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Outcomes and Measures for College and Career Success:
How Do We Know When High School Graduates Meet Expectations?

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INTRODUCTION

College and career readiness has become a key priority for the PK–20 education community and the nation at large. And although college and career readiness is a PK–20 issue, much of the attention has focused on secondary education, fueled by economic projections and secondary reform efforts. Recent projections indicate that within the next decade, 63 percent of all jobs in the United States will require some postsecondary education, and 90 percent of new jobs in growing industries with high wages will require some postsecondary training; however, institutes of higher education and the business community have long expressed concern over the inadequacy of a traditional high school education in preparing students for postsecondary education or training necessary to succeed in these careers (Alliance for Excellent Education, 2009; Carnevale, Smith, & Strohl, 2010; U.S. Department of Labor, 2008).

High schools face many challenges in ensuring that all students are college and career ready. Not only must high schools raise their expectations and help students set more ambitious postsecondary goals, but they must also provide a wider array of supports to help students meet their individual goals. Furthermore, the growing consensus on the importance of all students mastering a broad range of knowledge and skills—like the English language arts and mathematics standards within the Common Core State Standards; key learning skills such as social and emotional and academic success skills; and knowledge of and exposure to a diverse range of postsecondary pathways—is made even more challenging in that there is also subset of college and career readiness skills that are directly tied to individual postsecondary goals. As each student identifies postsecondary aspirations, he or she will require specific knowledge and skills to prepare for the identified pathway (Alliance for Excellent Education, 2009; Educational Policy Improvement Center, 2009; ACT, 2006).

The increased focus on college and career readiness, combined with the complexity of the challenges associated with the topic, has led to a rapidly expanding college and career readiness community that is rich with resources yet replete with confusion. The National High School Center recently conducted a scan of organizations that address college and career readiness and identified more than 70 such organizations, including those focused on policy, practice, advocacy, access, and research. Through this scan, the College and Career Development Organizer was created to help make sense of this increasingly complicated topic.

The purpose of this brief is to summarize and organize the college and career readiness outcomes and measures that the National High School Center has collected as part of a scan of organizations involved in college and career readiness. The brief is a companion piece to the National High School Center's College and Career Development Organizer and is the third in a series of briefs describing the three strands identified therein (see http://www. betterhighschools.org/CCR/resources.asp to download briefs):

- *Expectations and Goals for College and Career Readiness: What Should Students Know and Be Able to Do?*

- *Pathways and Supports for College and Career Preparation: What Policies, Programs, and Structures Will Help High School Graduates Meet Expectations?*

- ***Outcomes and Measures for College and Career Success: How Do We Know When High School Graduates Meet Expectations?***

In the pages that follow, the National High School Center briefly summarizes the outcomes and measures of college and career success that have been collected and organizes this information into three key threads (see Exhibit 1):

- On-Track Indicators

- Attainment and Authentication

- Accountability and Improvement Feedback

Along with a brief description of each thread, key components are highlighted and examples of each type of outcome and measure are provided. The brief concludes with key factors that schools, districts, and states may want to consider as they begin to build, analyze, and address measures and outcomes specific to college and career readiness in their contexts.

Exhibit 1. College and Career Development Organizer: Outcomes and Measures Strand

STRAND 3: Outcomes and Measures for College and Career Success *How do we know when high school graduates meet expectations?*		
THREADS	**COMPONENTS**	**EXAMPLES**
On-Track Indicators	**Academic/Technical Performance and Engagement**	Credit accumulation and recovery ▸ Attendance, grade point average, and suspensions ▸ Participation in accelerated learning programs and/or college- and career-ready courses of study ▸ Performance on aligned assessments of high school core content (e.g, Partnership for Assessment of Readiness for College and Careers and Smarter Balance assessments, high school end-of-course and exit examinations) ▸ Performance on career and portfolio assessments
	Postsecondary Access and Enrollment	Free Application for Federal Student Aid (FAFSA) and postsecondary applications completed ▸ Postsecondary program enrollment ▸ Employment applications completion
Attainment and Authentication	**Secondary Certification**	High school diploma (standard, alternative, college and career readiness) or GED ▸ College credits in dual enrollment, Advanced Placement, or International Baccalaureate courses ▸ Postsecondary degree(s) ▸ Awarded industry-recognized credential or certificate
	Postsecondary Success	Postsecondary education graduation certificate ▸ Postsecondary training certification ▸ Earning wage in "middle-skills" (e.g., jobs that require an associate's degree, a vocational certificate, on-the-job training, or some college) or higher skills job ▸ Postsecondary remediation not needed
Accountability and Improvement Feedback	**Accountability Reporting Systems**	High school and district report cards, reporting college and career readiness measures ▸ Performance-based assessments
	Data-Informed Improvement Cycles	High school and district diagnostic assessments ▸ State and district improvement plans ▸ Early warning systems for dropout and college and career readiness ▸ National High School Senior Survey and school climate surveys

ON-TRACK INDICATORS

A number of *On-Track Indicators*, the first thread in the Outcomes and Measures strand, have emerged from research on college and career preparedness and are increasingly being used to identify students who need additional assistance to complete high school (e.g., Allensworth & Easton, 2005, 2007; Gwynne, Lesnick, Hart, & Ainsworth, 2009; Heppen & Therriault, 2008). Much of the existing body of on-track indicators work refers to indicators that students are on track to graduate from high school. On-track indicators for college and career readiness may require more rigorous benchmarks or an expanded focus because being on track for high school graduation is not necessarily the

same thing as being on track for college and career success. Indicators of college and career readiness need to build on but move beyond previous on-track indicator work to measure not only academic and engagement indicators that ensure students are on track to master the skills they need but also process indicators that ensure students are immersed in the complex steps of enrolling in postsecondary education or beginning a career.

ACADEMIC/TECHNICAL PERFORMANCE AND ENGAGEMENT

Academic/Technical Performance and Engagement indicators, the first component in the On-Track Indicators thread, include credit accumulation and recovery, attendance and grade point average (GPA), and more recently, performance on career portfolios (Pennsylvania Department of Education, n.d.). Course failure, insufficient accumulation of course credits, poor attendance, and failure to enroll in college and career ready courses can signal a need for interventions such as credit recovery opportunities.

Exhibit 2. College and Career Development Organizer: Outcomes and Measures Strand, Academic/Technical Performance and Engagement Component

COMPONENTS	EXAMPLES
Academic/Technical Performance and Engagement	Credit accumulation and recovery ▸ Attendance, grade point average, and suspensions ▸ Participation in accelerated learning programs and/or college- and career-ready courses of study ▸ Performance on aligned assessments of high school core content (e.g, Partnership for Assessment of Readiness for College and Careers and Smarter Balance assessments, high school end-of-course and exit examinations) ▸ Performance on career and portfolio assessments

Among the most common academic/technical performance and engagement measures are coursework and assessment scores. The successful completion of rigorous coursework in high school, particularly rigorous mathematics coursework, is one of the strongest predictors of educational outcomes and future wages (Adelman, 2006; Rose & Betts, 2004; Whitehurst, 2009). Furthermore, high school graduates must have completed a "college preparatory" curriculum to be eligible for enrollment at most state universities (National Center for Public Policy and Higher Education & Southern Regional Education Board, 2010). Twenty states and the District of Columbia have been recognized as requiring completion of college-ready curricula in mathematics and English/language arts for earning a high school diploma (Achieve, 2011), and many more states are encouraging and tracking enrollment in accelerated learning options such as Advanced Placement (AP), International Baccalaureate (IB), and dual enrollment course options. With respect to career readiness, states, districts, and high schools have been working to increase the rigor and relevance of technical curricula and instruction and integrate them more seamlessly with content that has traditionally been defined as "academic" or "college preparatory" (e.g., physics, geometry, statistics) (Brand, 2009).

In addition to coursework, more states are administering end-of-course assessments to increase rigor and facilitate better alignment between state standards and curriculum as well as additional testing (ACT, 2011) to track students' college and career readiness (Zabala, Minnici, McMurrer, & Briggs, 2008). The development and adoption of college readiness assessments are anticipated to expand dramatically, as the Partnership for Assessment of Readiness for College and Careers (PARCC) and the Smarter Balance Assessment Consortium are tasked with creating "next generation assessments" to measure college and career readiness in mathematics and English/language arts. The consortia intend to roll out summative (end-of-year) and interim assessment tools for Grades 3 through 8 and high

school by 2015, with standard-setting and cut scores established thereafter. The consortia have announced that they will form a joint Technical Advisory Committee to study compatibility and comparability of their assessments and scores (Center for K–12 Assessment & Performance Management, 2001).

Beyond academic measures, some districts and high schools are also measuring students' social and emotional learning and engagement with schooling in recognition of importance of these factors to success after high school. For example, Chicago Public Schools surveys students on their perceptions of teacher expectations for them, safety and respect, support from teachers and other adults in the school, and their social and problem-solving skills (Chicago Public Schools, n.d.). A key step toward prioritizing social and emotional learning is measuring and tracking it.

POSTSECONDARY ACCESS AND ENROLLMENT

Postsecondary Access and Enrollment indicators comprise the second component in the On-Track Indicators thread. To be college and career ready, high school students must have college and career goals and knowledge; they must learn to successfully navigate the process of selecting, applying to, and financing various college or career pathways (see Exhibit 3).

Exhibit 3. College and Career Development Organizer: Outcomes and Measures Strand, Postsecondary Access and Enrollment Component

COMPONENTS	EXAMPLES
Postsecondary Access and Enrollment	Free Application for Federal Student Aid (FAFSA) and postsecondary applications completed ▸ Postsecondary program enrollment ▸ Employment applications completion

Navigating the requirements, applications, and timelines for applying to college; selecting from among the thousands of community colleges, four-year institutions, and programs; and financing a postsecondary education can be daunting. Many publicly available supports recommend beginning to plan for college in Grade 9 or even earlier (see for example, The College Board, n.d.). The Consortium on Chicago School Research (CCSR) has followed cohorts of graduated Chicago Public School (CPS) students beginning in 2004 and examined their various postsecondary experiences in an effort to explore the relationships between high school preparatory practices, financial aid applications, college choices and admission rates, and related postsecondary outcomes. The study found that only 41 percent of students who stated they were interested in postsecondary education completed the application and enrollment process at four-year institutions prior to high school graduation (Roderick et al., 2008). CCSR also found that completing the Free Application for Federal Student Aid (FAFSA) is associated with college enrollment. Students who do not file the FAFSA are responsible for paying higher costs for their college education. In addition, students who completed the FAFSA were more than 50 percent more likely to enroll in a two- or four-year college than students who did not.

Enrollment in employment opportunities while in high school is another potential indicator of postsecondary access. Unfortunately, data on employment during and after high school are historically difficult to access or link to K–12

education data because reporting on employment is not required under federal law; however, most states have plans for and have been making progress on linking data across education and employment sectors. Such data, particularly when students are in high school, may provide valuable information on college and career readiness. Certainly, various career and technical education initiatives emphasize the importance of providing students with timely and relevant work experiences to further their postsecondary preparation through work-based components, such as job-shadowing, mentorships, internships, and employment (e.g., Symonds, Schwartz, & Ferguson, 2011). The Association for Career and Technical Education and the National Association of State Directors of Career Technical Education Consortium also endorse the value of internships and on-the-job experience to give students practice applying skills in an authentic workplace environment (Association for Career and Technical Education, 2009; National Association of State Directors of Career Technical Education Consortium, 2010). Along these lines, completing an internship or job application and securing an internship, particularly in a student's identified field of interest, may be a useful indicator that a student is acquiring necessary skills to enter a career pathway.

ATTAINMENT AND AUTHENTICATION

If on-track indicators provide predictive measures, then measures of *Attainment and Authentication*, the second thread in the Outcomes and Measures strand, serve as validation measures for whether outcomes are met. Measures of high school success include completion of advanced coursework and secondary certifications as well as outcome measures of postsecondary success in college and careers (see Exhibit 4).

Exhibit 4. College and Career Development Organizer: Outcomes and Measures Strand, Attainment and Authentication Component

THREADS	COMPONENTS	EXAMPLES
Attainment and Authentication	Secondary Certification	High school diploma (standard, alternative, college and career readiness) or GED ▸ College credits in dual enrollment, Advanced Placement, or International Baccalaureate courses ▸ Postsecondary degree(s) ▸ Awarded industry-recognized credential or certificate
	Postsecondary Success	Postsecondary education graduation certificate ▸ Postsecondary training certification ▸ Earning wage in "middle-skills" (e.g., jobs that require an associate's degree, a vocational certificate, on-the-job training, or some college) or higher skills job ▸ Postsecondary remediation not needed

SECONDARY CERTIFICATION

Secondary Certification is the first component in the Attainment and Authentication thread. The attainment of a high school diploma or general education diploma (GED) documents that students have completed a course of study that should enable them to enroll in college and/or start a career. However, not all high school diplomas hold students to rigorous college and career readiness standards and may not be valid indicators of readiness for college or careers. To address this issue, states have taken steps to increase both the rigor and relevance of high school diplomas. They have increased the rigor of courses required for graduation and have developed a number of high school diploma options for students to reflect diversity in students' interests and aspirations. For example, Alabama offers high school diplomas with advanced academic endorsement, advanced career/technical endorsement, career and technical endorsement, and

credit-based endorsement. Students with specific learning disabilities also have the option of an Alabama occupational diploma. All but the credit-based endorsement and occupational diploma require passing all five sections of the state high school graduation test. Although multiple diploma options may allow students to tailor their high school program of study to their individual college and career goals, it is essential that all diploma options hold students to similarly high standards for a high school diploma to be considered measures of college and career readiness.

Students who pursue advanced college-level coursework through AP, IB, or dual enrollment options signal that they have attained college readiness by virtue of their performance. AP subject test scores of three or higher (out of five) and IB subject area scores of five or higher (out of seven) often earn students college credit in those subject areas, and research indicates that scores in these ranges correspond with lower college-level remediation rates and higher college GPAs (International Baccalaureate Organization, 2010; Mattern, Shaw, & Xiong, 2009). Dual enrollment students who pass and earn credit for a college course typically keep the credits if they enroll in the host institution after high school. They may also be able to transfer the credits to another institution.

In addition, high school students can signal that they are career ready by earning an industry-recognized credential in their chosen field. There are challenges associated with using credentials as indicators because skill standards have not yet been developed in all industries, and in some industries, there is disagreement about which standards to use (Castellano, Stone, & Stringfield, 2005). Credentials and industry-sponsored certifications may vary depending on the credentialing and certifying agency, and employers in some industries may value documented work experience over industry certification (Bartlett, 2004).

POSTSECONDARY SUCCESS

Indicators of *Postsecondary Success*, the second component in the Attainment and Authentication thread, include enrollment in a postsecondary institution or training program and performance measures such as not being assigned to remedial courses in college, passing first-year courses and maintaining a passing GPA, and first- to second-year persistence rates (returning to the school after the first year) (Adelman, 2006). Of these, enrollment and remediation rates are perhaps the most commonly cited indicators. More distal success measures include the attainment of an associate's degree, bachelor's degree, or postsecondary certification in an industry-recognized training program and time-to-completion of degree or certification programs. Successful career outcomes can be signaled by employment data, wages earned, and/or securing a job that requires middle-level or high-level skills.[1]

Although the primary focus of the National High School Center is on how high schools can help students maximize postsecondary attainment, it is clear that college and labor market contexts also have an impact on postsecondary success. College-level factors that may impact success include variance in performance standards for remediation, implementation of remediation within or across colleges, college affordability, and the type and quality of supports available. Career factors include employment opportunities, family obligations, and childcare options and costs.

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[1] Middle-level skills jobs include plumbers, electricians, health care workers, legal assistants, machinists, and police officers. Such jobs require significant education and training but not necessarily a four-year college degree. High-level skills jobs include engineers, teachers, attorneys, and physicians.

ACCOUNTABILITY AND IMPROVEMENT FEEDBACK

To monitor and improve college and career readiness outcomes, stakeholders use effective *Accountability and Improvement Feedback* systems, the third thread in the Outcomes and Measures thread (see Exhibit 5). These systems depend on the availability of valid high school and post-high-school outcomes measures and intermediate measures that begin tracking progress starting by Grade 9 at the latest.

Exhibit 5. College and Career Development Organizer: Outcomes and Measures Strand, Accountability and Improvement Feedback Component

THREADS	COMPONENTS	EXAMPLES
Accountability and Improvement Feedback	Accountability Reporting Systems	High school and district report cards, reporting college and career readiness measures ▸ Performance-based assessments
	Data-Informed Improvement Cycles	High school and district diagnostic assessments ▸ State and district improvement plans ▸ Early warning systems for dropout and college and career readiness ▸ National High School Senior Survey and school climate surveys

ACCOUNTABILITY REPORTING SYSTEMS

Accountability Reporting Systems, the first component in the Accountability and Improvement Feedback thread, provide information on the status and progress of a school, district, or state attaining performance targets from year to year. Almost all states and many districts report some form of college and career readiness information such as student participation in and performance on SAT and ACT college admissions tests and AP and IB assessments, but these data provide an inaccurate snapshot of college readiness overall because student participation in the assessment is voluntary, not universal. Conversely, a few states have made considerable progress on designing and implementing their own college- and career-ready reporting or accountability systems, although the metrics and methods used in these systems vary widely. The Georgia Department of Education, for example, is considering the computation of a college and career readiness performance index (CCRPI) for schools that includes ten college and career readiness datapoints (e.g., the percentage of students completing three or more career "Pathway" courses; earning a state-approved industry-recognized credential; earning a "Work Ready Certificate" on the ACT Work Keys assessment; and entering technical, two- or four-year colleges without requiring remediation; among other criteria) (Georgia Department of Education, 2011). Other states such as Kentucky have similar plans (Kentucky Department of Education, 2012).

Career success indicators, such as employment and wages, are perhaps the most difficult to track during and after high school. Through federal grants and other sources of support, many states are making progress in developing P–20 longitudinal data systems to provide information on high school graduates' and dropouts' college and career outcomes after high school. Florida is recognized as a leader in this area, with an extensive longitudinal data warehouse tracking P–12 and postgraduate information such as unemployment, wages, welfare participation, and incarceration status, as well as nontraditional postsecondary education data such as participation in GED, adult education programs, and vocational and training programs for job-related continuing education (Data Quality Campaign, n.d.).

DATA-INFORMED IMPROVEMENT CYCLES

Data-Informed Improvement Cycles are the second component in the Accountability and Improvement Feedback thread. To be informed about the impact of college- and career-ready policies and programs and students' progress, local and state leaders require access to timely, actionable data. Semester and annual reports of student performance, course taking, and early-warning systems can be utilized at every level to help schools, districts, and states monitor policies and initiatives and determine a course for improvement. Identifying areas for improving the college and career readiness culture, practices, and outcomes is critical for continuous improvement. Toward this end, diagnostics can be created and used to guide actions by multiple stakeholders (e.g., state, district, or school staff).

For example, one popular tool traditionally used to support individual students, early warning systems, can be used to inform school improvement cycles. Information such as attendance, behavior, and course performance are among the most common inputs and when aggregated to the school, district, or state can provide an initial signal to alert leaders and the public to systemic challenges. Early warning systems can be integrated into a comprehensive cycle of school or district improvement; for example, the data can be used to identify trends in college and career readiness and inform and monitor the impact of improvement efforts. Early warning systems may allow users to identify subgroups that are less well-prepared for college and career than other members of their cohort or may help users determine which interventions show promise for getting students back on track and which efforts should be discarded. By tracking data over time, early warning systems can be used, not only to improve student outcomes but also the performance of the school or district as a whole over time (Heppen & Therriault, 2008).

KEY CONSIDERATIONS

This brief summarized the outcomes and measures of college and career success that the National High School Center has collected through a scan of more than 70 organizations and the research and policy literature. The goal of this brief, as well as the College and Career Development Organizer and the other briefs in the series, is to help key stakeholders traverse the vast college and career readiness landscape by mapping its terrain. Through development of the organizer and briefs, we have identified the following key landmarks that stakeholders may want to consider as they work through college and career readiness outcomes and measures within their local contexts:

- College and career readiness outcomes and measures should be explicitly driven by and aligned with college and career readiness expectations and goals. Those expectations and goals, and the measures and outcomes that accompany them, should be developed in collaboration with stakeholders from K–12 education, postsecondary institutions, and industry.

- College and career readiness should be measured with multiple types of data from different sources. It has many different dimensions (see, for example, Hein, Smerdon, & Lebow, 2012) and whether, when, and how to measure and track these dimensions are important questions to be discussed and answered as states, districts, and schools develop improvement strategies.

- College and career readiness outcomes and measures should be *valid* measures of the expectations and goals prioritized by the various stakeholders involved. For example, if college and career readiness is defined as students having knowledge of college and career opportunities and the steps they need to take to pursue

those options, student surveys may be developed and administered to gauge this knowledge. Measures and outcomes should be continuously validated, conceptually as well as empirically along the continuum, with the actual intended outcomes (college and career success) included in analyses. Adequate data and analytical systems are required for documentation and validation of instruments and processes.

- Measures and outcomes should be part of a system of assessment that measures the progress of individual students, schools, districts, and states toward college and career readiness and should be used to identify and examine the impact of appropriate interventions.

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