Over the past few decades, the profile of the typical college/university student has changed dramatically. Higher education needs to evolve as well. Members of today’s new student majority—including students from low-income backgrounds, first-generation college-goers, students over the age of twenty-five, and students of color—demand a learning environment that is more personalized. That is, they require learning that is more specific to their individual needs and goals.

Fortunately, technology provides educators and administrators with tools that can tailor the learning experience to the individual, help at-risk students master core skills, and develop guided pathways that assess students’ progress toward graduation and suggest interventions if challenges arise along the way. Although much must be done in order to implement the needed changes for personalized learning, the vision and evidence for unlocking student success drives us forward.
How Personalized Learning Unlocks Student Success

Why College?
Completing a postsecondary program has never been more important—both to whether a student will thrive or struggle and to whether the U.S. economy will grow or stagnate. Students with a postsecondary credential or degree are more likely to be healthy, employed, and civically engaged. With each step of the educational ladder they complete, their average earnings also increase.¹

By 2020, 65 percent of all jobs in the United States will require a postsecondary credential. Yet in 2013, only about 40 percent of working-age Americans had one.² Consequently, colleges and universities are under intense pressure to increase retention and completion rates.

At the same time, today’s students come from diverse backgrounds, face unique challenges, and often juggle numerous responsibilities in addition to their studies:

- 40 percent are over the age of twenty-five.
- Nearly 40 percent are the first in their family to go to college.
- 40 percent of full-time students and 76 percent of part-time students work while going to college.
- 38 percent are part-time students.
- 26 percent are raising dependent children.³

This increasingly varied student population makes it more important than ever to ensure that those of us in higher education not only are helping students complete their higher education but also are doing everything we can so that colleges and universities are ready to meet the needs of today’s students.

Getting to and through College
Enrollment in postsecondary education has grown by more than 50 percent over the last twenty-five years. However, over the past twenty years, more than 31 million Americans—15 percent of today’s working-age population—left college without earning a certificate or degree, and millions more are dropping out every year.⁴

According to ACT, freshman/sophomore-year retention rates range from 55 percent (for two-year colleges) to 64 percent (for non-selective four-year institutions).⁵ And according to the National Center for Education Statistics (NCES), the completion rate for first-time, full-time undergraduate students who began their pursuit of a certificate or associate’s degree in fall 2010 was just 29 percent. The completion rate for first-time, full-time students who began seeking a bachelor’s degree in fall 2007 was 59 percent.⁶ These statistics are troubling, and unless they change significantly, the U.S. economy will face a shortage of workers with postsecondary education.

Unfortunately, one of the strongest predictors of whether a student will complete a degree or certificate is not his or her intelligence, test scores, or grit, but family income.⁷ The hard truth is that although higher education has unique potential to be a bridge to opportunity and the middle class, it too often serves as a barrier.

The goal of the Bill & Melinda Gates Foundation is to ensure that students complete a postsecondary program that helps them support themselves, engage in their communities, and achieve their dreams. Our partners and grantees are tackling the challenge of how best to adapt to the new student majority. Their research shows that personalized learning can help students, especially underserved students, complete a certificate or degree.

What Is Personalized Learning?
Rather than trying to apply a one-size-fits-all approach to education, personalized learning offers students an individualized approach that is specific to their preexisting knowledge, learning needs, and goals. Students learn best when their education is targeted and
tailored to them. Examples of personalized learning activities that have been demonstrated to improve student outcomes include:

- adapting the scope of instruction based on assessments of students’ existing knowledge, skills, and gaps;
- using personalized hints or prompts that support students during learning activities or assessment items;
- prompting learners to generate explanations of how they have approached an activity (e.g., “show work”);
- employing algorithms that adapt the presentation of content based on relevance to learners’ goals; and
- adapting the complexity or presentation of content based on a student’s learning.

What if all of higher education had a strong culture of continuous innovation focused on adaptive learning experiences responsive to individual learners’ goals? What if new, innovative tools could make personalized education not only effective in terms of learning outcomes but also economically feasible?

Imagine that remedial and general education programs are personalized to suit the prior knowledge, skills, and personal interests of each student. In place of large, anonymous lecture classes where many first-generation and low-income students struggle, students could instead participate in interactive, blended courses where they would have access to continuously improving content, adaptive simulations, problem sets, and assessments.

Research shows that powerful new teaching, learning, and advising tools can help advisors and educators to be more personalized in how they instruct and advise students.

Research shows that powerful new teaching, learning, and advising tools can help advisors and educators to be more personalized in how they instruct and advise students. A personalized learning approach and environment can engage students and provide timely feedback and robust student supports. This higher-quality teaching and advising can result in greater retention and in higher rates of program completion.

“Good” Personalized Learning
Imagine that students everywhere are able to receive the most effective adaptive instruction at a reasonable price, using technologies and resources that tailor the learning to the individual.

Imagine that instead of an emphasis on lectures, the entire higher education system devotes time and attention to helping students achieve fluency and mastery through greater one-on-one tutoring, targeted group instruction, peer support, and other resources. In such an environment, students could take ownership of their learning and achieve mastery at their own pace.

Imagine that compelling personalization tools and advising applications are readily available to all students so that they can track their progress and achieve their individual goals. These tools would serve as personalized maps that motivate and guide students along every juncture of their postsecondary educational experience. Advisors and faculty would also use these tools to see where students are struggling and where they are succeeding, allowing the advisors to make real-time adjustments, deploy critical learning interventions, and apply increased or different supports based on the needs of each student.

Personalized Learning Today
The good news is that this world of innovative personalized learning interventions already exists. The capabilities are out there, and once they are adopted by more higher education institutions, more students will receive a personalized education and be able to reach their full potential. Technologies that boost the development of student-centered pathways, improve student supports with predictive analytics, and improve learning outcomes are emerging at postsecondary institutions around the nation. In addition, a growing body of evidence is demonstrating that new technologies can personalize learning at an unprecedented scale. At the foundation, we are working to accelerate the development of these technologies and to increase an understanding of how they can be used by faculty and advisors to help students achieve greater success on their way to a credential. From our grantees and research, we’ve learned that when at-risk students take high-quality blended courses (i.e., a combination of in-class and online courses) they can master the same amount of content in half the amount of time. We’ve also seen pass rates for at-risk students increase by one-third in blended courses.

Digital Courseware
Within personalized learning, digital courseware is a powerful lever to increase accessibility and affordability for students. The foundation partners with learning education technology organizations and colleges/universities to develop and scale the adoption of next generation digital courseware.
that delivers personalized learning. Through our Next Generation Courseware Challenge, we are funding high-quality courseware solutions to help low-income students succeed in high-enrollment general education courses, where they often struggle.

**Adaptive Courseware**

While the available evidence shows that adaptive digital courseware can yield better outcomes for learners, it also points to the possibility that these innovations may assist in reducing instructional costs by unlocking the potential of accelerated course completion. Research also has been able to identify where and how adaptive learning can have the biggest impact (see figure 1), so that institutions and policymakers can make the most of their resources for increasing student success.

**Integrated Planning and Advising for Student Success**

Integrated Planning and Advising for Student Success (iPASS) gives students and administrators the data and information they need to plot a course toward a credential or degree, along with the ongoing assessments and nudges necessary to stay on course toward graduation. iPASS combines advising, degree planning, alerts, and interventions to help students navigate the path to a credential. These tools draw on predictive analytics to help counselors and advisors determine in advance whether a student is at risk of dropping or failing out, and it can help assist students in selecting courses (see figure 2).

Multiple studies have documented the impact that these types of tools can have on student success. “The Effects of Student Coaching in College” report found a 4 percentage point gain in completion from interventions such as iPASS—and often at lower cost than other types of interventions. iPASS has also improved student success at early innovators like Arizona State University, which saw its graduation rate increase by 11.6 percentage points. Furthermore, results from the first round of iPASS programs demonstrate an increase in full-time enrollment, which research finds leads to a greater likelihood of college competition. Finally, the use of iPASS is tied to stronger advisor engagement, higher-quality data to guide and inform student plans, and increased likelihood of student success.

One example of iPASS is Degree Map at Austin Community College (ACC). In 2011, ACC transitioned from an all-paper advising process to an e-advising system, in an effort to better track progress and conversations for its students. With Degree Map, students are engaged and...
### FIGURE 3. Norris/Baer Framework: Optimizing Student Success through Analytics

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<th>ELEMENTS</th>
<th>DESCRIPTION</th>
<th>EXAMPLES</th>
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| 1. Manage the student pipeline                | Scientifically refine strategic enrollment management of the student pipeline. | • Use data mining and predictive analytics to improve the recruitment, admission, and enrollment of entering students (raise numbers) and improve chances of student success; and  
• Use longitudinal and predictive analytics to craft policies for improving success of at-risk students. |
| 2. Eliminate impediments to retention and student success | Eliminate structural, policy, and programmatic impediments to retention and success. | • Use analytics to support comprehensive first-year programs;  
• Eliminate bottlenecks in courses and program progressions; unreasonable prerequisites and other requirements; and  
• Use predictive analytics to shape policies and practices to enhance retention in sophomore-senior years. |
| 3. Utilize dynamic, predictive analytics to respond to at-risk behavior | Embed analytics in academic and administrative support processes to enable real-time interventions dealing with at-risk behaviors, both academic and co-curricular. | • Use dynamic, predictive analytics to determine at-risk behavior in courses early in the semester;  
• Embed predictive analytics in processes; and  
• Monitor levels of student engagement in academic and co-curricular activities and intervene with students who can be saved. |
| 4. Evolve learner relationship management systems | Build tracking systems that can track and manage the many facets of learner progress and identify and respond to at-risk behavior. | • Create the learner equivalents of customer relationship management functionality, supported by predictive analytics; and  
• Extend dynamic, predictive analytics to learner relationship management. |
| 5. Create personalized learning environments/learning analytics | Embed personalized learning analytics into learning management systems and learner relationship management systems. | • Create personalized learning modes with embedded predictive performance analytics;  
• Use these analytics-rich systems to personalize learning outcomes; and  
• Create learning experiences reaching beyond formal curricula. |
| 6. Engage in large-scale data mining           | Use data mining to illuminate pathways to student success and discover unforeseen insights. | • Leverage data mining to drive predictive modelling in processes;  
• Use forensic data mining to explore unthought-of correlates of success; and  
• Engage in cross-institutional comparison and cross-sectoral comparison. |
| 7. Extend student success to include learning, workforce, and life success | Expand the definition of student success to include the entire student lifecycle—cradle to career, including learning, work, learning-to-work transitions, and workforce success. | • Extend into Alumni analytics;  
• Undertake data mining spanning institutions, industries, and sectors; and  
• Pioneer pathway-to-success analysis. |

Source: Donald Norris, Linda Baer, et al., A Toolkit for Building Organizational Capacity for Analytics (Strategic Initiatives, 2012), p. 34. Reprinted with permission.

Today, the iPASS market includes over 100 vendors offering solutions that include components such as degree audit and planning, analytics and reporting, and alerts. The strongest iPASS programs combine these tools to best support students, advisors, and faculty members. Working together with the Community College Research Center, and in partnership with technology providers and colleges/universities, the foundation supports the development of technologies that improve student retention through iPASS, recently helping to provide grant awards to twenty-four institutions that are transforming advising in higher education.

### Essentials for Successful Implementation

The successful implementation of personalized learning usually comes with a strategic shift at higher education institutions—from leaders to those working directly with students. As a result, the institution focuses on allocating resources and implementing business practices in a way that ensures each student’s success. This requires that institutions and their leaders build core capabilities in student analytics and change management.

What underpins personalized learning and advising environments, however, is the use of learner analytics to drive institutional improvement around individual student success. This requires moving from the static data traditionally used for accountability purposes to gathering and
How Personalized Learning Unlocks Student Success

using real-time learning and advising data, which can inform decision making for administrators, student supports, and students themselves. This type of data allows important stakeholders to make informed, action-oriented decisions and allocate resources for student success. Faculty, advisors, and other staff to learn to use new technologies and analytics. To be successful, institutions must move forward with administering business practices that better support student success (despite existing environmental constraints) and with fostering students. However, it had experienced challenges in getting faculty to use the new tools and the network in a proactive way. One of QCC’s ongoing challenges in change management will be enabling students to benefit earlier from the support network.

The Norris/Baer Framework (see figure 3, p. 18) highlights the interdependence of different dimensions of the college/university when planning to use data for student success. For many institutions, transformation starts with engaging students, then collecting and using predictive data to inform retention, create learning environments, and support students moving into the workforce. Norris and Baer also offer a diagnostics review that institutions can use to determine how they should develop their analytics capabilities.

Change Management and Continuous Improvement

Personalized learning interventions cannot be effectively utilized and deployed without the connective tissue of organizational strategy and change management. This means aligning organizational processes such as strategic planning and capacity building. It also requires providing appropriate time, development, and supports for leaders, a culture of continuous improvement using the newly available tools.

An example is Queensborough Community College (QCC), which used Starfish Early Alert and Connect modules to create a network of student support services across the campus, including the Academic Literacy Center, the Campus Writing Center, the College Discovery Center, the Math Learning Center, and the Student Learning Center. This Student Support Network gathers real-time feedback from faculty and students to guide students to the resources that are most pertinent to their needs at the right time. This has allowed a breakdown of silos between support services, as well as between faculty and students. The redesign also provided a structure that can respond intentionally to student needs with the right intervention resources available on campus. For example, QCC found that academic tutoring was one of the more promising interventions when delivered appropriately to at-risk students. However, it had experienced challenges in getting faculty to use the new tools and the network in a proactive way. One of QCC’s ongoing challenges in change management will be enabling students to benefit earlier from the support network.

Swift and meaningful changes must be made to the outdated design of the postsecondary system in order to create the flexible and personalized learning environment needed by today’s student majority.

The Time Is Now

With more than 40 percent of first-time, full-time bachelor’s degree-seeking students at four-year postsecondary institutions dropping out before finishing a certificate or degree within six years, we can’t afford to stand by and do nothing. Swift and meaningful changes must be made to the outdated design of the postsecondary system in order to create the flexible and personalized learning environment needed by today’s student majority.

Benjamin Franklin is said to have observed: “Tell me and I forget; teach me and I remember; involve me and I learn.” Personalized learning involves students in their own growth and encourages them to take ownership of their learning. The structured, individualized, and supported approach helps them see a clear and guided pathway to academic and career success.

Bringing personalized learning solutions to the broader U.S. higher
education system will require major system changes and buy-in from colleges and universities around the nation. We have no time to waste in unlocking student success. Students deserve the environment and supports that will help them reach their full potential and earn their higher education certificate or degree.

Notes

Yvonne Belanger, Julia Gray, Jason Palmer, and Tracy Sherman also contributed to this article.


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