Toward Convergence:
A Technical Guide for the Postsecondary Metrics Framework

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The Institute for Higher Education Policy (IHEP) is a nonpartisan, nonprofit organization committed to promoting access to and success in higher education for all students. Based in Washington, D.C., IHEP develops innovative policy- and practice-oriented research to guide policymakers and education leaders, who develop high-impact policies that will address our nation's most pressing education challenges.

Executive Summary

The evidence is abundantly clear that a college degree is essential to economic success and social mobility in the 21st century, especially for low-income students and students of color, who historically have been left out of our higher education system.[1] However, many speculate about the value and outcomes of specific programs and institutions—in terms of both supporting students through to graduation and providing them with sufficient economic and noneconomic payoff. The information available today is inadequate and simply leaves the public wondering about answers to key questions about college access, progression, completion, cost, and outcomes.

The Institute for Higher Education Policy has partnered with the Bill & Melinda Gates Foundation to develop a Metrics Framework (see Table ES1) built on a decade of research and experimentation by the field.[2] Recognizing the pressing need for better data, institutional and state initiatives have implemented a series of voluntary data collections to fill the gaps left by federal data systems in particular. We analyzed the metrics and definitions these voluntary initiatives use, along with data specifications in national and state data collections, to identify points of consensus in the field. The resulting key metrics fall into three major categories:

- **Performance** metrics measuring institutional performance related to student access, progress, completion, cost, and post-college outcomes
- **Efficiency** measures considering how resources impact college completion, driven by increased interest in college costs and affordability
- **Equity** metrics seeking to include all students and accurately represent the higher education experience of populations that are underserved and may be "invisible" in other data collections

We should no longer rely on the fortitude, creativity, and willingness of a select set of institutions and states to produce this information, but rather should incorporate these metrics into federal and state data systems.

The field needs a core set of comprehensive and comparable metrics to answer critical questions about who attends college, who succeeds in and after college, and how college is financed. Importantly, to advance goals of social mobility and equity, the metrics must provide information specifically on how low-income and other underserved students fare. The metrics selected for the framework aim to measure each element as accurately and comprehensively as possible while balancing field convergence and data availability and feasibility.

We should no longer rely on the fortitude, creativity, and willingness of a select set of institutions and states to produce this information, but rather should incorporate these metrics into federal and state data systems. Doing so will make the data available for all students in *all* institutions, not only those that voluntarily collect and report it. These government data systems can make the results widely available to and usable by the public and policymakers, not to mention institutions themselves, thereby creating a transparent postsecondary system that facilitates effective policy and practice, and informed choices.

Table ES1: Recommended Metrics and Definitions Along With Availability in Federal Data Sources (Integrated Postsecondary Education Data System [IPEDS] and National Student Loan Data System [NSLDS])

Category	Key Performance Indicator	Key Performance Indicator Definition
PERFORMANCE	Enrollment	Twelve-month headcount that includes all undergraduate students who enroll at any point during the calendar year
	Credit Accumulation	The percentage of students earning sufficient credits toward on-time completion in their first year
	Credit Completion Ratio	The number of credits completed, divided by the number of credits attempted by first-year students
	Gateway Course Completion	The percentage of students completing college-level, introductory math and English courses tracked separately in their first year
	Program of Study Selection	The percentage of students in a cohort who demonstrate a program of study selection by taking nine credits (or three courses) in a meta-major in the first year
	Retention Rate	The percentage of students in a cohort who are either enrolled at their initial institution or transfer to a longer program at the initial or subsequent institution, calculated annually up to 200% of program length
	Persistence Rate	The percentage of students in a cohort remaining enrolled or earning a credential at their initial or subsequent institution, measured annually up to 200% of program length
	Transfer Rate	The percentage of students in a cohort who transfer into longer programs at the initial or subsequent institution(s), up to 200% of program length
	Graduation Rate	The percentage of students in a cohort who earn the credential sought at their initial institution, up to 200% of program length
	Success Rate	The percentage of students in a cohort who either graduate with the credential initially sought at the initial institution or transfer to a longer program at the initial or subsequent institution(s), up to 200% of program length
	Completers	The number of students who complete a credential in a given year
	Net Price	The average cost of attendance for an institution less all grant aid in a given year
	Unmet Need	The average net price for an institution less the average expected family contribution (EFC) in a given year
	Cumulative Debt	The median amount of debt student borrowers incur while attending an institution or program
	Loan Repayment Rate	The percentage of borrowers in a cohort who make at least $1 of progress on their loan principal in a fiscal year, measured at one, three, five, and 10 years into repayment
	Cohort Default Rate	The percentage of borrowers who enter repayment in a fiscal year and default within three fiscal years
	Graduate Education Rate	The number and percentage of bachelor's recipients enrolling in post-baccalaureate or graduate programs within one, five, and 10 (optional) years of completion
	Learning Outcomes	Public display of student learning goals, assessments, and outcomes using the National Institute for Learning Outcomes Assessment's (NILOA) Transparency Framework
	Employment Rate	The percentage of former students with any reported earnings at one, five, and 10 years after exit from the institution
	Median Earnings	The median annual earnings of former students one, five, and 10 years after exit from the institution (excludes zeros)
	Earnings Threshold	The percentage of former students earning more than the median high school graduate salary ($25,000 in 2014; includes zeros) at one, five and 10 years after exit from the institution
EFFICIENCY	Expenditures per Student	Education and related expenditures per full-time equivalent (FTE) student based on 12-month enrollment
	Cost for Credits Not Completed	The per-student expenditures for credits attempted but not completed by first-year students
	Cost for Completing Gateway Courses	For all gateway course completers in a given year, the per-student expenditures associated with all developmental and gateway courses attempted before gateway completion, tracking English and math courses separately
	Time to Credential	The average time accumulated from first date of entry to the institution to date of completion for all completers in a given year
	Credits to Credential	The average credits accumulated from the first date of entry to the institution to date of completion for all completers in a given year
	Change in Revenue from Change in Retention	The impact of changes in first-year retention rates from one cohort to another on tuition revenue available to the institution
	Cost of Excess Credits to Credential	The per-student expenditures for excess credits to credential for all completers with excess credits in a given year
	Completions per Student	The number of completions divided by the number of FTE students (based on 12-month enrollment) in a given year expressed as completions per 100 FTE
	Student Share of Cost	The percentage of education and related expenditures covered by net student tuition revenue versus public subsidies in a fiscal year
	Expenditures per Completion	Education and related expenditures divided by the number of completions in a fiscal year
EQUITY	Enrollment Status	First-time, transfer-in, or continuing students
	Attendance Intensity	Full time and part time, determined by the institution based on the number of credit hours taken
	Credential-Seeking Status	Certificate-, associate's-, bachelor's-, or noncredential-seeking students
	Program of Study	Six-digit Classification of Instructional Program (CIP) codes and reported for seven meta-majors
	Academic Preparation	Institutions classify students as "not college ready" and "college ready" in math and English as defined by institutional standards
	Economic Status	Pell Grant receipt as proxy for low-income or economic status
	Race/ethnicity	Current IPEDS categories: Hispanic or Latino, American Indian or Alaska Native, Asian, Black or African-American, Native Hawaiian or Other Pacific Islander, White, Two or more races, Nonresident alien, and Race/ethnicity unknown
	Age	Collected by date of birth, if available; otherwise reported by three categories: 19 and under, 20–24, 25 and over
	Gender	Male, female, or other
	First-Generation Status	Students whose parents' highest education level is some college but no degree or below (e.g., some college, no degree; vocational or technical training; high school diploma or equivalent; did not complete high school)

Note: These metrics measure undergraduate populations only.

Key: ■ Available with minor modifications needed ■ Available with moderate modifications needed ■ Available with major modifications needed ■ Not available

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The Metrics Framework is designed to be accessible to anyone interested in and passionate about improving current data collections to better student outcomes. This technical report aims to define each of the recommended metrics, demonstrate how the field converged on the metrics, and explore ways in which students, policymakers, and institutions can use the metrics to inform college decision making, design policies, and improve student success. Readers are encouraged to use this report to learn where in the field there is convergence on higher education data reporting and recommendations for how to calculate each of the metrics.

The subsequent chapters cover cross-cutting criteria for students and institutions as well as each of the three major metric categories: performance, efficiency, and equity. In the performance and efficiency metric chapters, we organize the 31 metrics by the corresponding metric type: access, progression, completion, cost, and post-college outcomes. For each of the 31 metrics, we present a table that summarizes the metric definition, population of students included in the metric, recommended disaggregates (all 10 are defined in Chapter 5), and suggested submetrics. Institutions can use submetrics to drill into their data further for institutional improvement and student success. Finally, supporting each table is a description of how the field has measured this construct over the past several years and a discussion of how institutions, policymakers, and students can use the metric.

Chapter 3:
Performance Metrics

This chapter includes all performance metrics, organized by metric type.
The chapter describes each performance metric in detail. Metrics covered
in this chapter include the following:

Introduction and Overview

The evidence is abundantly clear that a college degree is essential to economic success and social mobility in the 21st century, especially for low-income students and students of color, who historically have been left out of our higher education system.[1] However, many speculate about the value and outcomes of specific programs and institutions—in terms of both supporting students through to graduation and providing them with sufficient payoff for their investment. Better, more transparent data are needed to provide students, policymakers, and institutions with the information they need to answer important questions about college access, progression, completion, cost, and outcomes. Yet, with today's outdated data systems, answers to these questions remain elusive:

- How many low-income, first-generation, adult, transfer, and part-time students, who make up the new majority on today's campuses, attend each college?
- Do these students graduate?
- How long does it take students, particularly students who enter with less academic preparation or fewer financial resources, to complete college?
- Do the students who don't graduate transfer, or do they drop out?
- How much do students borrow, and can they repay these loans?
- Can students find jobs in their chosen field, and how much do they earn?
- What do students learn in college?

Equitable access to and success in higher education relies on information that reflects the higher education experience of *all students* at *all institutions*, yet many of today's students are missing or invisible in current data systems. Without answers to these key questions, *progress toward equity and success for all students is quite simply stagnated*—prospective students and policymakers will continue to be forced to make key decisions in a world lacking sufficient information. To advance the goals of social mobility and equity, the field needs a key set of comprehensive and comparable metrics that answer these critical questions about who attends college, who succeeds in and after college, and how college is financed. Specifically, the answers must provide information on how underserved students fare. Improved data that target student success will enable policymakers and institutions to help students—especially students of color, low-income students, and first-generation students—overcome barriers to college success, as well as empower the students themselves.

Recognizing this problem, the Institute for Higher Education Policy has partnered with the Bill & Melinda Gates Foundation (BMGF) to develop a Metrics Framework (see Table 1-1) built on a decade of research and experimentation by the field. BMGF's recent paper, *Answering the Call*, echoes the need for better and more complete data, calling for metrics that are reflective of all students, all institutions, and all outcomes.[2] It also outlines the proposed framework, which is designed to

Table 1-1: A Field-Driven Metrics Framework

	ACCESS	PROGRESSION	COMPLETION	COST	POST-COLLEGE OUTCOMES
PERFORMANCE	Enrollment	Credit Accumulation Credit Completion Ratio Gateway Course Completion Program of Study Selection Retention Rate Persistence Rate	Transfer Rate Graduation Rate Success Rate Completers	Net Price Unmet Need Cumulative Debt	Employment Rate Median Earnings Loan Repayment and Default Rates Graduate Education Rate Learning Outcomes
EFFICIENCY	Expenditures per Student	Cost for Credits Not Completed Cost for Completing Gateway Courses Change in Revenue from Change in Retention	Time/Credits to Credential Cost of Excess Credits to Credential Completions per Student	Student Share of Cost Expenditures per Completion	Earnings Threshold
EQUITY	Enrollment by (at least) Preparation, Economic Status, Age, Race/Ethnicity	Progression Performance by (at least) Preparation, Economic Status, Age, Race/Ethnicity	Completion Performance by (at least) Preparation, Economic Status, Age, Race/Ethnicity	Net Price and Unmet Need by (at least) Economic Status, Preparation, Age, Race/Ethnicity Debt by (at least) Economic Status, Age, Race/Ethnicity, Completion Status	Outcomes Performance and Efficiency by (at least) Preparation, Economic Status, Age, Race/Ethnicity, Completion Status

Key Student Characteristics

Enrollment Status	Economic Status
Attendance Intensity	Race/Ethnicity
Credential-Seeking Status	Age
Program of Study	Gender
Academic Preparation	First-Generation Status

Key Institutional Characteristics

Sector	Selectivity
Level	Diversity
Credential/Program Mix	Minority-serving Institution (MSI) Status
Size	Post-traditional Populations
Resources	Modality

serve dual purposes. First, institutions can leverage these metrics to guide internal improvement efforts and better serve all students. Second, policymakers at the state and federal levels can incorporate these metrics into their respective data systems for wider consumer use and public consumption as well as to support the development of student-focused policies. With these purposes in mind and informed by thorough research into the metrics that many states and institutions already are voluntarily using, this paper builds on *Answering the Call* to provide additional details on the metrics and definitions in the framework.

To be clear, these metrics and definitions were not chosen in a vacuum. For more than 10 years, institutional and state initiatives have recognized the pressing need for better data and have implemented a series of voluntary data collections to fill the gaps left by federal data systems in particular.[3] We analyzed the metrics and definitions these voluntary initiatives use, along with data specifications in national and state data collections, to identify points of consensus in the field. Appendix 1 shows which initiatives reviewed use each of the metrics included in the framework. The resulting metrics fall into three major categories:

• **Performance** metrics measure institutional performance related to student access, progress, completion, cost, and

post-college outcomes. Because many voluntary initiatives are designed to promote student access and success, most define and collect these types of performance indicators.

• **Efficiency** metrics consider how resources impact college completion, driven by increased interest in attainment and affordability. Much of the methodology presented in this paper is derived from the Delta Cost Project, a leader in the development of comparable metrics on college costs.

• **Equity** metrics seek to include all students, disaggregate by key student groups, and accurately represent the higher education experience of populations that are underserved and may be invisible in current data collections. Although some of these disaggregates are common practice in the field, this framework encourages increased disaggregation to support attainment goals for more underserved student groups.

The metrics selected for the framework aim to measure each element as accurately and comprehensively as possible while balancing field convergence and data availability and feasibility. Institutions should be able to calculate the metrics as described using a variety of sources, including internal student information systems, the National Student Loan Data System (NSLDS), the College Scorecard, the National Student Clearinghouse, and state earnings and employment records (if available). In the report, we note where institutions may have

difficulty obtaining data, but because data availability is continuously evolving, we also expect capacity and accuracy to continue to improve over time. Table 1-2 shows the metrics included in this framework and the associated definitions, with color coding to designate the current availability of these data in federal data sources.

The field has spent the past decade refining a set of postsecondary metrics, with the goal of using these data to help advance student success. This experimentation has led to substantial consensus on what we should measure and how

in higher education. At this point, we should no longer rely on the fortitude, creativity, and willingness of a set of institutions and states to produce this information, but rather, should incorporate these metrics into federal and state data systems. Doing so will make the data available for all institutions, not only those that voluntarily collect and report it. These government data systems can make the results widely available to and usable by the public and policymakers, creating the transparent postsecondary system our students so desperately need, with respect for data privacy in security, as outlined in Sidebox 1. With this transparent system, policymakers can design effective policies and students can make informed choices.

Table 1-2: Recommended Metrics and Definitions Along With Availability in Federal Data Sources (Integrated Postsecondary Education Data System [IPEDS] and National Student Loan Data System [NSLDS])

	Key Performance Indicator	Key Performance Indicator Definition
PERFORMANCE	Enrollment	Twelve-month headcount that includes all undergraduate students who enroll at any point during the calendar year
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	Completers	The number of students who complete a credential in a given year
	Net Price	The average cost of attendance for an institution less all grant aid in a given year
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	Employment Rate	The percentage of former students with any reported earnings at one, five, and 10 years after exit from the institution
	Median Earnings	The median annual earnings of former students one, five, and 10 years after exit from the institution (excludes zeros)
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	Economic Status	Pell Grant receipt as proxy for low-income or economic status
	Race/ethnicity	Current IPEDS categories: Hispanic or Latino, American Indian or Alaska Native, Asian, Black or African-American, Native Hawaiian or Other Pacific Islander, White, Two or more races, Nonresident alien, and Race/ethnicity unknown
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	Gender	Male, female, or other
	First-Generation Status	Students whose parents' highest education level is some college but no degree or below (e.g., some college, no degree; vocational or technical training; high school diploma or equivalent; did not complete high school)

Note: These metrics measure undergraduate populations only.

Key: ■ Available with minor modifications needed   ■ Available with moderate modifications needed   ■ Available with major modifications needed   ■ Not available

Cross-Cutting Criteria: Students and Institutions

This chapter details the cross-cutting definitions and cohort specifications that impact many of the performance metrics included in the framework. Parameters include the following:

Cohort Specifications

Many metrics in this framework measure performance for a specific group, or cohort, of students. In an attempt to build consistency across metrics, the framework defines cohorts as similarly as possible for each metric, and this chapter discusses the *core cohort recommendations that apply to multiple metrics*. For each decision point, we summarize the recommendation, evidence from the field that led us to that recommendation, and possible ways that the data can be used.

These definitional decisions are centered on the principle of counting all students. In many cases, this framework expands on the students included in the Integrated Postsecondary Education Data System (IPEDS) graduation-rate cohort to be more inclusive of all students and reflect the demographics, attendance, and mobility patterns of 21st-century students. Grounded in the work and innovation of numerous voluntary initiatives, the framework offers guidance on how to define the cohort population and create separate cohorts based on enrollment status, attendance intensity, and credential-level sought.

Cohort Population: 12-Month Enrollment

The framework recommends defining the *population* for most progression and completion metrics as all students who enter an institution during a 12-month period (12-month cohort, also known as a full-year cohort), instead of only students who enter the institution in the fall (fall cohort). This specification enables the metrics to capture the one in four students who start college outside the fall term, a particular issue in the community college and for-profit sectors, where about 35 percent and 45 percent of students begin at times other than the fall, respectively.[1]

Field Usage and Convergence

While many voluntary initiatives—including the Voluntary Framework of Accountability (VFA) and Achieving the Dream (ATD)—use fall-enrollment cohorts, moving toward 12-month cohorts aligns with the goal of counting all students. Further, IPEDS and Complete College America (CCA) have set a precedent for 12-month cohorts by allowing some institutions to use full-year instead of fall cohorts, depending on their academic calendar system.[2] Also, 32 members of the Postsecondary Data Collaborative have supported this switch to 12-month cohort reporting in order to capture more nontraditional students.[3]

Use Cases

Expanding cohorts to capture students beginning at any point during the year will provide institutions with a more comprehensive picture of student progression and completion, capturing outcomes for the 6 million students who enter institutions each year at times other than the traditional fall semester. While the late-year entrants will have slightly less

time to count as completers during a specified period (e.g., 150 percent of time), the benefit of adding these students into the calculation outweighs this downside. Because these students already are included in the 12-month enrollment counts for IPEDS, incorporating them into progression and success cohorts should not unduly increase burden.

Enrollment Status and Attendance Intensity

The framework recommends separating each cohort by *enrollment status* (first-time or transfer-in) and *attendance intensity* (full-time or part-time). This approach creates the following four distinctive cohorts: first-time full-time (FTFT), first-time part-time (FTPT), transfer full-time (TFT), and transfer part-time (TPT), as determined by students' status at entry. All four of these cohorts should be defined in each credential-seeking category (see next section for more details on defining credential-seeking status).

Field Usage and Convergence

Current IPEDS graduation rates track only FTFT students, thus excluding about 45 percent of today's degree- and certificate-seeking college entrants.[4] The rates often are criticized for their narrow scope, so 13 voluntary initiatives—including CCA and VFA—include transfer or part-time students in their completion rates in a variety of ways to be more inclusive of today's students.[5] The 2015 release of College Scorecard data included both the IPEDS graduation rate and rates for all Title IV recipient students, using National Student Loan Data System (NSLDS) data. While these data are imperfect, this release shows a movement toward non-first-time, full-time cohort usage. Also, the new IPEDS Outcome Measures component used the same four cohorts this framework recommends.[6]

Use Cases

By including transfer and part-time students in the cohorts, these data present a more complete view of progression and completion for all students enrolled at the institution, compared with the IPEDS FTFT graduation rates, which have long and widely been criticized by the field. The inclusion of these multiple cohorts reinforces the commitment to supporting all students enrolled in higher education through to completion.

Credential Level Sought

The framework recommends distinguishing cohorts by *credential level sought*—including non-credential-seeking, certificate-seeking, associate's-seeking, and bachelor's-seeking students—because these degree types differ in expected time to completion. Data show that students who complete a degree or certificate tend to complete the credential they initially sought, indicating they can accurately report their degree plans at entry. Among completers at their first institution, nearly 100 percent of certificate-seeking students, 82 percent of associate's-seeking students, and 98 percent of

bachelor's-seeking students received their intended degree, as opposed to a credential of a different level (see Table 2-1 for more details). Also, data show that persistence and completion rates vary substantially among students pursuing different credential types, highlighting the importance of measuring these student groups separately.[7] While some have noted challenges with identifying students' credential level at entry, institutions now are required to report this information to the NSLDS to allow for tracking of student loan eligibility, which is limited to 150 percent of program length. This new compliance requirement should enhance the quality of data on students' credential level to near complete coverage, as reported by the National Student Clearinghouse.

Field Usage and Convergence
As a required reporting element in NSLDS and in codebooks for voluntary initiatives such as CCA, Completion by Design, and the Student Achievement Measure, the field has demonstrated that institutions are capable of reporting data separately by the level of credential sought, including for certificates for some initiatives. Some have debated whether institutions can accurately determine student intentions at college entry in order to place them in a cohort. To examine this issue, we evaluated the trends in student degree plans, enrollment activity, and credential completion in a nationally representative survey, the Beginning Postsecondary Students (BPS) study. In sum, these results—discussed in the bullets below—show that activity by students in their first year tends to match their intent.

1. **Students who earn credentials at their first institution tend to earn the credential they initially sought:** Some have posited that placing students in cohorts based on the level of credential initially sought—and measuring success as completion of that credential—could undercount actual success rates, because students may complete other credentials, such

as stackable credentials, even if they do not ultimately complete their longer, intended degree. However, analysis of BPS data shows that very few students who earn a credential at their first institution earn it at a level other than their initial program of entry. Students are most likely to complete the credential they sought or leave college altogether, but they are unlikely to complete a credential of a different level than the one they initially sought. Further, most students, especially in certificate and bachelor's programs, earn the degree they initially sought at their first institution rather than at a subsequent institution. For example, only 1 percent of students in bachelor's programs earned either a certificate or associate's degree at their first institution, and only 4 percent of them earned a credential other than a bachelor's degree anywhere. Additionally, only 4 percent of students in associate's programs earned a certificate or bachelor's degree in six years at their initial institution (see Table 2-1).[8]

2. **Most students do not seek credentials only to receive financial aid:** There remains some concern in the field that students who are enrolled in degree programs are designated as such only in order to receive financial aid, not because they intend to complete a credential. Here, we examine several trends that seem to at least limit the scope of that problem. Using BPS, we found: (1) 65 percent of degree-seeking federal aid recipients who eventually drop out stay enrolled beyond their first year, suggesting that most of them intended to receive the degree sought, a trend consistent with students who do not receive aid;[9] and (2) degree-seeking students who do not complete are as likely to have borrowed as students who do complete and more than half (52 percent) of noncompleters borrow. While it may be feasible that students would declare false degree intentions in order to receive grant aid, it seems less likely that they would do so to take out loans, especially given that most noncompleters do persist beyond the first year.

Table 2-1: Cumulative Attainment in Six Years at First Institution and Anywhere

Degree program	Attained bachelor's degree	Attained associate's degree	Attained certificate	No degree, still enrolled	No degree, transferred	No degree, left without return
Attainment at First Institution						
Certificate	*	*	51%	3%	13%	33%
Associate's degree	1%	9%	3%	8%	31%	38%
Bachelor's degree	56%	1%	0%	5%	24%	14%
Not in a degree program	4%	7%	6%	9%	36%	38%
Attainment Anywhere						
Certificate	*	2%	52%	9%	N/A	36%
Associate's degree	11%	18%	6%	18%	N/A	46%
Bachelor's degree	63%	3%	1%	12%	N/A	21%
Not in a degree program	16%	7%	8%	21%	N/A	49%

Source: IHEP analysis of Beginning Postsecondary Student Survey: 2004–09 data.
Note: Rows may not add to 100 percent due to rounding. Asterisks (*) denote where estimates are unstable because the standard error represents more than 30 or 50 percent of the estimate.

3. **Behaviorally defined cohorts likely omit many students who are legitimately seeking credits:** Behaviorally defined cohorts base credential-seeking status on students' course-taking behavior, rather than their stated degree intention, due to concerns about the accuracy of student self-reports.[10] However, using BPS, we found that a considerable number of students who fail to meet early behavioral milestones, such as accumulating six to 12 credits in their first one to three years, do display persistence behavior, such as course-taking and completion, beyond the initial enrollment time frame (i.e., one to three years). In brief, students who fail to meet early behavioral milestones at community colleges do go on to complete credentials both at their initial institution (about 14 percent) and at subsequent institutions (about 8 percent) within six years. Additionally, about 10 percent of these students continue enrollment at their initial institution, and about 31 percent transfer to a subsequent institution within six years.[11] It should be noted that including these students in the cohort does lower completion rates because students who do not gain early academic momentum are less likely to complete than those who attain; however, eliminating them from the cohort reduces the chances that institutions can or will intervene to help them on their pathway to success. Because of the goal to count all students and all outcomes, this iteration of the framework uses initial credential-level to maximize the scope of students included in cohorts. Further, as behaviorally defined cohorts can only be developed retrospectively, they are not conducive to improvement efforts, which need to track student cohorts in real-time in order to influence their outcomes.[12] Finally, as discussed in the persistence and outcome rates chapters subchapters, all outcomes will be captured regardless of the credential sought by the student. For example, an associate's-seeking student who earns a certificate will count as persisting in the persistence rate, even though she will not count in the numerator of the outcome rate.

Use Cases
Because behaviors and outcomes are distinct, depending on students' initial credential level, the framework recommends tracking each cohort separately based on the type of credential sought. This disaggregation will allow institutions to understand how specific groups of students progress toward credentials and to identify challenges that impact success differently for students in different credential programs. Further, in the framework, students who transfer between credential levels at the initial institution or a subsequent institution would still be counted, so their progress would still be reported.

Key Institutional Characteristics
In addition to the commitment to count all students, the framework also seeks to include all institutions. For this reason, it recommends collecting key institutional characteristics that can help contextualize the student data and the mission of the institutions. Table 2-2 shows the institutional characteristics included in the framework.

Table 2-2: Key Institutional Characteristics

• Sector	• Selectivity
• Level	• Diversity
• Credential/Program mix	• Minority-Serving Institution status
• Size	• Post-traditional populations
• Resources	• Modality

Each characteristic has implications for understanding the context of the institution. Sector, level, and degree or program mix are commonly used in research to distinguish institutions at their most basic level: who controls the institution and what degree types are available. The size and resources of the institution establish the fiscal framework of the institution—small, resource-rich schools operate in a very different environment than do larger, underresourced schools. The selectivity of the school reveals important information about the academic preparation of incoming students, while diversity and Minority-Serving Institution status demonstrate the demographics and history of a campus. Finally, modality is becoming increasingly important, as institutions expand their online learning capacities. By understanding the structure of the institutions, student access, progression, completion, cost, and post-college outcomes can be contextualized as appropriate. These data can be obtained from IPEDS and will not cause additional reporting burden for the institutions.

CHAPTER 3:

Performance Metrics
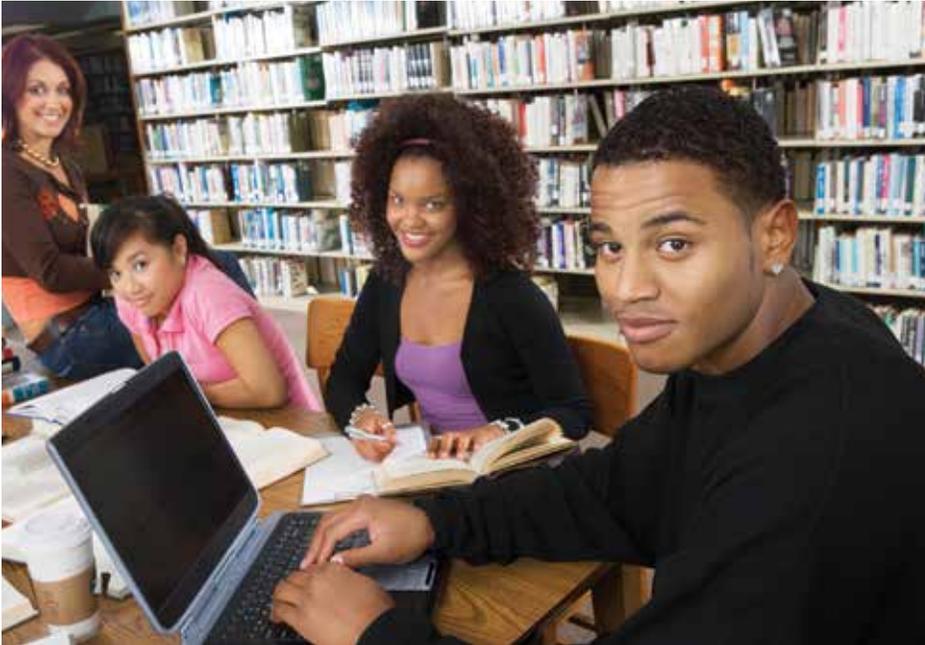
This chapter describes the following set of performance metrics:

ACCESS

Enrollment	
Definition	Twelve-month headcount that includes all undergraduate students who enroll at any point during the calendar year
Population	Twelve-month unduplicated undergraduate headcount by credential level and student enrollment status and attendance intensity
Disaggregates	Academic preparation, economic status (at entry), race/ethnicity, gender, age, first-generation status, and program of study
Submetrics for further analysis	• Recruitment of underrepresented populations • Application start and completion among underrepresented populations • Financial aid application completion by underrepresented populations • Financial aid gap for underrepresented populations • Acceptance rates for underrepresented populations • Yield for underrepresented populations • Enrollment in Science, Technology, Engineering, and Math (STEM) fields by underrepresented populations • Date of application or enrollment relative to term start date • Dual or summer enrollment before first term • Co-enrollment in another institution

20 initiatives measure Enrollment

Field Usage and Convergence
All of the reviewed initiatives consistently collect an enrollment metric, though most collect only fall enrollment because much of the Integrated Postsecondary Education Data System's (IPEDS) reporting is based on fall counts. Not only are IPEDS' fall enrollments disaggregated more thoroughly than IPEDS' 12-month enrollments, but retention and graduation rates for most institutions also are based on fall cohorts. While fall enrollments include only students who follow the traditional academic schedule, 12-month enrollments include every student, regardless of whether they first enroll in the fall, spring, or summer. This broader enrollment definition, used by Complete College America (CCA) and Predictive Analytics Reporting (PAR) Framework, increases total enrollment counts by about 25 percent and includes more nontraditional students whose enrollment and attendance patterns fall outside of past norms.

As such, the framework recommends the use of 12-month counts—both to measure enrollment trends *and* to define cohorts for other metrics, such as outcome rates, a change supported by many higher education policy organizations (for more detail, see the Postsecondary Data Collaborative comments on IPEDS Outcome Measures (OM) and their response to Sen. Lamar Alexander [R-TN]).[1] This framework recommends creating 12-month enrollment cohorts based on enrollment status, attendance intensity, and credential level,

and disaggregating the data by academic preparation, economic status, race/ethnicity, gender, age, first-generation status, and program of study. IPEDS currently includes some of these details (e.g., enrollment status, attendance intensity) in the fall enrollment survey but includes only race/ethnicity and gender in the 12-month survey. Fully disaggregating full-year enrollments will provide a more comprehensive view of access trends, especially for key demographics, including underprepared, low-income, and underrepresented minority populations.

Use Cases
By expanding the metric to include entrants throughout the year, institutions would include almost one in four more students, largely from the community college and for-profit sectors.[2] Enrollment is a foundational metric for this framework because 12-month enrollment also defines the cohort population used in many of the other metrics, such as outcome rates. It also provides a baseline of information about college access, allowing institutions to measure their effectiveness at enrolling diverse student populations, to evaluate access over time, and to assess their campus diversity against their service area's demographics. Policymakers use enrollment data to determine how effective institutions are at enrolling diverse student populations and can design policies to advance that agenda. Students and families use these data—such as whether there are students like them enrolled there—to help determine fit at an institution.

PROGRESSION

Credit Accumulation	
Definition	The percentage of students earning sufficient credits toward on-time completion in their first year: 30 credits for full-time and 15-credits for part-time students. Prior credits from Advanced Placement (AP), International Baccalaureate (IB), dual enrollment, and transfer are not counted, nor are noncredit remedial courses. Credit is earned based on institutional standards
Population	Twelve-month cohorts by credential level and student enrollment status and attendance intensity (e.g., first-time full-time [FTFT], transfer full-time [TFT], first-time part-time [FTPT], transfer part-time [TPT])
Disaggregates	Academic preparation, economic status (at entry), race/ethnicity, gender, age, first-generation status, and program of study (at entry)
Submetrics for further analysis	• Remedial course enrollment and completion (if applicable) • Average credit load per term or year • Summer or intersession credits earned • Enrolled at least half time (for part-time students) • Continuous enrollment

9 initiatives measure Credit Accumulation

Field Usage and Convergence
Drawing on research that demonstrates early credit accumulation as a key leading indicator of degree completion,[3] Achieving the Dream (ATD), CCA, the Voluntary Framework of Accountability (VFA), and six other initiatives[4] established the widespread use of this metric with hundreds of colleges in nearly all 50 states across the country. Following the most expansive collection of this metric in the field, the recommended 30- and 15-credit thresholds align with CCA's reporting requirements, which were recently revised to further encourage on-time completion for full-time students while recognizing that part-time students also need a reasonable, yet timely, pathway to success.[5] Although some initiatives suggest including all credits in this calculation, the framework excludes remedial courses here, per CCA and other organizations, because those credits do not count toward a credential. Also, a coalition of six organizations recently encouraged the adoption of corequisite remediation and other new models that support students to actively accrue credits toward their credentials—despite needing developmental education—adding further reason to not count separate developmental credits toward this progression metric.[6]

Building on the field's work, the framework also recommends the addition of key disaggregates. As such, this framework's proposed metric builds on CCA's specifications by expanding to a 12-month cohort that incorporates nonfall entrants, adding cohorts for transfer students, and separating cohorts based on the level of credential sought. Reporting lag times are expected because spring entrants should receive a full year to accumulate credits. These changes align this progression metric with the enrollment and completion metrics in the framework and provide more detail about how specific students are progressing to more fully inform institutional improvement efforts. (For an in-depth explanation of considerations around cohort determination, please see Chapter 2).

Use Cases
This metric is designed to help institutions and policymakers measure the extent to which students are progressing toward completion, and the disaggregates clarify *which* students are (and are not) gaining academic momentum early in order to determine what can be done to help more of these students succeed. Disaggregation is especially important for this metric because it better articulates the degree pathways for full-time or part-time and first-time or transfer students. While any given student may have specific reasons for taking more or less credits (e.g., program of study, personal finances), the average number of credits accumulated by entering students in the first year serves as an important institution-wide indicator of student progress.

It is also important to disaggregate by credential level, as students in various programs (certificate-seeking, associate's-seeking, and bachelor's-seeking) may tend toward different problems and solutions relative to academic progress. The field shows that academic preparation is among the most important disaggregates for this metric, because remedial requirements can slow student progress toward credit milestones and eventual completion and largely do not count toward a credential. Economic status is also an essential disaggregate because students must be able to afford and enroll in courses to earn credit. Further, active intervention by institutions can positively affect students' level of preparation and financial situations.

In order to support an institution's ability to understand student momentum and progression, the framework highlights additional submetrics, like average credit load and credit completion ratio, as a way for colleges and universities to drill down into these metrics and develop strategies to address stalled students. The remedial enrollment and completion submetrics could be useful for institutions, as these submetrics highlight which students are affected and need additional support. Credit accumulation indicators have been incorporated into early warning systems and advising technology, like Civitas and Starfish, to make the data useful for students and advisors. Policymakers also have incorporated credit-based momentum measures into many outcome-based funding models to shape state funding.[7]

Credit Completion Ratio	
Definition	The number of credits completed, divided by the number of credits attempted by first-year students. Prior credits from AP, IB, dual enrollment, and transfer are not counted. Credit is earned based on institutional standards.
Population	Twelve-month incoming cohorts by credential level and student enrollment status and attendance intensity (e.g., FTFT, FTPT, TFT, TPT)
Disaggregates	Academic preparation, economic status (at entry), race/ethnicity, gender, age, first-generation status, and program of study (at entry)
Submetrics for further analysis	• Percentages of remedial courses among uncompleted credits • Percentage of D's, F's, W', I's among uncompleted credits • Percentage of uncompleted credits that were retakes • Percentage of D's, F's, W's, I's in high-enrollment courses • Grade point average by term and year • Course engagement/interaction by course completion • Course format/modality by course completion

4 initiatives measure Credit Completion Ratio

Field Usage and Convergence

CCA, the Consortium for Student Retention Data Exchange (CSRDE), the PAR Framework, and the VFA all use credit completion ratios to measure student momentum toward a credential. This framework follows a combination of VFA's, CSRDE's, and CCA's definitions. For example, the metric includes remedial courses in the calculation even if they do not count toward degree requirements, which is consistent with VFA and CSRDE standards. Including, rather than omitting, these remedial courses provides a more complete analysis of academic momentum remedial courses; however, this framework's proposed metric follows CCA guidelines for credit completion by counting D's only if the institution accepts the grade as passing, while VFA and PAR Framework, on the other hand, exclude D's in all cases. CCA's guideline for treatment of D's is more customized to individual institution's circumstances.

The population and disaggregates counted in this metric match those of the framework's proposed completion metrics to maintain consistency across the framework and with the field convergence around the four major cohorts. As a result, the primary differences between the framework's definition and CCA's are that this framework disaggregates by credential level instead of institution type, is based on full-year cohorts instead of fall only, and disaggregates transfer students by full- and part-time status. However, full- and part-time students could be aggregated when interpreting the metric, without confounding results. Because the metric includes all students enrolled throughout the year, reporting lag times are expected, as spring entrants should receive a full year to complete credits.

Use Cases

The credit completion ratio improves institutional understanding of credit accumulation and student academic momentum in the first year by focusing in on courses passed versus courses attempted. Research shows that higher credit accumulation ratios in the first year are correlated with ultimate credential completion, so the measure can be a useful tool to discover students' academic setbacks and allow for early interventions.[8] The academic preparation and economic status disaggregates are most important when determining the underlying causes holding students back from completing their enrolled courses. Moreover, the submetrics suggested, in addition to the ratio, help further mine the data for populations that may require additional assistance and for gaps in course-taking and completion patterns, which can be improved by institutional intervention through early warning and other advising systems. For policymakers, both the credit completion and accumulation metrics are primary tools to show academic progression and help design and shape policy and funding decisions, and are incorporated in some Outcomes Based Funding (OBF) formulas.[9]

Gateway Course Completion	
Definition	The percentage of students completing college-level, introductory math and English courses tracked separately in their first year. Prior credits from AP, IB, dual enrollment, transfer, and College Level Examination Program (CLEP) do count. Credit is earned based on institutional standards.
Population	Twelve-month incoming cohorts by credential level and student enrollment status and attendance intensity (e.g., FTFT, FTPT, TFT, TPT)
Disaggregates	Academic preparation, economic status (at entry), race/ethnicity, gender, age, first-generation status, and program of study (at entry)
Submetrics for further analysis	• Enrollment in prerequisite remedial courses by subject (if applicable) • Completion of prerequisite remedial courses by subject (if applicable) • Enrollment in gateway courses by subject • Number of attempts to complete gateway courses by subject • Average time to complete gateway courses by subject • Completion of both gateway courses • Availability of remedial and gateway courses in sequence • Percentages of D's, F's, W's, I's in gateway courses by subject • Course engagement/interaction by gateway course completion • Course format/modality by gateway course completion

8 initiatives measure Gateway Course Completion

Field Usage and Convergence

Eight voluntary initiatives[10] use gateway course completion metrics, though the intricacies of the metric vary by initiative. Because no national standards exist for classifying gateway courses, individual institutions should define which courses count as "gateways," broadly defined as nonremedial entry-level or introductory courses in the subject area.

Similar to the credit completion ratio, the passing grade recommendation follows CCA definitions, which includes A, B, C, and P grades, in addition to D's if recognized by the institution. The field varies in the time frame used for this metric. CCA and VFA measure the percentage of students completing gateway courses after one and two years and just two years, respectively, while Completion by Design (CBD) measures completion after only one year. Because early gateway course completion is essential to on-time progression, this framework recommends following CBD's guidelines to signal to the field that one year is an important time frame for institutions to target for getting students through these courses.

Use Cases

Gateway course completion in the first year is a key momentum point that predicts student success, and the proportion of students meeting this momentum point indicates to an institution whether students began their college careers on the right track.[11] In one respect, it is the best measure of true college readiness. For this reason, policymakers too must be keenly aware of and aim to use this and other completion measures when they are designing and shaping programming, policy, and funding. Performance on this metric also can inform institutional efforts to help students build academic momentum early through counseling and technology-enabled advisory systems.

Academic preparation is the most critical correlate of gateway course completion, and institution leaders can use this disaggregate to evaluate whether preparation or another factor is the primary roadblock to on-time gateway completion. Also, age and economic status are important disaggregates when analyzing these data. Age may demonstrate adverse effects related to delayed entry, and economic status may show the extent to which lack of funds can delay timely course enrollment and completion. The recommended submetrics can further assist institutions, as institutions then can understand how remedial course-taking, course sequence availability, and time and number of attempts to completion can affect this metric and, ultimately, student completion.

Program of Study Selection	
Definition	The percentage of students in a cohort who demonstrate a program of study selection by taking nine credits (or three courses) in a meta-major in the first year. Meta-majors include: education; arts and humanities; social and behavioral sciences and human services; science, technology, engineering, and math; business and communication; health; trades[12]
Population	Twelve-month incoming cohorts by credential level and student enrollment and attendance intensity (e.g., FTFT, FTPT, TFT, TPT)
Disaggregates	Academic preparation, economic status (at entry), race/ethnicity, gender, age, first-generation status, and program of study (at entry)
Submetrics for further analysis	• Percentage of students undeclared at entry • Number of major changes • Likelihood of meeting requirements for entry to intended major • Availability of intended major (e.g., wait lists) • Availability of detailed degree maps for intended major • Availability of prerequisite courses in sequence for intended major

1 initiative measures Program of Study Selection

Field Usage and Convergence
Research by the Community College Research Center (CCRC) shows that community college students who do not enter a program of study within their first year are much less likely to persist and achieve a successful outcome. However, CCRC also finds that using students' declared major or program of study is not as useful as using students' course-taking behavior in identifying whether they have successfully entered a program of study. As a result of these findings, CCRC recommends the methodology employed by CBD, in which students must complete nine credit hours or three courses in a program of study to count as "concentrators" in a major field.[13] The framework supports this practice by measuring whether students select a program of study within the first year of enrollment, regardless of credential level. This recommendation diverges slightly from CCA's practice of measuring major selection at entry for all students; however, this framework recommends measuring major selection at the end of the first year to allow institutions to use the CBD methodology.

The framework leans on CCA's classification of meta-majors (see list above) because when students enroll early in one of these categories, they are able to get on a "guided pathway to success."[14] The meta-majors offer a level of specificity without limiting future adjustments to students' more refined major selections. CCA has mapped two-digit Classification of Instructional Programs (CIP) codes to the seven meta-majors to allow for easy classification and more in-depth analysis.

Use Cases
Concentration in a program of study is an early indicator of student progression through higher education, offering more information about how and why some students falter. If an institution finds that large proportions of their students are not concentrating in a major early in their collegiate careers, then the institution can adjust advising, course registration, and scheduling practices to encourage students to concentrate earlier and build momentum toward their degrees. While not specifically geared toward students for consumer purposes, program of study selection is another progression metric that can enhance academic advising and course selection.

The submetrics are designed to highlight the likelihood of a student progressing as well as factors that could contribute to slower progression. Specifically, if students change majors frequently, an institution may need to provide more intensive advising and earlier information about major tracks and associated career opportunities. Similarly, if students do not accumulate the credits or GPAs necessary to enter specific majors, the institution can revisit its policies and communication strategies for alerting students to the steps they need to take to prepare for their major of interest. Detailed degree maps by major are another resource for ensuring that students are on a pathway to postsecondary success, as demonstrated through research by CCA, CCRC, and the Education Trust on guided pathways, Integrated Planning and Advising Services (IPAS), and using data to support at-risk students.[15]

Retention Rate	
Definition	The percentage of students in a cohort who are either enrolled at their initial institution or transfer to a longer program at the initial or subsequent institution, calculated annually up to 200 percent of program length
Population	Twelve-month incoming student cohorts by credential level and student enrollment status and attendance intensity (e.g., FTFT, FTPT, TFT, TPT)
Disaggregates	Academic preparation, economic status (at entry), race/ethnicity, gender, age, first-generation status, and program of study (at entry)
Submetrics for further analysis	• Timely registration for classes • Term-to-term retention rates • Retention with advanced class standing (e.g., credits) • Stopout or consecutive enrollment rates • Academic standing (e.g., GPA, credits) on transfer or dropout • Number of credits and degree conferral at transfer out • Near completion (e.g., fewer than 15 credits) on transfer or dropout • Major/degree at subsequent institution compared with initial institution • Withdrawal rate (percentage of all enrolled students who leave in one year)

9 initiatives measure Retention Rate

Field Usage and Convergence
First-year retention rates are a commonly used metric of student progression, collected in IPEDS and seven voluntary initiatives reviewed for this project.[16] However, retention rate specifications often do not align with other progression and outcome metrics, such as graduation rates. This framework's retention definition aims to leverage the field's best thinking about progression and completion to design a retention metric that parallels those efforts.

For instance, CCA and IPEDS use fall enrollment cohorts to measure retention, but this framework proposes a 12-month cohort to capture more nontraditional students. Also, while IPEDS and other commonly used retention metrics measure retention only after one year, this framework proposes tracking retention every year up until 200 percent of program length to provide continuous updates on the progress of each cohort. Additionally, while VFA does not count transfer students as retained and CCA includes in the numerator of the retention rate students who transfer to any level of institution or program, this proposed measure includes in the numerator only students who transfer to a longer program. This recommendation aligns with the framework's proposed retention rate with the proposed outcome measures (graduation, transfer, and success). Students who transfer into degree programs with the same or shorter length do not count in the numerator of this retention

rate but are captured in the numerator of the persistence rate. Finally, some initiatives, like the VFA, measure retention rates term-to-term in the first year, rather than annually from the first to second year. To manage reporting burden, this framework opts for longer term reporting (up to 200 percent of program time) over more frequent (term-based) reporting, although institutions could supplement this retention metric by reviewing retention data each term.

Use Cases
Measuring retention across years enables an institution to decipher when and which students stopout and dropout and, through subsequent investigation of submetrics, determine why. For example, a student dropping out after one year is very different from a student dropping out just short of a credential. Parsing the different times for stopout and dropout, especially for different student populations such as underrepresented minorities, allows institutions to target interventions to address students' specific barriers or needs.

Programs and institutions can further use the recommended submetric data on academic momentum and achievement at the time of stopout or dropout to better understand if students are leaving their institution due to income constraints, low achievement, or alternative reasons. While largely used as an institutional improvement measure, retention rates can also serve as important signals for both prospective students, who can use retention to select institutions where they have the best chance of persisting, and policymakers, who can design policies and programs that promote higher retention rates.

Persistence Rate	
Definition	The percentage of students in a cohort remaining enrolled or earning a credential at their initial or subsequent institution, measured annually up to 200 percent of program length
Population	Twelve-month incoming student cohorts by credential level and student enrollment status and attendance intensity (e.g., FTFT, FTPT, TFT, TPT)
Disaggregates	Academic preparation, economic status (at entry), race/ethnicity, gender, age, first-generation status, and program of study (at entry)
Submetrics for further analysis	• Stopout or consecutive enrollment rates • Academic standing (e.g., GPA, credits) on transfer or dropout • Number of credits and degree conferral at transfer out • Near completion (e.g., fewer than 15 credits) on transfer or dropout • Major/degree at subsequent institution compared with initial institution • Withdrawal rate (percentage of all enrolled students who leave in one year)

15 initiatives measure Persistence Rate

Field Usage and Convergence
The persistence metric in this framework is based largely on the Student Achievement Measure (SAM), an initiative supported by the American Association of Community Colleges (AACC), the American Association of State Colleges and Universities (AASCU), the Association of American Universities (AAU), the American Council on Education (ACE), the Association of Public and Land-grant Universities (APLU), and the National Association of Independent Colleges and Universities (NAICU).

Specifically, the framework's recommendations closely mirror SAM's bachelor's-seekers model. For instance, this framework recommends including enrollment and completion at subsequent institutions in the persistence rate numerator because those figures can provide useful feedback to all colleges, particularly two-year colleges, to help support students along their degree pathways. Thus, the numerator of the persistence metric includes counting students who: have earned any credential at their initial institution, have earned any credential at any subsequent institution, are still enrolled at the initial institution, or are still enrolled at any subsequent institution. This methodology matches SAM's bachelor's-seeking model, but differs from its associate's-seeking model, which does not require institutions to report completions at subsequent institutions and reports only once at the end of the six-year reporting period. By applying consistent metric definitions to all credential levels, this framework aims for results that are more comparable across institutions. Additionally, the associate's-seeking model for SAM is scheduled to expand this fall to offer an option of applying the bachelor's-seeking model to associate's-seeking students.

This framework's proposed persistence metric does expand on SAM by using 12-month cohorts for all three undergraduate credential levels (bachelor's degree, associate's degree, certificate) and all four incoming student cohorts (FTFT, FTPT, TFT, TPT) as detailed in the cohort specifications section of this paper, instead of the fall-start cohorts SAM uses, as a reflection of IPEDS definitions. As currently specified, SAM's bachelor's-seeking model requires only two cohorts: FTFT and TFT, although institutions may opt to report FTPT and TPT students also. SAM also reports outcomes to only 150 percent of program time, whereas some collections, like the VFA and IPEDS Outcome Measures, track certificate- and associate's-seeking students to 300 percent or 400 percent of program time, stating that this additional time could capture additional students who may have stopped out or dropped out during their education careers.[17] This framework strikes a compromise, proposing that persistence rates be measured annually up to 200 percent of program time, signaling the importance of timely completion while also allowing some flexibility for students who take longer to complete.

The framework does distinguish this *persistence* metric from the proposed *success* metric, which measures whether students earn the credential sought at their initial institution or transfer to a longer degree program at the initial or subsequent institution, because the field is using both of these measures for complementary, yet distinct uses. This measure is designed to include those students not captured in the numerator of the retention or success measure, for a more comprehensive view of student persistence. By tracking all transfers and completions, the student-centric persistence metric is designed to present a comprehensive picture of student movement throughout the postsecondary system, while the institution-centric success metric is designed to focus colleges and universities specifically on their institutional contributions to students' outcomes (for more detail, see the section on outcome rates).

Use Cases
Along with retention and outcome rates, institutions, prospective students, and policymakers can use persistence rates to better understand the full range of outcomes for college students. For institutions, for instance, the persistence rate signals a credible target for improving their success rates, because students who are persisting elsewhere might have graduated from their initial institution instead. The persistence rate is also useful for institutions that aim to prepare many of

their students for transfer, so they can demonstrate their progress and success.

Institutions can also use information gleaned from the full range of student progression outcomes reflected in the persistence rate to inform student support policies and programs, as well as academic programs. The submetrics mirror those recommended for retention and can help institutions evaluate when, which, and why students move within and outside of the institution. Policymakers can use persistence rates to evaluate how students progress through the higher education system, especially when examined within a state. Finally, students can use persistence rates in concert with outcome rates to understand how they may fare by beginning at a particular institution, while also accounting for potential success elsewhere. These rates add another layer of information that prospective students and families can use to make the best and most informed higher education decisions.

COMPLETION

Outcome Rates: Transfer Rate, Graduation Rate, and Success Rate	
Definition	**Transfer rate:** The percentage of students in a cohort who transfer into longer programs at the initial or subsequent institution(s), up to 200 percent of program length
	Graduation rate: The percentage of students in a cohort who earn the credential sought at their initial institution, up to 200 percent of program length
	Success rate (graduation rate + transfer rate): The percentage of students in a cohort who either graduate with the credential initially sought at the initial institution or transfer to a longer program at the initial or subsequent institution(s), up to 200 percent of program length
	Each outcome rate should be captured at least at 100 percent, 150 percent, and 200 percent of program length, and should be reported in real-time, not retroactively.[18]
Population	Twelve-month incoming student cohorts by credential level sought, enrollment status, and attendance intensity at entry (e.g., FTFT, FTPT, TFT, TPT)
Disaggregates	Academic preparation, economic status (at entry), race/ethnicity, gender, age, first-generation status, and program of study (at entry)
Submetrics for further analysis	• Stopout or consecutive enrollment rates • Graduation rates by number of transfer-in credits (if applicable) • Academic standing (e.g., GPA, credits) on transfer or dropout • Number of credits and degree conferral at transfer out • Near completion (e.g., fewer than 15 credits) on transfer or dropout • Major/degree at subsequent institution compared with initial institution • Withdrawal rate (percentage of all enrolled students who leave in one year)

17 initiatives measure Transfer Rate

18 initiatives measure Graduation Rate

1 initiative measures Success Rate

Field Usage and Convergence
More accurately accounting for the success of all students has been a top priority of many voluntary initiatives over the past decade. In fact, 18 of the initiatives reviewed for this framework collect some variation on the proposed metrics, with varying levels of detail. IPEDS, SAM, VFA, Access to Success (A2S), and CCA in particular provide the foundation for this framework's proposed outcome measures, disaggregates, and calculations. Reflecting the advancements in the field, this framework recommends tracking these outcomes for four 12-month enrollment cohorts. The four cohorts (FTFT, FTPT, TFT, TPT) are based on the cohorts defined in the IPEDS OM survey as well as the voluntary initiatives. Precedent also exists in the field for tracking separate cohorts based on credential sought, as the federal government now requires institutions to report credential-seeking status by credential level for federal aid purposes, and CCA and SAM report separate cohorts based on credential level sought. Although some students will change credential levels throughout the course of their studies, most students do not. Of those students who attain a degree,

Beginning Postsecondary Student (BPS) Survey shows that at least 85 percent receive their initially sought degree at the first institution attended, as opposed to a subsequent institution.[19] Similarly, according to a recent National Student Clearinghouse (NSC) report, 77 percent of the 2009 cohort that completed a degree did so at the initial institution.[20]

Finally, in terms of transfer, CCA tracks transfer only from a two-year to a four-year institution, while IPEDS OM and SAM report all transfers combined. This framework builds and expands on this previous work, recommending that institutions report transfer from a shorter to a longer credential program separately from transfer to a credential program of shorter or the same length. Only transfer to a longer program is counted in the recommended success rate, but all types of transfer are captured in the persistence metric described earlier. To better reflect student pathways, CCA recently began collecting a success rate, using the same calculation as recommended by the framework. This differentiation of transfers by level of receiving credential program in the success rate is particularly relevant for measuring the success of community-college students seeking transfer to four-year programs. New research also stresses the importance of tracking transfer from community college to four-year institutions to measure the effectiveness of an institution's ability to support students through the transfer process.[21] Some initiatives have reported in the past that it is not possible to reliably identify the length of the transfer credential program, only the level of the transfer institution. However, due to new federal reporting requirements for loan and Pell eligibility, the Clearinghouse is reporting near complete coverage on credential length in 2015 in its enrollment file, so we are confident that institutions can make this distinction or should be able to in the near term.

Use Cases
These outcome rates provide a more complete picture of how effectively students achieve their postsecondary objectives, highlight institution-level student success, and best reflect the information needed by students, policymakers, and institutions to understand and improve student outcomes. Outcome rates are used in tandem with persistence and retention rates to explore student mobility and success in higher education even more fully.[22]

Disaggregated for student characteristics like race/ethnicity, economic status, age, first-generation status, and academic preparation, outcome rates can be particularly useful in helping institutions target their efforts to promote equitable results among all of their students. For example, examination of the disaggregated outcome rates recommended here could allow institutions to identify groups of students that need more support and subsequently design interventions to move more of those students toward completion. In particular, nearly every initiative examined disaggregates completion rates by Pell status, demonstrating that such reporting is feasible and useful for institutions and policymakers—both of whom are increasingly interested in the success of low-income students. Furthermore, understanding what types of programs students transfer to can give colleges insight into whether they are helping students reach their next intended degree goal or whether they can improve by retaining students who are simply leaving to attend other institutions. Given that completing a credential is the primary goal of most students, it is crucial that institutions take a close and frequent look at the completion outcomes of all of their students.

Completers	
Definition	The number of students who complete a credential in a given year
Population	All completers in a given year by credential level attained
Disaggregates	Race/ethnicity, gender, age, academic preparation (at any time), economic status (at any time), first-generation status, program of study (at exit), and part-time (at any time) and transfer status
Submetrics for further analysis	• Crosstabulations of credentials awarded by key disaggregates (e.g., race and gender) • Distribution of credentials awarded by program of study • Distribution of credential awarded to underrepresented populations • Credentials awarded to underrepresented populations in STEM • Time and credits to credential

20 initiatives measure Completers

Field Usage and Convergence

This completers metrics recommends counting the number of *students* who complete, as opposed to the number of *credentials* completed. This specification follows convention for the new completers measure added to IPEDS in 2011–12. While IPEDS collects counts of both completers (number of students) and completions (number of degrees/certificates), this framework recommends using completers as the primary metric, as it aligns with national goals to raise attainment by graduating more credential completers. However, it may still be appropriate to track and report completions (including students who earn multiple degrees at the same time) for other purposes.

IPEDS disaggregates the number of completers by credential level, gender, race/ethnicity, and age and the number of completions by credential level, program of study, race/ethnicity, and gender. This framework recommends using all of these disaggregates already in IPEDS and adding economic status, academic preparation, first-generation status, and part-time and transfer status as recommended disaggregates. In addition to IPEDS, the National Community College Benchmark Project (NCBBP), the VFA, and others[23] collect unduplicated completion counts, which are functionally similar to this proposed completers metric.

Use Cases

Institutions can use counts of completing students to demonstrate productivity and their institutional contribution to the workforce and society. Especially when disaggregating by demographic characteristics, top-performing institutions can make the case that they are contributing large numbers of underrepresented college graduates. Alternately, these data on completers could show that some institutions are producing very few graduates in certain fields (e.g., STEM) or from certain student groups (e.g., African Americans) or a cross between the two (e.g., African American STEM graduates). These results can trigger the college to investigate the cause for small numbers or gaps and evaluate whether their credential awarding patterns align with institutional goals and workforce needs. Students and policymakers can employ this metric to examine the types of students that succeed at a particular college, contributing to informed school selection and strategic policies that advance those institutions that serve all students well. For example, many states include the number of credentials awarded or students completing—particularly for underrepresented student groups—in their outcomes-based funding formulas.[24]

Time and Credits to Credential*	
Definition	**Time to credential:** The average time accumulated from first date of entry to the institution to date of completion for all completers in a given year
	Credits to credential: The average credits accumulated from first date of entry to the institution to date of completion for all completers in a given year
Population	All completers in a given year by credential level attained
Disaggregates	Race/ethnicity, gender, age, academic preparation (at any time), economic status (at any time), first-generation status, program of study (at exit), and part-time (at any time) and transfer status
Submetrics for further analysis	• Average number and percentage of transfer credits accepted (if applicable)
	• Number of course D's, F's, W's, I's or retakes
	• Major declaration/major changes
	• Stopout or continuous enrollment rates
	• Cumulative debt by time or credits to credential

*Although classified as an efficiency metric in the framework, this is presented in this chapter because of its close relationship with the completers metric.

Field Usage and Convergence
Time and credits to credential measure the efficiency with which students complete their degrees or certificates. As such, it is classified as an efficiency metric in this framework but presented here alongside the performance metrics because it is so closely connected to the completers metric. Time and credits to credential have become commonplace in the field, with seven initiatives, including ATD, CCA, and the PAR Framework calculating similar metrics.[25]

This metric measures only credits accumulated and time spent at the specific institution of interest, though if measuring for a state or system, credits at any institution in that state or system should be included. The framework proposes using CCA's definitions and methodology for remedial courses and stopouts. For example, remedial courses *should count* toward the total accumulations, regardless of whether the credits count toward degree completion, to provide a comprehensive picture of time and credit accumulation for students at varying levels of academic preparation.[26] To control for outliers and reflect institutional practices related to stopouts, this recommended calculation excludes students who stopout for more than five years.[27] As for disaggregations, the framework builds on those required by CCA to further align these metrics with many of the others included in the framework. These disaggregates also allow for deeper and more dynamic analysis.

Use Cases
This metric allows institutions to analyze how efficiently students complete credentials, flagging potential inefficiencies to be addressed. First, institution and department leaders can use these data to understand which programs take longer to complete and thus may be more costly options for students, as well as programs that need curricular review to determine if degree requirements are set appropriately. Some credential requirements may be outdated and could be streamlined to reduce the number of credits required for completion while still maintaining quality. In some cases, students may be taking unnecessary courses because credential pathways are not communicated clearly or because the courses they need for their credential are unavailable, which can be addressed in the academic advising and scheduling process.

8 initiatives measure Time and Credits to Credential

Also, if certain student populations tend to take more courses than needed or take a long time to complete, corrected pathways and additional supports can be implemented at the college or department level to intervene with additional advising for students at risk of extended time to credential. Additionally, those institutions with favorable transfer policies should show lower rates of time and credits to degree because acceptance of transfer credits enhances efficiency. In cases where the opposite is true, transfer policies could be reevaluated to decrease time to credential. Students also can use these data to inform college decision-making. Because time and credits to credential directly affect college affordability for many students, knowing these outcomes manages expectations for personal finance and time that should be dedicated to higher education. For policymakers, longer-than-average time to completion can signal inefficient use of federal or state funds.

COST

<table>
<tr><td colspan="2" style="background:#d0103a;color:white">Net Price*</td></tr>
<tr><td>Definition</td><td>The average cost of attendance (COA) for an institution less all grant aid in a given year

Net Price = COA − All Grant Aid

COA follows federal definitions for costs associated with a year of college, including tuition and fees; room and board (determined by living arrangements); books and supplies; and other expenses, like travel and personal items

Grant aid includes grants from all sources (federal, state or local, institutional, and other)</td></tr>
<tr><td>Population</td><td>FTFT, and all full-time undergraduates by credential level; includes all students, not just aid recipients; excludes out-of-state students</td></tr>
<tr><td>Disaggregates</td><td>Credential level, economic status (at that time), academic preparation, race/ethnicity, gender, age, first-generation status, program of study (at that time)</td></tr>
<tr><td>Submetrics for further analysis</td><td>• Percentage of students applying for aid
• Percentage of students receiving grant aid (by type or source)
• Net price for students receiving grant aid
• Net price by dependency status
• Net price divided by average income within quintiles
• Net price for part-time, transfer, out-of-state students
• Net price by year in college
• Number of hours worked
• Number of dependents</td></tr>
</table>

*Also see the related unmet need metric.

2 initiatives measure Net Price

Field Usage and Convergence

This net price metric recommendation is based on the current IPEDS collection but expands on it by including non–grant aid or non–Title IV aid recipients, adding a cohort for all full-time undergraduates and cohorts by credential level, allowing for analysis of grant aid by source, and adjusting the income bands. This metric follows IPEDS methodology by calculating a weighted average COA based on students' living arrangements (on-campus, off-campus with family, off-campus not with family). COA for non-Free Application for Federal Student Aid (FAFSA) filers may need to be estimated if living arrangement information is not available through other sources.

Including nongrant/non-Title IV aid recipients

The precedent in IPEDS is to include only first-time, full-time grant/Title IV aid recipients in net price reporting, but this framework recommends expanding coverage by adding nongrant/non–Title IV aid recipients into the cohorts to surmise a more accurate picture of net price for more of the student population. Some contend that displaying the net price for aided students next to the percentage of students receiving aid provides a comprehensive enough picture of net price for all students. While these two data points together are valuable,

the net price figure is often displayed separately from the percentage of students receiving aid, creating a misleadingly low result by omitting full-pay students. Because of this limitation, the framework recommends including nonaided students in the calculation to present an "upper limit" of what students might be expected to pay.[28]

Others have noted that income data may not be available for non–Title IV recipients, making it difficult to disaggregate net price by income if all students are included. Although income data will be missing for some students not receiving federal aid, it will be available for all FAFSA filers, accounting for 70 percent of students, even if they do not receive aid, because that information is provided back to institutions. Indeed, for students whose family income falls in the upper two quintiles, at least 55 percent of students apply for federal aid.[29] Also, some colleges collect income information through their own financial aid applications or other methods, supplementing the FAFSA data. Therefore, it is recommended that institutions use all available income data and classify remaining students in an income-unknown category.

Adding a cohort for all full-time undergraduates and separate cohorts for each credential level

This framework also recommends adding a cohort of all full-time undergrads to supplement the first-time, full-time net price cohort. This all-undergraduate cohort will capture pricing for continuing and transfer students who may receive different levels of aid as compared with first-time students. While the all-undergraduate net price cohort would be an addition to IPEDS, including it aligns with other portions of IPEDS that collect a measure for both a *FTFT cohort* and an *all undergraduate* cohort (e.g., number and size of Pell Grant awards and federal student loans). Also, the framework expands on IPEDS by recommending separate net price calculations for each credential level offered at the institution. IPEDS data currently group students together regardless of credential level sought, but COA and grant aid may vary by credential level. While the framework includes only full time, in-state students to normalize costs, part-time and out-of-state student net prices could be calculated separately as submetrics to better understand the financial situations of those populations.

Allowing for analysis of grant aid by source

While not impacting the ultimate net price figure, this framework recommends reporting the federal, state, and institutional grant aid separately for each income level—rather than combined, as IPEDS does now. Reporting separate amounts

for each type of grant aid will allow one to evaluate the distribution of grant aid across income levels for each source. These measures of grant aid by source already are used to calculate the IPEDS net price figure, but they are not reported separately, confounding the impacts of federal, state, and institutional financial aid policies on students of varying income levels. However, average federal, state, and institutional grant aid *are* available elsewhere in IPEDS, just not disaggregated by income. These data would be more valuable if disaggregated by income level and better integrated across surveys.

Changing the income bands

Finally, this framework advances recommendations for new net price income bands using quintiles based on the annually published American Community Survey (ACS) family income data.[30] As the one-year ACS survey estimates are published two months ahead of the IPEDS net price data collection, the income categories can be updated annually to better reflect the landscape of families and students applying for aid. While the income thresholds will change annually, the methodology will offer consistency by always representing national income quintiles. These income quintiles demonstrate a change from the current IPEDS net price income categories, the origins of which are unclear, although they appear to approximate ACS quintiles from the time the net price legislation was being drafted in Congress.[31] They are not indexed to change over time, although the Secretary of Education has the authority to adjust them.

Use Cases

This metric is likely best known as a consumer information tool, providing students and families with the likely cost of higher education at any given institution based on their income level. However, current net price figures can be misleading because they apply only to students who receive aid, thus omitting the amount paid by nonaided students and making the results particularly unrepresentative of higher-income students who are less likely to receive Title IV aid.[32] Because students do not know whether they will receive aid before applying, they do not know if the IPEDS net price figures will apply to them. This framework's proposed metric provides comprehensive net price data for all consumers to evaluate expected prices and for policymakers to assess college affordability for all attendees, not just recipients of federal funding. Policymakers also should use net price results to evaluate how institutions and states spend their aid dollars and determine whether their practices align with the priorities of the federal government in lowering the net price for low-income students. Regardless of the adoption of this proposed net price metric, institutions should improve and better publicize their net price calculators so prospective students and families can obtain a more customized estimate of their expected price.[33]

For institutional improvement, financial aid officers and other college administrators can use these more inclusive figures to evaluate how much they are expecting students from different income levels to pay and can adjust financial aid policies and target intervention strategies accordingly. If, for instance, the net price is higher for low-income students than high-income students, the institution or state should redistribute grant aid toward the students with greater need. The net price submetrics also can be especially useful to guide institutional action. For example, if an institution finds that net price increases substantially for low-income students based on their year in program, they can reevaluate policies to implement more predictable prices across time.

Unmet Need*	
Definition	The average net price for an institution less the average expected family contribution (EFC) in a given year *COA – All Grant Aid – EFC = Net Price – EFC*
Population	FTFT, and all full-time, undergraduates by credential level; includes all students, not just aid recipients; excludes out-of-state students
Disaggregates	Credential level, economic status (at that time), academic preparation, race/ethnicity, gender, age, first-generation status, program of study (at that time)
Submetrics for further analysis	• Percentage of students applying for aid • Percentage of students receiving aid • Percentage of students with unmet need and their average unmet need • Unmet need for aid recipients by type or source • Unmet need by year in college • Part-time, transfer, and out-of-state unmet need • Student payment methods for meeting unmet need • Completion rates by level of unmet need • Number of hours worked • Number of dependents

*Also see the related net price metric.

0 initiatives measure Unmet Need

Field Usage and Convergence

This unmet need metric expands on what is currently collected through the IPEDS net price metric, by incorporating EFC into the calculation. Unmet need is used frequently by institutions, advocates, and researchers to evaluate the adequacy of financial aid in meeting students' financial needs.[34] However, an institution may not have data to calculate unmet need for all students in the cohort because of missing EFC information, which is calculated via the FAFSA. The framework recommends that reporting strive to be as complete as possible, given available data. Unmet need data are included in the National Postsecondary Student Aid Survey but are reported only at the national—not the institutional—level, which is problematic for all key constituencies needing the data.

While some prefer to use net price *or* unmet need, the framework encourages the field to consider both metrics in conjunction with each other, as they help understand the price of higher education in relation to family or personal income in different ways. For example, net price can be calculated as a percentage of family income, as a measure of affordability, whereas unmet need provides a concrete dollar amount that students must find a way to finance, above and beyond what their family can afford to pay.

Use Cases

As part of financial aid awarding processes, institutional leaders should use unmet need to drive organizational change and improvement around equitable access to higher education. Accounting for EFC through an unmet need calculation offers a better understanding of the financial hurdles facing students of varying income levels and allows institutions to promote practices and processes that are mindful of affordability for all students. If, for example, the institution finds overmet need (negative unmet need) for high-income groups and substantial unmet need among low-income groups, which is the case in nationally representative survey data, it can adjust its financial aid policies to redirect aid to the students with remaining financial need.

The submetrics help to clarify how financial aid application, aid received, payment methods, dependency status, and work burden can impact unmet need, and a student's ultimate ability to pay for college. While much of these data are accessible through the National Center on Education Statistics' (NCES) sample studies, they are not available at the institution level, so the collection and analysis of these data could fill a large gap in the field's understanding of the variability of unmet need across colleges.

Students can use unmet need to evaluate whether that particular institution is affordable for them and how it financially serves students in similar financial situations. Policymakers could use this metric in tandem with net price to assess the full scope of financial burden that is placed on students and families and adjust financial aid policies accordingly—or encourage institutions to do so.

Cumulative Debt	
Definition	The median amount of debt student borrowers incur while attending an institution or program. Includes all sources of student debt—federal, state, institutional, and private loans
Population	All undergraduate borrowers who leave the institution in a given year (completers and noncompleters, but disaggregated)
Disaggregates	Credential level, completion status, economic status (at any time), enrollment status, attendance intensity (at any time), program of study (at exit), race/ethnicity, academic preparation (at any time), age, gender, first-generation status
Submetrics for further analysis	• Percentage of students borrowing overall and by type of loan • Loan debt by type of loan • Loan debt by dependency status • Cumulative loan debt across all institutions attended for transfer students (if available)

7 initiatives measure Cumulative Debt

Field Usage and Convergence
The College Scorecard uses median cumulative loan debt as a core debt measure, derived from National Student Loan Data System (NSLDS) data.[35] The voluntary Common Data Set also collects debt data, which have served as the basis for most analyses of student debt to date.[36] This framework's proposed definition for median debt is similar to the College Scorecard standards in many ways, as discussed below. Key components of this metric design include using completion status as an *essential* disaggregate, reporting the percentage of students borrowing as an *essential* submetric, and counting all debt accumulated at the reporting institution, including Parent PLUS and private loans.

Completion status is an essential disaggregate
This framework recommends including all students exiting the institution during a given year in the median debt measure, in addition to reporting separate cumulative debt figures for completers and noncompleters.[37] In other words, completion status is an *essential* disaggregate for this debt measure because debt aggregated across completers and noncompleters could confound results. For example, if a typical student leaves a college with a degree and $30,000 in debt, that college is serving students far better than a college where the typical student leaves with $30,000 in debt and no degree. Reporting cumulative debt for noncompleters is necessary as well because these students are most likely to struggle with repayment.[38]

The percentage of students borrowing is an essential submetric
To provide context around the accumulated loan debt, the framework also strongly recommends reporting the percentage of the cohort that borrowed any loans as an essential companion metric. An institution with $30,000 in median debt

and 95 percent of students borrowing is performing very differently from an institution with $30,000 in median debt and 5 percent of students borrowing. This combination creates the foundation for understanding loan borrowing patterns for an institution, and both should be reported together.

This methodology differs from the framework's recommended net price definition, which includes all students—aided and unaided. Including all students in the net price measure results in a higher estimate of what students might be expected to pay than if nonaided students were omitted. In the same regard, *excluding* nonborrowers from the median debt calculation leads to a higher estimate of debt than if nonborrowers were included. In both cases, the decision reflected in the framework is designed to provide students with a sense of the greatest likely financial risk.

Count all debt accumulated at the reporting institution, including Parent PLUS and private loans
While the Scorecard includes only federal student loan debt, excluding Parent PLUS and private loans, this framework recommends including all loans, including Parent PLUS and private loans. While PLUS loans are taken out by a different person (parent rather than student), they still contribute to the family's total debt required to pay for college, and combining them with student loan debt paints a more complete picture of college affordability or lack thereof.

In addition to including Parent PLUS loans, the framework also recommends including private student loan debt in this metric to discern the full extent of borrowing. While not required by law, most lenders require that an institution certify student enrollment at the time of the loan, so institutions should be able to keep records on private borrowing.[39] This private loan data collection goes beyond what is reported on the College Scorecard, but the benefits of understanding the extent of nonfederal loans, which often carry high interest rates and are void of the consumer protections federal loans afford, outweigh the additional burden of collection. If an institution prefers not to rely on its own records, it can access private student loan data through a contract with MeasureOne, a third-party that captures private student loan volume from the six major lenders, representing 71 percent of the student loan market.[40] One potential drawback to the inclusion of private loans is that while institutions are aware of the aid amounts as disbursed through the institution, they are not necessarily aware of earned interest or payments made while enrolled, which impact the total loan debt at exit. Regardless of this limitation,

including the initial private loan amounts would still help to capture the amount borrowed to cover the cost of the degree.

While the framework recommends including all loan types in the cumulative debt amount, it also recommends disaggregating the metric by loan type to parse out the impact of different loan programs, like Parent PLUS and private loans. The framework also recommends disaggregation by credential level and program of study because students should be able to view debt and earnings side by side, by program, to understand their earnings prospects in relation to debt. Additionally, emergency short-term loans from institutions are not to be included in this metric, as their repayment period diverges from other federal loans and are not intended to cover unmet need—only emergencies. Finally, this framework recommends that the median cumulative loan debt metric include only the debt accrued from the reporting institution, as the Scorecard does, but the total cumulative debt submetric should include the students' total debt, regardless of institution or program, if available. This submetric will provide a more comprehensive view of the debt burden students carry into their post-college lives.

Use Cases
Understanding student loan debt is a necessary component to measuring institutional performance for policymakers and institutions alike, as financing can impact student access, progression, and completion. Specifically for cost metrics, the distinction among median debt among students of different economic statuses is essential, as high costs limit access to low-income students and further stratify higher education. With the disaggregates and submetrics, especially specific to low- and moderate-income students, institutions can use these data to develop better, more targeted counseling and services for populations who may be at risk of high student loan debt. Institutions and policymakers also can use the disaggregated debt data to help craft financial aid policies to reduce debt, especially for the most economically vulnerable students, as they are more likely to take on loan debt.[41]

Debt data also can be used to inform student decisions in the same way as net price, providing prospective students with a better understanding of how students in similar situations fare at the institution. Median cumulative debt seeks to quantify both affordability and financing methods used by typical students at each institution. While total loan volume across an entire institution, available on the Federal Student Aid Data Center, is a useful data point for evaluating broader trends regarding student loans, the median cumulative debt better demonstrates what is required financially of a typical student.

POST-COLLEGE OUTCOMES

Loan Repayment and Default Rates	
Definition	**Loan repayment rate:** The percentage of borrowers in a cohort who make at least $1 of progress on their loan principal in a fiscal year, measured at one, three, five, and 10 years into repayment *Number of Borrowers Paid in Full + Number of Borrowers in Active Repayment* *Number of Borrowers Entering Repayment* **Cohort default rate** (CDR- federal three-year rate): The percentage of borrowers who enter repayment in a fiscal year and default in three fiscal years[42]
Population	All borrowers who enter repayment in a given year.
Disaggregates	Undergraduate versus graduate status, completion status, economic status (at any time while enrolled), program of study (at exit), race/ethnicity, enrollment status, attendance intensity (at any time while enrolled), academic preparation (at any time while enrolled), age, gender, first-generation status
Submetrics for further analysis	• Incidence of deferment, forbearance, and delinquency • Use of income-driven repayment plans • Average amount of defaulted loan • Loan repayment and cohort default rates by loan type • Student Default Risk Index

3 initiatives measure Loan Repayment and Default Rates

institutions accountable for default on debt taken out to attend their institution or previous institutions, institutions that can parse out the default rate for loans from their institution alone, using their LRDR and SPR, could provide better outreach and counseling to students at risk. This framework also recommends the Institute for College Access and Success' (TICAS) proposed Student Default Risk Indicator (SDRI) as a submetric to CDRs. The SDRI is calculated by multiplying the CDR with the institution's borrowing rate to better contextualize the borrowing environment of the institution.[47] Either a lower borrowing rate or a lower default rate would improve performance on this metric.

Repayment rates gained prominence during the past five years through gainful employment regulations and proposals related to federal risk-sharing and accountability; they were included in the September 2015 release of the College Scorecard data.[48] These rates are valuable because borrowers could

Field Usage and Convergence
The framework recommends using CDRs and repayment rates in tandem because CDRs measure the worst outcome for students—default—and repayment rates complement by showing whether student make at least minimal progress annually on their loans. CDRs are calculated and released by the U.S. Department of Education (ED) annually to determine institutional federal financial aid eligibility, and repayment rates were released on the latest College Scorecard.[43] The framework proposes maintenance of current field practice and definitions because institutions must work with the data that ED provides currently. Despite concerns around gaming CDRs,[44] this metric fills a crucial role in measuring institutional performance, by showing the frequency of students' worst debt-related outcome. Research has shown that institutions can reduce student loan default through targeted actions, improved performance on the metric and, more importantly, borrowers' financial situations.[45] Institutions are becoming more creative in ways to reach out to delinquent borrowers and help them into a positive repayment status before default.

Federal CDRs currently exclude PLUS, Perkins, consolidation, and private loans, although the framework recommends that institutions attempt to calculate for these loans default rates based on data from their Loan Record Default Reports (LRDR) and School Portfolio Reports (SPR) available through the Office of Federal Student Aid (FSA).[46] Because CDRs hold

be avoiding default but experiencing other poor outcomes, such as delinquency or negative amortization. The framework recommends using the basic calculation and definition parameters used in the Scorecard and in the 2014 gainful employment regulations: a borrower-based rate where the borrower must pay down at least $1 of principal balance in the fiscal year measured to be counted as in repayment.[49] Repayment rates should be calculated at one, three, five, and 10 years into repayment in order to maintain consistency with repayment rates reported through the College Scorecard, with the length of the standard repayment period, and with other post-college outcome metrics recommended through the framework. Also, for future versions of the framework, field experts and policymakers should define successful repayment as more than just a $1 reduction in principal. The field acknowledges the need to raise the bar but has not chosen a new threshold for successful repayment.

At a minimum, ED should continue to release repayment rate data annually, either through updates to College Scorecard data or through the FSA or IPEDS Data Centers, and they also should consider improving the quality of the data available in the SPRs available to institutions. Detailed recommendations regarding repayment rates are discussed in *Making Sense of Student Loan Outcomes: How Using Repayment Rates Can Improve Student Success*.[50]

Use Cases

To build on current practice, institutions are encouraged to integrate the CDR data they receive from ED with student-level data in their student information systems in order to conduct additional analysis.[51] With this integration, institutions can disaggregate default rates by completion, economic status, and credential level—including by graduate and undergraduate student status—to determine which students default. With additional support from ED, institutions also can attempt to extend the CDR time frame beyond three years, disaggregate by loan type, and recalculate CDRs based only on debt accumulated at their institutions. CDRs are also an important consumer information tool for prospective students and families because a high cohort default rate signals that students may have a difficult time repaying their loans, and default has serious credit consequences for students. Policymakers also use CDRs to set basic standards that institutions must meet to receive federal financial aid dollars.

Repayment rates can offer additional actionable data to improve borrowers' post-college outcomes. A set of four institutions recently calculated and disaggregated their own repayment rates in a variety of ways using FSA data and, through that endeavor, the colleges noted how valuable the results were in helping them rethink their practices, such as student loan counseling and financial aid packaging, to set students up to repay their debts successfully. When merging FSA data with institutional records, institutions can use repayment rates to evaluate which borrowers (e.g., noncompleters, students in specific programs, low-income students) are least likely to make adequate progress on their loans and target financial aid and interventions accordingly. Policymakers have proposed using repayment rates to enhance institutional standards and protect students through either minimum performance thresholds, risk-sharing, or consumer disclosures. This metric can also help alleviate concerns around CDR manipulation and the ability of institutions to game the system.[52]

Graduate Education Rate	
Definition	The number and percentage of bachelor's recipients enrolling in postbaccalaureate or graduate programs in one, five, and 10 (optional) years of completion
Population	Bachelor's recipients in a given year
Disaggregates	Program of study (at exit), enrollment status, attendance intensity (at any time while enrolled), academic preparation (at any time while enrolled), economic status (Pell ever), race/ethnicity, gender, age, first-generation status
Submetrics for further analysis	• Relationship between undergraduate program of study and graduate program of study • Income, gender, or racial gaps in graduate education, especially STEM programs • Relationship between debt and graduate education enrollment or graduate program of study

3 initiatives measure Graduate Education Rate

Field Usage and Convergence

In most of the reviewed voluntary initiatives, the graduate education rate is not explicitly captured. For some, like the NSC and the Western Interstate Commission for Higher Education (WICHE), the postbaccalaureate enrollment data are collected so the rate can be calculated if the initiatives chose to do so. The cohort for this framework's proposed graduate education rate includes only bachelor's recipients—the persistence and transfer metrics capture continuing education rates at 200 percent of program time for certificate- and associate's-seeking graduates.

The time frames of one, five, and 10 years are aligned with the earnings and employment metrics to be used in tandem to understand the spectrum of post-college outcomes for students, furthering the goal of counting all outcomes. To further support these timeline thresholds, the Baccalaureate and Beyond Longitudinal Study (2008–12) reports that 25 percent of students surveyed enroll in one year and almost 40 percent enroll in four years, showing a marked increase between the two time frames.[53] Graduate Record Examination (GRE) scores are valid for up to five years after taking the test, so measuring graduate education after five years should capture most students who completed a bachelor's degree with the intention of enrolling in further education.[54]

Use Cases

At graduation, bachelor's recipients have a variety of options. In order to comprehensively account for post-college outcomes, the framework includes graduate education rates to capture outcomes for students who may choose not to enter the workforce. For students, policymakers, and institutions, these rates are used to fill in the gaps that exist when only employment outcomes are considered.

Additionally, institutions can compare graduate education rates with the mission of their programs to see if their credentials are in fact preparing students for their intended outcomes—either employment or further education. If graduate education rates are not consistent with expected student outcomes (i.e., the continuing education rate is low for a program that should be the foundation for graduate school education), then leadership can evaluate why student pathways are inconsistent with the institution's or program's goals. Because this metric is disaggregated by program of study, institutions also can use the submetrics to evaluate the enrollment of specific populations of students into graduate programs, specifically for the STEM fields, and measure whether students enroll in a program similar to that of the undergraduate degree.

Learning Outcomes	
Definition	Public display of student learning goals, assessments, and outcomes using the National Institute for Learning Outcomes Assessment's (NILOA's) Transparency Framework. Institutions also should consider using Lumina Foundation's Degree Qualifications Profile (DQP) and the Association of American Colleges & Universities' (AAC&U's) Valid Assessment of Learning in Undergraduate Education (VALUE) Rubrics to develop, refine, and measure mastery of learning outcomes
Population	Subject to institutional availability
Disaggregates	Credential level, economic status (Pell ever), race/ethnicity, and academic preparation, program of study
Submetrics for further analysis	• Subject to institutional availability

4 initiatives measure Learning Outcomes

Field Usage and Convergence

This framework recommends reporting student learning outcomes using NILOA's Transparency Framework as a guide. The NILOA Framework encourages institutions to publish information about student learning outcomes statements, assessment plans, assessment resources, current assessment activities, evidence of student learning, and use of student learning evidence.[55] The Voluntary System of Accountability (VSA), an initiative of APLU and AASCU, recently adopted the NILOA Framework.[56]

This framework recommends that institutions consider using Lumina Foundation's DQP and the AAC&U's VALUE Rubrics as tools for developing or refining their approach to student learning outcomes. The DQP provides a set of baseline reference points for what students should know and be able to do on earning a credential at the associate's, bachelor's, and master's degree levels. These encompass demonstrating proficiency in specific areas of learning including Specialized Knowledge, Broad and Integrative Knowledge, Intellectual Skills, Applied and Collaborative Learning, and Civic and Global Learning. The complementary Tuning process helps institutions to identify and assess discipline-specific learning outcomes.[57]

VALUE offers a set of rubrics for 16 essential learning outcomes. Two of these rubrics—Critical Thinking and Written Communication—were endorsed for use as part of the initial guidelines for the VSA College Portrait.[58] Lumina Foundation also leverages the VALUE rubrics in the DQP, highlighting the resource as a means for institutions and instructors to understand student achievement of college-wide learning or course objectives.[59] To continue to advance the use of these rubrics and to meaningfully compare the results across entities, AAC&U is partnering with the State Higher Education Executive Officers (SHEEO) to implement them at 69 institutions in 10 states.[60]

While NILOA, DQP, and AAC&U's VALUE rubrics are continuing to advance the field in assessing student learning, institutional usage of rubrics and assessments to gauge learning outcomes varies widely. Some institutions use these initiatives' rubrics and guidelines; some use standardized tests such as the Collegiate Learning Assessment (CLA), ACT's Collegiate Assessment of Academic Proficiency, and the Educational Testing Service (ETS) Proficiency Profile; and some use a combination of measurement techniques, including those developed at the individual institution.[61] As such, clear convergence across many institutions and initiatives is not yet apparent. Because the field remains in flux on this topic, this framework defers to VSA and their use of NILOA's Transparency Framework, as it is used by a large array of schools participating in the initiative.[62]

Use Cases

Learning outcomes strive to quantify what students learn through their credential program. States and institutions should use these rubrics and assessment tools to benchmark progress on student outcomes and to refine teaching and curriculum to improve student learning. Institutions can use these tools to understand where gaps in student learning exist, especially for specific student groups (e.g., low-income students and students of color), restructure and revise course structure and content, and continuously improve student academic achievement.

Learning outcomes assessments also are used by institutions to demonstrate educational effectiveness transparently, effectively communicate program goals and outcomes to a variety of audiences, and fulfill accreditation requirements. While not in use in federal data collections, learning outcomes data can be used by the institution and state to measure the quality of programs and institutions of higher education. For example, in 2012 and 2013, Massachusetts commissioned the Multi-State Collaborative for Leaning Outcomes Assessment to compare outcomes with other states in partnership with AAC&U and SHEEO.[63] Using the VALUE Rubrics as a common language, colleges and universities in Massachusetts used several metrics to create composite indicators of student learning, including: pass rates on national licensure exams and mean scores on graduate entrance exams.[64] States and institutions use these exams as evidence that college students accumulated knowledge and skills while enrolled. Precollege and post-college scores are examined to gauge quality of learning and inform curricular or instructional changes.

Workforce Outcomes: Employment Rate, Median Earnings, and Earnings Threshold	
Definition	**Employment rate:** The percentage of former students with any reported annual earnings at one, five, and 10 years after exit from the institution[65]
	Median earnings: The median annual earnings of former students one, five, and 10 years after exit from the institution (excludes zeros)
	Earnings threshold: The percentage of former students earning more than the median high school graduate salary ($25,000 in 2014; includes zeros) at one, five, and 10 years after exit from the institution. The threshold should be updated annually using Current Population Survey data.[66]
Population	All students who exited the institution in a given year
Disaggregates	Credential level, completion status, program of study (at exit), economic status (Pell ever), race/ethnicity, gender, age, enrollment status, attendance intensity (at any time while enrolled), academic preparation (at any time while enrolled), first-generation status
Submetrics for further analysis	• Percentiles for earnings (10th, 25th, 75th, and 90th) • Pre- and post-college earnings • Relative wages (e.g., compared with local or regional wages)

Field Usage and Convergence
Increasingly, states and institutions are leveraging workforce data to enhance their understanding of labor markets in relation to higher education and student outcomes. Though some remain skeptical about the use of workforce measures—arguing they show a one-dimensional, incomplete view of college outcomes[67]—many seek this return-on-investment information. In fact, the use of Unemployment Insurance (UI) wage records at the state level to measure and publish student outcomes[68] and the inclusion of earnings and employment data in the recently revamped College Scorecard shows that students, policymakers, and the public are interested and invested in these data. Indeed, at least 90 percent of students say a primary reason they are attending college is to get a better job,[69] an understandable goal given the substantial financial investment students must make in their education. Proposed improvements to existing workforce data, like the inclusion of major-level data, could help to ease some of these concerns.[70]

After years of experimentation with workforce data in the states, the field is coming closer to consensus on how to define workforce metrics. In recent years, the federal government has built on the work of the states and defined and reported postsecondary workforce measures through both Gainful Employment and the College Scorecard. This framework heavily leverages the College Scorecard definitions, with some adjustments, to propose two workforce performance metrics (**employment rate** and **median earnings**) and one workforce efficiency metric (**earnings threshold**).

8 initiatives measure Employment Rate

7 initiatives measure Median Earnings

1 initiative measures Earnings Threshold

Employment Rate
A variety of demographic data sources, such as the Bureau of Labor Statistics, capture **employment rates** (or often, unemployment rates) at the national, state, and regional levels. The Workforce Innovation and Opportunity Act of 2014 (WIOA) requires reporting of employment rates for program exiters in addition to median earnings, credential attainment, measurable skill gains, and employer engagement.[71] However, until recently employment outcomes have not been reported for most colleges, including by program of study.[72] Now, the Gainful Employment regulations require institutions to report the program-level job placement rates of their graduates, and the College Scorecard data include an institution-level unemployment rate.[73]

Building on these efforts, this framework recommends an employment rate that counts as employed any graduate with any annual earnings in the specified period. This methodology is similar to that used by the College Scorecard[74] and the metrics reported for Florida as part of College Measures' Economic Metrics.[75] Additionally, some outcomes-based funding models use an unemployment or employment rate to illustrate similar points—the rate at which former students do or do not gain employment after exiting the institution or program.[76]

Median Earnings
This framework also recommends adopting a **median earnings** metric to gauge how students fare in the workforce after leaving college. A number of initiatives—including College Measures, the State Council for Higher Education in Virginia, WICHE's Multistate Longitudinal Data Exchange (MLDE), and the College Scorecard—measure post-college earnings, reflecting growing interest in these results.[77] This framework recommends using median rather than mean earnings to follow field practice,[78] disaggregating by at least credential level and completion status, reporting on wages at one, five, and 10 years after exiting the institution, and adjusting for inflation.[79] The proposed submetrics can provide added context to median earnings information, as follows:

• Evaluating earnings percentiles as submetrics can provide added insight about the full income distribution beyond what the median can show.
• Measuring the change in earnings pre- and post-college can provide a better understanding of the value-add of the credential, especially for returning adult students. A variety of

initiatives and efforts, including the VFA, the Voluntary Institutional Metrics (VIM) Project, and Salary Surfer for California's Community Colleges, measure pre- and post-college earnings.[80] These data are valuable, but institutions are reliant on readily available labor data and may be limited in their ability to calculate the metric. As data systems improve, the framework recommends revisiting the possibility of calculating pre- and post-earnings metrics on a larger scale.

• Contextualizing median earnings with regional-level economic data can ease concerns about earnings that vary based on region. An example of such contextualization is the Aspen Institute College Excellence Program's measurement of relative wages, which compares graduates' wages with the average wage of the county of the community college, one and five years after program completion.[81]

<u>Earnings Threshold</u>
Finally, the framework recommends an **earnings threshold** metric based on the methodology of the 2015 College Scorecard. This threshold measures the proportion of former students who earn above a bare minimum amount. ED chose $25,000 because it is the median salary of students with a high school diploma or GED,[82] so earnings above $25,000 indicate a fiscal value-add from the postsecondary education. The framework recommends updating this threshold annually to account for inflation and national income variation. It works particularly well alongside the median earnings metric because it sets a baseline expectation that any postsecondary program—regardless of expected career path—should at least boost student earnings above what they would likely earn without the college credential.[83]

<u>Data Sources</u>
Unfortunately, institutions cannot implement all of these recommendations on their own, since they must rely on the data provided to them by state and federal sources, which need to be refreshed on a regular basis. Routine use of employment rates, median earnings, and the earnings threshold is contingent on the federal government continuing to supply these data through releases like the College Scorecard. Without them, institutions will need to rely on state sources, making it more difficult to achieve measurement consistency and comprehensiveness. For instance, while UI wage records are widely used for workforce outcomes, they exclude the self-employed, those who work for the federal government or military, and former students who reside in a different state.[84] Initiatives like WRIS2, the WICHE MLDE,[85] and the Federal Employment Data Exchange System build linkages between systems to fill some of these gaps, but a single federal source would be a simpler solution.

However, College Scorecard data are not without limitations. These metrics are populated by linking education records from NSLDS with earnings data from the U.S. Department of Treasury.[86] As a result, the metrics are limited to Title IV aid recipients, which represent 70 percent of all college students and only 62 percent of community college students.[87] Unfortunately, without more comprehensive student-level data, the federal government is limited to calculating workforce outcomes only for students included in NSLDS.

This framework proposes using these metrics with currently available data, but continuing to work toward better metrics, which would expand on the recent College Scorecard efforts by including all students; disaggregating by credential level, program, and completion status; and reporting outcomes one, five, and 10 years after program exit—rather than six and 10 years after program entry. Earnings can vary widely depending on college major, as some professions (e.g., teaching, social work) are expected to have lower earnings than others (e.g., finance, engineering), making program-level disaggregates particularly important.[88] Similarly, students who complete credentials typically earn more than those who do not, so results could be muddied if completers and noncompleters are not reported separately. Finally, measuring workforce outcomes among a cohort of students who *exit* at the same time would provide more consistent data than for a cohort of students who *enter* at the same time, likely leaving the institution at different times due to stopouts and varying time-to-degree. The framework recommends following states' leads by measuring workforce outcomes one, five, and 10 years after exit, as opposed to six and 10 years after entry.[89]

Use Cases
Post-college workforce outcome measures like earnings, employment, and earnings thresholds can be used by a variety of audiences. Students and families can use these data to learn about the potential earning power of their intended degree post-graduation, considering the expected value in relation to the major investment required to attend an institution of higher education. In recent years, policymakers at both the state and federal levels have used workforce outcomes data for accountability and funding. For example, gainful employment incorporates student earnings—as it relates to debt—into its accountability framework. Of the 30 states with outcomes-based funding models, 12 use a form of labor market outcomes metrics as part of the equation,[90] highlighting the importance of these metrics to both policymakers and institutions. Institutions can use these data to be aware of their students' outcomes to revise program offerings, tailor prices

and financial aid, and implement student supports like career services and increased work opportunities that make their students more prepared for the workforce.

The primary reason many students pursue college is to improve their employment prospects.[91] While students also gain other life skills in college that allow them to contribute to society in other nonfinancial ways, a baseline assumption for many students it that they will be prepared to earn a middle-class living. These metrics can be used individually or in tandem to explore post-college workforce outcomes for students.

CHAPTER 4:

Efficiency Metrics

This chapter details the following set of efficiency metrics:[1]

Efficiency Metrics

While much of this framework focuses explicitly on student access to, progression through, and completion of higher education, resource-related metrics help provide additional context to inform efforts to effectively and efficiently improve college attainment. Increased attainment and parity in educational outcomes are the ultimate goals of an improved postsecondary system; moving students through the system more efficiently is a supporting goal, as many institutions must better serve students with the limited resources already at their disposal. Thus, efficiency metrics can help institutions evaluate how effectively they are using existing funds to educate students.

The efficiency metrics included in this framework are based mostly (but not exclusively) on the metrics and methodology developed by the Delta Cost Project, which uses publicly available data from the Integrated Postsecondary Education Data System (IPEDS).[2] Because Delta Cost is at the forefront in analyzing college and university finance data, many efforts have drawn on their work. For example, the National Governors Association (NGA) developed its set of efficiency metrics for state policymakers based on Delta's data.[3] Additionally, as states embrace outcomes-based funding, many have incorporated similar efficiency measures into their funding structures.[4] Of the initiatives reviewed for this framework, Complete College America (CCA) and Completion by Design (CBD) also include efficiency metrics in their data reporting.

The drawbacks to IPEDS finance data are well-known.[5] For example, the expenditures data in IPEDS combine undergraduate, graduate, and noncredit expenditures, inflating any estimates that attempt to focus on credential-seeking undergraduates alone, as this framework does. Further, parent/child issues are known to affect institutions that report finance data for more than one campus.[6] However, the field has not yet developed efficiency metrics, nor a publicly accessible database, that improve on current practice, so IPEDS and Delta Cost data remain the most accurate finance information currently available. The framework also recommends adjusting dollars for inflation for metrics that trend over time.

Institutions can extract much of the data for these metrics directly from the Delta Cost Project, which relies on IPEDS data. Table 4-1 notes the variables and label names from Delta Cost that correspond to the calculations in this chapter. If data elements are not available through Delta Cost, or this framework's recommendation differs from Delta Cost, those details are noted throughout the chapter. For example, neither Delta Cost nor IPEDS includes data on credits attempted and completed, so institutions must gather it from their student information system. In addition, Delta Cost and IPEDS data on retention are based on fall enrollment, not the 12-month enrollment cohorts recommended by this framework.

Table 4-1: Framework Metrics Mapped With Delta Cost Variables

Framework's Proposed Metric	Data Elements Needed to Calculate Proposed Metric	Data Source and Corresponding Variable
Expenditures per Student	Expenditures for instruction and student services	Expenditures for instruction: current year total (instruction01) Expenditures for student services: current year total (studserv01)
	Expenditures for instruction, student services, research, and public service	Expenditures for instruction: current year total (instruction01) Expenditures for student services: current year total (studserv01) Expenditures for research: current year total (research01) Expenditures for public service: current year total (pubserv01)
	Expenditures for academic support, institutional support, and operations and maintenance	Expenditures for academic support: current year total (acadsupp01) Expenditures for institutional support: current year total (instsupp01) Expenditures for operations and maintenance of plant: current year total (opermain01)
	12-month full-time equivalent (FTE) enrollment	Total 12-month FTE student enrollment (fte12mn)
	Education and related expenditures	Education and related expenses (eandr)
Cost for Credits Not Completed*	Number of credits not completed by cohort in the first year	
	Number of students attempting credit-bearing courses in the cohort in the first year	
Cost for Completing Gateway Courses*	Number of development and gateway course credits attempted before completion	
	Number of gateway completers in a given year	
Change in Revenue From Change in Retention	Net tuition revenue	Net tuition and fees revenue (nettuition01)
	Change in retention rate	Full-time retention rate (ftretention_rate) for each cohort year** Part-time retention rate (ptretention_rate) for each cohort year
	Number of student in cohort	Full-time first-time degree/certificate-seeking undergraduate for current year (grscohort)** Part-time first-time degree/certificate-seeking undergraduate for current year (pt_ugentering)
Cost of Excess Credits to Credential*	Total earned credits for each completer with excess credits	
	Average credits across all completers	
	Total number of completers with excess credits	
Completions per Student	Completions per 100 FTE students	Total completions (totalcompletions) Total 12-month FTE student enrollment (fte12mn)
Student Share of Cost*	Net tuition revenue paid by students	Net tuition directly from students (net_student_tuition)
Expenditures per Completion*	Expenditures per completion	Education and related expenses per completion (eandr_completion)

Note: Blank rows in the Data Source column indicate that the variable is to be determined by the institution.
* Uses education and related expenditures (per credit) as part of calculation, itemized in Expenditures per Student variable.
** Delta Cost and IPEDS data do not break out first-time and transfer students and are available for only fall entrant cohorts, not 12-month enrollments.

Expenditures per Student	
Definition	Education and related (E&R) expenditures per full-time equivalent (FTE) student based on 12-month enrollment
Population	Twelve-month FTE enrollment calculated using 12-month instructional activity credit hours in IPEDS
Disaggregates	Disaggregations (including separating undergraduate from graduate students) are not available due to finance data limitations.
Submetrics for further analysis	• Distribution of students by credential level or program of study • Instructional expenditures per FTE student and as a percentage of E&R expenditures • Salaries as a percentage of instructional expenditures • Student support expenditures per FTE student and as a percentage of E&R expenditures • Administration expenditures per FTE and as a percentage of E&R expenditures • E&R expenditures as a percentage of total education and general expenditures • FTE faculty/staff per FTE student

2 initiatives measure Expenditures per Student

Field Usage and Convergence
This metric relies on IPEDS data and Delta Cost's methodology for calculating E&R, which was developed as a measure of spending on direct educational costs. Per Delta Cost, E&R includes spending on instruction, spending on student services, and a prorated share of spending on academic and administrative support and operations and maintenance (e.g., administration).[7] To determine the prorated amount of indirect spending, Delta first finds the "education share" as the spending for instruction and student services divided by the spending for instruction, student services, research, and public service.

$$Education\ Share = \frac{Expenditures\ for\ Instruction\ and\ Student\ Services}{Expenditures\ for\ Instruction,\ Students\ Services,\ Research,\ and\ Public\ Service}$$

The education share then is multiplied by the spending for academic support, institutional support, and operations and maintenance, which is then added to spending on instruction and student services, resulting in the E&R.

In other words, Delta defines E&R as all spending on instruction and student services, plus a prorated share of indirect expenditures that support the academic mission (e.g., academic support, institutional support, and operations and maintenance).[8] Because of changes in IPEDS survey reporting formats, Delta has made adjustments to reported data in some years to maintain comparability over time.[9]

$$\begin{array}{l} Education \\ and\ related \\ expenditures \end{array} = \begin{array}{l} Expenditures \\ for\ Instruction \\ and\ Student \\ Services \end{array} + \left(\begin{array}{l} Education \\ Share \end{array} \times \begin{array}{l} Expenditures\ for \\ Academic\ support, \\ Institutional\ support, \\ and\ Operations\ and \\ Maintenance \end{array} \right)$$

The metric also relies on data already available from IPEDS that calculate 12-month full-time equivalent (FTE) enrollment based on credit-hour activity rather than headcounts[10] because full- and part-time enrollment is not currently available in IPEDS' 12-month enrollment survey, as this framework recommends.

$$\frac{Education\ and\ related\ Expenditures}{12\text{-}month\ FTE\ Enrollment}$$

However, Delta Cost does not employ 12-month enrollment in their trend analyses, which date back to 1998, relying instead on fall FTE enrollment because 12-month enrollment was not available in IPEDS before 2004. The 12-month enrollment data are recommended here to be more inclusive of all students, and because more than 10 years of trend data are probably sufficient for most institutions today. Trend analyses of this metric, or any cost or efficiency metric, should be inflation-adjusted over time.

Use Cases
This metric provides a basic understanding of how much institutions are spending to provide an education for each student, which is useful to both institutions and policymakers. Colleges also can use these data to track trends in their spending per student over time and in relation to peer institutions. The recommended submetrics (also available from Delta Cost) can help colleges determine how changes in spending over time impact resource allocation to core educational functions, such as instruction and student services, which can help contextualize changes in student completion rates. When interpreting trends in expenditures per student, institutions should evaluate whether changes in the metric resulted from changes in enrollment, changes in expenditures (or available revenues), or both, for better interpretation and use. For students, this metric is not usually a concern or consideration in the decision-making process, but may be indicative of how much an institution makes available to spend on students relative to other institutions. It also can be useful for policymakers in clarifying the causes of price increases. It is a widely held belief that increases in student tuition and fees are the result of surges in college spending, but analysis from the Delta Cost Project shows that institutional spending has not risen as fast as prices. Rather, they find that a decrease in public subsidies is a primary contributor to price increases.[11]

PROGRESSION

Cost for Credits Not Completed	
Definition	The per-student expenditures by the institution for credits attempted but not completed by first-year students
Population	Twelve-month cohorts of first-year students (e.g., first-time full-time [FTFT], transfer full-time [TFT], first-time part-time [FTPT], transfer part-time [TPT])
Disaggregates	Credential level, academic preparation, economic status, race/ethnicity, gender, age, first-generation status, and program of study
Submetrics for further analysis	• Number of credits attempted, not completed • E&R per credit • Total E&R for credits attempted, not completed • Total and average net tuition paid by *students* for uncompleted credits

Field Usage and Convergence
The cost for credits not completed metric is built on the credit completion ratio performance metric and illustrates the monetary impact for the institution of credits attempted but not completed. Prior credits attempted from Advanced Placement (AP), International Baccalaureate (IB), dual enrollment, and transfer are not counted; however, credits attempted through remedial coursework are counted, following the definition for the Credit Completion Ratio metric.

The framework recommends building the metric calculation based in part on Delta Cost Project metrics and methodology, using IPEDS finance data. Dividing the E&R expenditures (discussed in more detail in the Expenditures per Student metric) by all 12-month credit-hour activity provides the E&R spending per credit.[12]

E&R per credit is then multiplied by the number of credits not completed in the first year, which is divided by the number of students attempting credit-bearing courses in the first year.

$$\frac{\textit{Education and related expenditures per credit} \times \textit{Number of credits not completed by cohort in the first year}}{\textit{Number of students attempting credit-bearing courses in the cohort in the first year}}$$

Use Cases
Institutions waste money and students lose money when students attempt credits but do not complete them—whether they withdraw from the course or receive failing grades.[13] Institutions may be able to save or at least better allocate scarce resources by improving student course completion.[14] To interpret accurately the metric's results, institutions should also consider the recommended submetrics, which indicate whether the metric is changing over time because of changes in the number of uncompleted credits, the expenditures per credit, the number of students attempting credits, or all of these factors. This metric may also be of interest to state and federal policymakers concerned with whether public funds are being used to subsidize multiple course repeats.

0 initiatives measure Cost for Credits Not Completed

Cost for Completing Gateway Courses	
Definition	For all gateway course completers in a given year, the per-student expenditures associated with all developmental and gateway courses attempted before gateway course completion, tracking English and math courses separately
Population	Gateway course completers in a given year
Disaggregates	Credential level, academic preparation (at any time), enrollment status, attendance intensity (at any time), economic status (at any time), race/ethnicity, gender, age, first-generation status, and program of study
Submetrics for further analysis	• Net tuition cost to *students* to complete gateway courses • Enrollment in developmental courses (if applicable) • Completion of developmental courses (if applicable) • Number of developmental course attempts (if applicable) • Enrollment in gateway courses • Number of attempts to complete gateway courses • Completion of both gateway courses • Availability of developmental and gateway courses in sequence • Percentage of D's, F's, W's, I's in gateway courses • E&R expenditures per credit

However, this efficiency metric, unlike the performance metric, is not cohort-based. Instead, it looks retrospectively at gateway *completers* to examine the efficiency of students' pathways to earning gateway course credit. The efficiency of these pathways is related to, but distinct from, the percentage of students completing gateway courses in a given cohort. Interpretation of the metric should evaluate whether efficiency is changing over time because of changes in the number of gateway credits attempted per student, the number of students completing gateway courses, the expenditures per credit, or a combination of factors. The disaggregates and submetrics align with the framework's 12-month cohort specifications and encourage a deeper dive into the institutional costs to help students complete gateway courses.

Use Cases
Frequent failed attempts at prerequisite remediation or gateway courses require institutions to spend money delivering courses

(1) initiative measures Cost for Completing Gateway Courses

Field Usage and Convergence
Drawing on IPEDS data and Delta Cost methodology, this efficiency metric largely follows the CBD definition to evaluate the cost associated with students passing math and English gateway courses—including the expense associated with course repeats.[15] Specifically, this metric measures the cost of all coursework undertaken to lead to gateway completion—including developmental courses in that subject, as well as all gateway attempts that eventually led to course completion. This metric provides a financial lens that complements the metric that measures the percentage of students completing gateway courses in the first year.

that do not result in credit accumulation, and this decreases institutional efficiency. These failed attempts also require students to spend money and financial aid that does not help them progress toward a degree. Quantifying the cost of the various steps toward completing a gateway course can help institutions focus on ways to increase efficiency and decrease both student and institutional expenses. Federal and state policymakers, who subsidize developmental and gateway course attempts, also have a vested interest in students progressing toward completion in an efficient manner, especially in light of time limits on Pell Grant and Direct Loan eligibility.

$$\frac{\textit{Number of developmental and gateway course credits attempted prior to completion} \times \textit{Education and related expenditures per credit in the year attempted}^{16}}{\textit{Number of gateway completers in a given year}}$$

Change in Revenue From Change in Retention	
Definition	The impact of changes in first-year retention rates from one cohort to another on tuition revenue available to the institution
Population	Twelve-month cohorts of students (e.g., FTFT, FTPT, TFT, TPT)
Disaggregates	Credential level, enrollment status, attendance intensity, academic preparation, economic status, race/ethnicity, gender, age, first-generation status, and program of study
Submetrics for further analysis	• Change in first-year retention rates over time • Change in net tuition per student over time • Change in net tuition revenue per student due to change in retention • Change in subsidy revenue due to change in retention (total and per student) • Change in net tuition plus subsidy revenue due to change in retention (total and per student)

2 initiatives measure Change in Revenue From Change in Retention

Use Cases
By highlighting the possibility for increased revenue generation resulting from retention rate increases, the results of the metric can support institutions advocating for additional funding for student support services that improve retention. The metric also can quantify the return on investment of those support services, which can ultimately offset some of their costs.[21] Considering the investment of the state and federal governments in higher education, these data can help policymakers to understand and support efforts to increase student retention because of the impact these efforts have on institutional, state, and federal budgets.

Field Usage and Convergence
The change in revenue from change in retention metric is related to the retention rate performance metric in that it compares first-year retention rates for two cohorts and evaluates how that change impacts net tuition revenue for an institution. CBD includes a similar efficiency metric as an optional measure for use by its community colleges, but variations on this measure have been used widely by the field.[17]

$$\text{Change in the first year retention rate from Cohort 1 to Cohort 2} \times \text{Number of students in Cohort 2} \times \text{Net tuition revenue per student for year 2}^{18}$$

Similar to CBD, this metric calculates changes in net tuition revenue only, related to changes in retention, because institutions receive tuition on a per-student basis, whereas other funding sources may be allocated in a variety of ways.[19] However, based on recent studies, institutions might also consider estimating the impact of changes in retention on other revenue sources, such as local and state appropriations.[20] To fully understand the results, institutions must determine whether the revenues are changing over time because of changes to the number and percentage of students retained, changes in net tuition, or both. When trending these data over time, it is essential to adjust for inflation and consider changes in the size of cohort as well as in tuition for accurate analysis.

COMPLETION

Cost of Excess Credits to Credential	
Definition	The per-student expenditures for excess credits to credential for all completers with excess credits in a given year
Population	All completers in a given year by credential level
Disaggregates	Enrollment status, attendance intensity (at any time), academic preparation (at any time), race/ethnicity, economic status (at any time), age, gender, program of study (at exit)
Submetrics for further analysis	• Excess credits earned by transfers by number/percentage of prior credits accepted • Total (instead of average) cost of excess credits to credential • Total and average net tuition cost to student of excess credits to credential

2 initiatives measure Cost of Excess Credits to Credential

Use Cases

This metric measures the financial outlay by the institution for students taking excess credit hours to credential. Because of the multitude of factors affecting this metric, it is imperative to determine whether efficiency is changing due to more students taking more excess credits, the expenditures per credit, or both over time. Changes in expenditures per credit over time can be controlled for by using the expenditures per credit in the year the credit was taken, instead of the year the student completed, for more precision. If costs increase largely due to excess course taking, institutions can proactively address degree pathways and academic advising to improve efficiency and help students complete more quickly and at a lower cost. The metric also provides institutions and policymakers with another piece of the cost–of-college puzzle, identifying a possible intervention strategy to reduce costs for both students and taxpayers. By creating efficient pathways to a credential, institutions and students can minimize excess credits to credential, lessening the cost per completer for the institution, student, and taxpayer.

Field Usage and Convergence

The metric is related to the average credits to credential metric in this framework, which mostly follows CCA calculation guidelines to determine the average number of credit hours completed by credential earners by credential level. The framework goes further by calculating the number of credits earned above the average number of credits, to calculate excess credits to credential, based on CBD's optional average number of excess credits metric. This framework's proposed efficiency metric combines these approaches with IPEDS data and Delta Cost methodology by assigning costs to the excess credits.

It does so by calculating the total number of credits earned above the average, summed across completers who accumulated more than the average. Multiplying by expenditures per credit (E&R expenditures divided by 12-month instructional credit activity) provides the total cost of these excess credits, and dividing by the number of completers with excess credits translates this metric into a cost per completer (with excess credits). Using the average credits to credential to calculate excess credits includes some inefficiency because many students may take more credits than required, thus increasing the average above catalog credit requirements. Ideally, this metric would use the number of credits required by the course catalog for each credential level and program of study instead of the average number of credits to credential. However, that level of detail currently is not readily accessible to institutional researchers based on our discussions with the field. As such, this metric should be interpreted with caution as some of the "excess" may be explained by requirements that differ across programs and degrees.

Completions per Student	
Definition	The number of completions divided by the number of FTE students (based on 12-month enrollment) in a given year expressed as completions per 100 FTE
Population	Twelve-month FTE undergraduate enrollment and undergraduate credentials (certificates, associate's, bachelor's) conferred in a given year
Disaggregates	Race/ethnicity, gender, age, credential level, program of study (at exit), academic preparation (at any time), economic status (at any time), first-generation status, enrollment status (at entry), attendance status (at any time)
Submetrics for further analysis	• Change in number of completers • Change in FTE enrollment • Completion rates

6 initiatives measure Completions per Student

Field Usage and Convergence
Simply stated, this metric is intended to show how effectively institutions turn credential-seekers into credential-holders. The recommended metric follows Delta Cost Project and CCA methodology with some proposed modifications.[22] These include using 12-month undergraduate enrollment, instead of fall, and disaggregating at least by credential level, race, gender, age, economic status, and academic preparation. IPEDS collects disaggregations for completions by program of study, credential level, race/ethnicity, and gender, but does not disaggregate 12-month FTE enrollment by any demographic characteristics.[23] While CCA does not currently disaggregate completions per student by these student characteristics, they could disaggregate this metric by most of the characteristics recommended here given the level of disaggregation available for both their enrollment and credential production metrics.[24]

Completers would be the ideal option for the numerator because they count unduplicated students, as opposed to *completions*, which count students more than once if they earn multiple credentials in the same year. However, data on completers were not added to IPEDS until the 2012–13 collection, so these data cannot be trended over a longer span of time.[25] Once more data are available for completers, the framework recommends amending this metric to calculate completers per student, to produce an unduplicated measure.

When examining this metric over time, it should be noted whether changes in the metric are due to changes in the number of credentials awarded, the number of FTE students, or both, for better interpretation and use.

Use Cases
Some institutions use this metric to illustrate student progress toward graduation. For example, the University of Texas-El Paso uses a similar degree-production ratio that compares the total number of FTE undergraduates enrolled four years earlier with the total number of baccalaureate degrees awarded that year.[26] These data can supplement the traditional IPEDS graduation rates by capturing completions regardless of whether the student began with a first-time, full-time status, although the more inclusive completion rates recommended as part of this framework can alleviate this issue. Policymakers can also use this metric, in conjunction with success rates, to determine how many credentials institutions award in relation to how many students they enroll. Some states, like Tennessee, include a similar completion per 100 FTEs metric in their outcomes-based funding models.[27]

COST

Student Share of Cost	
Definition	The percentage of E&R covered by net student tuition revenue versus institutional subsidies in a fiscal year
Population	All students
Disaggregates	Disaggregations (including separating undergraduate from graduate students) are not available due to finance data limitations.
Submetrics for further analysis	• Sticker price and net price • Net tuition revenue per 12-month FTE enrollment • E&R per 12-month FTE enrollment • Subsidy per 12-month FTE enrollment

1 initiative measures Student Share of Cost

Field Usage and Convergence
This metric is drawn directly from the Delta Cost Project, which refers to it as the net tuition share of E&R. The metric quantifies the proportion of education-related expenditures paid for by net tuition revenue relative to other institutional resources, such as state and local appropriations, investment or endowment incomes, or other revenues generated by the institution—or what Delta Cost calls the "subsidy share."

Net tuition revenue (gross tuition revenue minus institutional grant aid)

Education and related expenditures

The metric includes the entire student population, rather than only undergraduates, because graduate and undergraduate expenditures cannot currently be separated in IPEDS/Delta Cost Project data. Further, while no disaggregates are recommended due to data limitations, the submetrics are intended to better explain whether and how burden has shifted to students, so that institutions and policymakers may seek to lessen the financial impact on students, particularly those with the greatest need.

Use Cases
Net tuition revenue accounted for roughly 50 to 62 percent of education-related spending at public four-year institutions in 2013. The student share of costs at public institutions was between 10 and 19 percentage points higher than it was in 2003, varying by institution type.[28] The tuition share of E&R at private institutions was also about 4 to 5 percentage points higher in 2013 than it had been a decade prior.

This metric is highly relevant to policymakers because it quantifies the impact of decreased state support for higher education—and its direct impact on students. As per-student state investment has declined, students and families have had to pick up an increasing share of college costs, affecting their ability to access and succeed in college, especially for low-income students with fewer resources to draw on.[29] A report using Delta Cost Project data noted that decreased state funding is responsible for almost 80 percent of the rise in public education tuition between 2001 and 2011.[30] While more recent analysis shows a slight increase in per-student state and local funding for public colleges and universities (5.4 percent between 2013 and 2014), longer-term trends in state disinvestment in higher education have had a major impact on college affordability.[31] State policymakers should work to restore appropriations to at least prerecessions levels, and institutions should realign institutional aid practices to address the financial hardships of low-income students and families, who were unduly burdened by cuts.

Expenditures per Completion	
Definition	E&R divided by the number of completions in a fiscal year
Population	All credentials conferred in a given year
Disaggregates	Disaggregations (including separating undergraduate from graduate students) are not available due to finance data limitations.
Submetrics for further analysis	• Distribution of completions by award level and program of study • Change in number of completions over time • Change in E&R over time

5 initiatives measure Expenditures per Completion

Field Usage and Convergence

This metric, also drawn directly from the Delta Cost Project, calculates E&R per completion, including all credentials because undergraduate and graduate students cannot currently be disaggregated in the IPEDS expenditure data. Additional disaggregates also are not included for this metric due to data limitations, but the recommended submetrics can help to explain whether the metric is changing due to changes in the number of completions, the level of expenditures, or both over time. Further, understanding the distributions of completions by award level and program of study can help interpret why expenditures at a given institution may be higher or lower than at other institutions with different credential and program mixes.

Completers would be the ideal option for the denominator because they count unduplicated students, as opposed to *completions*, which count students more than once if they earn multiple credentials in the same year. However, data on completers were not added to IPEDS until the 2012–13 collection, so these data cannot be trended over a longer span of time.[32] Once more data are available for completers, the framework recommends amending this metric to calculate completers per student, to produce an unduplicated measure.

Use Cases

This metric is a proxy for the resources required to educate students through to credential completion. It is a proxy because the data are not readily available to assign actual costs to individual students as they progress (or do not progress) toward completion. As such, this metric captures the costs associated with both completers but also noncompleters, by comparing the resources spent to educate all students in a given year with the number of credentials awarded by the institution in that same year. Initiatives like CBD and the Voluntary Institutional Metrics Project already use the expenditures per completion metric to measure the cost associated with achieving the ultimate goal of degree completion.[33]

CHAPTER 5:

Equity Metrics

This chapter details the equity metrics that are crucial to promoting and enhancing equity within higher education by disaggregating the performance and efficiency metrics by critical student characteristics. The following characteristics are considered in more detail, given the greater complexity required to define them:

Key Student Characteristics/Disaggregates

A core purpose of data collection and use is to shine a light on—and to develop strategies to close—gaps in college access and success that continue to disadvantage underrepresented students. Nontraditional and underserved student populations have largely been left out of or are invisible in federal data collections, making it difficult or impossible to measure how well these students are served by higher education and to develop strategies to better serve them. As such, this framework recommends *disaggregating* each metric by key student characteristics used by a host of voluntary data initiatives over the past decade. These equity-focused disaggregates are essential to uncovering and remedying inequities in and across our colleges and universities.

Depending on the metric type, the framework recommends determining student characteristics at different points in time: at entry, ever during enrollment, or at exit. The time of identification is shown in the snapshot charts of Chapters 3 and 4. In general, the framework follows Complete College America (CCA) and Access to Success (A2S) precedent by basing student characteristics *at entry* for cohort-based measures, like graduation rate*s,* and defining them if the student met the criteria *at any time* for retrospective measures, such as completions. For disaggregates, such as major and credential received, which are most relevant at the point of college exit, the framework recommends defining them *at exit*. For cost metrics, such as net price and unmet need, that are measured annually, the framework recommends defining disaggregates *at that time*, to reflect the student's status that year. Recommendations for how to define the student disaggregates—including academic preparation, economic status, first-generation status, program of study, race/ethnicity, gender, and age—are explored below.

Academic Preparation

This framework recommends that institutions minimally identify students as "college ready" or "not college ready" in math and in English according to their own criteria until further research develops more robust measures of academic preparation that are comparable across colleges.

13 initiatives measure Academic Preparation

Often-used proxies for academic preparation include standardized test scores, high school GPA, placement or enrollment in remedial education, and multiple measures frameworks that incorporate several metrics. If college-ready assessments like the Partnership for Assessment of Readiness for College and Careers (PARCC) or Smarter Balanced gain widespread use, this recommendation should be revisited to determine whether performance on these exams could serve as an adequate measure of college-readiness. Because the field has not yet converged on a universally accepted indicator for college readiness, the framework defers to institutional practices until further research shows consensus.

Field Usage and Convergence
To determine the most appropriate metric for academic preparation, we reviewed current and emerging research around: high school curriculum rigor, high school GPA, college entrance exam scores, remedial coursework, and multiple measures (See Table 5-1).

Use Cases
Measures of academic preparation are crucial for institutions to understand whether incoming students are ready for a college environment; they highly correlate with students' college outcomes without intervention.[9] Colleges and universities can use these data to develop and target services to best reach underprepared students and create pathways for their college success. In addition, academic preparation data allow institutions to measure the efficacy of interventions that aim to help students become college-ready after entry. Policymakers can use academic preparation at the state level to develop coherent and consistent policies to signal clearly to students and schools how they should prepare for college in terms of high school curriculum and remedial education in college.[10]

Table 5-1: Advantages and Disadvantages to Alternate Academic Preparation Indicators

	Advantages	Disadvantages
High School Curriculum Rigor	Considered the best predictor of college success based on quantitative analysis by the Department of Education[1]	Time and labor intensive to quantify, because measuring high school rigor requires transcript analysis Measurement would be difficult to operationalize at scale because of the labor required to implement
High School GPA	Considered one of the best predictors of college entrance, persistence, and completion through correlation and regression analysis [2] Captures academic performance (cognitive) and personal attributes (noncognitive), such as motivation and perseverance[3]	Requires a GPA threshold to define "college-ready," and though there is a linear relationship between high school GPA and college outcomes, there are no clear GPA cutoffs to indicate readiness[4]
College Entrance Exam Scores	Used by many institutions during the admission process to determine college readiness Both SAT and ACT scores are predictive of first-year GPA and student outcomes, such as retention and completion, in college[5]	Many students at open-access institutions, such as community colleges and for-profit schools, do not take these tests
Remedial Coursework	Used by many initiatives, states, and institutions to signal college readiness[6]	Not all institutions offer remediation, and many are shifting away from stand-alone courses toward co-requisite remediation models that may be more difficult to track Remedial placement policies vary widely across states and institutions, as there are no shared standards The predictive value of taking remedial courses on completion varies substantially across credential types, having little predictive value for certificate and associate's seekers, while predictive for bachelor's seekers[7]
Multiple Measures	Creates a composite view of the student, using a variety of indicators such as standardized test scores, high school GPA, and high school course completion and rigor Deployed in a number of states and institutions[8]	Much of the research is still ongoing; no clear best practices have emerged yet but may allow for more robust recommendations in the future

Economic Status

The framework recommends using *Pell Grant receipt* as the primary indicator of low-income status at this time, despite its known limitations, which are discussed below. Pell receipt is the most frequently used measure of economic status in the field, and each

13 initiatives measure Economic Status

alternate indicator faces even more substantial limitations than Pell receipt. Table 5-2 explores the advantages and disadvantages of six potential measures of economic status: Pell Grant receipt, Pell Grant eligibility, expected family contribution (EFC), income, poverty status, and student's home location (geocode). Income is a promising indicator for economic status that should be tested further in the field and explored for inclusion in future iterations of the framework.

Field Usage and Convergence
Higher education can be an engine of social and economic mobility, but low-income students remain underrepresented among college-goers and college graduates. To promote mobility, equity, and our nation's economic competitiveness, many federal, state, local, and institutional efforts center on improving access and success for low-income students. For instance, all initiatives reviewed as part of this research—Completion by Design, A2S, Achieving the Dream, Voluntary Framework of Accountability, the new College Scorecard, and more—use *Pell Grant receipt* as an indicator of low-income status.

While Pell receipt is a frequently used proxy for economic status, it is not perfectly accurate. Its primary limitation is that it undercounts the proportion of low-income students, especially at institutions where many do not apply for federal financial aid, due to either lack of information, low costs, or citizenship status. Also, it is subject to changes in federal financial aid policy, sometimes causing notable shifts that may not actually reflect demographic shifts.[11] However, Pell receipt remains the primary indicator of economic status used by the field, is fairly comprehensive of low-income students, and takes into consideration important factors that influence financial need, such as family size. In 2011–12, 41 percent of undergraduate students were Pell recipients.[12]

Table 5-2: Advantages and Disadvantages to Economic Status Proxies

	Advantages	Disadvantages
Pell Grant Receipt	Most commonly used proxy for low-income status in the field Accounts for factors aside from income that influence financial need	Undercounts low-income students, especially at institutions where many students do not file a Free Application for Federal Student Aid (FAFSA) Vulnerable to policy changes unrelated to shifts in economic status
Pell Grant Eligibility	In addition to Pell recipients, captures low-income students who apply and are eligible for but do not receive Pell because of administrative hurdles Accounts for factors aside from income that influence financial need	Can be determined only for FAFSA completers Requires integration of data for non-Pell FAFSA filers in student information systems, which could be burdensome Vulnerable to policy changes unrelated to shifts in economic status
Expected Family Contribution	In addition to Pell recipients, captures low-income students who apply and are eligible for but do not receive Pell because of administrative hurdles Expressed in a dollar amount, which is helpful in making comparisons with price Accounts for factors aside from income that influence financial need Allows for an "EFC Unknown" category that prevents classifying all students with missing data as non-low-income (with a dichotomous Pell proxy, some students classified as non-Pell simply have missing data)	Can be determined only for FAFSA completers Requires integration of data for non-Pell FAFSA filers in student information systems, which could be burdensome Vulnerable to policy changes unrelated to shifts in economic status Requires defining a threshold to determine what EFC counts as low-income, although Pell eligibility guidelines can be used
Family Income	In addition to Pell recipients, captures low-income students who apply for but do not receive Pell for a variety of reasons Expressed in a dollar amount, which is helpful in making comparisons to price Allows for an "Income Unknown" category that prevents classifying all students with missing data as non-low-income (with a dichotomous Pell proxy, some students classified as non-Pell simply have missing data) College Scorecard paved the way by calculating completion rates of Title IV recipients by family income	Can be determined only for FAFSA completers Requires integration of data for non-Pell FAFSA filers in student information systems, which could be burdensome Does not take into consideration important characteristics like family size, dependency status, and number of family members in college Requires defining a threshold to determine what income counts as low-income, although some guidance is available from national Census data
Poverty Status	In addition to Pell recipients, captures low-income students who apply for but do not receive Pell for a variety of reasons Commonly used in means-tested programs Accounts for one factor that influences financial need aside from income (family size)	Can be determined only for FAFSA completers Requires integration of data for non-Pell FAFSA filers in student information systems, which could be burdensome Does not take into account dependency status or the number of students in college Requires defining a threshold to determine which poverty level counts as low-income
Student's Home Location (Geocode)	Students' home residence location can be predictive of student outcomes, on average[13] Captures all students regardless of FAFSA completion or aid receipt	Best used to describe an institutional service area and institutional-level outcomes, rather than economic status for individual students, which may vary widely within the same geographic area[14]

As noted in Table 5-2, some indicators could increase coverage beyond only the aided students captured by a Pell receipt proxy, by counting the low-income students who file a FAFSA (and thus have their data recorded) but do not receive a Pell Grant—possibly because of administrative hurdles such as verification. Table 5-3 examines by how much each option undercounts or improves upon other options. Data for the analysis are derived from the National Postsecondary Student Aid Survey (NPSAS) in 2012, which imputes EFC for students who did not file a FAFSA. Analyzing statistics on Pell receipt, EFC (including imputed values), income, and poverty level,

alongside the percentage of students who filed a FAFSA, we can calculate the percentage of students that institutions should be able to identify as low-income using that indicator of economic status—assuming they can discern EFC, income, or poverty level only for FAFSA filers.

For example, while 58 percent of students likely would be Pell-eligible based on their (actual or imputed) EFCs in NPSAS, only 41 percent receive Pell Grants. However, if Pell eligibility/ EFC were used as a proxy for economic status, it would increase the percentage of students *known to the institution* as

Table 5-3: Accuracy of Economic Status Proxies

Indicator	Threshold	A = Percentage of Students Identified as Low-Income in NPSAS	B = Percentage of Students Identified as Low-Income Who Filed a FAFSA	C = Percentage of Students Potentially Known as Low-Income by Institutions (C = A x B)
Pell Grant Receipt	Receipt equals low-income	41%	100%	41%
Pell Grant Eligibility or EFC	EFC under $5,273 equals low-income[15]	58%	83%	48%
Family Income	Income in the bottom two quintiles nationally equals low-income	60%	78%	47%
Poverty Status	250% of poverty[16]	59%	79%	47%

Source: IHEP analysis of National Postsecondary Student Aid Study 2012 data.

low-income by only 7 percentage points over Pell receipt (48 percent vs. 41 percent), because only 83 percent of students with Pell-eligible EFCs actually file a FAFSA, which institutions rely on to obtain this information.

So, as Table 5-3 shows, while using Pell eligibility, EFC, family income, or poverty status could count slightly more low-income students (6–7 percentage points), the added precision does not warrant the added complication of diverging from how the field typically measures economic status. Furthermore, the majority (71 percent) of students with Pell-eligible EFCs do in fact receive the grants, making it a sufficiently accurate—albeit imperfect—proxy.[17] Because of Pell receipt's widespread use and its coverage relative to the other proxy variables, the framework recommends Pell receipt as the best metric at this time.

Use Cases
Institutions can use economic status to disaggregate other metrics and gain a better understanding of how low-income students are accessing and succeeding in their colleges or universities. Low-income students face different challenges in higher education than do middle- and high-income students, so it is crucial that institutions have access to disaggregated data to identify gaps and to tailor solutions and financial aid strategies for the neediest students. Recent research confirms that some institutions serve low-income populations more effectively than others, so institutions can use these data to continuously improve student access and success.[18] In addition, state and federal policymakers often express interest in understanding how low-income students access, progress through, and succeed in higher education. At the federal level specifically, policymakers are interested in the outcomes of low-income students, and a recent Integrated Postsecondary Education Data System (IPEDS) proposal includes Outcome Measures for Pell Grant recipients.[19]

First-Generation Status
The framework recommends defining *first-generation students* as students whose parents' highest education level was some college but no degree, or below (e.g., some college, no degree; vocational/technical training; high school diploma or equivalent; did not complete high school). Defined as such, first-generation students constitute 52 percent of undergraduates.[20]

3 initiatives measure First-Generation Status

Field Usage and Convergence
According to Beginning Postsecondary Students (BPS) Longitudinal Study, degree completion rates increase from 35 percent for students whose parents have no education beyond high school, to 56 percent for students whose parents have bachelor's degrees or higher. While there is a linear increase in students' completion rates as their parents' education level increases from high school to some college, to associate's degree, to bachelor's degree, to professional degree, there is a sizable difference between students whose parents have less than an associate's degree (43 percent) and those whose parents have an associate's degree or higher (59 percent).[21]

While the federal TRIO programs, which provide supports to low-income students, first-generation students, and student with disabilities, identify students as first-generation if their parent(s) do not have bachelor's degrees,[22] current policy conversations that focus on baccalaureate *and* sub-baccalaureate credentials suggest that there is value in shifting the definition. Furthermore, the gap in overall degree completion between non-first-generation and first-generation students increases by only one percentage point when students whose parents have associate's degrees are included in the first-generation group.[23]

The share of first-generation students is also available in the College Scorecard as a disaggregate for the student body and other measures such as median cumulative debt and earnings. These data on first-generation status are based on self-reported information on the FAFSA. When measuring the share of the student body that is first-generation, data are reported separately for students whose parents' highest education level is middle school, high school, and some post-secondary education.[24]

Use Cases

Parental education is highly correlated with student outcomes, and considerable efforts in the field are focused on improving outcomes for this population. Measuring these gaps at the institution level can help colleges address them. Many institutions, states, community-based organizations, and the federal government implement programs and student supports geared toward first-generation students to assist them in overcoming obstacles related to access and completion of a college degree. Initiatives like *I'm First* serve as a resource for first-generation students, providing information and peer support.[25] Movements by first-generation students on college campuses, backed and supported by these institutions, also help to create a system of support, especially at institutions where the class divide is more apparent.[26] Institutions and policymakers need disaggregated data to continue to support first-generation students through interventions like the TRIO programs and to create an environment where these students can succeed.

Additional Disaggregates

The remaining disaggregates follow the conventions of most reviewed initiatives.

Program of study

Researchers, advocates, and institutions advocate for disaggregation of data by program of study to provide the most refined view of student outcomes possible. Given the value of

10 initiatives measure Program of Study

program-level data, the framework recommends using the Classification of Instructional Program (CIP) codes. Institutions should collect data at the six-digit CIP code level and aggregate to two-digit codes for reporting purposes aligned to CCA seven meta-majors: Education; Arts and Humanities; Social and Behavioral Sciences and Human Services; Science, Technology, Engineering, and Math (STEM); Business and Communication; Health; and Trades.[27]

Race/ethnicity

The framework recommends using the latest IPEDS race/ethnicity categories: Hispanic or Latino; American Indian or Alaska Native; Asian; Black or African-American; Native Hawaiian or Other

17 initiatives measure Race/ethnicity

Pacific Islander; White, Two or more races; Nonresident alien; and Race/ ethnicity unknown.

Gender

The framework recommends using IPEDS gender definitions (Male and Female) and adding an Other category.

15 initiatives measure Gender

Age

The framework recommends using date of birth if such data are available. Otherwise, we recommend disaggregating by age categories aligned with CCA: 19 and under, 20–24, or 25 and over.

14 initiatives measure Age

Appendix 1: Major Data Initiatives & Measures Crosswalk

	MEASURES	Access to Success	Achieving the Dream	Aspen Prize	Common Data Set	Completion by Design	Complete College America	College Measures	College Scorecard	Consortium for Student Retention Data Exchange	Delta Cost Project	Integrated Postsecondary Education Data System	Multistate Longitudinal Data Exchange	National Community College Benchmark Project	National Governors Association	National Student Clearinghouse	Predictive Analytics Reporting Framework	Student Achievement Measure	Voluntary Framework of Accountability	Voluntary Institutional Metrics	Voluntary System of Accountability	Total
ACCESS	Enrollment	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	20
PROGRESSION	Credit Accumulation		✔	✔		✔	✔						✔			✔	✔		✔	✔		9
	Other Course Completion		✔			✔	✔			✔				✔		✔	✔		✔	✔		9
	Gateway Course Completion		✔			✔	✔							✔		✔	✔		✔	✔		8
	Program of Study Selection					✔																1
	Retention			✔	✔		✔	✔	✔	✔									✔	✔	✔	9
	Persistence	✔	✔	✔	✔	✔	✔			✔		✔	✔	✔		✔	✔	✔	✔		✔	15
COMPLETION	Graduation	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔		✔	✔	✔	✔	✔	✔	18
	Transfer-Out	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔		✔		✔	✔	✔	✔	17
	Success						✔															1
	Credentials Conferred or Completers	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	20
COST	Net Price											✔									✔	2
	Unmet Need																					0
	Student Prices				✔			✔	✔			✔		✔		✔					✔	7
	Debt		✔	✔				✔	✔							✔	✔				✔	7
POST-COLLEGE OUTCOMES	Employment			✔				✔	✔				✔	✔	✔				✔	✔		8
	Earnings			✔				✔	✔				✔		✔				✔	✔		7
	Earnings Threshold									✔												1
	Repayment							✔	✔											✔		3
	Learning Outcomes			✔												✔		✔			✔	4
	Graduate Education												✔			✔				✔		3
EFFICIENCY	Costs Related to Credit-Taking or Completion					✔				✔			✔									3
	Time to Credential		✔			✔	✔			✔			✔				✔	✔		✔		8
	Credits to Credential		✔			✔	✔						✔					✔		✔		6
	Expenditures per Student							✔			✔											2
	Change in Revenue from Change in Retention					✔		✔														2
	Completions per Student			✔		✔		✔	✔		✔					✔						6
	Student Share of Cost										✔											1
	Expenditures per Completion					✔		✔			✔						✔			✔		5
EQUITY*	Enrollment Status	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔		✔	✔	✔	✔	✔	✔	18
	Attendance Intensity	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔		✔	✔	✔	✔	✔	✔	18
	Degree/Certificate-Seeking Status	✔	✔		✔	✔	✔	✔	✔			✔	✔					✔	✔	✔	✔	13
	Economic Status	✔	✔		✔	✔	✔	✔	✔			✔	✔					✔	✔	✔	✔	13
	Race/Ethnicity	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔		✔	✔		✔	✔	✔	17
	Gender		✔	✔	✔	✔	✔	✔	✔			✔	✔	✔		✔	✔		✔	✔	✔	15
	Age		✔	✔	✔	✔		✔	✔			✔	✔	✔		✔	✔		✔	✔	✔	14
	Program of Study		✔		✔	✔	✔	✔	✔				✔			✔	✔			✔		10
	First-Generation Status		✔							✔				✔								3
	Level of Academic Preparation		✔	✔		✔	✔		✔	✔			✔	✔		✔	✔		✔	✔	✔	13
Total Measures by Initiative		10	21	16	15	23	22	20	22	16	6	14	20	17	8	19	19	9	19	22	18	

*These are the disaggregates available for each initiative. Not all of the measures are disaggregated by all characteristics listed here.

Endnotes

Executive Summary

1   Carnevale, A., Rose, S., & Cheah, B. (2011). *The college payoff*. Washington, D.C.: Georgetown Center on Education and the Workforce. Retrieved from https://cew.georgetown.edu/report/the-college-payoff/; Baum, S., Ma, J., & Payea, K. (2013). Education pays 2013. Washington, D.C.: The College Board. Retrieved from: http://trends.collegeboard.org/sites/default/files/education-pays-2013-full-report-022714.pdf

2   Engle, J. (2016, February). *Answering the call: Institutions and states lead the movement for better metrics to measure postsecondary performance and progress*. Washington, D.C.: The Bill & Melinda Gates Foundation. Retrieved from http://postsecondary.gatesfoundation.org/wp-content/uploads/2016/02/AnsweringtheCall.pdf

Chapter 1

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2   Engle, J. (2016, February). *Answering the call: Institutions and states lead the movement for better metrics to measure postsecondary performance and progress*. Washington, D.C.: The Bill & Melinda Gates Foundation. Retrieved from http://postsecondary.gatesfoundation.org/wp-content/uploads/2016/02/AnsweringtheCall.pdf

3   For more information on each of the initiatives reviewed for this project, refer to pages 9 and 10 in Engle, J. (2016, February). *Answering the call: Institutions and states lead the movement for better metrics to measure postsecondary performance and progress*. Washington, D.C.: The Bill & Melinda Gates Foundation. Retrieved from: http://postsecondary.gatesfoundation.org/wp-content/uploads/2016/02/AnsweringtheCall.pdf

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5   Department of Education. (2014, July). *Protecting student information* (Dear Colleague Letter) Washington, D.C.: The U.S. Department of Education. Retrieved from http://www.ifap.ed.gov/dpcletters/attachments/GEN1518.pdf; National Institute of Standards and Technology. Special publications list. Retrieved from http://csrc.nist.gov/publications/PubsSPs.html; The Department of Education. Safeguarding student privacy. Retrieved from https://www2.ed.gov/policy/gen/guid/fpco/ferpa/safeguarding-student-privacy.pdf

6   Educause. (2014, April). *What leaders need to know about managing data risk in student success systems*. Washington, D.C.: Educause. Retrieved from http://net.educause.edu/ir/library/pdf/PUB4007.pdf; Educause. (2015, May). *IPAS evaluation and assessment guide*. Washington, D.C.: Educause. Retrieved from http://net.educause.edu/ir/library/pdf/ERS1506.pdf

Chapter 2

1   IHEP analysis of: U.S. Department of Education (2013). Integrated Postsecondary Data System (IPEDS), 2012-13, Enrollment. Retrieved from: https://nces.ed.gov/ipeds/datacenter/.

2   Institutions that use a nontraditional calendar system (e.g., not based on semesters, quarters, trimesters, or 4-1-4) report graduation and retention rates using a full-year, instead of a fall, cohort. IPEDS Data Center, variable definition for "Reporting method for student charges, graduation rates, retention rates and student financial aid." Complete College America notes that for institutions who enroll more students through the year or have nontraditional academic calendars, states may wish to use a 12-month enrollment method to identify graduation rate cohorts.

3   Postsecondary Data Collaborative members. (2014, December). *PostsecData Comments on IPEDS Outcome Measures Technical Review Panel*. Retrieved from http://www.ihep.org/press/opinions-and-statements/postsecdata-comments-ipeds-outcome-measures-technical-review-panel; Postsecondary Data Collaborative members. (2015, April). *PostsecData Comments to the Senate Health, Education, Labor, and Pensions Committee*. Retrieved from http://www.ihep.org/sites/default/files/uploads/postsecdata/docs/resources/postsecdata_collaborative_help_response.pdf

4   These results are based on fall entrants only. IHEP analysis of: U.S. Department of Education (2014). Integrated Postsecondary Data System (IPEDS), 2014, Fall Enrollment. Retrieved from: https://nces.ed.gov/ipeds/datacenter/.

5   Also includes: Achieving the Dream, Access to Success, College Scorecard, Completion by Design, Consortium for Student Retention Data Exchange, National Community College Benchmark Project, Predictive Analytics Reporting Framework, Student Achievement Measure, Western Interstate Commission for Higher Education Multistate Longitudinal Data Exchange, Voluntary Institutional Metrics Project and Voluntary System of Accountability.

6   IPEDS' OM survey addresses the problem of only FTFT cohorts but still has limitations. OM measures outcomes at six and eight years regardless of institution type, collapses credential-seeking statuses, and lacks disaggregation by race/ethnicity and gender. For more information, see the PostsecData Comments on IPEDS Outcome Measures Technical Review Panel. Retrieved from http://www.ihep.org/press/opinions-and-statements/postsecdata-comments-ipeds-outcome-measures-technical-review-panel

7   Ninety-four percent of bachelor's-seekers and 95 percent of certificate-seekers who attain any credential anywhere earn their intended degree. While only 51 percent of associate's-seeking students who attain any credential anywhere attain the associate's degree, another 32 percent earn a bachelor's degree. Only 17 percent earn a certificate as their highest credential. IHEP analysis of: U.S. Department of Education (2009). Beginning Postsecondary Students Longitudinal Study, 2004-2009. Retrieved from: http://nces.ed.gov/datalab/index.aspx.

8   It should be acknowledged that about 8.5 percent of students are not in a degree program at entry in BPS, and the survey imputes credential level for students with missing data by using the degree program reported by the institution or the Free Application for Federal Student Aid (FAFSA). This variable is edited further to ensure that the degree program reported was actually offered by the institution. For those reported at a higher level than the institution offered, the variable is reclassified at the highest level offered by the institution.

9   Fifty-six percent of nonfederal aid recipients who eventually drop out stay enrolled beyond the first year. IHEP analysis of: U.S. Department of Education (2009). Beginning Postsecondary Students Longitudinal Study, 2004-2009. Retrieved from: http://nces.ed.gov/datalab/index.aspx.

10 American Association of Community Colleges. *Voluntary framework of accountability metrics manual*. Retrieved from American Association of Community Colleges website: http://vfa.aacc.nche.edu/Documents/VFAMetricsManual.pdf

11 Failure to reach a behavioral milestone for this analysis is defined as earning fewer than 12 credits in the first year of enrollment. IHEP analysis of: U.S. Department of Education (2009). Beginning Postsecondary Students Longitudinal Study, 2004-2009. Retrieved from: http://nces.ed.gov/datalab/index.aspx.

12 IHEP analysis of: U.S. Department of Education (2009). Beginning Postsecondary Students Longitudinal Study, 2004-2009. Retrieved from: http://nces.ed.gov/datalab/index.aspx.

Chapter 3

1   Postsecondary Data Collaborative members. (2014, December). *PostsecData Comments on IPEDS Outcome Measures Technical Review Panel*. Retrieved from http://www.ihep.org/press/opinions-and-statements/postsecdata-comments-ipeds-outcome-measures-technical-review-panel; Postsecondary Data Collaborative members. (2015, April). *PostsecData Response to Senate Health, Education, Labor and Pensions Committee*. Retrieved from http://www.ihep.org/sites/default/files/uploads/postsecdata/docs/resources/postsecdata_collaborative_help_response.pdf

2   IHEP analysis of: U.S. Department of Education (2013). Integrated Postsecondary Data System (IPEDS), 2012-13, Enrollment. Retrieved from: https://nces.ed.gov/ipeds/datacenter/.

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4   Aspen Prize for Community College Excellence, Completion by Design, Predictive Analytics Reporting Framework, Voluntary Institutional Metrics Project, Western Interstate Commission for Higher Education Multistate Longitudinal Data Exchange.

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10 Achieving the Dream, Completion by Design, Complete College America, National Community College Benchmark Project, National Student Clearinghouse, Predictive Analytics Reporting Framework, Voluntary Framework of Accountability, Voluntary Institutional Metrics Project.

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16   Aspen Prize for Community College Excellence, Complete College America, Consortium for Student Retention Data Exchange, Student Achievement Measure, Voluntary Framework of Accountability, Voluntary System of Accountability.

17   About 5 percent of certificate-seekers and 4 percent of associate-seekers earn the credential sought at their first institution in more than 200 percent, but less than 300 percent of time. IHEP analysis of: U.S. Department of Education (2009). Beginning Postsecondary Students Longitudinal Study, 2004-2009. Retrieved from: http://nces.ed.gov/datalab/index.aspx.

18   While some initiatives provide additional time for part-time students or report longer than 200 percent of program time, the metrics and definitions proposed by this framework are aligned with initiatives that aim to encourage decreased time to degree for the benefit of both students and the public.

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22   Persistence and retention are covered in the progression subchapter of Chapter 3.

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25   Five additional initiatives calculate a time or credits to credential metric: Completion By Design, Consortium for Student Retention Data Exchange, National Student Clearinghouse, Voluntary Institutional Metrics Project, and Western Interstate Commission for Higher Education Multistate Longitudinal Data Exchange.

26   The credit accumulation metric attempts to evaluate how students initially progress toward a credential, whereas the credits to credential metrics evaluates the speed and efficiency with which they complete. If a student takes credits that do not count toward their credential, it impacts their ability to complete on time.

27   The states and data experts that served as CCA's data advisory committee advised them to control for outliers and reflect institutional practices related to stopouts, thus excluding those students who stopped-out for more than five years. In addition, for the National Student Clearinghouse Degree Pathways report, the calculation of mean time-to-degree excludes students taking longer than six years. See more information from: *Snapshot Report—Degree Pathways*- https://nscresearchcenter.org/snapshotreport-degreepathways19/

28   An overall net price, including students receiving grant aid and those not receiving grant aid, actually can be calculated using the IPEDS data on overall net price for grant recipients and the percentage of student receiving grant aid because the net price for non–grant recipients equals the total cost of attendance.

29   IHEP analysis of: U.S. Department of Education (2012). National Postsecondary Student Aid Study (NPSAS), 2012. Retrieved from: http://nces.ed.gov/datalab/index.aspx.

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31   Net price income quintiles in the Higher Education Opportunity Act of 2008 include: $0–30,000; $30,001–48,000; $48,001–75,000; $75,001–110,000; and $110,001 and more. For more information, see: http://www.gpo.gov/fdsys/pkg/PLAW-110publ315/pdf/PLAW-110publ315.pdf

32   Thirty-four percent of students in the top quintile receive federal aid, whereas 76 percent of students in the bottom quintile receive federal aid. IHEP analysis of: U.S. Department of Education (2012). National Postsecondary Student Aid Study (NPSAS), 2012. Retrieved from: http://nces.ed.gov/datalab/index.aspx.

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73   While using the same terminology, the College Scorecard and Census Bureau define unemployment differently. The Census Bureau's unemployment rate seasonally adjusts and only measures employment trends among those seeking employment, but the College Scorecard measures the proportion of former students with any earnings.

74   The College Scorecard's unemployment rate is the inverse of the employment rate proposed here. The Scorecard rate counts as unemployed any former students not included in the Department of Treasury's earnings records for an entire year.

75   College Measures Economic Metrics. Beyond Education. Retrieved from: http://beyondeducation.org/

76   Institute for Higher Education Policy. (2016, March). *Employing postsecondary data for effective state finance policymaking*. Retrieved from http://www.ihep.org/research/publications/employing-postsecondary-data-effective-state-finance-policymaking

77   Cielinski, A. (2015, May 8). Internal memo: Gates metrics – Workforce outcome measures background research.

78   Schneider, M. (2014). *Measuring the economic success of college graduates*. Retrieved from American Institutes for Research website: http://www.air.org/resource/measuring-economic-success-college-graduates-lessons-field; Cielinski, A. (2015, May 8). Internal memo: Gates metrics – Workforce outcome measures background research.

79   These disaggregates and adjustment for inflation allows for better year-over-year comparison, improving and building on the work of the College Scorecard. Without inflation adjustment, comparison can be imprecise so measurement in constant dollars can transparently show how earnings trend over time and accurately compared outcomes for students.

80   California Community Colleges. (2016). *Salary surfer*. Retrieved from http://salarysurfer.cccco.edu/SalarySurfer.aspx

81   Aspen's calculations use national data from the Census Bureau's Longitudinal Employer-Household Dynamics survey for recent graduates and the Bureau of Labor Statistics' Quarterly Census of Employment survey for overall county wages five years out. Aspen Institute. (2015, August). *Using comparative information to improve student success*. Retrieved from http://www.aspeninstitute.org/sites/default/files/content/docs/pubs/UsingComparativeInformationGuide.pdf

82   College Scorecard. (2015, September). *Using federal data to measure and improve the performance of U.S. institutions of higher education*. Retrieved from http://collegescorecard.ed.gov/assets/UsingFederalDataToMeasureAndImprovePerformance.pdf

83   College Scorecard. (2015, September). *Using federal data to measure and improve the performance of U.S. institutions of higher education*. Retrieved from https://collegescorecard.ed.gov/assets/UsingFederalDataToMeasureAndImprovePerformance.pdf

84   Workforce Data Quality Campaign. (2014, May). *Employing WRIS2: Sharing wage records across states to track program outcomes*. Retrieved from http://www.nationalskillscoalition.org/resources/publications/file/WRIS2-Report-May-2014.pdf

85   The Western Interstate Commission for Higher Education's Multistate Longitudinal Data Exchange links four states' (Hawaii, Idaho, Washington, and Oregon) postsecondary records with the UI records in those states to increase student coverage by up to 22 percent in some states. WICHE. Multistate Longitudinal Data System. Retrieved from http://www.wiche.edu/longitudinaldataexchange

86   The College Scorecard uses full-year income data from the Department of Treasury taken from W-2 forms and positive self-employment earnings from Schedule SE. Department of Education . (2015, September). *Using federal data to measure and improve the performance of U.S. institutions of higher education*. Retrieved from: https://collegescorecard.ed.gov/assets/UsingFederalDataToMeasureAndImprovePerformance.pdf. *Self-employment tax*. Retrieved from https://www.irs.gov/pub/irs-pdf/f1040sse

87   IHEP analysis of: U.S. Department of Education (2012). National Postsecondary Student Aid Study (NPSAS), 2012. Retrieved from: http://nces.ed.gov/datalab/index.aspx; College Scorecard. (2015, September). *Using federal data to measure and improve the performance of U.S. institutions of higher education*. Retrieved from http://collegescorecard.ed.gov/assets/UsingFederalDataToMeasureAndImprovePerformance.pdf

88   Cielinski, A. (2015, October). *Using post-college labor market outcomes: Policy challenges and choices*. Retrieved from Center for Law and Social Policy (CLASP) website: http://www.clasp.org/resources-and-publications/publication-1/Using-Post-College-Labor-Market-Outcomes.pdf

89   Employment and earnings measurement periods: the University of Texas Productivity Dashboard: degree recipients employed in the fourth quarter of the calendar year in which the program ended; Florida College Measures: "Total Found Employed percent," one year after graduation, Median Earnings, one and five years after graduation; VFA: for ABE cohort, dependent on exit, could be as short as two quarters; WIOA: second and fourth quarter after exit

90   Cielinski, A. (2015, May 8). Internal memo: Gates metrics – Workforce outcome measures background research. States using workforce outcomes in their performance equation include: Arkansas, Florida, Kansas, Louisiana, Minnesota, Missouri, Montana, New York, North Carolina, Tennessee, Utah, and Wisconsin.

91   New America. (2015, May). *Deciding to go to college*. Retrieved from https://www.luminafoundation.org/files/resources/deciding-to-go-to-college.pdf; Young Invincibles. (2013, December 12). *Will college be worth it?* Retrieved from http://younginvincibles.org/will-college-be-worth-it/

Chapter 4

1   Because it is closely tied to the Completers performance metric, Time and Credits to Credential is included as a stand-alone metric in Chapter 2, which details the Completion performance metrics. Additionally, because it is closely tied to the Median Earnings performance metric, the Earnings Threshold metric is described in Chapter 2 under Workforce Outcomes.

2   Delta Cost Project. (2009, February). *Metrics for improving cost accountability* (Issue Brief No. 2). Retrieved from http://www.deltacostproject.org/sites/default/files/products/issuebrief_02.pdf

3   National Governors Association. (2011, July). *From information to action: Revamping higher education accountability systems*. Retrieved from http://www.nga.org/files/live/sites/NGA/files/pdf/1107C2CACTIONGUIDE.PDF

4   Davies, L. (2014, March). *State "shared responsibility" policies for improved outcomes: lessons learned*. Washington, D.C.: HCM Strategists. Retrieved from http://hcmstrategists.com/wp-content/uploads/2014/04/HCM-State-Shared-Responsibility-RADD-2.0.pdf

5   Delta Cost Project. (2009, February). *Metrics for improving cost accountability* (Issue Brief No. 2). Retrieved from http://www.deltacostproject.org/sites/default/files/products/issuebrief_02.pdf; National Center for Education Statistics (2012, August). *IPED analytics: Delta Cost Project database 1987–2010*. Retrieved from https://nces.ed.gov/pubs2012/2012823.pdf; Delta Cost Project. (2011, December). *Delta Cost Project documentation of IPEDS database and related products*. Retrieved from National Center for Education Statistics website: https://nces.ed.gov/ipeds/deltacostproject/download/DCP_History_Documentation.pdf

6   Specifically, the Delta Cost Project database collapses data from institutions that are part of a parent/child reporting relationship into a single observation each year, to maintain comparability over time and across multiple IPEDS surveys. These reporting relationships are more common in the public sector, but affect only a small proportion of public institutions. This parent/child relationship in IPEDS finance data could affect empirical results, but the effects appear small. Jaquette, O., & Parra, E. (2016, February). *The problem with the Delta Cost Project database*. New York, NY: Research in Higher Education. Retrieved from http://link.springer.com/article/10.1007/s11162-015-9399-2

7   E&R excludes spending on sponsored research, public service, auxiliaries, and other operations. Delta Cost Project. (2016, January). *Trends in College Spending: 2003–2013*. Retrieved from http://www.deltacostproject.org/sites/default/files/products/15-4626%20Final01%20Delta%20Cost%20Project%20College%20Spending%2011131.406.P0.02.001%20....pdf

8   A portion of indirect expenditures also supports the research and public service functions in institutions with these activities.

9   Institutions report finance data to IPEDS either through a GASB form (primarily used by publics) or FASB form (primarily used by privates). A new GASB form was phased in during fiscal year (FY) 2008 and FY09, with institutions required to use the new form in FY10. To maintain consistency over time and across surveys, Delta Cost adjusts some expenditure elements. Institutions can use Delta's data as part of this framework or replicate Delta's adjustments using their institutional (not IPEDS) data. For institutions using (1) the GASB form in FY10 and after, (2) the new "aligned" form during the transition period in FY08 and/or FY09, or (3) the FASB form in FY97 and after, Delta extracts spending on operations and maintenance (O&M) and interest out of the six main functional expenditure categories (instruction, research, public service, student services, academic support, and institutional support). Each of the O&M totals is then resummed into a stand-alone O&M category for each institution. Interest remains excluded to maintain consistency over time because public institutions did not report interest to IPEDS in early years.

10   IPEDS reports calculated 12-month FTE estimates based on instructional activity. Integrated Postsecondary Education Data System (2015). *12-month enrollment full instructions*. Retrieved from https://surveys.nces.ed.gov/ipeds/VisInstructions.aspx?survey=9&id=30069&show=all

11 Kirshstein, R. (2015, April 8). *How the New York Times got it wrong about college tuition*. Retrieved from Noodle website: https://www.noodle.com/articles/how-the-new-york-times-got-it-wrong-about-college-tuition-opinion

12 This framework recommends using total credit hour activity, including undergraduate and graduate activity to align with the numerator, which includes expenditures on undergraduate and graduate students combined. CBD includes only undergraduate credit activity in the denominator because they work only with community colleges, at which graduate expenditures would be minimal.

13 Credit earned and not earned is based on institutional standards. In the case that an institution accepts a D grade as passing, those credits would be considered completed. The use of institutional standards to determine credit earned is consistent in this framework across relevant metrics, including credit accumulation and credit completion ratio.

14 Belfield, C., Crosta, P., & Jenkins, D. (2014, September). *Can community colleges afford to improve completion? Measuring the costs and efficiency effects of college reforms*. Retrieved from Community College Research Center website: http://ccrc.tc.columbia.edu/publications/can-community-colleges-afford-to-improve-completion.html

15 Coffey Consulting (personal communication, March 5, 2016).

16 The calculation for E&R per credit can be found in the description for the previous metric, cost for credits not completed.

17 Ruffalo Noel Levitz. Retention revenue estimator. Retrieved from https://www.ruffalonl.com/college-student-retention/retention-revenue-estimator; Noel-Levitz. Return on investment estimator. Retrieved from https://www.ruffalonl.com/upload/Student_Retention/ReturnonInvestmentEstimator.pdf; Walmart, Lumina Foundation, Delta Cost Project, & Jobs for the Future. (2009, December). *Calculating cost-return for investments in student success*. Retrieved from Delta Cost Project website: http://www.deltacostproject.org/sites/default/files/products/ISS_cost_return_report.pdf

18 Depending on data availability, average credit load and tuition charge per credit can be used in lieu of net tuition revenue per student, which is how CBD calculates this metric.

19 The CBD metric measures the revenue in year 1 for retained students instead of year 2 because their metric seeks to evaluate how many more students would have persisted and what the potential tuition revenue gain would have been in year 1 had the institution already had year 2's retention rate.

20 Schneider, M., & Yin, L. (2011, October). *The hidden costs of community college*. Retrieved from American Institutes for Research website: http://www.air.org/sites/default/files/downloads/report/AIR_Hidden_Costs_of_Community_Colleges_Oct2011_0.pdf; Schneider, M., & Yin, L. (2011, August). *The high cost of low graduation rates: How much does dropping out of college really cost?* Retrieved from American Institutes for Research website: http://www.air.org/sites/default/files/downloads/report/AIR_High_Cost_of_Low_Graduation_Aug2011_0.pdf

21 Walmart, Lumina Foundation, Delta Cost Project, & Jobs for the Future. (2009, December). *Calculating cost-return for investments in student success*. Retrieved from Delta Cost Project website: http://www.deltacostproject.org/sites/default/files/products/ISS_cost_return_report.pdf

22 We considered using headcount instead of FTE based on concerns that using the latter may inflate the metric for institutions with larger part-time populations, but we opted to use 12-month FTE here for consistency with other metrics using these data in this framework.

23 Integrated Postsecondary Education Data System (2015). *Completions for all institutions*. Retrieved from https://surveys.nces.ed.gov/IPEDS/Downloads/Forms/package_10_80.pdf; Integrated Postsecondary Education Data System (2015). *12-month enrollment for 4-year institutions*. Retrieved from https://surveys.nces.ed.gov/IPEDS/Downloads/Forms/package_9_69.pdf

24 Complete College America. (2014, April). *Common college completion metrics technical guide*. Retrieved from http://completecollege.org/wp-content/uploads/2014/11/2014-Metrics-Technical-Guide-Final-04022014.pdf

25 Integrated Postsecondary Education Data System (2015). *Instructions for the IPEDS completions component*. Retrieved from https://surveys.nces.ed.gov/ipeds/VisInstructions.aspx?survey=10&id=30080&show=all

26 Vuong, B., & Cullum Hairston, C. (2012, October). *Using data to improve minority-serving institution success*. Washington, D.C.: Institute for Higher Education Policy. Retrieved from http://www.ihep.org/sites/default/files/uploads/docs/pubs/mini_brief_using_data_to_improve_msi_success_final_october_2012_2.pdf

27 Snyder, M. (2015, February). *Driving better outcomes: Typology and principles to inform outcomes-based funding models*. Washington, D.C.: HCM Strategists. Retrieved from http://hcmstrategists.com/drivingoutcomes/wp-content/themes/hcm/pdf/Driving%20Outcomes.pdf

28 The difference in tuition share of E&R cost at public institutions between 2003 and 2013 varied by institution type: Research, 18.5 percentage point difference; Master's, 16.3 percentage point difference; Bachelor's, 14.2 percentage point difference; and Community Colleges, 9.9% percentage point difference. Delta Cost Project. (2016, January). *Trends in college spending: 2003–2013*. Retrieved from American Institutes for Research website: http://www.air.org/resource/trends-college-spending-2003-2013-where-does-money-come-where-does-it-go-what-does-it-buy

29 Oliff, P., Palacios, V., Johnson, I., & Leachman, M. (2013, March 19). *Recent deep state higher education cuts may harm students and the economy for years to come*. Retrieved from Center on Budget and Policy Priorities website: http://www.cbpp.org/research/recent-deep-state-higher-education-cuts-may-harm-students-and-the-economy-for-years-to-come?fa=view&id=3927; Bergeron, D., Baylor, E., & Flores, A. (2014, October). *A great recession, a great retreat*. Retrieved from Center for American Progress website: https://cdn.americanprogress.org/wp-content/uploads/2014/10/PublicCollege-report.pdf

30 Hiltonsmith, R. (2015, May). *Pulling up the higher-ed ladder: Myth and reality in the crisis of college affordability*. Retrieved from Demos website: http://www.demos.org/publication/pulling-higher-ed-ladder-myth-and-reality-crisis-college-affordability

31 State Higher Education Executive Officers Associations. (2015, April). *SHEF: FY 2014, state higher education finance*. Retrieved from http://www.sheeo.org/sites/default/files/project-files/SHEF%202014-20150410.pdf; Baylor, E. (2014, December). *State disinvestment in higher education has led to an explosion of student-loan debt*. Retrieved from Center for American Progress website: https://cdn.americanprogress.org/wp-content/uploads/2014/12/BaylorStateDivestment.pdf

32 Integrated Postsecondary Education Data System (2015). *Instructions for the IPEDS completions component*. Retrieved from https://surveys.nces.ed.gov/ipeds/VisInstructions.aspx?survey=10&id=30080&show=all

33 Also collecting this metric: College Measures, the Consortium for Student Retention Data Exchange, and the NGA efficiency metrics.

Chapter 5

1 Adelman, C. (2006, February). *The toolbox revisited*. Washington, DC: U.S. Department of Education. Retrieved from: http://www2.ed.gov/rschstat/research/pubs/toolboxrevisit/toolbox.pdf

2 Roderick, M., Nagota, J., & Coca, V. (2009). *College readiness for all: The challenge for urban high schools*. Chicago: University of Chicago. Retrieved from: https://ccsr.uchicago.edu/publications/college-readiness-all-challenge-urban-high-schools; Belfield, C. & Crosta, P. (2012, February). *Predicting success in college: The importance of placement tests and high school transcripts*. New York: Community College Research Center, p. 39. Retrieved from: http://67.205.94.182/media/k2/attachments/predicting-success-placement-tests-transcripts.pdf

3 Geiser, S. & Santelices, M. (2007). *Validity of high-school grades in predicting student success beyond the freshman year: High-school record vs. standardized tests as indicators of four-year college outcomes*. Berkeley: University of California at Berkeley, Center for Studies in Higher Education. Retrieved from: http://www.cshe.berkeley.edu/publications/validity-high-school-grades-predicting-student-success-beyond-freshman-yearhigh-school

4 An analysis of BPS data finds that more than 50 percent of entering postsecondary students with a high school GPA of 3.0 or above earn a credential. However, this cutoff varies by credential type, making it difficult to set one standard. Among associate's-seeking students, the high school GPA threshold for reaching this 50 percent attainment rate is higher (3.5), while it is lower for bachelor's-seeking students (2.5). IHEP analysis of: U.S. Department of Education (2009). Beginning Postsecondary Students (BPS) Longitudinal Study, 2004-2009. Retrieved from: http://nces.ed.gov/datalab/index.aspx. Some studies, such as Geiser & Santelices (2007) and Roderick, Nagota, & Coca (2009) show that a threshold of 3.0 is more predictive for student outcomes than other thresholds, but variability by credential level steers the framework away from setting a specific standard.

5 For example, scoring a 1550 out of 2400 or above on the SAT is associated with a 65 percent probability of earning at least a B- average in the first year of college. For the ACT exam, scoring 22 or above is correlated with a 75 percent chance of earning a C or better in collegiate English and math courses. The College Board. 2013. *The SAT report on college and career readiness: 2013*. Retrieved from: http://media.collegeboard.com/homeOrg/content/pdf/sat-report-college-career-readiness-2013.pdf; ACT Research and Policy. (2013, September). *What are the ACT college readiness benchmarks?* Retrieved from: https://www.act.org/research/policymakers/pdf/benchmarks.pdf

6 Including: Achieving the Dream, Aspen Prize for Community College Excellence, Complete College America, Completion by Design, Consortium for Student Retention Data Exchange, National Community College Benchmarking Project, Predictive Analytics Reporting Framework, Voluntary Framework of Accountability, and Voluntary Institutional Metrics Project.

7 For bachelor's degree seekers, of those who took no remedial coursework, 71 percent attained a bachelor's degree. Only 42 percent of those who took two or more remedial courses attained a bachelor's degree. For associate's seekers, associate's degree completion hovers between 17 percent and 19 percent, regardless of the number of remedial courses taken. IHEP analysis of: U.S. Department of Education (2009). Beginning Postsecondary Students (BPS) Longitudinal Study, 2004-2009. Retrieved from: http://nces.ed.gov/datalab/index.aspx.

8 For example, Promise Pathways at Long Beach Community College uses the Multiple Measures Assessment Project for community college course placement; the North Carolina Community College System is evaluating its Multiple Measures for Placement Policy that establishes a hierarchy of measures to determine student readiness for college coursework; and multiple measures are used in a variety of formats in Massachusetts, Colorado, Florida, and Hawaii. The RP Group (n.d.). *Multiple Measures Assessment Project*. Retrieved from: http://rpgroup.org/projects/multiple-measures-assessment-project/pilot-college-resources; North Carolina State Board of Community Colleges (n.d.). *Multiple Measures of Placement*. Retrieved from: http://www.nccommunitycolleges.edu/sites/default/files/state-board/program/prog_04_multiple_measures_2-12-15.pdf; WestEd. (2014, March). *Exploring the use of multiple measures for placement into college-level courses*. Retrieved from: https://www.wested.org/resources/core-to-college-evaluation-exploring-the-use-of-multiple-measures-for-placement-into-college-level-courses/

9 Belfield, C., & Crosta, P. (2012, February). *Predicting success in college: The importance of placement tests and high school transcripts*. (CCRC Working Paper 42). New York: Community College Research Center. Retrieved from: http://ccrc.tc.columbia.edu/publications/predicting-success-placement-tests-transcripts.html; Scott-Clayton, J. (2012, February). *Do high stakes placement exams predict college success?* (CCRC Working Paper 41). New York: Community College Research Center. Retrieved from: http://ccrc.tc.columbia.edu/publications/high-stakes-placement-exams-predict.html; Cromwell, A., McClarty, K., & Larson, S. (2013, May). *College readiness indicators*. Washington, D.C.: Pearson. Retrieved from: http://images.pearsonassessments.com/images/tmrs/TMRS_RIN_Bulletin_25CRIndicators_051413.pdf

10 Complete College America. (2012, April). *Remediation: Higher education's bridge to nowhere*. Retrieved from: http://www.completecollege.org/docs/CCA-Remediation-summary.pdf

11 For example, between 2008–09 and 2009–10, the number of Pell Grant recipients rose by 1.9 million. This increase was driven by changes in the economy and changes to the maximum Pell award. Changes in Pell enrollments at individual institutions should be contextualized with national changes in Pell recipient trends. Congressional Budget Office. (2013, September). *The Federal Pell Grant program: Recent growth and policy options*, p. 9. Retrieved from: http://www.cbo.gov/sites/default/files/cbofiles/attachments/44448_PellGrants_9-5-13.pdf

12 IHEP analysis of: U.S. Department of Education (2012). National Postsecondary Student Aid Study (NPSAS), 2012. Retrieved from: http://nces.ed.gov/datalab/index.aspx.

13 Perry, P. (2014). *Postsecondary institution ratings systems symposium*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

14 Silver, N. (2015, May 1). *The most diverse cities are often the most segregated*. FiveThirtyEight. Retrieved from: http://fivethirtyeight.com/features/the-most-diverse-cities-are-often-the-most-segregated/

15 The maximum EFC for Pell eligibility in 2011–12 was $5,273. Federal Pell Grant Program Payment Schedule 2011–12. Retrieved from: http://www.ifap.ed.gov/dpcletters/attachments/P1101Attach.pdf

16 This threshold is derived from the College Board proposal that suggests tying the amount of the Pell Grant award to the family's poverty level. Under this proposal no Pell award would be disbursed above 250 percent of the poverty level. It should be noted though that 15 percent of Pell recipients today are from families living slightly above 250 percent of the poverty level. College Board. (2008, September). *Fulfilling the commitment: Recommendations for reforming federal student aid*. Retrieved from: http://media.collegeboard.com/digitalServices/pdf/advocacy/homeorg/rethinking-student-aid-fulfilling-commitment-recommendations.pdf

17 IHEP analysis of: U.S. Department of Education (2012). National Postsecondary Student Aid Study (NPSAS), 2012. Retrieved from: http://nces.ed.gov/datalab/index.aspx.

18 Campbell, C., & Voight, M. (2015, October). *Serving their share: Some colleges could be doing a much better job enrolling and graduating low-income students*. Retrieved from: http://www.ihep.org/research/publications/serving-their-share-some-colleges-could-be-doing-much-better-job-enrolling-and; Nichols, A.H. (2015, September 24). *The Pell partnership: Ensuring a shared responsibility for low-income student success*. Washington, D.C.: The Education Trust. Retrieved from: http://edtrust.org/wp-content/uploads/2014/09/ThePellPartnership_EdTrust_20152.pdf

19 Department of Education. Agency Information Collection Activities; Comment Request; Integrated Postsecondary Education Data System (IPEDS) 2016–2019. Retrieved from: https://www.federalregister.gov/articles/2016/02/18/2016-03338/agency-information-collection-activities-comment-request-integrated-postsecondary-education-data

20 IHEP analysis of: U.S. Department of Education (2012). National Postsecondary Student Aid Study (NPSAS), 2012. Retrieved from: http://nces.ed.gov/datalab/index.aspx.

21 IHEP analysis of: U.S. Department of Education (2009). Beginning Postsecondary Students (BPS) Longitudinal Study, 2004-2009. Retrieved from: http://nces.ed.gov/datalab/index.aspx.

22 U.S.C. Chapter 28, Subchapter IV, Part A: Federal Early Outreach and Student Services Programs. Division 1—Federal Trio Programs. Retrieved from: http://www2.ed.gov/about/offices/list/ope/trio/statute-trio-gu.pdf

23 IHEP analysis of: U.S. Department of Education (2009). Beginning Postsecondary Students (BPS) Longitudinal Study, 2004-2009. Retrieved from: http://nces.ed.gov/datalab/index.aspx.

24 Department of Education. (2015). *Data documentation for the college scorecard*. Retrieved from: http://collegescorecard.ed.gov/data/documentation/

25 I'm First. (n.d.). *Overview*. Retrieved from: http://www.imfirst.org/#overview

26 First-generation students unite. (2015, April 8). *New York Times*. Retrieved from: http://www.nytimes.com/2015/04/12/education/edlife/first-generation-students-unite.html?_r=0

27 Complete College America. (2014, April). *Metrics technical guide*. Retrieved from: http://completecollege.org/wp-content/uploads/2014/11/2014-Metrics-Technical-Guide-Final-04022014.pdf