Iowa College and Career Readiness Indicators Literature Review

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Introduction

This brief presents a review of research and current state practices as they relate to measures that Iowa might consider for its federal accountability indicator of school quality or student success—specifically, for inclusion within a composite index of postsecondary readiness. In 2016, the state of Iowa adopted an updated definition of college and career readiness that encompasses four components (see Appendix A):

> Iowa students who are college and career ready have acquired the necessary knowledge, skills, and strategies to be successful in postsecondary opportunities as demonstrated through multiple sources of evidence, including those generated by students. Iowa students who are college and career ready have successfully:
>
> - Achieved proficiency in essential content knowledge (component 1)[1]
> - Acquired practical transition skills (component 2)
> - Developed key learning skills and cognitive strategies (component 3)
> - Built a strong foundation of self-understanding and engagement strategies[2] (component 4)

These four components form the basis of Iowa's Definition of College and Career Readiness (DCCR). They include a focus on developing essential academic and career-specific content knowledge, postsecondary transition skills, cognitive and broader learning skills that are transferable across subjects and content, and self-understanding that leads to successful engagement in social contexts.

Under the Elementary and Secondary Education Act (ESEA), as amended by the Every Student Succeeds Act (ESSA), all states are required to develop "not less than one indicator of school quality or student success…[that allows] for meaningful differentiation in school performance…is valid, reliable, comparable, and state-wide…. and may include measures of 'postsecondary readiness,'" among other factors.[3] Iowa's DCCR was adopted after several periods of consultation and revision, taking into account not only these statutory criteria but also the increasingly complex and holistic needs of Iowa's students in a rapidly changing workforce. Iowa stakeholders have determined they will use a postsecondary readiness index for this additional indicator.

Section 1 of this brief introduces a framework for evaluating and selecting measures of postsecondary readiness for accountability, reviews the four components of Iowa's DCCR, and summarizes the research on the relationship between measures of postsecondary readiness and student postsecondary outcomes embedded in the four components of Iowa's DCCR. Section 2 summarizes current practices on the use of measures of postsecondary readiness in other states.

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[1] Component numbering has been added by American Institutes for Research.
[2] Iowa Department of Education. (2016). An Iowa definition of college and career readiness. Retrieved from https://www.educateiowa.gov/article/2016/08/04/iowa-definition-college-and-career-readiness
[3] Elementary and Secondary Education Act of 1965, 20 U.S.C. § 1111, 2017. Retrieved from https://www2.ed.gov/documents/essa-act-of-1965.pdf

Section 1: Potential Measures for Inclusion in a Postsecondary Readiness Index

Framework for Evaluating and Selecting Potential Measures of Postsecondary Readiness

Researchers have identified criteria for evaluating potential measures of postsecondary readiness that consider technical quality, stakeholder relevance, and system utility (Marion and Lyons, 2016; Conley, 2014; Schwartz et al., 2011). The most common criteria have been adapted and are presented here for the Iowa Department of Education (IDE) to use in facilitating broad, cross-stakeholder conversations about appropriate measures (see Table 1). This brief focuses on the "research base" criterion, which addresses the relationship of measures of postsecondary readiness to postsecondary student outcomes.

Table 1. Criteria for Evaluating Potential Measures of Postsecondary Readiness

Dimension	Criterion
Technical quality	Has a **research base** that demonstrates a positive relationship with desired postsecondary student outcomes.
	Allows for **fair comparisons** that support equity among all subgroups of students.
Stakeholder relevance	Is **clear and understandable** to educators and noneducators.
	Is **actionable** and appropriately sensitive to instructional adjustments.
	Has low susceptibility to gaming, faking, and other **forms of distortion**.
System utility	Balances support for **multiple postsecondary pathways**, including college, career, and the military.
	Minimizes **burden on resources** at all levels of government.

Table 2 presents categories of measures that Iowa may consider for its postsecondary readiness index and the components of the Iowa DCCR they support. Categories of measures are included on the basis of two criteria: The categories have a research-based connection to Iowa DCCR components, and they each have a precedent for use in other states' accountability systems (or at least in field-testing stages), described in consolidated Title I plans submitted under ESEA as amended by ESSA (see Section 2 for a complete description of cross-state measure usage).[4] The research-based connection of any given measure to postsecondary readiness may take one of several modes: as a *direct* measure of an observable student outcome (e.g., results on an Advanced Placement® [AP®]/International Baccalaureate® [IB®] exam or a college entrance exam as a demonstration of essential content knowledge), as a *perceptual* measure of a student outcome (e.g., student survey measures of their own social-emotional competencies), as a *lagging* measure at or near the end of the K–12 educational trajectory (e.g., college enrollment as a lagging measure of the attainment of essential knowledge), or as a *leading* measure of an activity that promotes the attainment of a component competency (e.g., participation in work-based learning as a driver and leading measure of self-understanding and broader engagement).

[4] Hereafter, these plans will be referred to as *ESSA plans*.

For any given measure category, a participation-based measure might therefore act as a leading measure whereas a performance-based measure might act as a direct measure.

This brief reports on measures that can support Iowa's DCCR components to varying degrees. Table 2 distinguishes between primary measures of postsecondary readiness (denoted by ✚) and secondary measures of postsecondary readiness (denoted by ✜) across the four components. Whether a measure of postsecondary readiness is considered a primary measure or a secondary measure for each component was determined by a specific measure category's research base and its predominance within theories of action for affecting the student outcomes embedded in any given component.

Table 2: Overview of Potential Postsecondary Readiness Measures and Alignment With Iowa's Definition of College and Career Readiness

Category of Postsecondary Readiness Measure	Iowa Definition of College and Career Readiness Component			
	1. Essential Content Knowledge	2. Transition Skills	3. Learning Skills and Cognitive Strategies	4. Self-understanding and Engagement Strategies
Advanced Placement®/International Baccalaureate® coursework or exams	✚			
Career plans		✚		✜
Career readiness tests (e.g., ACT WorkKeys®, NOCTI®)	✚	✜	✜	✜
Career technical education (CTE) programs (including certification)	✚	✜		
College enrollment (e.g., bachelor's degree program, associate's degree program, or trade school)	✚	✜		
College entrance exams (e.g., ACT®, SAT®)	✚	✜		
College placement exams (e.g., ACCUPLACER®, COMPASS®)	✚			
Dual/concurrent coursework and early college	✚	✜	✜	
Free Application for Federal Student Aid (FAFSA) completion		✚		
Grade point average (GPA)	✚		✜	

Category of Postsecondary Readiness Measure	Iowa Definition of College and Career Readiness Component			
	1. Essential Content Knowledge	2. Transition Skills	3. Learning Skills and Cognitive Strategies	4. Self-understanding and Engagement Strategies
Learning/cognitive skills perceptual data	✚		✚	
Military enlistment	✚	✚		
Military readiness assessment (i.e., Armed Services Vocational Aptitude Battery [ASVAB])	✚	✚		
Rigorous course sequence (high school; e.g., 4 years of English and 3 years mathematics; not AP/IB)	✚			
Seal of Biliteracy	✚			✚
Self-understanding and engagement strategies perceptual data				✚
Service learning/community service		✚	✚	✚
Work-based learning experience (internship, apprenticeship, cooperative learning, or job shadowing)	✚	✚	✚	✚

Note. Within each category of postsecondary readiness, various measures focus on either student participation or student performance (i.e., results). Implications for the inclusion of either type of measures, although succinctly discussed in the next section, are beyond the scope of this brief.

Iowa Components: Research Overview

This section of the brief presents research on measures of postsecondary readiness that support Iowa's DCCR. First, we provide a brief overview of the four components of Iowa's DCCR, including the definition of each component, its foundational research, and a summary of supporting measures. Following this overview, we describe the research on measures of postsecondary readiness in greater detail.

Component 1: Essential Content Knowledge

Definition: Students with essential content knowledge have acquired the critical academic and other technical knowledge and skills to prepare them for postsecondary success, whether through postsecondary education, direct work placement through a career and technical education (CTE) program culminating in certification or licensure, or military enlistment. Such knowledge is most often codified in state academic and CTE standards, such as the Iowa Core Standards. As such,

the measures supporting this component support mastery of these academic and career-based standards without the need for remediation during postsecondary education.

Students achieving essential content knowledge would be likely to graduate from high school and succeed in postsecondary pursuits, including taking credit-bearing courses at postsecondary institutions without remediation (Conley, 2005). For students transitioning to the workforce, those demonstrating essential knowledge and skills would be prepared to begin workforce training, certification, and participation (Conley, 2011) or to meet the requirements for military enlistment.

Measures Supporting Acquisition: Most potential measures of postsecondary readiness relate to the Iowa DCCR through component 1. Direct measures of essential content knowledge include completion of a core coursework sequence at the CCR rigor level, performance results for CTE, grade point average (GPA), performance results for AP/IB or dual/concurrent enrollment coursework or exams and early college, and attainment of a Seal of Biliteracy. Leading measures of essential content knowledge include participation in CTE coursework or pathways and work-based learning experiences. Other measures of essential content knowledge include military enlistment or placement test (Armed Services Vocational Aptitude Battery [ASVAB]) results, career readiness test results, college enrollment, and college entrance or placement exam results.

Component 2: Transition Skills

Definition: Students demonstrating key transition skills are aware of postsecondary opportunities, have set goals for themselves, and are able to navigate the transition from high school to college or the postsecondary training and development path of their choosing, including the selection and admission processes. Career awareness and a knowledge of pathways to careers of personal interest and economic security are important scaffolds for these skills.

Students with strong records of academic achievement alone may not be prepared for postsecondary success if they lack either a personal road map or the skills to pursue such paths. For example, accomplished students may not be familiar with the processes for applying to college or for financial aid, particularly if they are first-generation college students (Goldrick-Rab, Kelchen, Harris, & Benson, 2016). Many otherwise qualified students find that the financial aid application process is challenging and complex, and that the timelines for application align poorly with college admission application timelines (Bettinger, Long, Oreopoulos, & Sanbonmatsu, 2012). King (2004) estimates that in 2000, more than 10% of all college students did not complete financial aid forms even though they would have qualified for a Pell Grant.

Individualized college and career plans, as well as assistance in creating those plans, support postsecondary transitions. Research suggests that students with academic goals and assistance with planning had higher college enrollment prospects (e.g., Bettinger et al., 2012; Roderick, Nagaoka, Coca, & Moeller, 2008; Adelman, 2006). In particular, the presence of career guidance counselors and programs can aid in the development of these plans and, in turn, the skills to navigate transitions (Kuijpers, Meijers, & Gundy, 2011).

Measures Supporting Acquisition: Completion by students of individualized career plans is a primary measure of the attainment of knowledge and skills necessary to transition to postsecondary life. Participation in college entrance exams is a prerequisite transition activity for

college that many states track. Measures of FAFSA completion also have a strong, research-based connection to component 2. Additionally, completion of early college experiences is predictive of enrolling in and completing college and therefore could warrant measurement. A number of measures support component 2 by promoting or measuring career awareness. These include measures of work-based learning or service learning participation, career readiness tests that include a career aptitude component (e.g., ACT® WorkKeys®), and participation in CTE coursework. Finally, lagging indicators such as college acceptance or enrollment and military enlistment can be used in targeted ways to track attainment of transitional skills. For example, pre- and post-results for these measures could be tracked in the context of a state-level information campaign related to application or enlistment processes.

Component 3: Learning Skills and Cognitive Strategies

Definition: Students who have developed key learning skills and cognitive strategies can manage and pursue their own learning independently at both the task level and over the trajectory of their education. At the task level, these competencies vary in complexity to include study skills such as time management or the use of mnemonic devices; cognitive competencies of problem formulation and critical thinking that involve the organized synthesis of information; and metacognitive skills that involve the student's ability to reflect on these approaches and apply them. On a broader level, students demonstrating mastery of this domain display competencies such as agency and proactivity in their learning and development (Gates, Lippman, Shadowen, Burke, Diener, & Malkin, 2016; Nagaoka, Farrington, Ehrlich, & Heath, 2015). As such, they are better prepared to navigate college and workplace settings.

Conley and French (2014) summarize research-based connections between metacognitive skills and K–12 achievement scores, GPA, and college persistence and conclude that agentic, metacognitive competencies such as self-monitoring and self-direction are key components of postsecondary readiness. Similarly, researchers maintain that seeking to increase one's learning capacity, or what some scholars call a *growth mindset*, predicts gains in academic performance (Dweck, Walton, & Cohen, 2014). In a national survey, 93% of employers agreed that "a candidate's demonstrated capacity to think critically, communicate clearly, and solve complex problems is more important than their undergraduate major" (Hart Research Associates, 2013). Studies have demonstrated that skills such as critical thinking and the transfer of knowledge and skills to new contexts can be taught and that such skills support several kinds of academic attainment (Lombardi, Kowitt, & Staples, 2015).

Measures supporting acquisition: A number of instruments validly measure cognitive skills and key learning skills. Perceptual measures of these skills, as reported by students and teachers, have promise for inclusion in state-level accountability systems in the near future, largely pending the results of trailblazers such as California's CORE Districts, which are currently field testing and phasing in such measures.[5] However, consensus among researchers is that these surveys have not attained a level of validity prerequisite for use in high-stakes accountability systems at the state level. Until such measures are deemed technically sound, IDE may look to secondary measures that capture or encourage skills attainment. GPA in particular captures

[5] California's CORE Districts include Fresno, Long Beach, Los Angeles, Oakland, Sacramento, San Francisco, and Santa Ana.

certain student competencies associated with persistence and management of learning over time that apply to component 3 (Lombardi et al., 2015). Career preparedness tests assess certain metacognitive competencies such as problem solving and can supplement other data related to these skills. Furthermore, participation in community service and work-based learning can encourage development of these skills, because students are embedded in applied settings that call on their integrated problem-solving skills. Finally, early college experiences also can promote greater ownership of learning and use of metacognitive strategies.

Component 4: Self-understanding and Engagement Strategies

Definition: Self-understanding and engagement strategies are important scaffolds for a range of competencies and, in themselves, are of high value to employers. Students who demonstrate self-understanding and self-directed engagement possess what Nagaoka and colleagues refer to as a strong sense of *identity*, or a "sense of internal consistency of who one is across time and across multiple social identities" (Nagaoka et al., 2015, p. 2). These students are self-directed, comfortable communicators and leaders who are able to identify and navigate their personal, civic, and social responsibilities. The first domain reinforces the second: Students who demonstrate self-understanding possess a stable social-emotional foundation, including both their sense of self and their ability to manage emotions and goals. In turn, this social-emotional stability supports their ability to connect to—and work with—others (Dymnicki, Sambolt, & Kidron, 2013).

The connection between social-emotional competencies and postsecondary readiness is well documented (English, Cushing, Therriault, & Rasmussen, 2017). Researchers have noted that students with healthy social-emotional skill sets are better able to manage anxiety and complex workloads (Dymnicki et al., 2013). Moreover, these internal competencies allow students to navigate a variety of challenges in different environments, both alone and in interactions with others (Gates et al., 2016).

Measures Supporting Acquisition: Like measures of metacognitive skills, a multitude of valid instruments have been developed for the measurement of social-emotional competencies, but they have not been validated for use at the state level as part of accountability systems. In addition to student surveys, teacher observational measures and performance-based assessments that include direct observations of cooperative behavior or self-reflective activities have been validated outside of accountability contexts (Melnick, Cook-Harvey, & Darling-Hammond, 2017). Student and teacher surveys show the most promise for inclusion in accountability systems in the near term (Melnick et al., 2017; West, Buckley, Bartolino Krachman, & Bookman, 2017). Other measures can provide secondary support. Students who participate in work-based learning and community service learning experiences are embedded in environments in which they are called upon to learn, demonstrate, and practice social-emotional competencies (Darche & Stern, 2013; Corporation for National & Community Service, 2007). The development of career plans and participation in career readiness assessments encourage exploration of career interests and personal strengths, which contributes to self-understanding. Attainment of second language proficiency, as demonstrated through the Seal of Biliteracy, prepares students for engagement in diverse contexts.

Research Base for Potential Measures of Postsecondary Readiness

In this section, we present the research base for measures of postsecondary readiness that IDE might consider including in its accountability system to provide support across the four components of its DCCR. Table 3 summarizes the most relevant research that IDE might further reference.

Table 3. Summary of Research for Measures of Postsecondary Readiness

Postsecondary Readiness Measure for Consideration	Summary of Research	Relevant Research
Advanced Placement® (AP®)/International Baccalaureate® (IB®) coursework or exams	Multiple research studies demonstrate a positive relationship between participation or performance in AP/IB coursework and exams and college readiness, persistence, and success.	▪ Conley (2014a, 2007) ▪ Ackerman et al. (2013) ▪ Caspary (2011) ▪ Roderick et al. (2008)
Career plans	Long- and short-term career planning improves self-understanding, planning skills, career awareness, and proactivity along career pathways. Students need to have access to counselors to complete a plan and to update their plan regularly.	▪ Kuijpers et al. (2011) ▪ Rennie Center (2011) ▪ Welsh (2005) ▪ Bullock & Wikeley (1999)
Career readiness tests (e.g., ACT WorkKeys®, NOCTI®)	ACT WorkKeys and NOCTI are vendor-validated measures of foundational content knowledge and skills and some metacognitive and SEL competencies. ACT WorkKeys results inform career awareness and also have been shown through independent research to correlate with postsecondary success, but third-party research on NOCTI is limited.	▪ Conley (2014a) ▪ Swaney et al. (2012) ▪ Lindon (2010) ▪ Hendrick (2006) ▪ Bowles (2004)
Career technical education (CTE) programs (including certification)	Research strongly supports the use of various measures of participation and performance in CTE courses, but particularly supports measuring the attainment of industry-recognized credentials.	▪ Achieve (2015) ▪ Visher & Stern (2015) ▪ Carnevale et al. (2012)
College enrollment (e.g., bachelor's degree program, associate's degree program, or trade school)	Enrollment is a lagging measure of college readiness and transition skills. Remediation is a significant barrier for many students who eventually drop out of college; therefore, measuring college enrollment with no remedial courses in students' first year may provide a lagging measure of likely success.	▪ U.S. Department of Education (2016) ▪ Stewart et al. (2015) ▪ Bailey et al. (2008)
College entrance exams (e.g., ACT®, SAT®)	Meeting benchmark scores on college admission exams is correlated with postsecondary success, though the correlation is not as strong as other potential measures, such as completion of rigorous coursework and high school GPA.	▪ Adams (2014) ▪ Conley (2014a) ▪ Sanchez (2013) ▪ Roderick et al. (2009)

Postsecondary Readiness Measure for Consideration	Summary of Research	Relevant Research
College placement exams (e.g., ACCUPLACER®)	ACCUPLACER is an assessment tool used for placement in appropriate college course levels for mathematics, English language arts/reading, and computer science. It may serve as a lagging measure of college readiness in these subjects, though the research base is weak.	▪ Hodara & Lewis (2017) ▪ Conley (2014a)
Dual/concurrent coursework or early college enrollment	Accelerated coursework experiences expose students to challenging content and potentially to college environments in which students must manage transitions and their own learning.	▪ Davis et al. (2017) ▪ Pierson et al. (2017) ▪ Conley & French (2014) ▪ D'Amico et al. (2013)
Free Application for Federal Student Aid (FAFSA) completion	High-quality randomized controlled trials have found that successfully securing financial aid through FAFSA significantly increases college enrollment.	▪ Goldrick-Rab et al. (2016) ▪ Roderick et al. (2011) ▪ Roderick et al. (2008) ▪ Adelman (2006)
Grade point average (GPA)	Students maintaining a 3.0 or higher GPA are more likely to succeed in first-year college courses. High school GPA can predict college enrollment and first-year retention, even as early as grade 9.	▪ Easton et al. (2017) ▪ Hodara & Lewis (2017)
Learning/cognitive skills perceptual data	Although multiple valid measures of metacognitive ability have been developed and their connection to college and career readiness has been well documented, state use currently is confined to annual reporting of student and teacher self-reported data. CORE districts are leading efforts to use in accountability.	▪ West et al. (2017) ▪ Conley (2014, 2014b) ▪ Duckworth & Quinn (2009)
Military readiness assessment (i.e., Armed Services Vocational Aptitude Battery [ASVAB])	Military service enlistment is a lagging indicator of content knowledge and transition skills. ASVAB proficiency is one of several requirements for enlistment. Good results on the ASVAB, however, may not translate to civilian readiness.	▪ Conley (2014a) ▪ Fairbank et al. (1990)
Rigorous course sequence (high school; 4 years of English and 3 years mathematics; not AP/IB)	Researchers have found this measure to exhibit the strongest correlations to success in college, compared to other predictors of postsecondary readiness.	▪ Tyson & Roksa (2017) ▪ Conley (2014a) ▪ Roderick et al. (2009) ▪ Adelman (2006)
Seal of Biliteracy	Research has established the connection between acquisition of a second foreign language and other academic skills, but no formal research has been conducted specifically on the relationship between attaining the Seal of Biliteracy and other academic skills. Supports engagement in multicultural contexts.	▪ Rodriguez et al. (2014) ▪ Conley (2014b)

Postsecondary Readiness Measure for Consideration	Summary of Research	Relevant Research
Self-understanding and engagement strategies perceptual data	Perceptual measures of these constructs correlate with student postsecondary outcomes and are recommended for statewide reporting but not for accountability at this point. The measures are being phased in for use in accountability in California's CORE Districts while issues relating to reference bias, gaming, and meaningful differentiation between schools are addressed in additional validity testing.	▪ Melnick et al. (2017) ▪ West et al. (2017) ▪ Duckworth & Yaeger (2016) ▪ Villavicencio et al. (2015) ▪ Faircloth & Hamm (2005)
Service learning/community service	Community service opportunities embed students in diverse environments in which students learn to engage with others in meaningful social and civic contexts. Community service also provides an important career awareness benefit.	▪ Celio et al. (2011) ▪ Corporation for National & Community Service (2007) ▪ Meyer (2003) ▪ Chin et al. (2000) ▪ Finch & Mooney (1997)
Work-based learning experience (internship, apprenticeship, cooperative learning, or job shadowing)	Research suggests rich benefits for students across all of Iowa's DCCR components, including learning, practicing, and demonstrating applied, essential content knowledge in high-quality professional settings.	▪ Alfeld (2013) ▪ Darche & Stern (2013) ▪ Swail & Kampits (2004) ▪ Chin et al. (2000)

AP/IB Coursework or Exams: AP and IB academic programs offer students the opportunity to take college-level coursework while in high school. Through common culminating exams, students can demonstrate proficiency on an advanced set of content standards and potentially earn early college credits. AP courses may be taken individually whereas the IB program generally includes a sequence of courses. Various research studies demonstrate a correlation between completing AP or IB coursework or exams and achieving postsecondary success (Conley, 2014a; Ackerman, Kanfer, & Calderwood, 2013; Caspary, 2011; Roderick et al., 2008; Conley, 2007). Research suggests that a score of at least 3 out of 5 on an AP exam and 4 out of 7 on an IB exam demonstrates college-level academic readiness (Conley, 2014a). As Conley and colleagues (2014a) observe, AP and IB courses help students "demonstrate college preparedness in a way that college admissions officers understand and take into account in a variety of ways" (p. 19).

Career Plans: Schools are increasingly working with students to develop detailed plans—often referred to as *career plans*, *individualized learning plans*, *student learning plans*, or *personal learning plans*—that lay out students' postsecondary aspirations and the steps necessary to achieve those goals. This development process embeds knowledge and skill elements of component 3, including making connections between personal skills and interests, taking the steps necessary to achieve goals, researching and pursuing required credentials, identifying potential obstacles to achieving goals, and developing an understanding of labor market opportunities and demand levels. Goal formation is central to this process, contributing greatly to the motivational basis for learning about postsecondary options and requirements (Conley & French, 2014). Research has shown that students with access to career planning advisement and support are more aware of

postsecondary opportunities, have improved long-term planning skills, and can be more reflective, proactive, and interactive in their career planning and networking (Kuipers, Meijers, & Gundy, 2011; Welsh, 2005). Aligning student interests with labor demand appears to impact student engagement positively in college: One study, for example, found that African-American students who selected majors in high-demand fields were more likely to persist in college (St. John, Hu, Simmons, Carter, & Weber, 2004).

In addition to supporting the attainment of transition skills, the process of exploring the connection between one's interests and career opportunities promotes self-understanding and personal growth. The development of postsecondary plans has been shown to support growth in "students' ability to reflect upon and understand their own skills and interests and areas for improvement" (Rennie Center, 2011, p. 4; see also Bullock & Wikeley, 1999).

Career Readiness Tests: ACT WorkKeys® and NOCTI® are vendor-developed suites of standardized assessments of job readiness. Although both can support all four Iowa DCCR components to some degree, they serve primarily as measures of applied content knowledge essential to careers. The WorkKeys suite tests foundational skills in applied mathematics, business writing, graphic literacy, and applied technology knowledge transferable across various industries. By contrast, NOCTI has a highly specialized pool of assessments of technical knowledge for 15 industry clusters and certificate programs, such as architecture and construction, finance, and information technology. Both suites extensively incorporate the assessment of metacognitive skills related to the application of knowledge and problem solving in varying contexts.

Both suites also assess student perceptions of soft skills associated with component 4. ACT WorkKeys assessments ask participants to reflect on their values and behaviors related to cooperation, goodwill, workplace influence, personal integrity, and sociability. NOCTI's stand-alone Employability Skills test includes items on collaboration, speaking and listening skills, positive attitude, and workplace ethics. ACT WorkKeys includes a Fit Assessment career aptitude test that identifies potential career paths based on participants' indicated strengths, contributing to the foundation of career and pathways awareness that undergirds transition skills embedded in component 2. Subtests within each assessment solicit student perceptions of their metacognitive skills and also embed skills such as problem formulation and problem solving. Subtest and strand score results can therefore be used to supplement other information regarding attainment of outcomes associated with component 3.

Construct validity of the tests (i.e., the extent to which a test measures what it is intended to measure) is largely limited to studies conducted by the vendor, although Swaney, Allen, Casillas, Hanson, and Robbins (2012) found an association between person–occupation fit and desirable work outcomes. According to other independent research, the use of ACT WorkKeys testing in the hiring process improved the retention rate for new employees (Hendrick, 2006), but it is a weak predictor of *college* success (Bowles, 2004; Lindon, 2010). Additional research is necessary to assess the relationship between NOCTI scores and long-term college and career outcomes (Conley, 2014a). Despite this modest research base, these assessments are in wide use by employers; as such, they may provide a rich source of information on more specialized competencies.

Career and Technical Education Programs: CTE programs often include multiple years of academic and career-focused training in a particular field. Fulfillment of state or district requirements for a CTE program generally includes the completion of academic and hands-on, career-based coursework. Satisfaction of these requirements is a direct measure of skills-based content knowledge. In addition to completing school-based course requirements, researchers recommend exploring other criteria to measure career readiness, including earning industry-recognized credentials (Carnevale, Rose, & Hanson, 2012). Studies have found that high-quality CTE programs lead to earning state licenses or industry-recognized credentials, achieving passing scores on job skills assessments, and earning high grades. For example, students in three programs in an Ohio study were employed or enrolled in further education at rates exceeding 97% (Achieve, 2015). Furthermore, Carnevale and colleagues (2012) found short-term wage premiums for students with credentials, although they also found longer term uncertainty and uneven returns based on differences in race and gender.

Participation in high-quality CTE programs can lead to higher academic engagement, high school achievement, and high school graduation rates (Visher & Stern, 2015). In addition, Visher and Stern found that completion of a high-quality CTE program correlated with better postsecondary outcomes, including higher earnings and greater chances of college admission when compared to outcomes of students in other high school programs.

College Enrollment: Rates of college enrollment irrespective of remediation status (in 2- or 4-year colleges) and rates of college enrollment without requiring remediation are lagging indicators of essential content knowledge. Remediation status is particularly relevant: While a growing proportion of professions, perhaps as many as two-thirds, will require some postsecondary education in the next decade (Carnevale, Smith, & Strohl, 2013), only 60% of all students beginning a 4-year degree in 2008 finished in 6 years, with lower rates of completion among Hispanic and African-American students (U.S. Department of Education, 2016). Students referred for remedial coursework often fail to enroll in or complete those sequences and, therefore, complete their original degrees at lower rates than most students (Bailey, Jeong, & Cho, 2008). Understanding which students have successfully enrolled in postsecondary programs, and whether those programs fit their needs and goals, can also aid in assessing transition skills and the postsecondary plans that students prepared during high school.

College Entrance Exams: College entrance exams such as the SAT® and ACT® are widely known and well understood by most students and schools. Administered by private vendors and required by several states, these assessments are a prerequisite for admission to many colleges and universities. They serve primarily as direct assessments of academic content knowledge, but they also can demonstrate transition skills in cases in which students must register for the exams and arrange to send their scores to selected schools. Recommended thresholds for proficiency are 500 of 800 on each section of the SAT and 18 of 36 on the English section and 22 of 36 on the mathematics section of the ACT (Conley, 2014a). Correlations between exam scores and postsecondary success have been found, but they are largely confined to first-year college grades (Conley, 2014a; Sanchez, 2013). Correlations are not as strong as those for GPA and rigorous course-taking patterns (Conley, 2014a). Secondarily, college entrance exam-taking is, in itself,

an important transition skill. Researchers at the University of Chicago found positive correlations between college acceptance and attendance rates and *taking* the PSAT/NMSQT® (Roderick et al., 2008). In states such as Kentucky, where state law has required all students to take the ACT since 2008, college-going rates have improved (Adams, 2014).

College Placement Exams: College placement exams such as ACCUPLACER® and COMPASS can be used as a lagging measure of essential content knowledge. ACCUPLACER is an exam created by the College Board to measure college readiness in reading, writing, mathematics, and computer skills. Colleges use ACCUPLACER scores to place students into the appropriate levels of various required courses. One high-quality research study found a significant correlation between ACCUPLACER results and college GPA, although the relationship is weaker than that of high school GPA to college GPA (Hodara & Lewis, 2017). No common benchmarks that correlate with postsecondary success have been established for proficiency on this measure.

Dual/Concurrent Coursework or Early College Enrollment: Dual enrollment refers to opportunities for high school students to take college-level courses, including online, on college campuses, or at their high schools. The courses are taught by either high school teachers or college instructors. Taking college-level courses in high school has been found to correlate with higher rates of college enrollment (Davis, Smither, Zhu, & Stephan, 2017; D'Amico, Morgan, Robertson & Rivers, 2013). According to recent research, students who completed these experiences "were more likely than students who did not [complete these experiences] to enroll or persist in postsecondary education and earn a higher grade point average" (Pierson, Hodara, & Luke, 2017, p. 4). The study by Pierson and colleagues found, however, that dual enrollment courses can vary in quality and rigor, in part because of the location of the course (e.g., online, college campus, or high school campus) and the quality of the instructor. As such, these experiences may not be universal indicators of students achieving essential content knowledge, particularly if instructor quality is low or coursework is not demanding.

Researchers also argue that early college experiences such as dual enrollment can support students' transition skills, in part by helping them understand the structures, experiences, and demands of college life (e.g., Conley & French, 2014). However, dual enrollment courses that are completed online or at high school campuses may not offer experiences for transition skill development. Similarly, early college coursework can require greater student autonomy and therefore can help to develop learning skills including time management, goal setting and strategic reading (Conley, 2014). Access to these opportunities is uneven because it relates to factors such as gender, race, economic status, and geographic locale.

FAFSA Completion: The FAFSA is a free, government-supported form that allows students to determine their eligibility for financial aid in college. Federal aid programs and many institution-based aid programs require the completion of this form; therefore, it is an important transitional activity. The act of completing the FAFSA, along with other formal application steps, can be complex, and financial aid often goes unclaimed (Goldrick-Rab et al., 2016; Bettinger et al., 2012). King (2004) estimates that 850,000 college students eligible for federal grant aid in 2000 did not apply, and the Federal Commission on the Future of Higher Education concluded that many students "don't

enter college because of inadequate information and rising costs, combined with a confusing financial aid system" (as reported in Bettinger et al., 2012, p. vii). Researchers have found that "filing a FAFSA application may shape the likelihood that a student who has been accepted into a four-year college enrolls" (Roderick, Coca, & Nagaoka, 2011, p. 190). Bettinger and colleagues found that the effects of offering students assistance with the complex process of FAFSA completion were substantial, leading not only to higher FAFSA completion rates but also to aid receipt and enrollment. In general, assistance with postsecondary planning has been proven to correlate with higher college enrollment and attrition prospects (e.g., Roderick et al., 2008; Adelman, 2006), similar to helping students complete postsecondary plans. High-quality, randomized controlled trials have demonstrated the power of financial aid to increase college completion rates, particularly among disadvantaged students (Goldrick-Rab et al., 2016).

GPA: A student's GPA, the average of his or her grades across all completed high school courses, is a measure commonly included in high school records and college applications. GPA is a primary measure of content knowledge and may serve as a secondary measure of metacognitive skills and other learning strategies. GPA is a strong predictor of postsecondary success and, in some cases, has been found to be a more powerful predictor of postsecondary success than standardized test scores such as the SAT. One recent study found that GPA explained a greater degree of variance in first-year college grades than college entrance exams or college placement tests (Hodara & Lewis, 2017). Other studies have found correlations between college outcomes and GPA from as early as grade 9 (Easton, Johnson, & Sartain, 2017). In implementing such a measure, states and districts may calculate the numbers and percentages of students meeting or not meeting their locally validated threshold, which research suggests should be approximately 3.0 to predict college readiness and persistence (Hodara & Lewis, 2017).

Because maintaining a high GPA can offer opportunities for sustained, complex task completion and self-management, Hodara and Lewis suggest that GPA also may serve as a measure of competencies such as "self-control, tenacity, academic motivation, metacognitive strategies, study skills, time management, and problem-solving skills" (p. 7).

Learning/Cognitive Skills Perceptual Data: As discussed earlier, students with key learning and cognitive skills are those who can manage their own learning by using metacognitive competencies to identify and deploy task-level approaches to learning and, more broadly, to persist in learning over the course of their education.

Conley and colleagues (2014b) reviewed 33 instruments that measure metacognitive skills through student and teacher perceptions. The authors identified four with the strongest research base for both construct validity and correlation to student postsecondary outcomes: ACT Engage®, CampusReady created by EPIC, Learning and Study Strategies Inventory (LASSI) from H&H Publishing, and Standardized Letters of Recommendation developed by ETS. ACT Engage was shown to be a significant predictor of college grades and retention, CampusReady was found to be a strong predictor of college success, and eight of the 10 LASSI subscales were shown to significantly predict college GPA (Conley, 2014b).

Despite a substantial research base establishing the relationship between metacognitive skills and postsecondary readiness, researchers emphasize that much additional validation is required within high-stakes accountability contexts before direct assessments of metacognitive skills can be "safely" incorporated into accountability systems. Conley describes a self-reinforcing cycle of exclusion of measures of metacognitive skills from accountability:

> Not surprisingly, policymakers have demonstrated considerable reluctance to include metacognitive measures in accountability systems or to encourage their use broadly as performance measures in schools. This sends a signal to educators that the information gained from a metacognitive assessment might be less valid or valuable. The result is a cycle in which such measures are not seen as technically rigorous, are not used, and therefore the technical rigor is never improved. Use remains limited to boutique schools and esoteric settings, and the general public's familiarity with these instruments never increases (Conley, 2014b).

Nonetheless, California's CORE Districts are pioneers in integrating measures of growth mindset, self-management, and self-efficacy into their accountability systems (West et al., 2017). These districts' work to date remains the bellwether in the use of measures of metacognitive skills in accountability systems (see Box 1: Supporting Social-Emotional Learning and Metacognitive Skills in CORE Districts). West and colleagues' early results identify significant correlations between students' perceptions of metacognitive skills and academic achievement. These results reinforce the importance of deploying learning strategies to master essential content knowledge, as does the body of research summarized by Conley and French connecting these skills to K–12 achievement scores (Conley and French, 2014).

Military Enlistment or Readiness Assessment: Military enlistment[6] in one of the active service branches, or in a military reserve or National Guard unit, is a postsecondary goal for approximately 4% of recent high school graduates (Bureau of Labor Statistics, 2006). The ASVAB is the key instrument used to assess military readiness and to connect newly enlisted personnel to military occupational specialties. Portions of this assessment (e.g., clerical, mathematics) have been shown to correlate with high school grades (Fairbank, Welsh, & Sawin, 1990). No common benchmarks have been established for proficiency on this measure, though individual states have set benchmarks (e.g., Kentucky's benchmark is 55th percentile; see Conley, 2014a). However, Conley (2014a) notes that the ASVAB "has not been demonstrated to have a relationship to career success in civilian occupations [following military enlistment]" (p. 23). This finding has important implications for those who are enlisted in the military for interim periods.

Use of the ASVAB as the only measure of military readiness has limitations, however. First, Fairbank and colleagues (1990) found that ASVAB scores do not correlate highly with success in introductory coursework to *technical tracks,* after entry into a service branch. Second, minimum ASVAB scores are not the only prerequisite for military enlistment. More than one in five high school students do not meet the minimum standards for ASVAB achievement, physical fitness, or character. Iowa compared

[6] This measure refers only to enlistment in a noncommissioned role after completing high school, and assumes that those seeking officers' commissions are college bound. Character, fitness, and academic qualifications would still apply.

favorably to the national average in the percentage of students who recently failed to qualify for enlistment (Mission: Readiness, 2009); however, the above facts suggest that Iowa might consider measures beyond ASVAB scores and enlistment figures to support this pathway.

Rigorous Course Sequence: Students who complete a rigorous high school curriculum that covers all core subjects are more likely to succeed after high school. Rigor is commonly defined as "at least three years of mathematics, typically through the content of Algebra II and four years of rigorous, grade-level English" (Achieve, 2017, p. 14). This is a direct measure of essential content knowledge. A number of researchers have identified completion of a rigorous course sequence as the best predictor of college success among other postsecondary readiness measures (Conley, 2014a, p. viii; Roderick, Nagaoka, & Coca, 2009; Adelman, 2006). Although states should be cautious to avoid encouraging the development and implementation of policies that result in students enrolling in courses for which they are not prepared, recent research has found that students with mediocre grades in more demanding eighth-grade mathematics courses had higher overall mathematics attainment than students with higher grades in remedial or even general courses (Tyson & Roksa, 2017).

Seal of Biliteracy: The Seal of Biliteracy is a formal measure of bilingualism, which can be assessed in a variety of ways, such as through standardized instruments (AP exams or the SAT II), course completion and performance, or locally created exams. The Seal of Biliteracy can serve as a direct measure of knowledge essential to certain careers or contexts, geographic or otherwise (for example, working in healthcare in states with large Spanish-speaking populations), as well as a measure of the communication element of component 4. No research-based performance benchmarks have been established for seal attainment, though some measures, such as AP exams and the SAT II, have proficiency benchmarks.

Schools and states have required students to study foreign languages for many years, but formal certifications through the Seal of Biliteracy began in California in 2011 (California AB 815, 2011). Although there is a growing research base on the positive impacts of second language acquisition, including higher levels of literacy and cross-cultural understanding (e.g., Rodriguez, Carrasquillo, & Lee, 2014), a direct connection between the Seal of Biliteracy and improved college and career outcomes is less certain at this time (Conley, 2014b). However, criteria for achieving the Seal of Biliteracy in states such as California often do include otherwise reliable and valid measures, such as scores on AP or IB foreign language exams (3 or greater on the AP exam and 4 or greater on the IB exam).

Depending on the location or occupation, multilingual skills can be essential. Some evidence suggests that language skills also can lead to higher wage premiums (e.g., Saiz & Zoido, 2005). Bilingualism, within a postsecondary readiness framework, also plays an important role within multicultural contexts in supporting social awareness and ability to connect to diverse stakeholders.

Self-understanding and Engagement Strategies Perceptual Data: Melnick and colleagues (2017) classify measures that support development of social-emotional competencies, such as self-understanding and engagement, into three categories: social-emotional learning (SEL) competencies, school climate and supports for SEL (such as mental health counseling), and student outcomes related to climate and supports (see Table 4). They conclude that climate and support measures and outcomes are the most valid and reliable measures within the accountability context.[7] Among the measures of SEL competencies, only student surveys of social-emotional competencies are technically sound enough for statewide *reporting* use. (Melnick and colleagues stop short of recommending use of these measures for *accountability* purposes.) Nonetheless, the authors note that technical research on teacher observations of SEL competencies is strong enough that it could be used as "complementary" information to triangulate student SEL competency measures, which is important given the reliance on teacher perceptions for young students.

Table 4. Measures That Support Social-Emotional Competencies Such as Self-understanding and Engagement

Students' Social-Emotional Competencies	School Climate and Supports for Social Emotional Learning	Student Outcomes Related to School Climate and Supports
▪ Student surveys of their own social-emotional (SEL) competencies ▪ Teacher observations of student SEL competencies ▪ Performance assessments of SEL competencies	▪ Student surveys of school climate, learning opportunities and support for SEL ▪ Teacher/parent surveys of climate and conditions ▪ Observations of teacher practice ▪ School quality reviews ▪ SEL implementation rubrics	▪ Suspension rates ▪ Chronic absenteeism rates

Comprehensive lists of technically valid measures of social-emotional competencies, including self-understanding and engagement, are offered by the American Institutes for Research (AIR), the Collaborative for Academic, Social and Emotional Learning, and the Raikes Foundation. Aside from construct validity, other research has demonstrated predictive validity for postsecondary readiness. For example, students' self-reported sense of connection to high school has been shown to predict long-term college and career success (Villavicencio, Klevan, & Kang, 2015; Faircloth & Hamm, 2005). As such, the research base is rigorous enough to support use in low-stakes local systems. In Nevada school districts, for example, students assess their self-management skills, social awareness, and relationship skills to generate discussions between teachers and students. Researchers are in consensus, however, that major barriers to technical quality must be resolved before such measures can be included in high-stakes accountability contexts. The most prominent obstacles, noted by West and colleagues (2017) and Duckworth and Yeager (2015), include the following:

[7] Culture and climate surveys are not included as part of our formal analysis (i.e., Table 2), because they already are included in Iowa's accountability composite index.

- **Reference bias**, or the tendency for survey responses to be influenced by different frames of reference. For example, researchers have expressed concern that differing school cultures, such as one culture of high expectations versus one of low expectations, could lead to students in different schools interpreting scales differently (i.e., students with high expectations might be harder on themselves than other students).
- **Lack of meaningful differentiation** between schools. West and associates (2017), in their study of CORE Districts' early results, found that the school a student attends explains only 3% to 8% (depending on grade span) of variation in SEL perceptual scores (compared to 15% to 20% for mathematics test scores). Hough, Kalogrides, and Loeb (2017) found that only 50% of CORE schools had estimated effects on SEL scores.
- **Faking data** or providing answers that are desirable but not honest. Duckworth and Yeager (2015, p. 241) note that the extent to which faking of data occurs is "hotly debated" but that "the possibility of deliberately inflating or deflating scores on questionnaires is incontrovertible."

Nonetheless, the CORE Districts in California continue to forge ahead with efforts to phase student self-reports into accountability consequences. Efforts to mitigate the barriers described earlier have included development of anchoring vignettes that describe model students with varying social-emotional competencies and respective scores. Early field test results have found significant correlation between SEL outcomes, such as social awareness and self-management and GPA (West et al., 2017).

Service Learning/Community Service: Community service programs are "school-sponsored, credit-bearing educational experiences where students participate in organized service activities that meet identified community needs" (Swail & Kampits, 2004). A growing requirement in public schools and a longstanding requirement in many parochial schools, participation in community service experiences can lead to several positive outcomes for students; for example, these experiences may serve as a leading measure of social-emotional growth. Studies have found particularly positive impacts on civic engagement, self-concept, and social skills (Corporation for National & Community Service, 2007; Meyer, 2003; Finch & Mooney, 1997).

Research suggests secondary impacts on transition skills and key learning skills. As with work-based learning experiences, service learning environments, such as those in community or nonprofit organization settings, can expose students to career exploration opportunities that support career awareness and transition skills (Chin, Munby, & Hutchinson, 2000). Evidence also suggests that students participating in these activities reap the benefits of problem-solving skills in these work-like environments (Corporation for National & Community Service, 2007). Reflection opportunities are key to supporting the developing connections between these experiences and the growth of self-understanding, as well as learning and transition skills (Celio, Durlak, & Dymnicki, 2011).

Work-Based Learning: Learning in a real work environment, or work-based learning (WBL), is another long-standing education practice, though fewer students in the United States participate in WBL compared to those in other countries (Alfeld, 2013). WBL is defined in this case as school-sponsored or supervised internships, apprenticeships, or cooperative learning programs that take place in authentic work environments, are connected in some way to school learning, and are designed to give students hands-on experience toward meeting a professional goal (Swail & Kampits, 2004). These experiences are a direct way for students to learn content knowledge for a career of interest, and can serve as key experiences that contribute to development of transition skills, learning and problem-solving skills, self-understanding, and collaboration. Measures used at a statewide level are currently limited to participation measures.

Chin and colleagues (2000) identified the rich contribution that WBL experiences make to student learning, concluding that these experiences help students gain "knowledge and skills in particular occupations; [learn about] career exploration and planning; [learn] all aspects of an industry; [improve] personal and social competence related to work in general; and [enhance]…academic achievement and motivation through contextual learning" (Chin et al., 2000). These impacts thus touch on all the Iowa DCCR components. WBL experiences offer important career awareness and exploration opportunities that can inform postsecondary and career plans. They enhance motivation and provide opportunities to solve novel, real-world problems that call upon critical thinking and metacognitive problem solving. Like service learning, WBL experiences may serve as supports for social-emotional growth (Darche & Stern, 2013) because students must apply these competencies in their professional interactions. Furthermore, Swail and Kampits concluded that "students who participate in high school [WBL] activities achieve at the four-year postsecondary level as well [as] or better than students who do not participate in these activities" (p. 6), making WBL a potential college preparatory activity as well, at least partially because it supports transition skills and self-understanding.

Section 2: State Accountability Practices Scan

ESEA as amended by ESSA requires that states incorporate at least one measure of school quality or student success into their accountability systems. States have taken a variety of approaches to fulfilling this requirement, focusing on potential measures of postsecondary readiness, school climate, and student engagement. The project team conducted a scan of states' ESSA plans for measures that IDE might include in its postsecondary readiness index.[8] To complete the scan, the project team utilized a database of all accountability measures used by states in their ESSA plans. The database was constructed by AIR experts to document measures used for the school quality or student success indicator included in each state's proposed accountability system (see Appendix B). The project team then categorized each measure of postsecondary readiness according to the measure categories described in the preceding research discussion (see Appendix C).

The key findings from the scan are presented below. First, we describe the number and types of measures of postsecondary readiness found in states' accountability systems. Next, we highlight innovative approaches to measuring postsecondary readiness undertaken by three states—North Dakota, Pennsylvania, and Illinois.

Key Findings

Two-thirds of states (35) incorporate at least one measure of postsecondary readiness in their accountability systems (see Figures 1 and 2). States that do not include measures of postsecondary readiness instead tend to focus on measures of school climate and student engagement for their school quality or student success indicator (see Appendix B).

It is common for states to combine multiple measures into a single "meta-indicator" of postsecondary readiness. Of the 35 states that include at least one measure of postsecondary readiness, nearly half (16 states) include five or more measures. The state that incorporates the largest number of postsecondary readiness measures into its accountability system is Arizona, with 10 measures.

The specific combinations of measures of postsecondary readiness vary widely across states, although certain measures appear more often than others (see Figure 3). AP/IB coursework participation or performance measures appear most frequently in states' accountability systems (30 states), followed by participation or performance in dual/concurrent enrollment coursework or early college courses (28 states); participation or performance in CTE courses or pathways (28 states); participation in or performance on college entrance exams, such as the ACT or SAT (22 states); and participation in work-based learning experiences (11 states). No states use performance outcomes of work-based learning in their accountability systems, and efforts to capture such data for regional use are nascent (see the skill gain measures from work-based learning plans for the state of Massachusetts). States least often include measures of community service learning (two states), biliteracy (two states), and FAFSA completion (one state).

[8] The scan of state ESSA plans includes all 50 states plus the District of Columbia and Puerto Rico; we use the term *state* for readability. The scan was conducted in February 2018; as such, state data are in varying stages of federal approval.

Although no states use direct or perceptual measures of metacognition or self-understanding and engagement strategies, eight states include surveys of school climate or student engagement in their ESSA plans, which support metacognition and self-understanding and engagement strategies. For example, in Nebraska, school principals complete a survey measuring their perceptions of school climate in the following domains: positive partnerships, relationships, and student success; transitions between grades or to postsecondary education or employment; educational opportunities and access; college and career readiness; assessment; and educator effectiveness. In other states, students are asked to complete surveys about their perceptions of school safety and their engagement in learning. Currently, efforts are underway in California's CORE Districts to more directly measure social-emotional learning and metacognitive skills. For more information about these efforts, see Box 1: Supporting Social-Emotional Learning and Metacognitive Skills in CORE Districts.

Figure 1. Number of Measures of Postsecondary Readiness in States' Accountability Systems

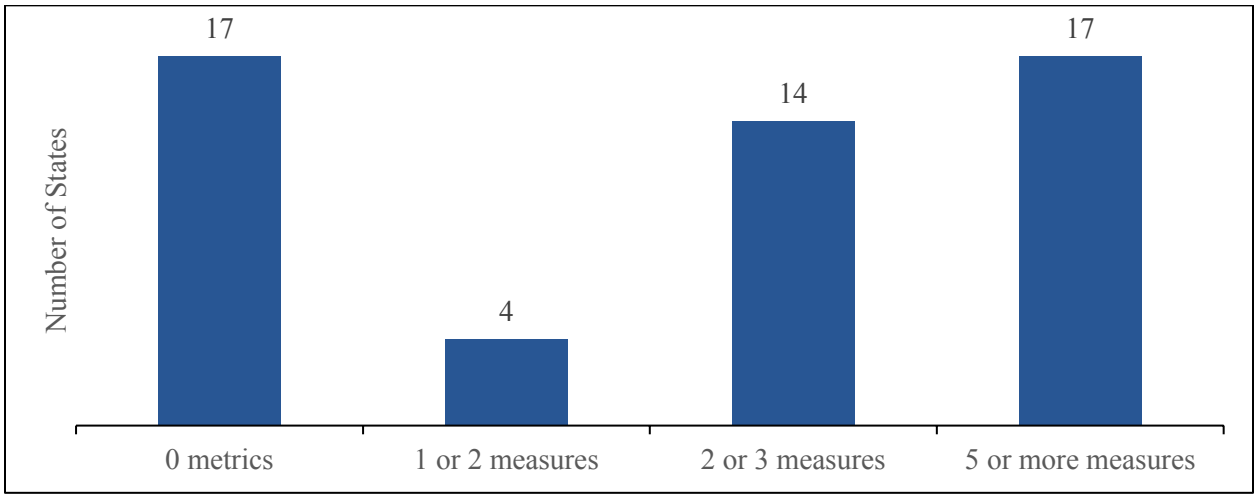


Figure 2. Number of Measures of Postsecondary Readiness in States' Accountability Systems, by State

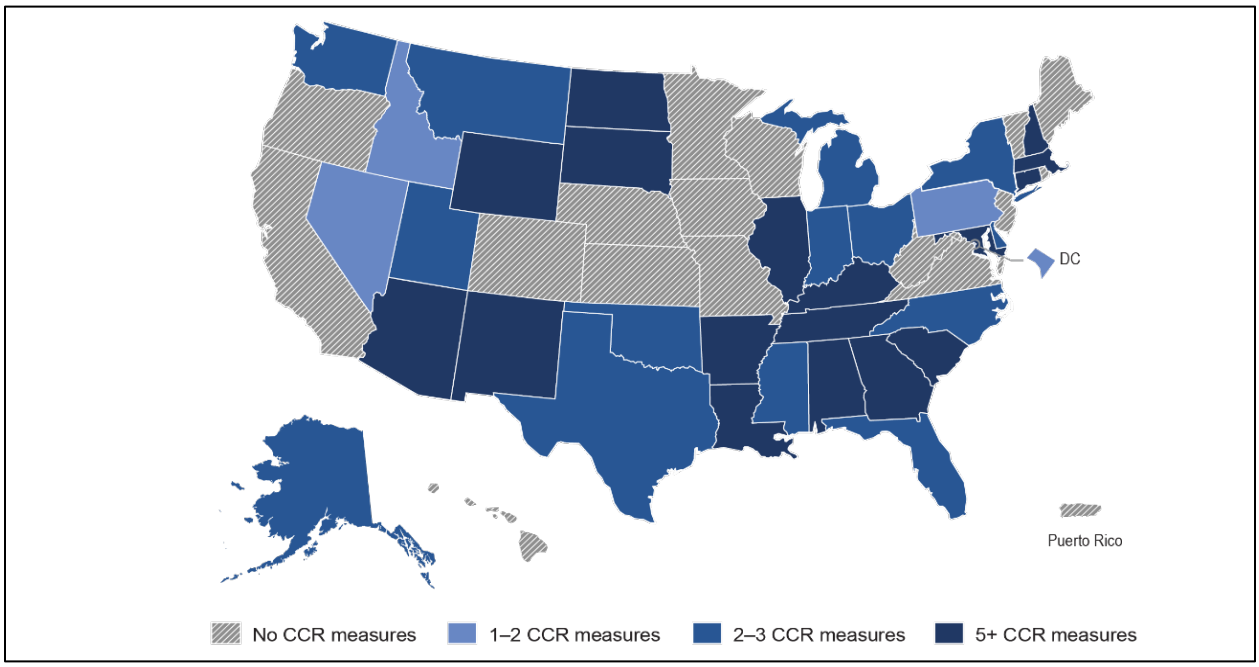
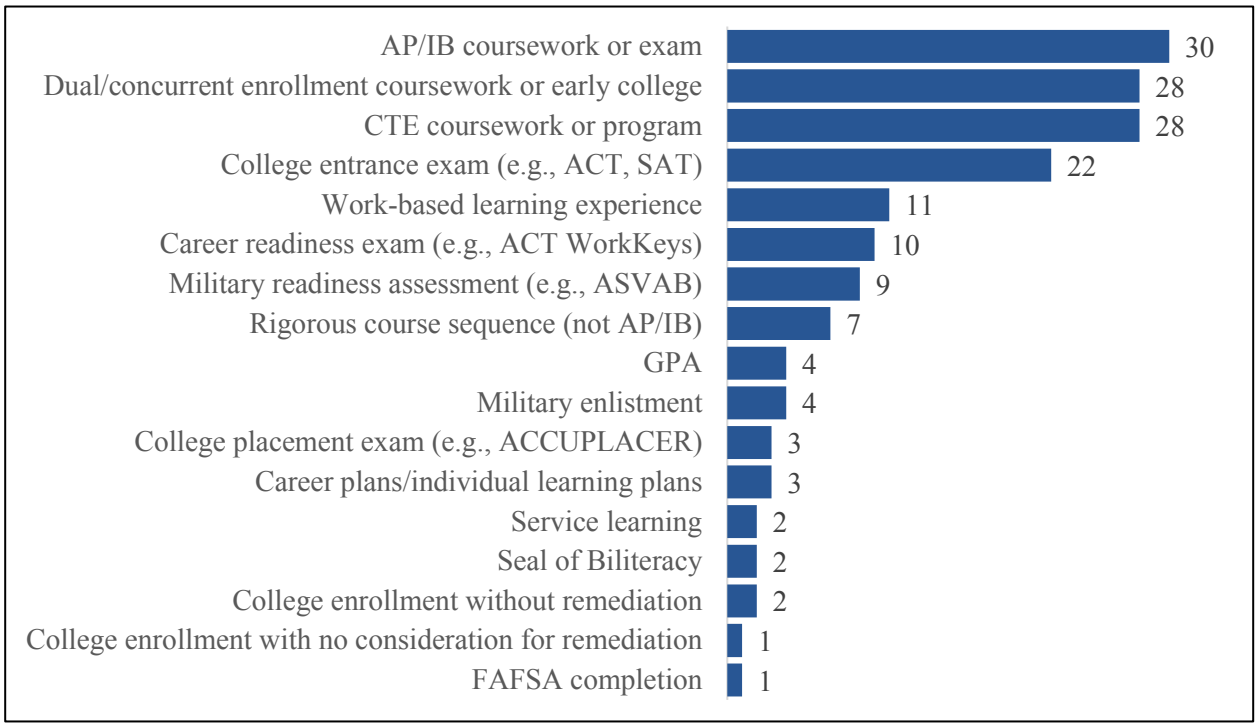


Figure 3. Number of States That Include Measures of Postsecondary Readiness in Their Accountability Systems, by Measure Category



Notes. AP/IB = Advanced Placement®/International Baccalaureate®. CTE = career and technical education. ASVAB = Armed Services Vocational Aptitude Battery. GPA = grade point average. FAFSA = Free Application for Federal Student Aid.

Box 1. Supporting Social-Emotional Learning and Metacognitive Skills in CORE Districts

Eight states include school climate or student engagement surveys in their ESSA plans (see Table 3), which measure perceptions of supports that are important scaffolds for social-emotional learning (SEL). (See Section 1: Potential Measures for Inclusion in a Postsecondary Readiness Index.) Some of these surveys include items that solicit perceptions related to metacognition, self-understanding, and engagement, but no states use surveys with validated SEL constructs (which consist of multiple items) for accountability.

California's CORE Districts—which comprise eight large, urban districts—came together in 2010 to address key challenges related to student learning. In coordination with the Collaborative for Academic, Social, and Emotional Learning, the CORE Districts have been integrating perceptual measures of SEL into their accountability system. In spring 2015, the CORE Districts field tested a set of items related to four SEL competencies across approximately half a million students: growth mindset, self-efficacy, self-management, and social awareness (Bartolino Krachman, Arnold, & LaRocca, 2016). Students in grades 5 through 12 were asked to self-report on behaviors and beliefs related to these competencies. Analyses of data from the field test revealed statistically significant correlations between measures of SEL competencies and other academic measures in the CORE Districts' accountability index, including GPA, English language arts achievement, and mathematics achievement (West, Buckley, Krachman, & Bookman, 2017).

After completing the field test, the CORE Districts began to measure and annually report these SEL competencies during the 2015–16 school year. Under California's approved ESSA plan, accountability measure performance levels are color coded to identify low-performing schools. As of the 2016–17 school report cards, at least two CORE Districts included SEL competencies as color-coded measures (see CORE Districts Data Dashboard).

Social-Emotional: Self-Management

Please answer how often you did the following during the past 30 days. During the past 30 days…

1. I came to class prepared.
2. I remembered and followed directions.
3. I got my work done right away instead of waiting until the last minute.
4. I paid attention, even when there were distractions.
5. I worked independently with focus.
6. I stayed calm even when others bothered or criticized me.
7. I was polite to adults and peers.

(Almost Never, Once in a While, Sometimes, Often, Almost All the Time)

Social-Emotional: Growth Mindset

Please indicate how true each of the following statements is for you:

1. My intelligence is something that I can't change very much.
2. Challenging myself won't make me any smarter.
3. There are some things I am not capable of learning.
4. If I am not naturally smart in a subject, I will never do well in it.

(Not at All True, A Little True, Somewhat True, Mostly True, Completely True)

Innovative Approaches

Although most states include measures of postsecondary readiness in their accountability systems, three states—North Dakota, Pennsylvania, and Illinois—have taken innovative approaches to constructing a measure of postsecondary readiness. North Dakota's College Choice framework is unique in that it *highlights* military readiness as one of several pathways to success. Pennsylvania focuses on measuring the use of individualized career plans. And Illinois uses an index that incorporates nine potential measures of postsecondary readiness. In this section, we examine each of these states' innovative approaches to measuring postsecondary readiness.

North Dakota's Emphasis on Multiple Pathways

North Dakota's three-pronged Choice Ready framework acknowledges multiple pathways to success by incorporating measures related to college, career, and military readiness. Students can demonstrate that they are on track to graduate "choice ready" by meeting all benchmarks in one of these three categories (see Figure 4). Measures of military readiness—such as military enlistment or ASVAB scores—are found in other states' accountability systems, but North Dakota is unique in highlighting military readiness as one of several pathways to success.

Figure 4. North Dakota's Choice Ready Framework

The percentage of students who are on track to graduate "choice ready" by meeting all benchmarks in one column:

College Ready	Career Ready	Military Ready
▪ ACT Composite score 22+ ▪ 2.8+ GPA ▪ At least two additional college ready indicators (see below)	▪ 2.8+ GPA in CTE pathway ▪ 2+ credits in Coordinated Plan of Study ▪ At least two additional career ready indicators (see below)	▪ ASVAB score 31+ ▪ Quality citizenship (no expulsions or suspensions) ▪ Physically fit as deemed by physical education instructor ▪ At least two college or career ready indicators (see below)

College Ready Indicators: C or higher in an AP course, an English or math dual credit course, or an Algebra II course; 3 or higher on an AP exam; 4 or higher on an IB exam; 3.0 or higher GPA in core course requirements for college admissions.

Career Ready Indicators: 3.0 or higher GPA in Career Readiness Practices; 75 or more hours of work-based learning experiences; C or higher in a dual credit course; ACT WorkKeys Gold or Silver certificate; or technical assessment or industry credential.

Pennsylvania's Focus on Individualized Career Plans

Pennsylvania's accountability system includes one measure of career readiness for high school students: The percentage of students who implement an individualized career plan through ongoing development of a career portfolio and participation in career preparation activities. This measure is scaffolded by measures that build on each other in earlier grade spans (see Figure 5). In grade 5,

students are expected to demonstrate engagement in career awareness and preparation, and in grade 8, they are expected to *create* individualized career plans and participate in career preparation activities. In grade 11, students must *implement* an individualized career plan through ongoing development of a career portfolio and participation in career preparation activities. Increasingly, states are asking schools to work with students to create individualized career plans—also referred to as *individual learning plans* or *personalized learning plans*—in grade 8 or 9. Illinois and Nevada also measure the use of individual learning plans in their ESSA plans, but Pennsylvania is unique in its sole focus on individual learning plans.

Figure 5. Pennsylvania's Career Readiness Framework

For the respective grade span, the percentage of students who attain all the following benchmarks:

Elementary School	Middle School	High School
In grade 5, demonstrate engagement in career awareness and preparation, via a state or locally designed career exploration and preparation program/curriculum.	In grade 8, create an individualized career plan and participate in career preparation activities.	In grade 11, implement an individualized career plan through ongoing development of a career portfolio and participation in career preparation activities.

Illinois's Use of Multiple Measures of College and Career Readiness

Illinois is one of several states that incorporate multiple measures of postsecondary readiness in a meta-indicator (see Figure 6). Students can be considered college and career ready by meeting benchmarks in three categories: College and Career Ready Option 1, College and Career Ready Option 2, and Distinguished Scholar. These categories encompass nine distinct, potential measures of postsecondary readiness. Other states that incorporate many potential measures of postsecondary readiness in their accountability systems include Arizona (10 measures), Maryland (nine measures), and North Dakota (nine measures).

Figure 6. Illinois's College and Career Readiness Meta-indicator

The percentage of students who attain all benchmarks in one column:

College and Career Ready Option 1	College and Career Ready Option 2	Distinguished Scholar
▪ GPA of 2.8 out of 4.0 ▪ 95% daily attendance in grades 11 and 12 ▪ College and Career Pathway Endorsement (see below)	▪ One academic indicator (see below) earned in ELA and math during grades 11 and 12 ▪ Career area of interest identified by end of grade 10 ▪ Three career-ready indicators (see below) earned during grades 11 and 12	▪ GPA of 3.75 out of 4.0 ▪ ACT score of 30 or SAT score of 1400 ▪ One academic indicator (see below) earned in ELA and math during grades 11 and 12 ▪ Three career-ready indicators (see below) earned during grades 11 and 12 ▪ 95% daily attendance in grades 11 and 12

College and Career Pathway Endorsement: completion of individualized learning plan, career-focused instruction, career exploration activities, and 60 hours of internships or similar experiences.

Academic Indicators: AP, IB, dual credit, college remedial course, or Algebra II course grade C or higher; AP or IB exam score 3 or higher; ACT English subject score of 18; ACT Reading subject score of 11; ACT Math subject score of 22 plus math credit earned in senior year; SAT reading and writing subject score of 480; SAT math subject score of 530 plus math in senior year.

Career-ready Indicators: participation in workplace learning experience; completion of an industry credential; enrollment in military service, including ROTC; participation in a dual-credit career pathway course with a grade of *B* or higher; completion of at least one CTE program of study; attaining and maintaining employment for at least 12 months; participating in consecutive summer employment; completing community service of 25 hours or more; participation in two or more co-curricular activities.

Next Steps

This brief provides IDE with a summary of research on the relationship between measures of postsecondary readiness and student postsecondary outcomes, which is just one consideration in selecting potential measures of postsecondary readiness. Moving forward, IDE can use this summary to inform a broader, cross-stakeholder conversation that considers the following:

- suitability of potential measures across multiple quality criteria;
- other states' accountability practices, including the types of measures used and how measures are combined; and
- the use of measures of postsecondary readiness within the broader framework of comprehensive accountability, beyond annual differentiation and the identification of low-performing schools.

Suitability of potential measures across *multiple quality criteria*

Demonstrating a positive, evidence-based impact on student outcomes is only one important criterion for evaluating and selecting measures of postsecondary readiness. No measure is perfect; for any given measure, there are trade-offs between criteria. A measure that is particularly meaningful because it is "rich" also may be difficult for stakeholders to understand because of its complexity. A measure that provides insight into a previously neglected student population's performance might be cost-prohibitive (see Schwartz, Hamilton, Stecher, & Steele, 2011, for a discussion of these trade-offs). IDE might consider the following research-based criteria in evaluating and selecting measures of postsecondary readiness (Marion and Lyons, 2016; Conley, 2014; Schwartz et al., 2011).

- **Has a research base that demonstrates a positive relationship with postsecondary success.** This brief summarizes the most relevant and recent research describing the relationship between potential measures of postsecondary readiness and student postsecondary outcomes. At minimum, a measure should demonstrate construct validity and be related to at least one student postsecondary outcome through a coherent theory of action, whether as a direct measure of an outcome, a perceptual measure, a leading measure or driver of the outcome, or a lagging measure within a system of feedback. All other factors held equal, measures having the greatest predictive validity—that is, the strongest statistical correlations with student postsecondary outcomes—are preferable to those with weaker correlations.
- **Recognizes multiple pathways to postsecondary success.** Measures should be considered within the context of providing a balanced approach to the multiple pathways to postsecondary success, through postsecondary education, direct career entry, or military enlistment. Consider how skills embedded in particular measures are transferable across pathways. For example, students engaged in service learning experiences build interpersonal competencies, such as collaboration, that are directly transferable to other pathways, such as military service.
- **Is less susceptible to gaming by stakeholders and to other sources of distortion.** Incentives to increase performance inherent in accountability systems also can act as incentives to "game" the system or otherwise fake or distort data. The selection of

participation versus performance measures illustrates this point well. The inclusion of a measure of *participation* in AP/IB coursework within a composite school performance index can inadvertently encourage the course enrollment of students who are not prepared for advanced coursework. Conversely, the use of a measures of *performance* (i.e., results-based) in AP/IB coursework can promote the enrollment of only the highest achievers in the coursework. The use of *both* these metrics within a single measure therefore has a moderating effect on their respective, unintended consequences. More extreme forms of distortion include data manipulation. IDE might therefore consider how gaming scenarios are mitigated by the use of moderating measures and how data integrity processes and training might supplement the deployment of a given measure.

- **Allows for fair comparisons across student subgroups that support equity.** Although concepts of fairness vary, Conley defines fairness as the elimination of systematic bias. Researchers have found that college placement test scores (SAT and ACT), for example, correlate strongly with both socioeconomic status and race when controlling for other academic factors such as statewide test scores (Conley, 2014). Although the complete elimination of bias from an accountability system may not be possible, IDE might account for it by avoiding reliance on any single measure of postsecondary readiness and reporting data appropriately. For example, reporting college placement test scores against "all schools" and "schools with students of similar backgrounds" can give report card readers proper context.
- **Is actionable and appropriately sensitive to instruction.** Measures should create incentives to change adult behaviors that impact students' opportunities for postsecondary success. In general, school-based measures are more actionable by adult stakeholders than measures of student competencies and outcomes outside the K–12 system, such as college placement tests, which, more than statewide assessments, may test for intelligence quotient independently of standards-based mastery (Conley, 2014a). Resources also must be available for some measures to be actionable. Without supports and training related to SEL-related deficiencies (e.g., mental health counseling, training to integrate SEL curricula), educators simply may not know how to act in response to low scores on measures that support components 3 and 4.
- **Is clear and understandable to educators and noneducators.** Measures should be as transparent as possible to educators, parents, and other community members. Sometimes, however, there is a trade-off between clarity and other criteria. For example, rigorous course-taking is considered one of the strongest predictors of future college success, but unpacking rigorous course-taking clearly in the text of a school report card can be challenging. Definitions of the measure can vary. For example, Achieve (2017) defines rigorous course-taking as at least 3 years of mathematics through Algebra II and 4 years of rigorous, grade-level English, and it is often confused with advanced coursework-taking, such as AP/IB courses. Both the measure name, or label, as well as the methodology for calculating the measure should be clear.
- **Minimizes burden on resources.** The implementation of any new accountability measure carries the cost of establishing an efficient data pipeline from collection to reporting. Aside from infrastructure costs, other notable expenses include training and resources to implement instructional or schoolwide adjustments in response to

accountability results, such as the cost of external experts, updated curricula, and/or schoolwide climate interventions (e.g., mentorship programs).

Other states' accountability practices, including the types of measures used and how measures are combined

In addition to applying the evaluative criteria in the preceding subsection, IDE might consider the current and prospective accountability practices of states detailed in Section 2, including the following high-level findings:

- The majority of states include at least one measure of postsecondary readiness in their accountability systems, but they vary a great deal on the basis of which measures they include. Pennsylvania includes only one measure of postsecondary readiness, whereas other states, such as Arizona, Illinois, Maryland, and North Dakota, use eight or more potential measures of postsecondary readiness (see Section 2). As Lombardi and colleagues (2015) observe, "CCR is a multi-dimensional construct, and thus assessing it requires multiple sources of academic and non-academic data" (p. 143).
- Several states are embedding parity among college, career, and military pathways in their accountability systems. CTE participation and performance is now the second most common measure of postsecondary readiness used across states, on par with or ahead of academic measures such as dual/concurrent coursework and college entrance exam participation and/or performance. At the same time, the use of military readiness measures has expanded to 12 states. In most of these states, readiness for each of these pathways carries equivalent mathematical value for calculating accountability results at the student level.
- Although certain measures of postsecondary readiness (AP/IB coursework, dual/concurrent coursework, CTE coursework/programs, college entrance exams) are the most popular across states, many states continue to use targeted measures that they consider central to their theories of action, such as college entrance without remediation, the Seal of Biliteracy, and FAFSA completion. By including these measures in their systems, *even at low weightings*, these states are signaling the importance of these outcomes to all stakeholders while retaining the option to adjust weightings in the future.
- States include measures of postsecondary readiness in their systems either individually or by combining them into a meta-indicator. IDE might explore the relative advantages and disadvantages of each of these approaches concurrently with its measure selection process. For example, meta-indicators are not as transparent for reporting purposes because they may combine many measures, but they can be perceived as fairer than individual measures because they may use disjunctive business rules (those that use the "or" statement) to allow students to demonstrate readiness in multiple ways, for example, through a single measure of the percentage of students who enroll in college *or* attain CTE certification *or* enlist in the military.

Use of postsecondary readiness measures within the broader framework of comprehensive accountability

In discussing potential measures of postsecondary readiness, IDE might consider how such measures might be used not only for annual differentiation of schools (i.e., calculation of a summative rating) and the identification of low-performing schools (comprehensive support improvement, targeted support improvement) but also to support other components of comprehensive accountability. Measures that may not meet a critical number of the aforementioned criteria in the *accountability* context nonetheless may be deployed in one or more of the following roles within a system of comprehensive accountability:

- **Annual reporting.** States can signal the importance of and catalyze adult behaviors toward improving student outcomes by including measures within annual school report cards that do not necessarily impact annual differentiation or the formal identification of low-performing schools. States may issue guidance to districts and schools to consider all report card data during the school improvement planning process and/or design tools that focus on report card measures that they wish to highlight. For example, various states report on SEL outcomes but do not include them in the accountability calculations for annual differentiation and the identification of low-performing schools.
- **Needs assessment.** States may issue guidance and/or tools related to needs assessment that integrate a variety of important measures of *access to inputs* to postsecondary readiness into concepts of equity. For example, access to advanced coursework, career counseling, college entrance exams (e.g., by absorbing costs of participation), CTE coursework, and rigorous academic coursework[9] are elements that can be included within definitions of equity. Because needs assessments generally focus on identifying inequities across schools, such measures may be included in these assessments.
- **Progress monitoring.** Some formative and interim measures of *student outcomes* may not be appropriate for statewide accountability, but they may be ideal for progress monitoring or inclusion in early warning systems used to inform adjustments to instruction and other improvements at the local level. For example, some states might hesitate to use GPA as a state accountability measure because of variations in grading practices at the classroom level. Regardless, course grades, often coupled with course rigor, are research-based measures of being on track to graduation, and states can encourage districts and schools to use course grades to inform progress. SEL measures are also recommended for use at the local level to drive improvements to SEL approaches, pending additional reliability and validity testing at the state level (Melnick et al., 2017).
- **Evaluation and monitoring.** Evaluation and monitoring at the state level can measure the extent to which accountability systems are achieving the desired impact on student and adult outcomes. In the context of traditional program evaluation, results of postsecondary readiness measures are compared to student outcomes that are independent of the accountability system. Several states, for example, measure correlations between accountability results and scores on the National Assessment for Education Progress

[9] Seventy-five percent of high schools with the highest populations of African-American and Hispanic students offer Algebra II courses, and only 63% of all high schools offer physics courses (Achieve, 2014).

(National Research Council, 2011). IDE may consider other measures that are not highly susceptible to distortion for a similar role, such as college entrance exam scores.

Monitoring often is associated with assessment of the fidelity of implementation of *adult behaviors* that drive student outcomes. It is a foundational activity for ensuring that the drivers of a theory of action are securely in place and not fundamentally flawed. A state might exclude participation in WBL experiences from its accountability system, but it might include implementation of WBL experiences in its monitoring program to catalyze adult behaviors in a manner that is similar to that of accountability incentives, but with lower stakes.

By considering measures of postsecondary readiness in the context of what role they might play within this *comprehensive* framework of accountability and not limiting discussion to simply whether or not a particular measure is suitable for use in IDE's accountability index, IDE can embed postsecondary readiness at multiple leverage points within its overall theory of action. At the same time, IDE can evaluate, formally or informally, the extent to which such measures are useful within various modes of system feedback and might be integrated into the composite index at a later date.

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Appendix A: Definition of College and Career Readiness in Iowa Flyer

Definition of College and Career Readiness in Iowa

Iowa students who are college and career ready have acquired the necessary knowledge, skills, and strategies to be successful in postsecondary opportunities as demonstrated through multiple sources of evidence, including those generated by students. Iowa students who are college and career ready have successfully…

Achieved Proficiency In Essential Content Knowledge

Acquired Practical Transition Skills

Developed Key Learning Skills And Cognitive Strategies

Built A Strong Foundation Of Self Understanding And Engagement Strategies

key terms

Student: A student is a person who is enrolled in a PK-12 educational program.

Post-secondary opportunities: Post-secondary opportunities include two or four-year degree programs, certificate or licensure programs, apprenticeships, training programs in the military, on-the-job training, and industry-based certifications.

Multiple sources of evidence: Multiple sources of evidence imply that data about student learning progressions in each of the four readiness areas has been obtained in a variety of ways.

The following outcomes begin to define the knowledge, skills and strategies that students who are college and career ready have acquired. The four areas are highly interdependent and mutually enhancing; as students develop skills in one area it enhances the development of skills in other areas.

Essential Content Knowledge

Students have the knowledge and skills associated with college and career readiness within the Iowa Core.

Students have the academic and technical content knowledge and skills to successfully enter credit-bearing, post-secondary courses; the workforce or military training; certificate or licensure programs; and/or apprenticeship programs without the need for remediation.

Transition Skills

Students have set goals for school, career, and post-secondary opportunities and are knowledgeable about a wide variety of pathways and requirements to achieve these goals.

Students have the practical knowledge and skills needed to successfully navigate transitions within the PK-12 system and develop plans consistent with their goals and aspirations.

Students have the practical knowledge and skills needed to successfully navigate through post-secondary program selection and admissions and enter into a career pathway that can provide economic security and personal satisfaction.

Learning Skills and Cognitive Strategies

Students are independent, reflective learners who apply meta-cognitive skills to better understand their learning style, their learning strengths and increase their learning capacity.

Students are able to set goals, demonstrate persistence, effectively manage time, employ organizational and study skills, and utilize technology to enhance their learning.

Students can formulate problems, conduct research, interpret and communicate findings, and generate innovative solutions.

Students can successfully engage in collaborative inquiry and numerous learning processes while valuing diversity and various perspectives.

Students can construct meaning for themselves as an active part of the learning development process and begin to understand the world through many sources of information.

Students utilize appropriate advocacy skills to make necessary arrangements for accommodations and adaptations to enhance their learning.

A Strong Foundation of Self-understanding and Engagement Strategies

Students are able to identify and navigate their personal, civic, and social responsibilities to engage in local, national, and global contexts.

Students take an active leadership role and engage others to address issues that are important to them.

Students are self-directed, confident, and aware of their strengths and areas for growth. They demonstrate the ability to take initiative, as well as manage, monitor and modify their effort to accomplish the desired result.

Students understand themselves, their values and beliefs, and can comfortably communicate with and build relationships with others including those with diverse perspectives and backgrounds. They are able to identify and resolve conflicts through various means.

Appendix B: School Quality and Student Success Indicators by State

The American Institutes for Research project team conducted a scan of states' consolidated Title I plans submitted under the Elementary and Secondary Education Act, as amended by the Every Student Succeeds Act, for measures that the Iowa Department of Education might consider including in its postsecondary readiness index.[1,2] To complete the scan, the project team utilized a database of all accountability measures used by states in their ESSA plans. The database was constructed by AIR experts to document measures used for the school quality or student success indicator included in each state's proposed accountability system. The following table defines the measures described in each state's ESSA plan. All school quality or student success (SQSS) measures are included, not just those that are most appropriate for a postsecondary index, to give additional context on how states' postsecondary readiness measures complement other SQSS measures. However, measures related to postsecondary readiness are highlighted in blue shading.

State	Measure	Definition
	**Chronic absenteeism**	Percentage of students absent for 15 or more of enrolled school days.
	College and/or career ready	Percentage of students in grade 12 who attain participation and/or performance benchmarks for any of the following activities: ■ ACT® or ACT WorkKeys® ■ Advanced Placement® (AP®)/International Baccalaureate® (IB®) exams ■ College credit while in high school ■ Industry credential ■ Enlistment into military
	**Reading proficiency by grade 3**	Percentage of students scoring at the performance level indicating grade-level proficiency or higher on annual statewide assessments in grade 3.
	Interim assessment participation	Percentage of enrolled students who participate in at least a fall and winter administration of a state-approved interim assessment.
	Freshman on track	Percentage of first-time ninth graders who earn at least five credits by the end of their first year of high school with at least four credits from language arts, social studies, math, or science.
	Chronic absenteeism	Percentage of students absent for more than 10% of enrolled school days.
	Alaska Performance Scholarship eligibility	Percentage of students graduating who are eligible for an Alaska Performance Scholarship based participation and/or performance benchmarks for all the following: ■ Grade point average (GPA) ■ ACT, SAT®, or ACT WorkKeys performance ■ High school curriculum that integrates advanced coursework and a well-rounded education (science, social studies, world languages, etc.)

[1] Hereafter, these plans will be referred to as *ESSA plans*.
[2] The scan of state ESSA plans includes all 50 states plus the District of Columbia and Puerto Rico; we use the term *state* for readability. The scan was conducted in February 2018; as such, state data are in varying stages of federal approval.

State	Measure	Definition
	**Chronic absenteeism**	Weighted average student-level absenteeism rate based on the following point values: ■ Absent < 5% enrolled days: 1 point ■ 5% ≤ absent < 10% enrolled days: 0.5 points ■ Absent ≥ 10% enrolled days: 0 points
	Proficiency (science)	Weighted average performance level achieved across students on statewide assessments based on the following point values: ■ Ready or Exceeds: 1 point ■ Close: 0.5 points ■ Not ready: 0 points
	Student growth (science)	Weighted average student growth (using student growth percentile [SGP]) across students on statewide assessments based on the following point values: ■ SGP ≥ 75%: 1 point ■ 25% ≤ SGP < 75%: 0.5 points ■ SGP ≤ 25%: 0 points
	Reading at grade level	Weighted average reading performance level achieved across students (assessments pending clarification) based on the following point values: ■ Ready or Exceeds: 1 point ■ Close: 0.5 points ■ Not ready: 0 points
	ACT/WorkKeys	Percentage of students in grade 12 scoring above ACT WorkKeys readiness benchmark.
	Bonus for ACT readiness benchmark	Percentage of ACT subject-specific assessments taken during grades 9–12 that are scored above readiness benchmark (using each student's best score for each subject).
	GPA	Percentage of students in grade 12 with final GPA greater than or equal to 2.8 on a 4.0 scale.
	Community service learning credits	Percentage of students in grade 12 earning 1 or more service learning credits during grades 9–12.
	On-time credits	Percentage of students in grades 9, 10, and 11 meeting grade-specific benchmarks for course credit accumulation for grades 9 (5.5 credits), 10 (11.0 credits), and 12 (16.5 credits).
	Computer science course credits	Percentage of students in grade 12 earning at least 1 credit for computer science during grades 9–12.
	AP/IB, dual/concurrent credits	Percentage of students in grade 12 earning at least 1 credit for AP/IB or concurrent coursework during grades 9–12.

State	Measure	Definition
	Acceleration/readiness	Combined point total across various measures related to student acceleration and/or readiness, based on a "menu" of student outcomes appropriate by grade span. Schools can earn up to 10 points based on maximum points available: ■ Grades 5–8 high school end-of-course (EOC) math (5 points): Percentage of full academic year (FAY) students proficient on EOC math tests. There is no minimum *N* size. Points are earned based on comparison with the school's prior-year proficiency percentage. ■ Grade 3 English language arts (ELA) minimally proficient (5 points): Percentage of FAY students minimally proficient in ELA. Points are earned based on comparisons with the school's prior-year, minimally proficient percentage. ■ Subgroup improvement (2 points per subgroup, up to 6 points total): Change in subgroup proficiency in ELA and math compared to the prior-year state average proficiency for the subgroup. Includes all required subgroups. ■ Special education inclusion (2 points): Percentage of special education students spending 80% or more of their day in the general education classroom. Schools receive points depending on the state average (7%) of special education students spending at least 80% of the day in general education classrooms. ■ Chronic absenteeism (2 points): Percentage of students absent for 10% or more of the school year (18 school days), compared to school's prior-year chronic absenteeism percentage.
	**College and career readiness**	Average number of points earned across all grade 12 students based on various student activities. Graduating seniors are awarded up to 2 college and career readiness indicator points. Students can earn bonus points by earning both college and career ready indicator points. *College Ready Indicators* ■ Earns a Grand Canyon or IB diploma (1.25 points) ■ Earns a passing score on AzMERIT Algebra 2 or ELA 11 (0.5 points per exam) ■ Meets cut score on ACT English, Math, Reading, or Science exam (0.35 points per exam) ■ Meets cut score on SAT English or Math exam (0.5 points per exam) ■ Meets cut score on any AP exam (0.5 points per exam) ■ Completes the Free Application for Federal Student Aid (FAFSA) (0.3 points) ■ Passes a college-level English, math, science, social studies, or foreign language course for which college credit can be earned with a grade of *C* or higher (i.e., dual enrollment and concurrent enrollment) (0.5 points per course) ■ Meets cut score of ACCUPLACER®, ALEKS®, Compass® (or any nationally recognized college placement exam currently used by an Arizona institution) or Cambridge IGCSE (International General Certificate of Secondary Education) English, Reading, Writing, Math, Social Studies, Science, or Foreign Language exam (0.35 points per exam) ■ Meets cut score on College-Level Examination Program® (CLEP®), Cambridge A or AS levels, or IB English, Math, Social Studies, Science, or Foreign Language exam (0.5 points per exam) ■ Meets all 16 Arizona Board of Regents project of study requirements (1 point)
		Career Ready Indicators ■ Completes a career and technical education (CTE) sequence and passes the Arizona CTE Technical Skills Assessment for that sequence (1.25 points) ■ Passes a college-level career pathway course for which college credit can be earned with a grade of *C* or higher (i.e., dual enrollment and concurrent enrollment) (0.5 points per course)

State	Measure	Definition
		■ Completes a CTE course with a grade of *C* or higher (outside of completed sequence referenced above) (0.25 points per course) ■ Meets benchmarks for Armed Services Vocational Aptitude Battery (ASVAB) (0.5 points) ■ Meets benchmarks for ACT WorkKeys (0.5 points) ■ Completes the FAFSA (0.3 points) ■ Earns an industry-recognized credential, certificate, or license (0.5 per credential, certificate, or license; no more than 1 point may be awarded) ■ Completes a well-defined, work-based learning internship of a least 120 hours (1 point)
	**Suspension rate**	Percentage of students suspended at least one time over the course of an academic year.
	**Dropout rate**	Percentage of all students enrolled in grades 7–12 who leave school during a single school year without subsequently attending "another school or educational program." This does not include students who graduate early or who have been expelled.
	Reduction in chronic absenteeism	Unduplicated count of students absent 10% or more of the days enrolled in public school during the school year, including students who are absent for any reason, regardless of whether absences are excused or unexcused.
	**Performance index, science**	Average student performance/proficiency index score on annual statewide assessments. A student's scale score is transformed into a performance/proficiency index score by subtracting the lowest possible scale score from his or her scale score and dividing the difference by the scale score range. Participation rate is not included in the calculation.
	Chronic absenteeism	Percentage of all students and students in the high-needs subgroup missing 10% or greater of the total number of days enrolled. Full points are awarded if the chronic absenteeism rate is 5% or lower; no points are awarded if the rate is 30% or higher; and rates between 5% and 30% will receive proportional points.
	Postsecondary entrance	Percentage of graduates who enroll in a 2- or 4-year postsecondary institution any time during the first year after high school graduation.
	Physical fitness	Percentage of students meeting or exceeding the "Health Fitness Zone Standard" in all four areas of the state physical fitness assessment (muscular strength and endurance, flexibility, and cardiovascular fitness).
	On track to high school graduation	Percentage of ninth graders earning at least 5 full-year credits during the ninth-grade school year and no more than one failing grade in English, math, science, or social studies.
	Preparation for college and career readiness exams	Percentage of students in grades 11 and 12 who attain benchmark score on at least one college/career readiness exam (e.g., SAT, ACT, AP, IB).

State	Measure	Definition
	Preparation for college and career readiness coursework	Percentage of students in grades 11 and 12 who participate in at least one of the following during high school: two courses in AP/IB/dual enrollment coursework, two courses in one of 17 CTE categories, or two workplace experience courses.
	Arts access	Percentage of students in grades 9–12 participating in at least one dance, theater, music, or visual arts course during the school year.
	**Alternative graduation metric**	Number of graduates (including extended year) divided by the number of students in the 4-year cohort.
	Addressing chronic absenteeism	The higher of either the percentage of enrolled students who are in attendance for 90% or more of enrolled days or the median student attendance growth percentile compared to other schools with similar historical attendance results.
	Re-enrollment	Percentage of eligible students who re-enroll in the school after their first year of enrollment, excluding students enrolled in terminal grade levels.
	AP/IB participation	Percentage of students taking at least one AP/IB exam.
	AP/IB performance	Percentage of students scoring at level 3 or higher on at least one AP exam and/or at level 4 or higher on at least one IB exam.
	In-seat attendance (K–12)	Average daily percentage of enrolled students who are present in school.
	In-seat attendance (Pre-K)	Average daily percentage of enrolled students who are present in school.
	CLASS observation (Pre-K)	Aggregated score across three domains (classroom organization, emotional support, and instructional support) on a research-based teacher observation tool for pre-K classrooms, relative to national benchmarks.
	**Chronic absenteeism**	Percentage of students who are absent 10% or more of school days during the school year.
	Proficiency (science)	Percentage of students who score at the proficient level (i.e., achievement level 3) or higher on annual statewide assessments. Delaware does not appear to integrate participation rate into the proficiency calculation.
	Proficiency (social studies)	Percentage of students who score at the proficient level (i.e., achievement level 3) or higher on annual statewide assessments. Delaware does not appear to integrate participation rate into the proficiency calculation.
	College and/or career preparedness	Percentage of all students enrolled in grade 12 attaining at least one of the following college and/or career preparedness benchmarks: ■ College preparedness options: AP test (score of 3 or better), IB test (score of 4 or better), postsecondary credit attainment with a grade of *B* or higher outside of a state-approved program of study, SAT College and Career Readiness Benchmarks (ELA, math, and writing) ■ Career preparedness options: Delaware Department of Education-approved industry credential; certificate of multiliteracy; postsecondary credit attainment with a grade of *B* or higher within a state-approved program of study; successful completion of an approved cooperative education and/or work-based learning extension; ASVAB General Technical score of 70+.

State	Measure	Definition
	**Proficiency (science, social studies)**	Percentage of students scoring at the performance level indicating grade-level proficiency or higher on annual statewide assessments.
	Middle/high school acceleration	For middle school, percentage of eligible students who pass a high school-level EOC assessment or industry certification exam. For high school, percentage of students within the graduating cohort who attain participation and/or performance benchmarks for any of the following activities: ■ AP, IB, or Advanced International Certification of Education (AICE) ("Cambridge") assessments ■ Dual enrollment coursework ■ Nationally recognized industry certification
	**Proficiency index (science, social studies)**	Weighted average performance level achieved across students on statewide assessments based on the following point values assigned to performance levels: ■ Beginning learner: 0 points ■ Developing learner: 0.5 points ■ Proficient learner: 1.0 point ■ Distinguished learner: 1.5 points
	Closing gaps (weighted equally across science, social studies)	Percentage of annual interim goals met for proficiency across all students and all subgroups.
	Literacy	Percentage of students demonstrating reading comprehension at or above the midpoint of the college- and career-ready "stretch" Lexile® band on statewide ELA assessment.
	Chronic absenteeism	Percentage of students absent for more than 10% of enrolled school days.
	Beyond the core (well-rounded education)	Percentage of students earning a passing score, within a well-rounded curriculum, for courses such as fine arts, world language, physical education, and career exploration.
	Accelerated enrollment (AP/IB, dual enrollment coursework)	Percentage of graduates earning credit for: ■ Dual enrollment coursework ■ AP/IB courses
	Pathways	Percentage of graduates completing a career pathway course of study in any one of the following areas: ■ Advanced academic coursework ■ Career, Technical, and Agricultural Education area ■ Fine arts ■ World language
	College and career readiness	Percentage of graduates completing at least one of the following benchmarks: ■ Entering the Technical College System of Georgia or the University System of Georgia without needing remediation ■ Achieving a readiness score on the ACT, SAT, two or more AP exams, or two or more IB exams ■ Passing an end-of-pathway assessment (nationally recognized industry credential) ■ Completing a work-based learning experience

State	Measure	Definition
	**Chronic absenteeism**	Percentage of students absent for more than 15 days of enrollment.
	**Satisfaction and engagement survey**	Results from a "student satisfaction and engagement" survey (pending clarification).
	College and career readiness	Percentage of students meeting participation and/or performance benchmarks to include: ■ Industry-recognized certification ■ Participation in apprenticeship program ■ Participation in "advanced opportunities" (pending clarification)
	**Chronic absenteeism**	Percentage of students absent for 10% or more of the school year, including excused and unexcused absences, excluding absences due to medically certified home/hospital instruction and absences pertaining to the death of a family member.
	On track to graduation (grade 9)	Percentage of students enrolled in grade 9 who earn at least 5 full-year course credits and no more than one semester *F* in a core course in grade 9.
	College and career readiness	Percentage of students who meet the criteria for College and Career Ready Status or Distinguished Scholar status: *College and Career Ready Status Option 1:* ■ GPA of 2.8 out of 4.0 ■ 95% daily attendance in grades 11 and 12 ■ College and Career Pathway Endorsement on high school diploma (endorsement criteria include an individualized learning plan, career-focused instruction, career exploration activities, and 60 hours of internships or similar experiences)
		College and Career Ready Status Option 2: ■ One academic indicator earned in each of ELA and math during grades 11 and 12 (except Algebra II can be credited at any grade level) (academic indicators include AP, IB, dual credit, college remedial course, or Algebra II course grade of *C* or higher; AP or IB exam score 3 or higher; ACT English subject score of 18; ACT Reading subject score of 11; ACT Math subject score of 22 plus math credit earned in senior year; SAT Reading and Writing subject score of 480; SAT Math subject score of 530 plus math in senior year) ■ Career area of interest identified by end of grade 10 ■ Three career ready indicators earned during grades 11 and 12 (career-ready indicators include workplace learning experience; industry credential; military service, including ROTC; dual-credit career pathway course grade of *B* or higher; completion of at least one CTE program of study; obtaining and maintaining employment for at least 12 months; consecutive summer employment; community service of 25 hours or more; two or more co-curricular activities).
		Distinguished Scholar: ■ GPA of 3.75 out of 4.0 ■ ACT score of 30 or SAT score of 1400 ■ At least one academic indicator earned in each of ELA and math (academic indicators include AP, IB, dual credit, college remedial course, or Algebra II course grade of *C* or higher; AP or IB exam score 3 or higher;

State	Measure	Definition
		ACT English subject score of 18; ACT Reading subject score of 11; ACT Math subject score of 22 plus math credit earned in senior year; SAT Reading and Writing subject score of 480; SAT Math subject score of 530 plus math in senior year) ■ Three career-ready indicators earned during grades 11 and 12 (Algebra II can be in any year if a *C* or higher is earned) (career-ready indicators include workplace learning experience; industry credential; military service, including ROTC; dual-credit career pathway course grade of *B* or higher; completion of at least one CTE program of study; obtaining and maintaining employment for at least 12 months; consecutive summer employment; community service of 25 hours or more; two or more co-curricular activities). ■ 95% attendance in grades 11 and 12
	Climate survey	Results of the 5Essentials survey of school climate across students and educators or an alternative survey selected from a preapproved state list.
	**College and career readiness**	Percentage of 4-year graduates who attain one of the following benchmarks: ■ Passing score on an AP/IB exam ■ At least 3 college credit hours from an approved course ■ Approved industry certification
	Chronic absenteeism	The sum of the percentage of students attending at least 96% of enrolled school days (irrespective of excuse) and the percentage of students who demonstrate improved attendance by attending 3% more school days over the previous year.
	**Conditions for learning**	Student survey results regarding conditions for learning across the following domains: ■ Safety: physical safety, emotional safety ■ Engagement: respect for diversity, student-to-student relations, adult-to-student relations ■ Environment: clear expectations, physical environment
	**Nonproficient students (ELA, math)**	Percentage of students scoring below proficiency on annual statewide assessments.
	Chronic absenteeism	Calculation to be determined.
	Suspensions/expulsions	Percentage of students receiving at least one suspension or expulsion during the course of a year.
	**Opportunities and access**	Combined score, measured using surveys and other instruments, across the following domains and measures (pending determination of meeting technical requirements): ■ Rich curriculum: Participation in arts, health/physical education, science, social studies, career exploration, cultural studies/world language ■ Equitable access: gifted and talented identification, advanced coursework ■ School quality: chronic absenteeism, disciplinary events, local measure ■ Whole-child supports: access to counselors, nurses, library/media specialists, teacher certification, career counselors
	Transition readiness	Percentage of students: ■ For elementary/middle schools, attaining "acceptable" a composite score across statewide tests in ELA, math, science, and social studies

State	Measure	Definition
		■ For high schools, the sum of: ● The percentage of graduates attaining participation and/or performance benchmarks for the following activities: high school diploma, college placement exams, dual credit coursework, AP/IB/Cambridge AICE coursework/exams, CTE, apprenticeship, ASVAB, enlistment ● The percentage of English learners (ELs) receiving services during high school who attain English language proficiency (ELP).
	**Assessment index (science and social studies)**	Average student performance on annual statewide assessments based on point values in the following table. Point values are combined and averaged across all subjects, with double weighting given to ELA and math within the measure calculation. ELs' performance on the state ELP assessment will be incorporated into the index in 2018–19. Zero points are assigned to enrolled students who do not participate.
	ACT/WorkKeys index	Average number of points awarded per student based on students' performance on the ACT or WorkKeys assessment in which each performance score of 18 to 36 corresponds to a specific point value between 70 and 150.
	Strength of diploma index	Average number of points awarded per student in a graduation cohort based on students' participation and/or performance in rigorous coursework (e.g., AP, IB, dual enrollment) and receipt of career credentials (through the state's Jump Start career and technical education program): ■ High school diploma plus associate's degree (160 points) ■ High school diploma plus (a) passing AP/IB/CLEP score or (b) advanced statewide Jump Start Credential (150 points; 160 points for accomplishing (a) and (b)) ■ Five-year graduate with a passing AP/IB/CLEP score (140 points) ■ High school diploma plus (a) at least one passing grade for an AP, college credit, dual enrollment, or IB course or (b) basic statewide Jump Start credential (110 points; 115 points for accomplishing (a) and (b)) ■ Four-year graduate (100 points) ■ High school diploma earned through pathway for students assessed on the state's alternate assessment system (100 points) ■ Five-year graduate without any diploma (75 points) ■ Six-year graduate without any diploma (50 points) ■ High School Equivalency Test plus any Jump Start credential (40 points) ■ High School Equivalency Test (25 points)
	Dropout/credit accumulation index	Average number of points awarded per student in schools with an eighth grade based on the number of Carnegie credits that students accumulate through the end of grade 9. Schools are awarded points ranging from 25 to 150 based on cumulative 0.5 credits that students earn (between 4.5 and 7.0). Schools receive 0 points for students who drop out, are third-year eighth graders, or earn fewer than 4.5 credits by the end of grade 9.
	**Chronic absenteeism**	Percentage of students who are absent for 10% or more of the school year.

State	Measure	Definition
	**Chronic absenteeism**	Number of students absent 10% or more of school days.
	School climate	Survey results across students and educators (as well as parents, pending validity tests). Surveys include four domains: relationships, safety, environment, and engagement and include at least one item, per state statute, for teachers regarding their "receipt of critical instructional feedback."
	On track in grade 9	Percentage of grade 9 students receiving at least 4 credits in any of ELA, math, science, social studies, and world language.
	Access to a well-rounded curriculum	For elementary and middle schools, percentage enrollment in science, social studies, fine arts, physical education, health, and/or computational learning. For high schools, percentage of students graduating or obtaining certificate of completion enrolled in AP, IB, or dual enrollment coursework or and/or CTE concentration, or, for certificate-of-completion students, enrollment in general education core academic or elective course.
	Credit for completion of a well-rounded curriculum	For elementary and middle schools, percentage: ■ Students proficient on statewide science and social studies (middle schools only) assessments (beginning 2018–19), or ■ Passing various courses including math, ELA, social studies, science, fine arts, physical education, and health by grade 5 (elementary) or grade 8 (middle schools)
		For high schools, percentage of students graduating or obtaining certificate of completion and meeting performance and/or participation benchmarks for any of the following activities: AP/IB exams; SAT/ACT exams; dual coursework enrollment; CTE apprenticeship, program completion, or industry certification; ASVAB exam; Seal of Biliteracy; postsecondary college and training, employment, or community service (for certificate-of-completion students); University of Maryland entry requirements.
	**Average scale score (science)**	Average, student-level scale score on statewide assessments. Massachusetts does not describe how subject results are combined and does not appear to include participation rate in the calculation.
	Chronic absenteeism	Percentage of students missing at least 10% of their days in membership in a school (18 days or more in a typical, 180-day school calendar).
	Extended engagement rate	Sum percentage of eligible students graduating within 5 years with a regular high school diploma plus students who do not graduate within 5 years but are still enrolled.
	Dropout rate	Percentage of students who drop out of school and do not return to school, graduate, or receive a general education diploma the following year.
	Success in grade 9 courses	Percentage of students who do not fail any course during grade 9.
	Successful completion of broad/challenging coursework	Percentage of all grade 11 and grade 12 students who complete a broad course of study (MassCore) or achieve a passing score in challenging coursework, including but not limited to AP, IB, honors and dual enrollment coursework.

State	Measure	Definition
	**Chronic absenteeism**	Percentage of students enrolled in school for at least 10 days who miss at least 10% of scheduled school days.
	Time spent in arts/physical education (K–8)	Amount of exposure students have to courses in the fine arts, music, and physical education.
	Access to librarian/media specialist (K–8)	Amount of exposure students have to courses taught by a library media specialist.
	Advanced coursework in grades 11 and 12	Percentage of students enrolled in grade 11 or 12 who complete advanced coursework, including dual enrollment coursework, AP/IB coursework, and CTE programs.
	Postsecondary enrollment rate	Percentage of students enrolling in postsecondary education within "key time points" subsequent to high school graduation.
	General participation	Participation rate of FAY students on statewide academic achievement tests (ELA and math).
	EL participation	Participation rate of EL participation on statewide tests of ELP.
	**Consistent attendance (chronic absenteeism)**	Percentage of students absent for less than 10% of enrolled school days.
	**Student growth index, lowest 25% performers (ELA, math)**	Weighted growth achieved from year to year on statewide assessments by the lowest 25% performers in the previous year, based on calculation provided at "Student growth index, all students."
	College and career readiness	Sum percentage of students meeting readiness benchmarks on the ACT Math exam and the ACT ELA exam.
	Acceleration/readiness	Percentage of high school students meeting participation and/or performance benchmarks for any of the following activities: ■ AP/IB exams ■ AICE assessments ■ Industry certification coursework ■ Dual enrollment coursework
	**Attendance (chronic absenteeism)**	Percentage of enrolled students attending at least 90% of enrolled school days.
	Satisfactory attendance	Percentage of students absent for 5% or less of enrolled school days.
	STEM (science, technology, engineering, and mathematics) (science proficiency)	Percentage of students scoring at the performance level indicating grade-level proficiency or higher on annual statewide assessments.

State	Measure	Definition
	**College and career readiness**	Percentage of students attaining participation and/or performance benchmarks for any of the following: ■ ACT assessment ■ CTE pathway completion ■ AP/IB or dual enrollment coursework completion with passing grade
	Program quality (school climate, student behavior, student engagement)	Survey results measuring school climate, student behavioral issues, and student engagement (pending clarification).
	**Evidence-based analysis results**	Results of survey completed by the school principal measuring perceptions of school climate within the following domains: ■ Positive partnerships/relationships and student success ■ Transitions (between grades or to postsecondary education or the workforce) ■ Educational opportunities and access ■ College and career readiness ■ Assessment ■ Educator effectiveness
	Chronic absenteeism	Percentage of students absent for more than 10% of enrolled school days.
	Science achievement	Average scale score (pending clarification).
	**Chronic absenteeism**	Percentage of students enrolled for 30 days or more who miss 10% or more of instructional days.
	ACT composite score	Average ACT composite score for grade 11 students taking the test within the state testing window.
	EOC achievement levels 3 and 4 percentage	Percentage of participating students achieving a level 3 or higher on EOC assessments in ELA and math.
	Proficiency (science)	Percentage of students who "meet" or "exceed" the minimum passing score on annual statewide assessments. For high schools only, the denominator of the calculation is either the actual number of participating students or 95% of the enrolled students in participating grades, whichever is higher).
	High school readiness	Percentage of students who earn at least the following number of credit units (*i.e.,* earn a passing grade) by the end of grade 8: 1.5 units in English, 1.5 units in math, 1 unit in science, and 1 unit in social studies.
	Academic learning plans	Percentage of students with a signed academic plan for transitioning to postsecondary education and/or the workforce.
	Ninth- and 10th-grade credit sufficiency	Percentage of grade 9 and grade 10 students who have earned a sufficient number of credits (at least 5 and 11, respectively) by the end of the regular school year.

State	Measure	Definition
	Student growth, lowest performing 25% (SGP for ELA, math)	SGP ranks year-to-year change in annual statewide assessment results for each participating student performing in the bottom quartile in the previous year. The final score is the median SGP.
	**College and career readiness**	Percentage of students graduating who attain participation and/or performance benchmarks in any of the following activities: ■ New Hampshire Scholars program of study (standard, STEM, or arts) ■ Dual enrollment coursework ■ SAT/ACT exams ■ AP/IB exams ■ CTE industry-recognized credential ■ CTE pathway program of student's choice ■ ASVAB ■ ACT National Career Readiness Certificate™
	**Chronic absenteeism**	Percentage of students absent for 10% or more of the days for which a given student is "in membership" during the school session from July 1 to June 30.
	**STEM readiness (science proficiency)**	At a minimum, will include the percentage of all students scoring at least proficient on the statewide science assessment. Additional measures beyond science proficiency are to be determined.
	4-year graduation rate growth	Annual change in 4-year adjusted cohort graduation rate based on the mathematical slope across the 3 most recent years of data.
	Opportunity to learn: chronic absenteeism	Percentage of students chronically absent, including excused and unexcused absences (threshold percentage to be determined).
	Opportunity to learn: survey	Average score on a student survey consisting of 10 items soliciting perceptions of teacher practices. Parents complete the surveys for K–2 students, and students complete the surveys beginning in grade 3.
	College and career readiness: participation	Percentage of students in the 4-year graduation cohort who attempt at least one college and career readiness activity during high school. Activities include ACCUPLACER (Math, Reading Composition, Sentence Skills, WritePlacer®), ACT (Math, English Composition, Reading, Science), ACT Aspire® (Math, ELA, and Science), COMPASS (Math, Reading, Writing Skills, Essay Writing), CTE course sequence (any CTE pathway recognized by the New Mexico Public Education Department), dual credit (nonremedial course), IB (all subjects, IB diploma), PSAT/NMSQT® (Reading/Writing, Math), SAT (Reading, Writing, Math), SAT (all subject areas).
	College and career readiness: success	Percentage of students, out of those attempting at least one college and career readiness activity, who meet at least one of the state-developed benchmarks for college and career readiness success (benchmarks provided in profile).
	Chronic absenteeism	Percentage of students absent for more than 10% of enrolled school days regardless of excuse.

State	Measure	Definition
	**College, career, and civic readiness index**	Weighted average level of diploma earned with a graduation cohort according to the following point values: ■ Various advanced diplomas, including rigorous pathways that include well-rounded education or CTE endorsement (2 points) ■ Regular diploma plus AP/IB or dual enrollment coursework credit (1.5 points) ■ Regular or local diploma (1.0 point) ■ High school equivalency diploma (0.5 points) ■ No high school or equivalency diploma (0 points)
	**Student growth (ELA, math, science)**	Value-added student growth model that compares year-to-year change in annual statewide assessment results with the predicted results for each participating student.
	Biology EOC test	Percentage of students scoring proficient (Level 3) or above on statewide EOC assessment in biology by the end of grade 11.
	ACT performance	Percentage of students achieving the University of North Carolina minimum entrance requirement of a composite score of 17 on the ACT.
	ACT WorkKeys performance	Percentage of CTE concentrators who achieve a Silver or higher designation on the ACT WorkKeys.
	Math course rigor	Percentage of graduates passing the North Carolina Math 3 course.
	**Choice Ready Framework (college, career, and military readiness)**	Percentage of students on track to graduate college, career, or military ready based on attainment of benchmarks for the respective particular pathway described below. *College-ready criteria:* ■ ACT composite score of 22 or higher ■ 2.8 GPA or higher ■ At least two additional indicators: AP course (*C* or higher), dual credit course (ELA/math, *C* or higher), algebra II (*C* or higher), AP exam (3 or higher), IB exam (4 or higher), 3.0 GPA or higher in the core course requirements for university admission *Career-ready criteria:* ■ 2.8 GPA or higher in a CTE pathway ■ Complete 2 credits in a coordinated plan of study ■ At least two additional indicators: work-based learning experience (75 hours), dual credit course (*C* or higher), WorkKeys (Gold or Silver), technical assessment/industry credential *Military-ready criteria:* ■ ASVAB score of 31 or higher ■ Quality citizenship (no expulsions or suspensions) ■ Physically fit as deemed by physical education instructor ■ At least two additional indicators: any two college- or career-ready indicators described above.
	Student engagement	Average level of student engagement across three domains—cognitive, behavior, and emotional—as determined by student survey results.

State	Measure	Definition
	General Equivalency Diploma (GED®) completion	Percentage of students completing a state GED before age 22.
	**Preparedness for success**	Percentage of high school graduates demonstrating college and career readiness based on: ■ Obtaining remediation-free scores on the ACT/SAT exams ■ Receiving an honors diploma ■ Receiving an industry-recognized credential ■ Earning dual enrollment credits ■ Earning AP/IB credits
	K–3 literacy	Percentage of students previously "off track" who improve to being at least "on track" based on statewide diagnostic and other literacy assessment.
	Gap closing (subgroup proficiency index for ELA, math, and graduation gaps)	Includes two measures: ■ Proficiency index, calculated for and combined across all subgroups (see "Academic Achievement" indicator [not a measure of gap between subgroups]) ■ Graduation gap closure (4-year graduation rate)
	**Chronic absenteeism**	Percentage of students absent for more than 10% of enrolled school days.
	Postsecondary opportunity	Percentage of students in high school who attain a participation and/or performance benchmark for any of the following activities: ■ AP/IB coursework ■ Dual/concurrent coursework ■ Work-based internship or apprenticeship ■ CTE programs leading to industry certification
	Scale score (science)	Raw score on annual statewide assessments (calculation to be determined).
	**Chronic absenteeism**	Percentage of students who are absent for 10% or more school days during the school year.
	Freshman on track	Percentage of first-time grade 9 students enrolled on the first day of school who complete at least 6 credits by the end of grade 9, or one-quarter of the district's required credits for graduation (whichever is higher).
	5-year high school completion rate	Percentage of eligible students who graduate in 5 years with a high school diploma or equivalent (GED, extended diploma, or adult high school diploma).
	**Chronic absenteeism**	Percentage of students absent for more than 10% of enrolled school days.
	Career readiness	For the respective grade span, percentage of students who attain any of the following benchmarks: ■ Demonstrate engagement in career awareness and preparation through a state or locally designed career exploration and preparation program/curriculum (grade 5) ■ Create an individualized career plan and participate in career preparation activities (grade 8) ■ Implement an individualized career plan through ongoing development of a career portfolio and participation in career preparation activities (grade 11)
	Student attendance rate	Average daily attendance rate ("present" means not missing more than two courses in a single day).

State	Measure	Definition
	**Teacher attendance rate**	Average percentage of days that teachers are present and teaching students in an assigned class (including sick leave and/or personal leave).
	Participation rate (SLA, math, English as a second language)	Percentage of students enrolled in tested grades who participate in statewide assessments in Spanish language arts, math, and English as a second language.
	**Exceeds expectations (ELA, math)**	Percentage of students scoring at the "exceeds expectations" performance level (level 4 out of 4) on annual statewide assessments.
	Chronic absenteeism (student and teacher)	Sum of the percentage of students absent for more than 10% of enrolled school days and the percentage of teachers absent for more than 10% of school days (not including approved professional development days and long-term, excused absences).
	Student suspensions	Percentage of students receiving an out-of-school suspension for a given school year.
	**Prepared for success (proficiency index for science and social studies combined)**	Weighted average performance level achieved across students on statewide assessments based on the following point values: ■ Level 1 (Not met): 0 points ■ Level 2 (Not met): 1 point ■ Level 3 (Met): 2 points ■ Level 4 (Exemplary): 3 points ■ Level 5 (Exemplary): 4 points Weighting between science and social studies varies by the number of participants for each assessment.
	College and career readiness	Percentage of high school students meeting various participation and/or performance benchmarks for any one of the following activities: ■ SAT/ACT exams ■ AP/IB exams ■ Dual credit coursework ■ ACT WorkKeys assessment ■ ASVAB performance ■ Apprenticeship program ■ CTE program
	Positive and effective learning environment	Results of student survey regarding perceived impact of school climate on student engagement.
	**Attendance (chronic absenteeism)**	Percentage of students attending 90% or more of enrolled school days, regardless of excuse.
	College and career ready index	Average number of college and career readiness participation and/or performance benchmarks met from the following: ■ Statewide assessments, college and career readiness level ■ ACT assessment ■ Completion of remediation courses ■ ACT National Career Readiness Certificate ■ CTE concentration or coursework ■ Dual credit coursework ■ AP exam or coursework

State	Measure	Definition
	High school completion	Percentage of eligible students obtaining a high school diploma or high school equivalency credential.
	**Proficiency (science)**	Percentage of students performing at proficiency or above ("on track" or "mastered") on statewide assessments. Schools with participation rates below 95% will automatically receive a grade of *F* on the proficiency measure.
	Chronically out of school	Percentage of students missing 10% or more of school days in a year, including out-of-school suspensions.
	Ready to graduate (college, career, or military readiness)	Graduation rate multiplied by the percentage of students meeting any one of the following benchmarks: ■ Scoring 21 or higher on the ACT/SAT or equivalent ■ Completing four early postsecondary opportunities (ESPOs) ■ Completing two ESPOs and earning industry certification (in approved CTE program of study, EPSOs may be general education OR included in CTE pathway) ■ Completing two ESPOs and scoring a state-determined designated score on the ASVAB EPSOs include AP/IB and dual credit/dual enrollment courses within the CTE curriculum as well as the general education curriculum. The inclusion of the military readiness option in the "Ready Graduate" indicator is contingent upon the availability of the Tennessee Department of Education to collect ASVAB Armed Forces Qualification Test performance data for all Tennessee students.
	**College and career readiness**	Percentage of high school graduates who demonstrate college, career, or military readiness by meeting participation and/or performance benchmarks in any of the following activities: ■ Texas Success Initiative benchmarks in reading or math ■ AP ("or similar") exams ■ Dual enrollment/early college/associate's degree while in high school ■ Military enlistment ■ Industry certification ■ Postsecondary certification programs ■ College preparatory course ■ Readiness for entry-level general education course for a baccalaureate or associate's degree without remediation
	Achievement at postsecondary readiness level (ELA, math)	Percentage of elementary/middle school students scoring at the performance level indicating postsecondary readiness (i.e., "Meets Grade Level") or higher on statewide assessments.
	Proficiency/student growth (science)	Percentage of students scoring at the performance level indicating grade-level proficiency or higher on annual statewide assessments.
	**Equitable educational opportunities**	For the lowest 25% of performers, a student growth percentile that ranks year-to-year change in annual statewide ELP assessment results for each participating student.
	Readiness coursework and ACT performance	Includes separate measures for readiness coursework and ACT performance that are combined. Readiness coursework is defined as the percentage of students who attain participation and/or performance benchmarks for any of the following activities: ■ AP/IB coursework ■ Concurrent coursework ■ CTE pathway

State	Measure	Definition
	**Chronic absenteeism**	Percentage of students absent for 10% or more of enrolled school days.
	**Achievement scale score (science)**	Average student scale score on annual statewide assessments. Vermont does not integrate participation rate into the achievement calculation.
	**Chronic absenteeism**	Percentage of students absent for 10% or more of enrolled school days, regardless of excuse.
	9th graders on track	Percentage of grade 9 students passing all courses attempted in the school year.
	Advanced course taking	Percentage of high school students who complete any of the following coursework: ■ AP/IB ■ Dual enrollment/early college ■ Tech Prep CTE program
	**Attendance (chronic absenteeism)**	Percentage of students attending at least 90% of enrolled school days.
	Behavior	Percentage of students with zero out-of-school suspensions during a given school year.
	**Chronic absenteeism**	Percentage of students absent for 10% or more of enrolled school days.
	**Equity**	Median SGP for performance on statewide assessment results for the lowest 25% of performers from the previous school year (ELA and math).
	College and career readiness	Percentage of students in grade 12 completing one of the following pathways: ■ College preparatory curriculum embedding a rigorous and well-rounded education and either readiness benchmark score on a college entrance exam or AP/IB/dual enrollment coursework ■ CTE curriculum and either passing a CTE exam or attaining industry certification ■ College prep or CTE curriculum and attaining military readiness score on the ASVAB

Appendix C. Measures of Postsecondary Readiness by State

The project team categorized each measure of postsecondary readiness identified in Appendix B by the measure categories discussed in section 1. The following table shows which states have measures of postsecondary readiness that fall in each measure category.

State	Measures of Postsecondary Readiness																
	AP®/IB® Course or Exam	Career Readiness Test	College Enrollment, Without Needing Remediation	College Enrollment, No Consideration for Remediation	College Entrance Exam	CTE Course or Program	Dual/Concurrent Course or Early College	GPA	Military Enlistment	Military Readiness Assessment	Rigorous Course Sequence (Not AP®/IB®)	College Placement Exam	Work-Based Learning Experience	Career Plans or Individual Learning Plans	FAFSA Completion	Seal of Biliteracy	Service Learning/ Community Service
Alabama	●	●			●	●	●		●								
Alaska		●			●			●									
Arizona	●	●			●	●	●			●	●	●	●		●		
Arkansas	●	●			●		●	●									●
California																	
Colorado																	
Connecticut	●			●	●	●	●						●				
District of Columbia	●																
Delaware	●				●	●	●			●			●			●	
Florida	●					●	●										
Georgia	●		●		●	●	●				●		●				
Hawaii																	
Idaho						●							●				
Illinois	●				●	●	●	●	●				●	●			●
Indiana	●					●	●										

Notes. AP®/IB® = Advanced Placement®/International Baccalaureate®. CTE = career and technical education. GPA = grade point average. FAFSA = Free Application for Federal Student Aid.

State	Measures of Postsecondary Readiness																
	AP®/IB® Course or Exam	Career Readiness Test	College Enrollment, Without Needing Remediation	College Enrollment, No Consideration for Remediation	College Entrance Exam	CTE Course or Program	Dual/Concurrent Course or Early College	GPA	Military Enlistment	Military Readiness Assessment	Rigorous Course Sequence (Not AP®/IB®)	College Placement Exam	Work-Based Learning Experience	Career Plans or Individual Learning Plans	FAFSA Completion	Seal of Biliteracy	Service Learning/ Community Service
Iowa																	
Kansas																	
Kentucky	●					●	●		●	●		●	●				
Louisiana	●	●			●	●	●										
Maine																	
Maryland	●				●	●	●			●			●			●	●
Massachusetts	●						●				●						
Michigan	●			●		●	●										
Minnesota																	
Mississippi	●				●	●	●										
Missouri																	
Montana	●				●	●	●										
Nebraska																	
Nevada					●									●			
New Hampshire	●	●			●	●	●			●	●						
New Jersey																	
New Mexico	●				●	●	●					●					
New York	●					●	●				●						
North Carolina		●			●						●						
North Dakota	●	●			●	●	●	●		●			●				

Notes. AP®/IB® = Advanced Placement®/International Baccalaureate®. CTE = career and technical education. GPA = grade point average. FAFSA = Free Application for Federal Student Aid.

State	Measures of Postsecondary Readiness																
	AP®/IB® Course or Exam	Career Readiness Test	College Enrollment, Without Needing Remediation	College Enrollment, No Consideration for Remediation	College Entrance Exam	CTE Course or Program	Dual/Concurrent Course or Early College	GPA	Military Enlistment	Military Readiness Assessment	Rigorous Course Sequence (Not AP®/IB®)	College Placement Exam	Work-Based Learning Experience	Career Plans or Individual Learning Plans	FAFSA Completion	Seal of Biliteracy	Service Learning/ Community Service
Ohio	●				●	●	●										
Oklahoma	●					●	●						●				
Oregon																	
Pennsylvania														●			
Puerto Rico																	
Rhode Island																	
South Carolina	●	●			●	●	●			●			●				
South Dakota	●	●			●	●	●										
Tennessee	●				●	●	●			●							
Texas	●					●	●		●								
Utah	●					●	●										
Vermont																	
Virginia																	
Washington	●					●	●										
West Virginia																	
Wisconsin																	
Wyoming	●				●	●				●	●						

Notes. AP®/IB® = Advanced Placement®/International Baccalaureate®. CTE = career and technical education. GPA = grade point average. FAFSA = Free Application for Federal Student Aid.

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