Increasing student success with big data in education

Strategies for building a high-performing, evidence-based culture with data and analytics
Are students in certain college programs more successful? Are initiatives to help first-generation or low-income students working? These are the kinds of questions educators want to answer with confidence – and evidence. Using big data, institutions can determine what impedes student success, why some discontinue studies while others flourish, and what interventions will make the most difference.

This is the mission of Achieving the Dream, the national community college network that champions evidence-based institutional improvement.

Focusing on college readiness, community engagement and knowledge sharing, Achieving the Dream has helped more than 4 million community college students achieve their dreams by creating a culture of data and evidence as a basis for educational reform.

This e-book shares knowledge and strategies you can use to move from a focus on student access to one that prizes access and success for all students.

Table of contents

Data drives destiny 2
A culture of evidence 6
Evolving your institutional insight 10
Lessons learned, looking forward 14
Data drives destiny

How a culture of evidence combined with big data in education will transform our community colleges – and why it is so critical now

Karen Stout, EdD, President and CEO, Achieving the Dream
I am drawn to collecting and analyzing data. In an odd way, this attention to data keeps me motivated and focused. For example, my Fitbit activity tracker tracks my daily calories, activities and steps, and syncs to my phone, giving me a daily, weekly, monthly and annual visual summary of my progress against my goals. The Virtual Run Coach app on my smartphone plots out a customized daily, weekly and monthly training plan that changes with me based on my progress. I get data on my performance and visuals that show my progress.

These technology tools put quantitative rigor and consistency to the patterns of an active life. I think of the maxim, “You cannot manage what you cannot measure” – sometimes attributed to statistician and quality expert Edwards Deming, sometimes to management consultant Peter Drucker (claimed by neither). Either way, data and my smartphone keep me honest and on track, continually charting progress against goals.

The data-driven life

Data is in my genes. As a young girl, I was fascinated with data. I memorized the statistics of all the major league players from the baseball cards I collected. I diligently kept score at games to track performance against the statistics on the cards. The 2003 book *Moneyball* sang to me. That book affirmed that an analytical, evidence-based approach could create a competitive sports franchise in spite of financial disadvantage.

Decades before *Moneyball* came out, I was already searching for truths to be found in data. Early in my career in community college administration, I created a strategic planning council presentation where I manually sorted through and synthesized data to look at student ZIP code against age, ethnicity and majors to develop a five-year enrollment development plan. After that exercise, institutional research started to report to me, and I was soon developing dashboards and effectiveness models well before the Middle States Commission on Higher Education cared and well before the accountability movement was upon us.

I have long been a believer that a love for data – and a deep curiosity to look to data for answers to the “cause to wonder” questions – can transform our community colleges.

The reform imperative

The US community college system is central to our economic vitality. Economists project that by 2020, more than 60 percent of jobs will require more than a high school diploma, yet only about half of those jobs will require a four-year degree. The other half of those jobs represent the vast

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need for skilled workers in technical and trades positions, such as licensed practical nurses, machinists, robotics technicians and aviation maintenance personnel. Our country needs 11 million more credentialed workers by 2025 to ensure US competitiveness, said Bill Gates, former Microsoft chairman and CEO. That’s a big gap.

The tragedy is that millions of young people are falling through the gaps rather than filling them. According to the US Bureau of Labor Statistics, more than 5.5 million young people (one in seven teens and young adults) are neither working nor in school. The youth unemployment rate is more than 11 percent. For young African-Americans it is more than 20 percent.

In his recent book, *Our Kids: The American Dream in Crisis*, Robert Putnam speaks to the alarming opportunity gap that has emerged between young people from “have” and “have not” backgrounds. He makes a case that for many, the American dream is no longer self-evident. We have to turn that around.

Community colleges play an important and growing part in addressing both the workforce gap and inequality. “Despite their mixed record, community colleges have real promise as a means of narrowing the opportunity gap by providing poor kids with a realistic path upward,” Putnam wrote. “To serve that role, they need more funding, improved student services, better connections to local job markets and to four-year colleges, and a lower dropout rate.”

This is where movements such as Achieving the Dream come in. This national reform network uses several approaches to close achievement gaps and accelerate student success. Working directly with community colleges, we offer technical assistance, support and peer learning experiences to promote evidence-based institutional change. We work with state leaders and community colleges to influence policy reform. And we promote best practices by conducting and sharing original research on success strategies and meaningful metrics. As the nation’s most comprehensive network of community college reformers, Achieving the Dream helps establish consensus, coalition and shared commitment.

The centrality of data in shaping the future

Data is central to meaningful reform. If community colleges are to adapt to better serve the country’s future, we can’t just espouse a new image. We can’t count on rebranding efforts to make our colleges more attractive.

“You [college presidents and boards] can’t communicate your way out of this problem,” said Rick Hesel of the rebranding firm Art and Science Group. Those days are gone, and for most of us were gone years ago.

The heart of our renewal agendas must be formed around evidence, not spin. For the potential to open the doors and windows of our colleges, data drives destiny. Margaret Wheatley, author of *Leadership and the New Science*, wrote: “We need to have information coursing through our systems, disturbing the peace, imbuing everything it touches with new life. We need, therefore, to develop new approaches to information — not management but encouragement, not control but genesis.” For community colleges, this genesis revolves around student progress and completion.

Big data in education can tell us about what we don’t know about our students, their motivations and their habits. Data can tell us how and when we can provide the essential learning supports blended with the right pedagogy, at the right time for the right students for their academic, career and life success. Big data in education can teach us about the capacities we must build to become high-performing organizations that will improve student learning while repaying public investments and keeping tuition affordable. Data can help our institutions remain viable in a changing world, where we have to balance a historic mission of access to a new mission of access and success.

See how SAS supports Achieving the Dream
Are we ready?

Despite much progress in using data and analysis to support better decisions, there’s a lot of work to do. A 2014 National Association of System Heads (NASH) study of the institutional research (IR) function among public university systems raised some troubling findings:

- IR teams are struggling to keep pace with rapidly increasing demand, caused both by accountability needs and growing interest in using data to improve performance and inform decision making.

- Decisions in critical areas – such as resource utilization, efficiency, connections to the workforce and how resource use leads to student success – continue to be made without appropriate information.

- While the quantity and quality of available data is improving, the use of information in decision making is not improving at the same rate. The main focus of IR offices is still compliance reporting.

- Despite evidence that colleges are investing more in IR, there are still extreme variations in staffing levels and staff skills and experience, particularly in community colleges.

“IR offices are running hard and yet many are still falling behind, deluged by demands for data collection and report writing that blot out time and attention for deeper research, analysis and communication,” the NASH report states. “The analytical functions remain topically stove-piped, with the IR office focused on student and student-related research, with reporting and research in other topical areas handled in the budget office. ... The overall ability of IR offices to use data to look at issues affecting many of the cross-cutting issues of the day, such as the connections between resource use and student success, is nascent at best.”

There are data management obstacles to evidence-based transformation as well:

- Unevenness in data definitions across colleges, states and sectors makes it difficult to compare performance across colleges and see what works.

- There are too many non-standard data definitions within systems (even within a single college with multiple campuses) to make full strategic sense of the data.

- Due to disparities among systems and campuses, too much time is spent finding and cleansing the data, time that could be better applied to analysis and communication.

- Legacy information systems weren’t developed to accurately code some groundbreaking innovations, such as the use of co-requisites. We then have to rely on unconnected shadow databases to evaluate progress.

In many respects, these are not technology gaps but leadership gaps, gaps in how we as leaders develop and nurture a culture of evidence to help us continually learn, improve our effectiveness and in turn improve outcomes for students.

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A culture of evidence

How big data in education will guide community college transformation

Karen Stout, EdD, President and CEO, Achieving the Dream
NFL players have a chip on their shoulders. Literally. Starting with the 2015-16 season, the league embedded RFID (radio frequency identification) chips into players’ shoulder pads. The chips provide real-time access to vector data such as players’ position on the field, their velocity, direction of travel, and yardage covered during a play. And the information coming from the chips can be used in a number of ways to enhance the game. Media outlets can use that data for enhanced replay. At-home viewers can see the data come to life in an NFL app for Xbox One and Windows 10.

It seems there isn’t an aspect of our lives that isn’t touched by data, including our dreams.

In 2013, The New York Times wrote about digital technology that advances our ability to understand the statistically recurring patterns in our dreams. The article ends with a solid hypothesis — that dreams are meaningful to a considerable degree — and a question: How much more might an enhanced system of big data dream analysis teach us about people’s lives?

Thinking as educators, how much more might big data analysis teach us about students’ lives and further accelerate the work of Achieving the Dream? The mission of this national reform network is to improve college completion rates, especially for the most underprepared students. Our information systems can be powerful enablers toward this goal.

Technologies such as cloud computing, advanced business intelligence systems, and visual analytics have redefined what community colleges can do with data, how fast it can be done, and how readily it can be shared and applied. Administrative staff can get real-time and accessible reports, dashboards, and data visualizations to optimize services and processes. Students, advisors and instructors can get in-the-moment advice and alerts to improve performance. We have only begun to explore the possibilities.

However, the greatest data and analytics in the world won’t have any effect if they don’t fuel a decision or change something. That requires a culture where people understand, value, and demand fact-based decisions and strategies.

From instinct and intuition to data and analytics
In the 2003 book Moneyball: The Art of Winning an Unfair Game author Michael Lewis documents the data-driven strategies that produced the competitive 2002 Oakland Athletics baseball team. The central premise of Moneyball is that traditional statistics used to assess players, such as stolen bases, runs batted in, and batting average, are relics of a 19th-century view of the game, and that the collective wisdom of baseball insiders is subjective and often flawed. Rigorous statistical analysis showed that other metrics, such as on-base percentage and hitting percentage, are better indicators of success. Luckily for the Oakland A’s, those qualities were cheaper to find on the open market than more traditionally valued qualities, such as speed and contact. This data-driven approach flew in the face of conventional wisdom and was met with skepticism. General Manager Billy Beane had heated discussions with his scouting team. They didn’t believe the numbers. Beane prevailed. His counterintuitive approach to player selection led to a team that was competitive with much larger market teams, such as the New York Yankees. Beane achieved that success with a payroll of $44 million, compared to the Yankees’ $135 million. And his value-sourced team made the playoffs in 2002 and 2003.

This is just one example of how analyzing all available data helped to surface the attributes that really mattered, identified players who had been under-valued by the market, and assembled a team that was destined for success. Isn’t this just what our nation’s community colleges are trying to do?

Anatomy of an analytical ecosystem
Whether you call it an “evidence-based,” “data-driven,” or “analytical” culture, it’s important to think in terms of an ecosystem rather than about institutional processes or a technology platform. In an ecosystem, all parts work together to keep the system in balance. Healthy ecosystems are strengthened and sustained by diversity. And they are controlled by both external and internal factors. A functioning analytical ecosystem must include the following elements:
Mission/commitment. A strong, stated commitment to evidence-based decision making as an institutional value that has consistent buy-in, involvement, and investment from the board, presidential leadership, and senior management.

Planning systems. Strategic and annual planning systems with clearly stated, measurable goals (long-term, medium-term, and short-term) and aligned key performance indicators that reach deep into the organization.

Support structure. An organizational structure/architecture that values and supports institutional research and information technology, coupled with strong systems for data management and governance.

Training and development. Skills building to enable employees at all levels to gain the needed level of data awareness and analytical competence.

Reporting and analysis. Tools and approaches such as Kaplan and Norton’s balanced scorecard to enable staff to develop unit- and course-based success cards and explore “what-if” scenarios.

As we work with community colleges to build the data capacity that serves this culture, four basic requirements become evident:

Get more granular. Understand the importance of using disaggregated, longitudinal cohort data. This idea was revolutionary in its time but commonplace for most colleges now. In addition to looking at aggregate data, dig deep into data that describes subgroups of students.

Get to the “why.” Data can very well tell us what happened. Achieving the Dream colleges also use focus groups to bring in the voice of students, faculty, and the community to clarify why something is happening.

Uncover the obstacles. Find the underlying factors that impede student success. Determine what should be done differently to help students succeed, and address those needs through interventions or policy changes.

It will be those of us who harness the value of analytics who are best positioned to compete, thrive, and optimally support our students for success in the future.

See how SAS supports Achieving the Dream
Prove what works. Assess each intervention to determine its effectiveness. In our early experience, many interventions worked, and some were scaled. Overall, the work has informed our thinking and moved us to more “whole college” approaches and reforms such as pathways and advising redesign.

**A matter of degrees**

Sound data principles alone will not make data-driven decision making come alive or make a difference. “The numbers have no way of speaking for themselves; we speak for them,” wrote Nate Silver in his 2012 bestseller *The Signal and the Noise*. Silver is the statistician who successfully called the outcomes in 49 of 50 states in the 2008 US presidential election and was named one of “The World’s 100 Most Influential People” by Time in 2009.

The numbers need an advocate, a Billy Beane – ideally, a campuswide legion of advocates – as well as the processes and channels to deliver data in consumable fashion to the point of action. Our colleges must have well-thought-out methods for getting faculty, administrators and senior leaders to engage with the data, believe in it, and use it to support decisions about institutional improvement and transformation.

I’m pleased to report that there is progress in that direction. According to Diana Oblinger, President Emerita of EDUCAUSE, the conversation in colleges has moved from “What is analytics?” to “How do we get started, and how do we use analytics well?”

Certainly, analytics capabilities in higher education are developmental. It will take time. It must be tended and nurtured; it is not linear, and it is messy. And it is not an either-or proposition. Institutions vary in the degree to which their people, processes, technology, and culture are prepared for the challenges of data-driven transformation. This readiness can be conceptualized on a maturity index from analytically challenged to analytically inspired.
Evolving your institutional insight

Where does your organization stand on its analytical maturity?

Karen Stout, EdD, President and CEO, Achieving the Dream

Aiman Zeid, Head of Global Business Consulting and Organizational Transformation Services, SAS
Big data in education can give us deep insights into college applicants and students, their motivations and habits, which ones will struggle and why. However, what sounds like simple cause and effect (i.e., big data leads to better decisions) is actually a complex issue. And it starts with analytics.

Analytics combines science and technology to mine information, uncover hidden trends and forecast potential outcomes in a student’s journey through college. Analytics can pinpoint the right interventions to help identified students achieve their academic and career goals. It can reveal which institutional investments will deliver results at the best value, and how to become a high-performing college while keeping tuition affordable.

We are past the stage of justifying analytics to inform our decision-making process. Most colleges, like their counterparts in the private sector, have had a taste of how analytics, and the insight it produces, can improve the accuracy of our decisions – and validate our assumptions and strategies.

All we need is technology, right?

Often the first reaction is to buy analytical and reporting tools to manage, mine and extract knowledge from the data already on hand. Unfortunately, institutions cannot buy their way out of an information jam with technology. Rather than focusing solely on the information platform and tools, institutions need to assess and develop four pillars in concert:

- **People (skills and resources).** Do we have enough skilled people in the right roles to support the institution’s information needs? Are they empowered to create and act on data-informed insights?

- **Information processes and operating model.** Are information processes fragmented at the individual or department level (think renegade spreadsheets), or are they aligned to institutional strategy and goals?

- **Technical information infrastructure.** Does the institution have the necessary data management, reporting and analytical capabilities to answer its most pressing questions?

- **Organizational culture.** Is there a culture that expects the use of data to support decisions? Will people use data to make decisions? Is information sharing the norm? Is there sufficient financial support for this effort?

It takes four pillars – people, processes, technology and culture – to drive meaningful use of information. Technology is just a piece of the puzzle.

Finding your starting point

Some public community college systems are far ahead of others in developing these pillars. Many leading institutions have created a sophisticated institutional research (IR) function that is well-integrated with IT and meets both internal needs for information and external accountability demands. These institutions have good data sharing among systems and campuses and a high degree of differentiation in roles between the system and the campus.

That is not the norm in higher education – yet. The Achieving the Dream network is working to change that. The mission of this national reform network is to improve college completion rates, especially for the most underprepared students. Data-informed decisions are central to that mission.

The investment is worth it. If the four pillars are lacking or out of alignment, the institution misses out on the full value of its technology investments. For example, information processes may be repeated each time a new question arises, which adds cost and delay. Multiple methods may be used, each drawing on different versions of the truth, which leads to inaccurate and inconsistent results. Ultimately, users then lose confidence in the data and fall back on educated guesses.

See how SAS supports Achieving the Dream
A systematic model to assess analytical maturity

In the books *Information Revolution* and *Business Transformation*, thought leaders at SAS defined the Information Evolution Model to articulate the various stages of maturity in how organizations manage and use data. Based on years of global consulting expertise, this model provides a framework to assess where you are today, the alignment (or misalignment) of the four pillars, landmarks at each level, and how to chart the evolution journey from there. It has guided successful transformations for organizations across industries and around the world.

The model defines five levels grouped into three categories:

**Challenged**

**Level 1.** At the individual level, individuals own and control data and use it to tackle day-to-day functional issues. The institution is in firefighting mode, project to project. There is little or no support or technology for a culture of evidence, and only spotty data and limited interest in analytics.

**Level 2.** At the departmental level, departments take control of their information and start to produce performance reports and metrics for their function. Still, systems are isolated into information silos and not well-aligned at the college level.

**Foundational**

**Level 3.** The enterprise-level institution integrates information from across functional areas into an institutionwide information environment with clear support from leadership. Reporting and analysis are effective and accurate, so people trust the data and use it to make decisions. The institution has a clear view of its internal information chain.

**Progressive**

**Level 4.** At the optimization level, quality data and advanced analytical capabilities are used to optimize outcomes across the institution - both in terms of operational efficiency and student success. The institution sees tangible improvements in key functions and metrics.

**Level 5.** Finally, at the innovation level, data supports deep and continuous renewal. There is a highly skilled IR/IE/IT team that focuses on new ways to achieve priorities. The college routinely reaps the benefits of enterprisewide analytics capability to find new ways to serve students, enhance success and manage operations.

Each level is a natural precursor to the next higher level; each higher level encompasses and exceeds all previous levels.

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**Where does your institution rank?**

Most community colleges have evolved out of the risky and ad hoc Level 1 phase, with its information mavericks. Many higher education institutions are at Level 2. Most have made great strides in managing the data but have not advanced as far in analyzing that data and communicating the
insights. Even in the enterprise world, most organizations have not fully achieved Level 3 status.

The Information Evolution Model helps colleges understand where they are today and how to structure their unique evolution journey from here.

**Signs of a rise in culture of evidence**

We are seeing sure signs of a rising culture of evidence. Achieving the Dream colleges are:

- **Making investments** in hiring new IR staff, buying new IT systems, forming data planning committees and improving professional staff data skills.

- **Owning their stories** and putting collective energy into improvement – converging around a consistent and intelligent methodology rather than arguing about the quality of the data or a specific metric.

- **Establishing data governance** and a philosophy of campuswide data stewardship rather than isolated data ownership.

**Engaging with the data** through self-service business intelligence, data visualizations, mobile apps and dashboards to inform policy and practice.

Momentum is building. There is growing enthusiasm about the work on our campuses, and more people asking the sorts of questions that spark new ideas.

In *Good to Great and the Social Sectors*, Jim Collins said it well: “In building a great institution there is no single defining action, no grand program, no one killer innovation, no solitary luck break, no miracle moment. Pushing with great effort - days, weeks and months of work, with almost imperceptible progress - you finally get the flywheel to inch forward. But you don’t stop. You keep pushing …”

Many of our Achieving the Dream colleges are now a full decade into this work. We’re seeing progress in developmental success rates, gateway course completion rates, persistence rates and, for many of you, a significant increase in the numbers of degrees, certificates and credentials conferred. The flywheel is in motion, and we’ll keep pushing.
Lessons learned, looking forward

Data-informed community colleges are changing the conversation—and the results

Karen Stout, EdD, President and CEO, Achieving the Dream
Evidence-based institutional improvement
Why are students successful in certain demographics?
Are we meeting certain college key thresholds that we have set?
Are students who have experienced certain programs within the college more successful?
Are initiatives to help first-generation or low-income students working?

These are the kinds of questions educators want to be able to answer with confidence — and evidence. Better data leads to better decisions that help drive success for students and the institution. Better analytics leads to new discoveries that would otherwise be missed. Better self-service discovery and visualization tools change the culture to one where people embrace data and use it for guidance.

This is the mission of Achieving the Dream, the national reform network that champions evidence-based institutional improvement. The national initiative was conceived in 2004 by a visionary group of partners and investors led by the Lumina Foundation. With support from partners, investors and network members, Achieving the Dream has expanded to include more than 200 colleges across 35 states and the District of Columbia.

Together, we have changed the conversation from a focus on student access to higher education to one that prizes access and success for all students, particularly low-income students and students of color.

Data is central to that mission. Big data in education can tell us what we don’t know about students, their motivations and their habits. Data can tell us what impedes student success, why some discontinue studies while others flourish, and what interventions will make the most difference. Data can identify capacities we must build to become high-performing organizations that improve student learning while repaying public investments and keeping tuition affordable.

When used effectively, data highlights when and where students struggle, helps prioritize efforts around what is working and what is not, and sets a direct, clear course toward sustainable institutional change that advances student achievement.

That’s why building a culture of data and evidence is a prime focus area for us. Achieving the Dream colleges use data-informed decision making to close achievement gaps and improve student outcomes. That mission is critical because we will need 11 million more credentialed workers by 2025.
Continuous progress. Quantifiable results.
We have seen firsthand what happens when there is long-term, sustainable commitment to improving student success. Achievement gaps close. Momentum builds. Lives change. Neighborhoods flourish.

By all accounts, the consortium concept for institutional reform is working. A 2014 survey showed many positive changes for community colleges that joined the Achieving the Dream network:

96% increased their use of data.
95% intensified their focus on student success.
79% revised and/or created new policies and procedures to support student success.
73% added more resources to support student success.
66% improved student outcomes.
66% reported broader faculty engagement and more courageous conversations.
63% achieved greater commitment to equity and closing achievement gaps.

These are encouraging results, but there's more to be done, and we have to change our approach if we hope to get there.

Figure 2. Improving student outcomes takes time, but we're seeing steady progress.
**Evolving the model**

The model that worked in the early stages of Achieving the Dream is not working for all of our colleges today. We started with five founding principles: committed leadership, evidence-based decisions, broad engagement, systemic institutional improvement and equity.

The five founding principles remain relevant. We are evolving to a new theory-of-change model based on what we have learned, much of it from a 10-year focus on evidence-based approaches. The new model is based on seven capacities that we believe lead to a high-performing, student-centered culture that boosts student progress and completion.

**What leads to a student-focused culture?**

The new model adds focus to three capacities that were not highlighted in the old model:

- **Teaching and learning.** Success requires intentional attention to our core work. This is about empowering faculty to advance student success by improving the method and practice of teaching — building coherent and clear course and program sequences, engaging in pathway design and advising reform. Our “cafeteria” approach must move to one where students see a clear academic path with academic supports well-aligned with those paths.

- **Strategy and planning.** We must design with the end in mind — plan for scale on the front end of design rather than on the back end. Tiger Woods said his father told him to play the hole from flag to tee box, rather than from the tee box to the flag. That subtle change in thinking changes one’s entire approach. We are also learning that scale can be universal (an intervention touches all students) or targeted (the intervention only touches certain students).

- **Data and technology.** IT and the use of data have changed profoundly since 2004. Think cloud, Hadoop, high-performance analytics, visual analytics, mobile apps and more. So much has changed about what is possible, even commonplace, in using data as a lever for campus transformation.

**Figure 3. The seven capacities that lead to a high-performing, student-centered culture.**
You don’t see the culture of evidence capacity in the new model, but it didn’t go away. Far from it. Implicit in this model is the understanding that high performance in every area requires use of evidence. It’s an inherent part of the model.

The big hypothesis, of course, is that colleges that rank strongly in all seven areas will see significant aggregate movement in student success and completion no matter what intervention strategies they choose to embrace – guided pathways, advising redesign, etc.

Some colleges are further along in this journey than others. Early-phase colleges may need a full Achieving the Dream “treatment.” Others may need deep, customized technical assistance in one, two or three areas. We are developing a capacity assessment tool for colleges to assess strengths and gaps in each area and modifying our coaching model and services to match this more customized approach.

Looking ahead
I’d like to conclude by offering some thoughts on the trends in this analytics movement, as well as barriers that we will continue to face. As leaders in community college reform, we need to:

Show the value. The accountability movement is not going away as it did in past cycles of conversations about higher education reform. The Chronicle of Higher Education contributor Jeff Selingo challenges us all to take the lead in defining the value of our institutions and figuring out how to measure it before others do it for us.

There are worthy efforts, such as the Voluntary Framework of Accountability (VFA) for community colleges and the Skills Assessment Manager (SAM) for gauging proficiency with Windows applications. Achieving the Dream metrics will need to be increasingly aligned with these efforts.

We need to engage journalists, private vendors and others who have access to our data to help tell their story about our value. Selingo speaks to the potential power of LinkedIn, for example, to combine new government statistics with the wealth of information it has on users to show the economic impact of what we do.

Data and analysis are not enough to show the value. As an English major, I also understand the importance of storytelling and using narrative to synthesize and express the patterns we find in data. With big data, the story is richer and more detailed than ever before.

Gain deeper insights into pedagogy. We have an urgent need to blend learning analytics with student information systems so we can learn more about student learning behaviors in and out of the classroom. To do this we must work to build vendor crosswalks, persuade faculty to adopt tools to make a difference, and address skepticism about moving from a transactional approach to a holistic one in advising students. We must re-examine the adviser and the faculty role in advising and perhaps bring deeper use of analytics into that process.

Develop partnerships. We are in a new era of partnerships, Partnerships 2.0, where our data systems must be connected across K-12, community colleges and universities, state agencies, labor market data, social services data – and even integrated with private vendor data.

Our Working Students Success Network (WSSN) strategy is one example. This innovative Achieving the Dream program integrates and bundles three distinct but related services – job training/placement, access to student financial aid and tax credits, and financial education and products – to help families build assets and self-sufficiency. Naturally this three-pronged approach requires a flow of data across multiple partner systems.
Invest in institutional research (IR). We must build further depth in our IR operations and extend support for applied research by faculty. We need more “semiprofessional analysts” on our campuses – professionals skilled in:

- Managing large quantities of data.
- Using visualization tools and techniques.
- Designing experiments.
- Speaking the language of research.
- Telling the stories that come from that research.

We need to develop deeper analytical expertise in middle managers so they have technical skills plus the ability to work in teams and communicate and synthesize findings, results and next steps. We need to speak the language of data.

Organize for openness and agility. We need to rethink not just how we staff the institution but how we design the organization to facilitate openness and agility.

- **Organizational dynamics.** IT and IR need to strengthen their relationship. Data stewardship across the institution needs a new and more strategic look. The head of the data decision support system must be part of top leadership.
- **IT tools.** The tools to handle the volume, velocity and variety of big data continue to improve in most vertical markets, but higher education is not keeping up. We seem less willing to abandon legacy systems and less bold to adopt open source solutions or combinations of open source and proprietary systems.

Closing thoughts
Community colleges remain the nation’s gateways to good jobs for millions of students who dream of a better tomorrow. Yet too often these dreams are cut short. Nearly half of all students seeking higher education choose a community college, but less than half of those students actually finish what they start.

For the first time in our history, the current generation of college-age Americans will be less educated than their parents’ generation. Those without an education will be unable to compete in a national landscape that more than ever before demands high-level job skills.

Achieving the Dream network members are working to turn that around. They’re creating a strong culture of data and evidence to make sure investments in reform are the right ones, the ones that pay off.

The goal is too important for anything less. Student success means so much more than a personal goal attained. It means better skills, better employability, and economic growth for families, communities and our nation as a whole.

Achieving the Dream
Conceived as an initiative in 2004 by Lumina Foundation and seven founding partner organizations, Achieving the Dream now leads the most comprehensive non-governmental reform movement for student success in higher education history. Together with a network of more than 200 higher education institutions, 100 coaches and advisors, 15 state policy teams, and numerous investors and partners working throughout 35 states and the District of Columbia, ATD is helping the community college system transform itself to improve progress, success and economic opportunity for four million community college students.
Community colleges are tasked with meeting the workforce demands of today and tomorrow, while broadening access to education and improving student success rates. When administrators at community colleges harness the value of data and analytics, they are best positioned to compete, thrive and optimally support their students. Achieving the Dream shows how an analytical ecosystem can help colleges achieve those goals and serve students from the orientation to graduation – and beyond.