

Early Momentum Metrics: Why They Matter for College Improvement

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Postsecondary reform has several important goals, including improving degree completion, increasing students' chances of reaching well-informed goals, and closing equity gaps in student achievement. Thus, long-term measures—such as overall increases and improved equity in completion rates and employment outcomes—will eventually signal the success or failure of the current reform movement. But in seeking to reform college practice to improve student success over the long run, there are two broad reasons why stakeholders should initially focus on near-term measures.

First, graduation and employment will occur years in the future. If we rely on longer term metrics, we will have to wait several years after reforms are implemented to begin to get an indication of whether they are working. If we can find measures of near-term progress that predict long-term success, then we can gauge the effectiveness of the reforms much earlier. While near-term progress does not guarantee longer term success, it is unlikely that long-term success will occur if near-term outcomes are stagnant.

Second, focusing on near-term outcomes is not only valuable for the purpose of evaluation; it can also motivate and help guide continuous improvement and adjustment of reforms. If students begin their college careers off-track, then they will spend their first year not making progress toward their goals. In addition to wasting students' time and money, lack of progress in the first year can lead to excess credits and difficulties in transfer, and lowered chances of program completion. An examination of first-year metrics can motivate colleges to introduce practices that create the initial conditions necessary for subsequent success.

In this brief, we propose three measures of “early momentum” for both of the reasons described above: Research is beginning to show that these near-term metrics predict long-term success, and the metrics focus attention on initial conditions at colleges that are particularly important for solidifying the foundation for student success. While these measures are valuable individually, as a group they give a better picture of the impact of reforms on students, and thus are more valuable if used together. These measures include:

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1. **Credit momentum**—defined as attempting at least 15 semester credits in the first term or at least 30 semester credits in the first academic year.

Credit momentum is easy to measure and emphasizes the need to accumulate credits to arrive at completion. However, because it does not consider the content of the credits, on its own it does not provide much insight into the effects of reforms to college-level programs.

2. **Gateway momentum**—defined as taking and passing *pathway-appropriate* college-level math and college-level English in the first academic year.

Gateway momentum begins to focus attention on the content of credits. It also provides an indicator of the extent to which colleges have removed barriers to success created by traditional prerequisite remediation (Jaggars, Edgecombe, & Stacey, 2014; Scott-Clayton & Rodríguez, 2012), and how much they have moved to integrate academic support into college-level coursework.

3. **Program momentum**—defined as taking and passing at least nine semester credits (three courses) in the student's field of study in the first academic year.

Program momentum is a more explicit indicator of the potential effect of reforms such as program maps and redesigned intake advising on student outcomes. This indicator is more meaningful if the college's programs are coherent and well organized.

In the following sections, we present evidence that these metrics predict long-term success and then discuss how they can help focus reforms on the early foundations of student success.

Leading Indicators of Longer Term Success

There is growing evidence that these three relatively short-term metrics are strong leading indicators of improved student completion rates over a longer term. The relevant studies on credit momentum, gateway momentum, and program momentum are summarized in Table 1, on page 4.

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Evidence for Credit Momentum

Using nationally representative survey data, Attewell and Monaghan (2016) found that statistically matched entering students in two- and four-year institutions who attempted 15 rather than 12 semester credits in their first term (a difference of one course) graduated at significantly higher rates within six years of initial enrollment. The effects were especially strong for community college students. First-time community college students who initially attempted 15 credits were 9 percentage points more likely to earn any degree and 5 percentage points more likely to earn a bachelor's degree than were similar students who started by attempting 12 credits. Students who increased their credit load from below 15 credits in their first semester to 15 or more credits in their second semester were also more likely to complete a degree within six years than were similar students who stayed below the 15-credit threshold.

Using data on two- and four-year students in Tennessee, Belfield, Jenkins, and Lahr (2016) also found higher completion rates for students who took 15 credits rather than 12 in their first term and even higher completion rates for students who sustained this credit momentum through their first year. Both Attewell and Monaghan (2016) and Belfield et al. found especially strong effects of credit momentum for students of color. Belfield et al. also found that students who started with higher credit loads

paid substantially less per degree in tuition and fees and that overall college expenditures per degree were lower for momentum students (meaning a better return on taxpayers' investment), even as average tuition revenue for colleges was higher from students who took 15 credits their first semester or 30 credits their first year than from students who maintained lower course loads. The latter finding is especially important, as some colleges may be reluctant to encourage students to take higher credit loads, fearing that they might become overwhelmed and drop out, potentially lowering revenue for the college.

Evidence for Gateway Momentum

Using transcript data on a cohort of first-time community college students in Florida and event history modeling, Calcagno, Crosta, Bailey, and Jenkins (2007) found that for students who had previously enrolled in a remedial English course, taking and passing a college-level composition course more than doubled their probability of earning a community college credential in any given term. Remedial students who went on to pass the first college-level math course were also much more likely to graduate in any given term—an effect that was strong for all students, but especially so for those under age 25. Using data from community college students in Washington State, Leinbach and Jenkins (2008) also found that passing college-level math and English was associated with substantially better completion rates for students.

Neither study examined the effects of passing gateway courses early on, but looking historically, Tristan Denley (2016) of the Tennessee Board of Regents found that 48 percent of Tennessee community college students who passed gateway math and English courses in their first year graduated within six years, compared with 18 percent of those who did not pass these courses in their first year. Denley also found that over the three years it took to implement “guided pathways” reforms (see Bailey, Jaggars, & Jenkins, 2015a, 2015b) at scale in Tennessee, the number of community college students who passed college-level English and math gateway courses

in their first year increased by 79 percent, from 10 to 18 percent for all students (and by 240 percent, from 3.5 to 12 percent, for students of color), showing how gateway momentum can be used to indicate the effects of reforms in a relatively short amount of time.

Evidence for Program Momentum

Using data on students who started higher education in a community college in an anonymous state, Jenkins and Cho (2014) found descriptive evidence that students who completed at least nine semester credits in college-level courses in a particular program in their first year were more likely to complete a credential or transfer successfully within five years than students who entered a program after their first year. In his recent analysis of data on students in Tennessee, Denley (2016) found that 40 percent of community college students who completed at least nine semester credits in their program of study in their first year earned a college credential in six years, compared with only 16 percent of those who did not attempt nine credits in a program area. As with gateway momentum, Denley found that program momentum has improved substantially in the past three years as two- and four-year colleges across Tennessee have implemented guided pathways reforms—increasing from 21 percent for the 2012–13 community college cohort to 32 percent for the 2015–16 cohort, and from 23 percent to 42 percent for university entrants during that same period. Program momentum also increased substantially for racial/ethnic minority students in both two- and four-year colleges.

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Table 1. Summary of Studies Supporting Early Momentum Metrics

Study	Data	Methods	Key Findings
Credit Momentum			
Attewell and Monaghan (2016)	Beginning Postsecondary Students Longitudinal Study (BPS) 04/09 survey data on students in public two-year colleges and public or private nonprofit four-year colleges	Propensity score matching (PSM)	Community college students: • Compared with students taking 15 credits in term 1, those taking 12 credits were 9 percentage points less likely to earn any degree and 5 percentage points less likely to earn a bachelor's degree within six years. • Students who attempted fewer than 15 credits in term 1 but then increased to 15 credits in term 2 were significantly more likely to earn a bachelor's degree within six years than those who continued to attempt fewer than 15 credits. • Effects were strong for students of color and those with weak academic skills. Four-year college students: • Compared with students taking 15 credits in term 1, those taking 12 credits were 3 percentage points less likely to earn a bachelor's degree within six years.
Belfield, Jenkins, and Lahr (2016)	Transcript data on first-time college students who started at a Tennessee Board of Regents (TBR) two- or four-year institution in fall 2008 (sample confined to students who attempted at least 12 credits in term 1); tuition and expenditure data from TBR and the Integrated Postsecondary Education Data System (IPEDS)	Ordinary least squares (OLS) and PSM	Community college students: • After six years, students who attempted at least 27 credits in year 1 ("first-year momentum students") earned 22 more credits and were 18 percentage points more likely to earn a degree or certificate (43% versus 25%) than students who attempted at least 12 credits in term 1 but less than 27 credits in year 1 ("non-momentum students"). • First-year momentum students paid 20% less per degree in tuition and fees. • College expenditures were 14% less per degree for first-year momentum students. • First-year momentum students generated on average \$1,740 more in tuition and fees than non-momentum students. • Effects were especially strong for racial/ethnic minority students. Four-year college students: • After six years, first-year momentum students earned 27 more credits and were 19 percentage points more likely to earn a degree or certificate (57% versus 38%) than non-momentum students. • First-year momentum students paid 20% less per degree in tuition and fees. • College expenditures were 23% less per degree for first-year momentum students. • First-year momentum students generated on average \$4,890 more in tuition and fees than non-momentum students.

Table 1. Summary of Studies Supporting Early Momentum Metrics (continued)

Study	Data	Methods	Key Findings
Gateway Momentum			
Calcagno, Crosta, Bailey, and Jenkins (2007)	Transcript data on first-time college students who enrolled in a college-credit course at one of Florida's 28 community colleges in the fall of 1998–99 and were tracked for six years	Event history modeling	Community college students: • Students who started in remedial math and went on to pass a college-level math course were more than twice as likely to graduate in any given term than were students who had not passed college math by that point. • Benefits of passing college-level math were especially strong for younger students (those under age 25).
Denley (2016)	Transcript data on students entering TBR two-year colleges	Descriptive statistics	Community college students: • 48% of students who completed English Composition I and II and a college math course in year 1 earned a college credential within six years, compared with 18% of students who did not complete these three courses in year 1.
Leinbach and Jenkins (2008)	Transcript data on cohorts of first-time students in Washington State community and technical colleges	Descriptive statistics and OLS regression	Community college students: • 71% of students starting in transfer programs who completed a college-level math course completed a certificate or associate degree or transferred successfully within five years, compared with 11% of those who did not pass college math. • 52% of students starting in transfer programs who completed a college-level English course completed a certificate or associate degree or transferred successfully within five years, compared with 17% of those who did not pass college English. • Conditional effects were statistically significant.
Program Momentum			
Denley (2016)	Transcript data on students entering two- and four-year TBR institutions	Descriptive statistics	Community college students: • 40% of students who earned at least nine semester credits in their academic focus area in year 1 completed a college credential in six years, compared with 16% who did not attempt nine credits in their focus area. Four-year college students: • 53% of students who earned at least nine semester credits in their academic focus area in year 1 completed a college credential in six years, compared with 35% who did not attempt nine credits in their focus area.
Jenkins and Cho (2014)	Transcript data on first-time community college students in an anonymous state	Descriptive statistics and OLS regression	Community college students: • 51% of students who entered a program of study (by passing at least nine college credits in that program) in year 1 earned a community college credential or transferred to a four-year college within five years, compared with 32% of students who entered a program of study in year 2 and 20% of those who entered a program of study in year 3.

Discussion

The research summarized above suggests that increases in these near-term momentum rates should lead us to expect improved completion rates over a longer term. Thus, reformers do not have to wait several years before they can begin to see evidence of the effects of reforms. CCRC's experience with guided pathways reforms suggests that upward trends in these indicators should begin to provide evidence of reform effects within one to two years following implementation of guided pathways practices for all entering students (which itself can take two to three years or longer).

Focusing Reforms on Early Foundations for Long-Term Success

In addition to providing a relatively simple set of short-term leading indicators of long-term success, using early momentum metrics to gauge the effects of reforms has the advantage of helping to reframe and focus reform efforts in positive ways.

Focuses on Time to Completion From the Start

The *credit momentum metric* highlights the importance of helping students progress toward completion in a timely way beginning in their first year. For students entering community colleges in particular, there is generally little discussion of how long it will take to earn a degree. In fact, students are frequently misled about time to completion when they are told that 12 credits is full-time (because it is the minimum credit load for full financial aid) even though students who take 12 credits per term cannot complete an associate degree in two years or a bachelor's degree in four, as is typically advertised in college catalogs. Ideally,

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students should be shown precisely what courses they need to take to complete their certificates or degrees and given a clear estimate of how long this will take (and how the likelihood and cost of completing a program will be affected if their average course load falls below 30 credits per year).

Discourages Prerequisite Remediation and Encourages Integrated Supports

For students to complete college-level math and English courses in their first year, as measured by the *gateway momentum metric*, it is not feasible for them to go through multiple levels of prerequisite remediation, as is the norm in community colleges. In fact, CCRC research indicates that many more students can enter directly into college-level coursework and succeed than was once believed, and that students are more likely to succeed if those courses include integrated academic supports (Jaggars & Stacey, 2014; Scott-Clayton, Crosta, & Belfield, 2014; Scott-Clayton & Stacey, 2015). To increase *program and gateway momentum*, colleges will have to use “corequisite” academic support and other acceleration strategies (Jaggars, Edgecombe, & Stacey, 2014). They will also need to rethink assessment: Instead of using it as a tool for deciding whether students are college-ready, assessment should be used to identify areas in which students need academic support to master college-level coursework (Bailey et al., 2015a, chapter 4; Hughes & Scott-Clayton, 2011).

Encourages Colleges to Help Students Explore and Choose a Program of Study Early On

New students entering community colleges can seek out advisors or the career center for help in exploring careers and choosing a program of study. However, most entering students do not use such services. To increase *gateway and program momentum*—the rates at which students take and pass pathway-appropriate college-level math and English and other critical courses in their programs of study—colleges will have to substantially strengthen supports that help entering students to explore college and career options and choose at least a broad field of study

suited to their interests and aptitudes as soon as possible (Bailey et al., 2015a, chapter 2). For colleges to measure program momentum, they will need to be able to identify which program area each student is in. If colleges can do this in the first year, they should also be able to monitor students' progress in their programs in subsequent terms until they complete a credential.

Helps to Broaden Academic Support Beyond Math and English

A CCRC study by Zeidenberg, Jenkins, and Scott (2012) found that other courses—such as Economics 101, Psychology 101, Biology 101, and Anatomy and Physiology—pose just as great obstacles to degree completion for community college students as do college math and English. Yet the focus of community college remediation is almost exclusively on the latter two subjects. To improve *program momentum*, colleges will have to broaden the scope of the academic support they offer to critical program courses beyond math and English. Doing so could help open up discussions of how to improve teaching and learning across programs, not just within individual courses.

Discourages Boutique Innovations and Encourages Redesign of Programs and Supports at Scale

All three momentum metrics measure outcomes for all entering students. Therefore, small, “boutique” interventions will not suffice to move the needle on these metrics. Rather, colleges will need to redesign how they serve all entering students (ideally in ways that also benefit returning students).

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Areas for Further Research

While there is growing evidence of the value of momentum metrics for efforts to improve college outcomes, there is still a lot to learn about them. What incentives are effective in encouraging students to achieve early momentum? What practices are most effective in sustaining first-year momentum into subsequent years? Is first-year momentum a stronger signal of longer term success for some groups of students than for others? How important is first-year momentum in enabling students to graduate, compared with supports colleges provide after the first year? What strategies can college leaders use to motivate and manage the major changes in institutional practice and culture that appear to be necessary to improve momentum? What can we learn from more rigorous studies of the effects of early momentum on longer term student success? CCRC has begun and will continue to conduct a multifaceted program of research to answer these questions.

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