

In another model, an organization may want to have a hosted hardware/software platform without outsourcing IT services. In this case, it leases data center space and equipment; and its IT staff purchases, manages and maintains the hardware, software and services. Conversely, an institution may wish to work with a vendor that provides IT services using hardware and software that the institution buys and houses on-site.

CLOUD-BASED HOSTED SERVICE

Cloud computing is an emerging type of data center hosting that overcomes many of the limitations of the traditional client-server model. Applications are hosted and software licenses are managed on a server, not the client device. No installed client software is needed and the application is accessed through the Internet using the client's Web browser and log-in credentials, allowing virtually any client device to be used to access the application and creating the possibility for mobile use.

Cloud-based hosted services are served on demand using a shared pool of configurable technology resources that can be rolled out rapidly with minimal effort. Services and applications are shared among data center locations as server usage fluctuates, leading to the distinguishing characteristic of cloud-based services: the customer doesn't know the physical location of its systems, services and data. On-demand usage is matched with a buy-what-you-use pricing structure, leading to significant cost savings.

Cloud-based Hosted Services

Benefits:

- Allows access via virtually any client device
- Enables mobile use
- Browser-based end user interface means no client software needed
- Access to "best-in-class" components and software
- Sharing server resources is very cost-effective

When to use:

- Mobile device access is critical
- Lacking one or more appropriate resources such as IT support, capital budget, or physical space
- Data applications are already being managed in the cloud

Like the data center hosting model, there are many possible configurations for cloud-based hosted services. In a common model, a vendor of data management applications and dashboard software hosts a cloud-based, integrated dashboard/data management application. Depending on the combination of hardware and software used, these services may be called Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS) or Infrastructure-as-a-Service (IaaS).

Most of the reasons for using the cloud-based hosting model are the same as for the data center hosted option. Because it permits mobility, cloud-based hosting promises to dramatically transform the use of education dashboards, particularly in the higher education arena where mobility is so critical for students.

Cloud-based hosting is still in its infancy. The jury is still out on key issues such as security; recent high-profile security breaches and outages with hosted cloud computing services have given many potential users pause. But, as the economic benefits of sharing server applications without sacrificing performance and the Web-based ease of use become more visible, the technology is increasingly becoming more viable.

HOW DASHBOARDS ARE BEING USED

GLENVIEW PUBLIC SCHOOL DISTRICT

Glenview Public School District 34 is in Glenview, Ill., a northern suburb of Chicago. District 34 consists of three PreK-2 schools, three Grade 3-5 schools, and two Grade 6-8 schools with a total enrollment of just under 5,000 students.

District 34 began working in 2006 to develop a metrics and reporting solution to support its strategic improvement plan, emphasizing improvements in student achievement, climate and financial resources. It purchased a simple dashboarding solution that required an on-site application server and database repository that served as a repository for data from various external databases. The solution supports most Internet browsers and a number of mobile client devices.

Via the dashboard, district leaders, staff, parents and the community are able to measure and track student achievement metrics, including math, reading and writing assessments; school environment metrics, such as professional growth and community, parent, and staff satisfaction; and financial resources, such as auditing, fund balance and budget forecast.

> "THERE'S A NEAT THING ABOUT THE BUSINESS INTELLIGENCE SOFTWARE. IF SOMEONE IS CURIOUS, THEY CAN BECOME A DATA EXPERT. ALL IT REQUIRES IS CURIOSITY."
>
> BILL REICHELT, DIRECTOR OF ENTERPRISE INFORMATION SERVICES, COLLEGE OF ST. SCHOLASTICA

The dashboards are published on the district's webpage and provide a real-time monitoring tool that has received overwhelmingly positive feedback from the community and the school board. District 34 is evaluating other areas where it can leverage the dashboard tools to measure and report improvements.

COLLEGE OF ST. SCHOLASTICA

The College of St. Scholastica is a small, private Catholic Benedictine institution in northeastern Minnesota. In addition to its main campus in Duluth, St. Scholastica offers adult-learning courses in St. Paul, Rochester, St. Cloud and Brainerd, and offers online undergraduate and graduate programs. Total college enrollment is nearly 4,000 students.

St. Scholastica has been using business intelligence reporting and dashboarding systems for operational data since 2004. For administrative purposes, it relies on an ERP system to manage payroll, HR and financial data, which is fed to a database known as an operational data store as well as an enterprise data warehouse on the back end. Integrated on the front end is a sophisticated business intelligence solution that can use data from all enterprise sources to create reports, analysis, scorecards and dashboards. Recently, the college added a recruitment and admissions management system to the mix. On the academic side, St. Scholastica uses an LMS and is in the process of evaluating dashboarding and analytics for learning data. "There's a neat thing about the business intelligence software," said Bill Reichelt, St. Scholastica's director of enterprise information services. "If someone is curious, they can become a data expert. All it requires is curiosity."

IMAGE COURTESY OF WWW.EDUCAUSE.EDU

"YOU SHOULDN'T HAVE TO BE A ROCKET SCIENTIST TO USE BUSINESS INTELLIGENCE."

JOHN ROME, DEPUTY CHIEF INFORMATION OFFICER, ARIZONA STATE UNIVERSITY

Reichelt says that the college is developing ways to look at early warning signals and risk factors, analyze enrollment data, and work predictively with the advising department to help them measure demand and sculpt course offerings. "We've managed to use the business intelligence across the institution, and as one community," he says. "You can describe something to somebody but it's different to open a dashboard and see the same thing as the controller. It's a powerful change to the culture of the institution."

MESA PUBLIC SCHOOLS

With nearly 70,000 students, Mesa Public Schools (MPS) is Arizona's largest school district. Its 57 elementary schools, 11 junior high schools, six comprehensive high schools and several alternative schools serve students in most of the city of Mesa, plus portions of the cities of Tempe and Chandler.

MPS has been working over the last several years to reach many goals, including meeting new state reporting requirements, improving staff efficiency, enhancing data-driven decision-making, and increasing involvement of parents and students in the education process.

To meet its objectives, the district has implemented numerous data management systems, including an SIS that manages student data such as enrollment, demographics, disciplinary, grades, courses, transcripts, test results and assessment information. Teachers and administrators use an LMS to help measure and analyze classroom and curriculum improvements. A special education management system streamlines special education processes and helps generate student IEPs. The applications are built on a single, centralized database and designed to be accessed over the Internet.

Dashboards for teachers, parents and students engage every stakeholder in improving student outcomes. Teachers use an "electronic gradebook" application that's integrated with the SIS to perform complex student performance analyses. A parent portal provides near real-time information on enrolled students, and a portal for students helps them monitor assignments, events and performance.

ARIZONA STATE UNIVERSITY

With well over 70,000 students, Arizona State University (ASU) is the largest university in the United States by enrollment. Its academic programs are spread among four main campuses in the Phoenix area, and it has an extensive offering of online programs. In 2006, ASU launched an extensive set of Web-based dashboards to help improve information flow among faculty and staff.

ASU is using platform-independent dashboarding and business analytics software with a data warehouse and a few external databases. The school is very tech-savvy and began building its central data warehouse nearly 15 years ago. It originally used an ad hoc reporting tool. Over time, the university realized this tool was not user-friendly for the average end user and set out to create a more visually appealing and easy-to-use solution. "You shouldn't have to be a rocket scientist to use business intelligence," said John Rome, ASU's deputy chief information officer.

Besides the visual dashboard, a link is included back to the original data management system. If the user has access rights, he or she can view the data and go to the actual system of origin to make changes. In this way, the dashboard serves as an interface to ASU's data management systems.

Dashboards are available for almost every area, including enrollment, benefits reporting, payroll, personnel transactions, undergraduate and graduate admissions, faculty, budgeting, admissions, advising, academic profiles, student retention, degree programs and online learning. The most-used dashboards are for customer relationship management help desk support, high-level financials, HR, and research grants and award summaries.

The dashboard concept has proven very popular among what Rome calls casual users. ASU records approximately 600 dashboard uses daily among its faculty and staff.

GETTING STARTED WITH EDUCATION DASHBOARDS

Implementing education dashboards needn't be intimidating. Here are four questions to help you move forward on the path towards implementing them in your education institution.

1. WHAT ARE THE OBJECTIVES ?

There may be many, depending on your organization's needs and goals. Understanding your objectives helps identify your audiences. Perhaps you simply want to arm educators, administrators or department staff with the information they need to improve student outcomes, save money and be more productive. You may also need to meet state or federal funding or reporting requirements, provide a tool for communicating school or district performance to the community, or provide access to individual student performance to students and parents.

2. WHO WILL SUPPORT THE PROJECT?

Experienced users of education dashboards in K-12 and higher education say that the participation of key school leadership is critical to a successful deployment. Identify a high-level team of supporters that will shepherd the project through the organization. Determine who needs to be involved and get their buy-in and a promise of active involvement. They'll help develop a budget, identify lead staff members from each department and functional business area, and assign IT resources to the project. More important, they'll serve as the project's chief cheerleader, spokesperson, and salesperson to internal and external audiences.

3. WHERE ARE YOU NOW?

If your school is already collecting data from various data management systems, you're already halfway there. You'll need to identify existing data systems and work with IT staff to understand the supporting infrastructure to determine which technology solutions and vendors to evaluate.

4. WHAT WILL YOU MEASURE?

This depends in large part on what systems are already in place and whether you want to integrate dashboards with student and instructional data, administrative and operational data, or both. In some cases you'll create dashboard comparison representations using available data — for example, how many students enrolled last semester. But in other instances you may need to include a target — for example, projected compared to actual enrollment. So you must determine what benchmarks to create.

Every organization will be different, but here are a few examples of how different types of dashboards might be structured. Work closely with functional business areas and IT to understand security and privacy needs and to develop guidelines for role-based access to dashboards.

- *Educator Dashboard.* Individual and aggregated student data, including demographics, grades, attendance, disciplinary, at-risk status, assessments, test scores and standardized testing; disciplinary issues; measures of student engagement; and current class schedule should be included, along with separate dashboards for each category. To enable intervention as early as possible for gifted and at-risk students, it's useful to include a representation of exceptional students — those performing either below or above the norm. Help educators understand their own performance by giving them a dashboard view of their student and class outcomes compared to other teachers in the school and district. And offer a dashboard that includes comparison and benchmarks of performance evaluation, qualifications and professional development goals.
- *K-12 Administrator Dashboard.* School and district leaders are more interested in the "long view." They will not necessarily want a view of individual student outcomes, though they may want information on individual teacher, class and curriculum performance. They will want to compare performance indicators such as demographics; grades; attendance; disciplinary; at-risk status; assessments; test scores and standardized testing; and disciplinary issues at the school, district, and state level.
- *Student and Parent Dashboard.* Students and parents will see only performance data for the individual student, perhaps with aggregated data of his or her peers for comparison.
- *Dashboards for State and Federal Education Agencies and the General Public.* These dashboards will show very broad views of performance of schools, districts, universities, colleges and university systems using important measures of student performance and educator effectiveness. You may also need to offer dashboard measures for key performance indicators in the areas of finance, human resources, enrollment and admissions.

EDUCATION DASHBOARDS CAN BE USED TO HELP DATA MAKE SENSE TO MULTIPLE INTERNAL AND EXTERNAL AUDIENCES WITHOUT THE EXPERTISE OR TIME TO WADE THROUGH COMPLICATED ANALYSES.

CONCLUSION

As education organizations face the challenges of improving performance, they turn to a tool that many already have at hand: huge troves of data collected and stored by various campus data management systems. Education dashboards can be used to help data make sense to multiple internal and external audiences without the expertise or time to wade through complicated analyses.

Educators and administrators may remember the challenges and complexities they faced when implementing SIS, LMS and other data management systems with little fondness. In this light, they may be tempted to view education dashboards as yet another analytics technology that will only increase the mountains of data already being collected, further complicating their reporting and analyses efforts.

We encourage you to instead view dashboard technology as the missing piece in your organization's data strategy — the piece that will help transform your data into visual representations that can be called up at the click of a mouse to provide an at-a-glance explanation of a critical performance indicator to all audiences, regardless of data analysis expertise.

By bringing information to all levels of the education institution, members of the community and government education agencies, education dashboards actually ease the data burden and provide knowledge and business intelligence to help improve student outcomes and teacher performance, increase organizational efficiency and perform better financially.

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"Better decision making is what motivates organizations to invest in business intelligence tools and that is what Perceptive Software's Business Insight product provides ImageNow users. Using our library of reports/dashboards, drag and drop authoring studios to build specific reports/dashboards and access to report output within the ImageNow/WebNow clients, customers can make fast, accurate, fact-based decisions about their business processes."

JOANNA CRESPINO, PRODUCT MANAGER, PERCEPTIVE SOFTWARE

"Teachers armed with technology and the right data can reach more students and improve learning while keeping costs under control. Metrics can help match student performance on assessments with attendance, standardized testing trends and grades across disciplines, enabling educators to intervene as necessary and shift focus to where they can be most effective."

SIMONA ROLLINSON, PRESIDENT, FOLLETT SOFTWARE COMPANY

"Technology is an essential element of the operations of any educational organization that is tasked with improving effectiveness while reducing costs. HP offers a range of integrated document workflow solutions that facilitate educational processes, from streamlining teaching and grading tasks to reducing administrative costs."

LESLEY HARRIS, VICE PRESIDENT PUBLIC SECTOR, HP IMAGING AND PRINTING GROUP

"Adopting a powerful, robust, and reliable Education Data Management (EDM) system is critical to the success of students in any educational institution. An efficient and comprehensive EDM solution utilizes technology resources and high quality data, information, and knowledge to inform instruction practices, enhance educational outcomes, and improve operational efficiencies."

DONNA BOIVIN, EDUCATION SOLUTIONS SENIOR CONSULTANT FOR DELL, INC.

"True achievement of accountability and transparency is rooted in the quality of the data used in the dashboard. An ECM (Enterprise Content Management) system is the foundation providing accurate, secure and constant delivery of data. By eliminating the silos of information and connecting each stakeholder, data can be collected, shared, stored, secured, updated and delivered across the entirety of the organization."

LINDA DING, EDUCATION PROGRAM STRATEGIST, LASERFICHE

Promoting Student Success from a Single Source

Our rapidly changing world challenges today's educators to engage students in and out of the classroom. Giving students easy access to learning tools in a safe digital environment while simplifying your classroom management and communication encourages success. Viewing how goals or metrics affect every school, grade, teacher, class and student in your district focuses your efforts. Integrated software solutions let you achieve these goals so you can spend more of your time on learning environments — and more time with your students.

Follett Software Company's technology solutions include learning management systems, student information systems, and educational data analysis, all developed from a commitment to help inspire students with a lifelong passion for learning. Our tools enable you to create and sustain a rich, collaborative learning environment, all in a user-friendly setting.

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The Cognite™ learning management system enables students, educators, and parents to share and organize material — all from a single access point. Cognite facilitates the creation of an engaging curriculum from shared resources and access to a library of more than 300 digital content providers. This allows teachers to assess progress, manage grades and share lesson plans, teacher-created content and ideas. Digital workspaces let students manage class resources and discover critical learning tools.

Streamline communication.
The Aspen Student Information System (SIS) offers real-time integration of student data in a single place, increasing transparency between the front office, classroom and the home. Schools and districts of any size enjoy significant operational improvements with Aspen through both high-level and detailed information views, while analysis lets educators spend less time on administration and more time on student learning.

Make decisions with confidence.
TetraData® Insights is a robust suite of educational data analysis, management, and vision alignment tools designed to help districts drive systemic change while promoting a more purposeful and transparent culture. TetraData connects data points across district resources to create an accurate, real-time picture of school and student performance, so you can more easily evaluate the impact of resources, expenditures, and staff experience and development.

Maintain your success.
PD Reach™ professional learning services supports your goal of a successful, simple and seamless transition to our integrated educational technologies by blending structured classroom learning with webinars and eLearnings. Our on-site training with expert-delivered instruction — along with webinars to educate users quickly and efficiently — help your staff develop and maintain proficiency with tools so educator time is spent on what matters most: the success of every student.

Follett® Software Company
A Follett Corporation Company

Follett Software Company provides the K-12 educational community with open, integrated technology and content solutions that engage and inspire next generation learning. Follett's digitally powered systems, training and services help districts achieve better results by maximizing resources—from library materials, digital content, textbooks and other assets, to school and student data.

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EDUCATION INNOVATED SOLUTIONS

Managing data, eliminating unnecessary administrative tasks and improving student achievement

Teachers and administrators today rely on data to provide critical feedback on student progress and drive curriculum corrections. They look to technology to provide this data on demand and in an easy-to-consume format. Student achievement relies on real-time data being in the hands of the people who need it, when they need it.

Samsung understands these needs and provides integrated, scalable printer solutions for administrators and teachers to quickly scan, test, grade and manage data to more effectively and securely track student progress and eliminate unnecessary administrative tasks. These best-in-class printers check data for compliance with federal privacy regulations, scan documents and physical objects to help teachers develop digital lessons, retrieve and assemble mandated special education annual reports on students, and print out student data and reports for formal presentations.

Samsung printers are truly “Education Innovated” solutions that improve teacher effectiveness, student achievement and administrative efficiencies through an open platform that allows for creative, education-focused solutions.

PRINT SOLUTIONS PROVIDE:

- Central printer management and communications to back office
- Test grading and integrated reports with student information systems and learning management systems
- Secure data with FIPS compliance to address HIPAA and FERPA needs
- Ability to scan objects to create digital objects for lessons
- Capability to retrieve and assemble mandated special education student annual reports
- Printed student data and reports for formal presentations
- Scanning and storing for disciplinary, health & other sensitive records

SAMSUNG

For more information, visit www.samsung.com/education.

Solution Spotlight: HP

Standardized Technology Environments:

Real-life examples of cost savings, reliability and energy efficiency

Schools from K-12 to graduate level have technology needs in common: cost control, reliability and energy efficiency. HP offers an industry-leading portfolio of imaging and printing devices, designed with the environment in mind. Breakthroughs such as HP Auto-On/Auto-Off technology — an industry first,* which delivers up to 50% energy savings** so schools can reduce costs and their environmental footprint, is just one example of HP EcoSMART solutions. Standardizing and consolidating to fewer, more energy efficient devices with increased functionality is an effective strategy schools are using to increase productivity while reducing the overall costs of their print and imaging fleet.

At Idaho's Meridian Joint School District No. 2, employees enjoy network printing and shared resources from same-model HP LaserJet printers across offices. Jerry Reininger, Meridian director of information technology, says, ***"With the financial constraints we're under, schools are looking closely at the impact of optimization and manageability because it's a way to cut costs without compromising educational quality."***

Georgia's Cherokee County School District standardized on HP printers so students and teachers could enjoy reliable technology that supports an infrastructure to continue the district's top-five U.S. ranking. Assistant Superintendent Bobby Blount explains, ***"HP provides a great product line with multiple solutions for all of our needs, from classrooms and media centers to front offices and administration. Having such an array of products and services to pick from is very important to our standardization strategy."***

The Episcopal Academy in Philadelphia had a different problem: it needed new technology after moving onto a new campus. By creating an all-HP printer environment, the school improved printing access and reliability. Catherine Hall, director of technology, explains, "Before, it was the Wild West of printing around here. We didn't know who was printing, how much was being printed, or where." Now, after implementing the HP Universal Print Driver to facilitate printing to any HP printer, and money-saving measures such as default duplexing and need-restricted color printing, Hall says, ***"It's so different to have reliable printers that are up all the time, and knowing exactly where to find one and access it. HP has done a great job for us."***

Helping educational institutions save money, reduce waste and streamline technology is part of HP's commitment to providing efficient print environments for students and administrators, so they can spend more time on the most important goal: learning.

* HP Auto-Off capabilities subject to printer and settings. Compares energy consumption of HP LaserJets with HP Auto-Off Technology to top competing models based on market share as of September 2010. Energy consumption based on HP internal testing using the ENERGY STAR® program's Typical Electricity Consumption (TEC) method or TEC value found at energystar.gov./eu-energystar.org using greatest TEC value reported. Actual power usage may vary.

** HP Auto-Off capabilities subject to printer and settings.

Use the HP Green IT Action Plan to drive sustainability and decrease cost: **www.hp.com/go/greenITplan**.
For information on special offers for HP printers visit: **www.hp.com/go/SpecialOffers**.

Supercharging ECM with workflow and e-forms

Today's higher educational facilities continue to struggle with increasing mounds of paper — and the quandary of managing all those documents, while also complying with strict mandates for records retention.

Perceptive Software's enterprise content management (ECM) product suite, including ImageNow document management, document imaging and workflow, changes the equation by helping organizations easily eliminate the paper trail. ImageNow turns manual paper processes into efficient electronic processes, with all important documents and information stored in one central online repository. These searchable electronic documents allow staff and administrators to access, share and collaborate on important information.

The results can significantly reduce time-consuming manual efforts, such as drudging through file cabinets or transporting records between buildings. Additional benefits can include reduced storage and space costs, improved customer service and less paper waste.

To further unlock the power of its ECM system, Perceptive Software offers industry-leading workflow and e-forms software to automate business processes — and create quick ROI:

Drive efficiency with advanced workflow

Think of the processes your facility manages every day: Admissions handles enrollments. The business office might deal with supplier invoices, while advancement processes donations and grants. Some tasks may require a chain of steps and approvals by various personnel to complete.

Perceptive Software's ImageNow Workflow intelligently manages those steps as complete workflows. Within a workflow, documents are routed directly to the right people for immediate action, and then to the next person in the chain. Records can be automatically dispatched to users' work queues based on business conditions; specific data inside documents, databases and e-forms; and other criteria.

The software also prioritizes a user's tasks, and then sends customizable alarms and alerts to encourage action.

ImageNow's powerful workflow features allow higher learning organizations to:

- Significantly increase staff productivity and job satisfaction
- Drastically reduce completion of regular tasks
- Immediately improve distribution and management of information

E-forms help ECM work even smarter

By also adding ImageNow eForms, educational facilities can gain further efficiency, especially when working with resumes, enrollment applications and other information submitted via a website or online portal.

ImageNow routes electronic forms entered via the Web or portal automatically to admissions or other relevant department and personnel through workflow. The employee can check and review the form content, make annotations, and apply version control and retention policies. The ECM platform can then associate the information with other systems and records in your system, for example, to a student's record held within the school's student information system.

When it comes to ECM, Perceptive Software understands the paper chase like no other company, and provides advanced tools to drive user efficiency, productivity and satisfaction.

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For more information, visit us online at **www.perceptivesoftware.com/skipthesearch** or call 1-800-941-7460.

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SHOULDN'T THE SAME THING BE TRUE FOR THEIR TEACHERS?

Information technology may have changed the world, but it hasn't done nearly enough to help educators make the most of their time and talents.

At GlobalScholar, our next-generation solutions help everyone get the information they need—where, when and how they need it. So administrators can make better decisions, students can realize their full potential, and teachers have more time to connect, to teach and to inspire.

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BY DONNA BOIVIN, EDUCATION SOLUTIONS
SENIOR CONSULTANT FOR DELL, INC.

Education Data Management:

Turning Data into Actionable Information to Enhance Student Achievement

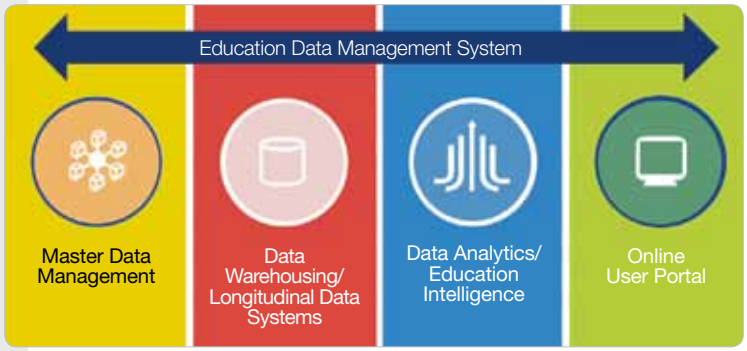
Adopting a powerful, robust, and reliable Education Data Management (EDM) system is critical to the success of students in any educational institution. An efficient and comprehensive EDM solution utilizes technology resources and high-quality data, information, and knowledge to inform instruction practices, enhance educational outcomes, and improve operational efficiencies.

What is Educational Data Management?

EDM is a data system solution for educational institutions that transforms high-quality data into actionable knowledge that can be used to improve educational outcomes and track student information over multiple years. An efficient EDM not only enhances the ability to efficiently, effectively, and accurately analyze academic data and report on that data, it also provides a platform to optimize information management for enterprise-wide operations such as HR, finance, facilities, and other functions.

Our Approach to Education Data Management

Dell is committed to helping districts, states, universities, community colleges, and technical schools create robust, high-quality EDM systems. Dell's services include all of the technology solutions, integration processes, change management strategies, professional learning, and tools needed for success. Our core EDM components include: Master Data Management, Data Warehousing, Education Intelligence Tools, and an Online User Portal.



Dell is providing critical EDM support services to help Laramie County School District #1

To provide the foundations for a robust Longitudinal Data System, Dell is delivering frontline support for key technology initiatives including virtualization, data storage, and data warehousing. Data is extracted, transformed, and loaded from various district data sources into a comprehensive data warehouse. Educational Intelligence tools and a flexible and easy-to-use SharePoint® user interface will allow users to access, analyze, and report on information. Phase 1 of the LDS project is scheduled to launch in the Fall of 2011.

> "When we decided to create a Longitudinal Data System for our district, Dell provided the technology and support services we needed. We are excited for the expected results."
>
> *— Gordon Knopp, Director of Technology (CIO), Laramie County School District #1, Cheyenne, WY*

Robert Morris University realizes $60,000 in annual cost savings with solution designed by Dell

Dell designed and helped the university implement a robust, self-service reporting solution using Microsoft® SQL Server® 2008 data warehouse along with SQL Server Reporting and Analysis Services, and SharePoint®. Benefits to the university include a projected reduction of 31 hours of IT support per week for an annual $60K savings, as well as a six-figure cost avoidance on the purchase of an alternative software solution.

> "We'll no longer have to reinvent the wheel every time someone needs a report. I expect to free up about one-third of my time for more value-added tasks."
>
> *— Dino Cehic, Programmer Analyst, Robert Morris University*

For additional EDM information, visit www.dell.com/edm, or contact a Dell EDM expert at EDM@dell.com.

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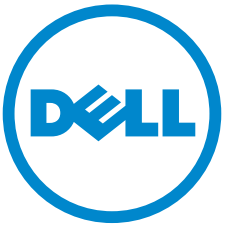


Caroline Brown is a writer and researcher specializing in communications for technology, education and science organizations.She has worked for several years in both corporate and non-profit communications. Her educational background includes an M.A. in Journalism and Mass Communication from the University of North Carolina at Chapel Hill. Caroline currently resides in Raleigh, N.C.

With assistance from Jeana Bruce, the director of publications for the Center for Digital Education and Becki Johnson, associate editor for the Center for Digital Education.

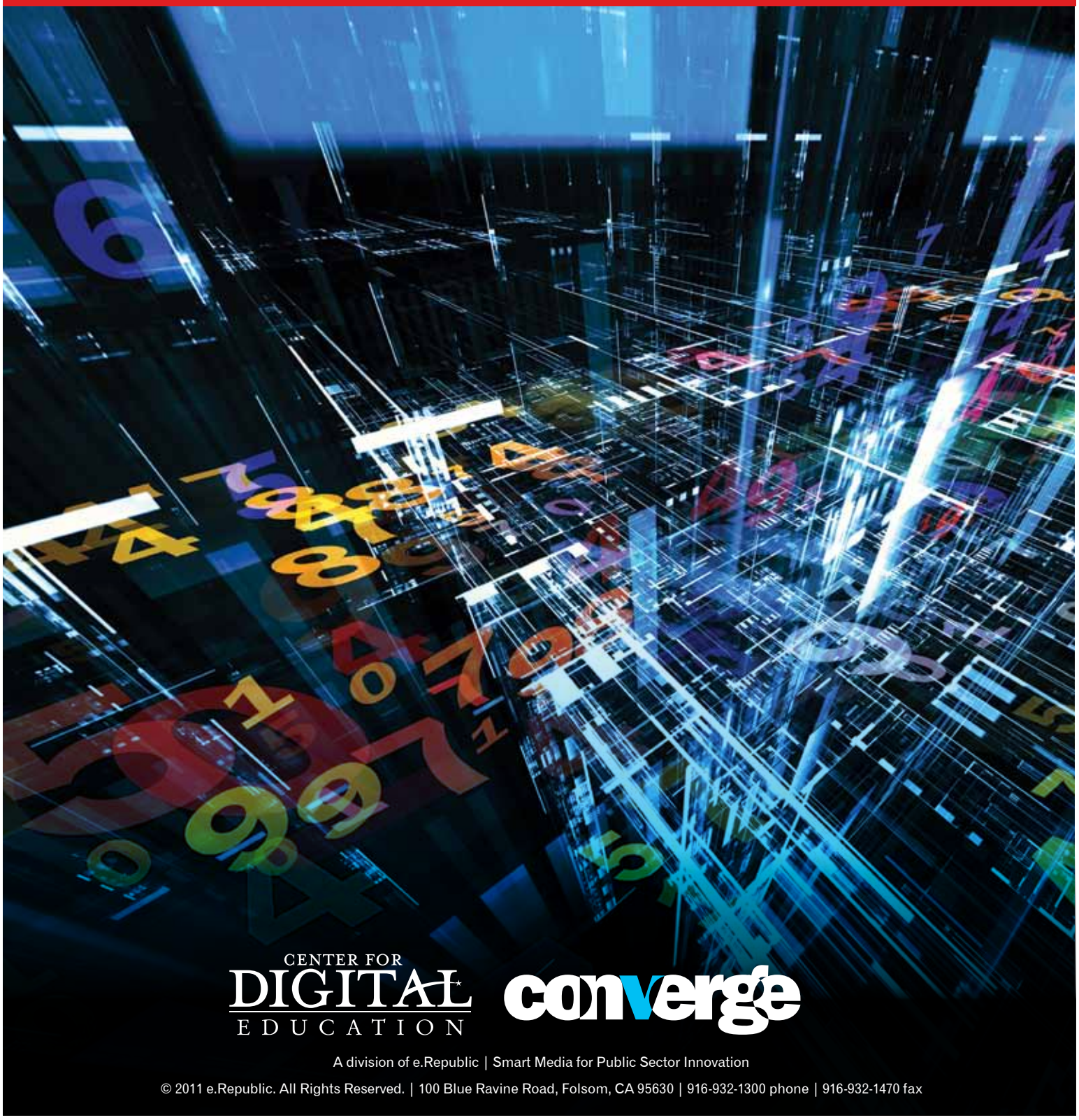
The Center for Digital Education is a national research and advisory institute specializing in K-12 and higher education technology trends, policy and funding. Along with its research services, CDE issues white papers and conducts the annual Digital School Districts and Digital Community Colleges surveys and award programs as well as hosting events across the K-12 and higher education arena. CDE also supports the Converge media platform comprised of the quarterly themed Converge Special Reports, Converge Online, and custom publishing services.

Coming in September

The Converge Yearbook is a once-a-year recap of what the market has been buying, the trends, and a highlight of K-12 and higher education innovators. In addition, this special issue gives a sneak-peek at forthcoming major purchases and highlights — with photo pictorials — the major events of the past year.

This unique publication validates those making great strides in education and showcases the market's personality — a who's-who that is inspirational for readers at all levels of authority, and a fun memento no one will want to miss.

You will be able to download a free copy at www.convergemag.com/reports.



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