

A Review of State Indicators of College and Career Preparedness

Introduction

The purpose of this memorandum is to review states' practices for measuring college and career readiness. The memorandum begins by exploring how states have defined the constructs of "college and career readiness." Next, common and well-established measures such as college entrance exams and statewide assessments in English Language Arts (ELA) and mathematics are described. Then, some less-established academic indicators are discussed. Finally, the memorandum discusses other career or work readiness indicators, including non-academic and other innovative indicators, that states may be including in their suite of exams to tap into career or workplace skills.

The information included in this memorandum was obtained from (a) states' federal peer review submissions, (b) publicly available information on websites (e.g., state websites, research organization websites, test vendor websites, governmental organization websites), and (c) a review of current articles and scientific literature (e.g., EdWeek articles). Each listed indicator/assessment includes its own research base and documentation; it is beyond the scope of this memorandum to include all of that information. However, enough detail is provided to allow interested parties to discover more information about assessments of interest.

As this memorandum will illustrate, assessments specifically designed to address "career readiness," including non-cognitive, social-emotional learning, and career exploration, are not widely used by states. Some of the indicators described in herein may be used by a single state or may not be administered to all students or even to all schools/districts within a state. However, many states are in the midst of procuring new statewide assessment contracts and the landscape of assessment is ever-changing. Thus, there are likely additional indicators of preparedness for college and career that are not included in this memorandum. As such, this memorandum represents a preliminary effort to catalog some of the innovative ways that states are beginning to approach college and career preparedness.

Framing the Need to Address Readiness for College and Career

Preparing students for post-graduation opportunities has long been a priority for states, districts, schools, teachers, and parents. The current expansion of the global economy and ongoing labor market shifts has refocused attention on the readiness requirements for student success in an ever-changing post-secondary landscape. The current workforce demands employees who can fill jobs that require a combination of technical and academic skills (Carnevale, Smith, & Strohl, 2010). However, employers struggle to find such qualified workers (Organization for Economic Co-operation and Development, 2013). Educational institutions struggle with defining and measuring the knowledge, skills, abilities, and dispositions necessary for success in the current post-secondary world. These efforts are key to guiding educators' efforts to identify which students are on track to succeed as they graduate from high school.

Porter (2018) provided an overview of the current landscape of occupations in the United States and their requirements during a talk at the National Conference on Student Assessment (NCSA). He described ways that states have attempted to upgrade their tests to prioritize the most relevant knowledge and skills for students. The summary figure is reproduced below.

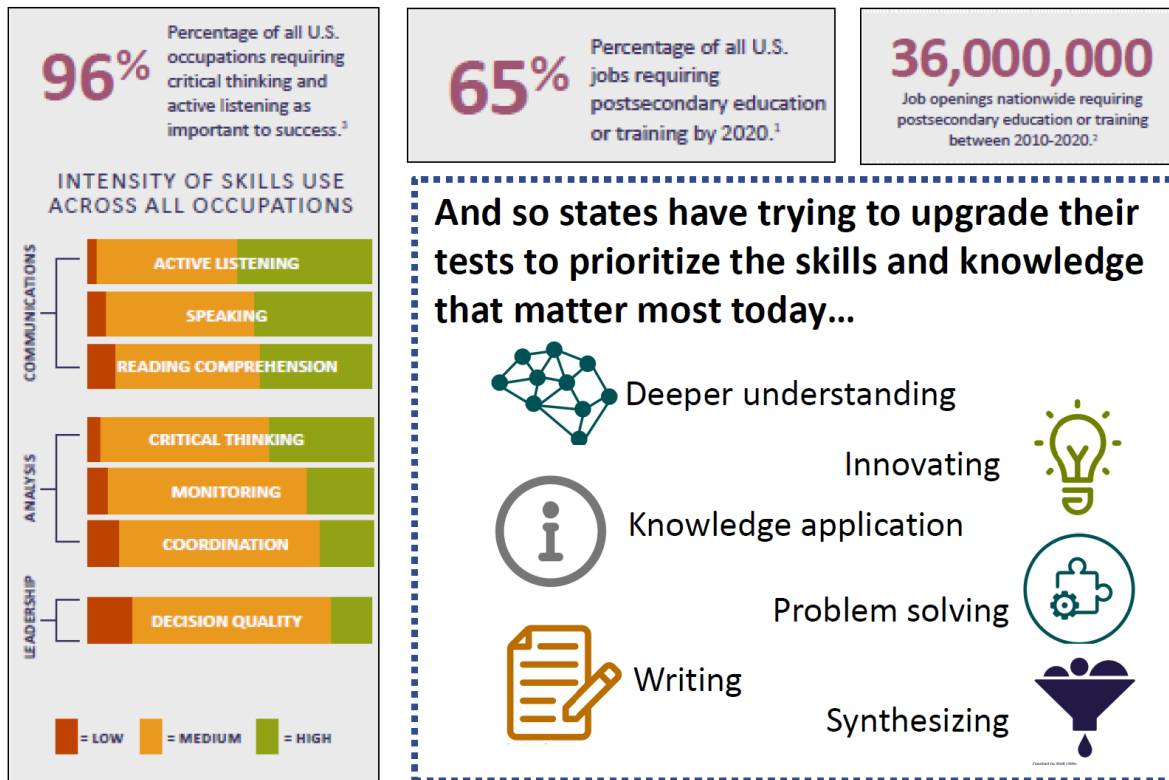


Figure 1. Occupational overview for the United States.

According to Mishkind (2014), 37 states defined college and career readiness as of 2014. For 33 of those, a single definition was used to describe both college and career readiness. The rationales for using a single definition tend to include views on the interconnectedness and similarities between visions of preparedness for college and preparedness for career. For example, the Oregon Investment Education Board⁴⁵ indicates that, “the overarching skills and strategies required for students of all ages entering colleges and careers are consistent.” New Hampshire, in their ESEA flexibility request⁴⁶, stated, “Evidence and experience indicate the knowledge and skills needed to succeed in college and career are greatly similar, and that all graduates will need some form of postsecondary education or training to succeed during their careers.”

The U.S. Department of Education (ED) currently indicates that “Nearly every state now has adopted college- and career-ready standards.” This quote refers to college and career readiness specifically in the subjects of mathematics and ELA. ED also describes the requirements for approval of state assessment and accountability systems under ESSA related to standards, indicating that “All states approved for ESSA flexibility have engaged in one of the following endeavors to raise expectations for students’ academic performance:

- Upgraded their existing standards to make them more rigorous by working with their four-year public universities to certify that mastery of standards ensures that students

⁴⁵ See <http://stand.org/oregon/OEIB>.

⁴⁶ See <https://www.education.nh.gov/accountability-system/documents/flexibility-waiver-request-renewal.pdf>.

will not need to take remedial coursework upon admission to a postsecondary institution in the system; or

- Adopted and implemented common standards developed by a consortium of states that build toward college and career readiness.⁴⁷

According to ED, as of May 31, 2018, 33 states (plus the District of Columbia) included a measure of college and/or career readiness in their ESSA plans.⁴⁸

In states where there are separate definitions, there is a tendency for considerable overlap in the definitions. For example, the Nebraska Department of Education defines a career ready person as follows, “A career ready person capitalizes on personal strengths, talents, education and experiences to bring value to the workplace and the community through his/her performance, skill, diligence, ethics, and responsible behavior.”⁴⁹ The Nebraska Career Readiness Standards indicate that when students are career ready, they are prepared for the next steps in their lives—whether that means getting their first job or beginning their college ‘career’ (which eventually leads to the workplace as well). Being career ready also means being ready for life.” Nebraska is one of an increasing number of states to also include career and technical education as part of their statewide accountability system. They provide programs outside of the regular school day for students to connect with resources to develop interests and skills for future success.

Mishkind (2014) identifies specific components of the states’ definitions of college and career ready and places them into the following six categories:

- Academic knowledge (e.g., English, mathematics, core subjects, preparation to take credit-bearing courses in related subjects)
- Critical thinking and/or problem solving (e.g., reasoning, problem solving, analysis, evaluation, presentation of ideas and information)
- Social and emotional learning, collaboration, and/or communication
- Grit/resilience/perseverance
- Citizenship and/or community involvement
- Other additional activities

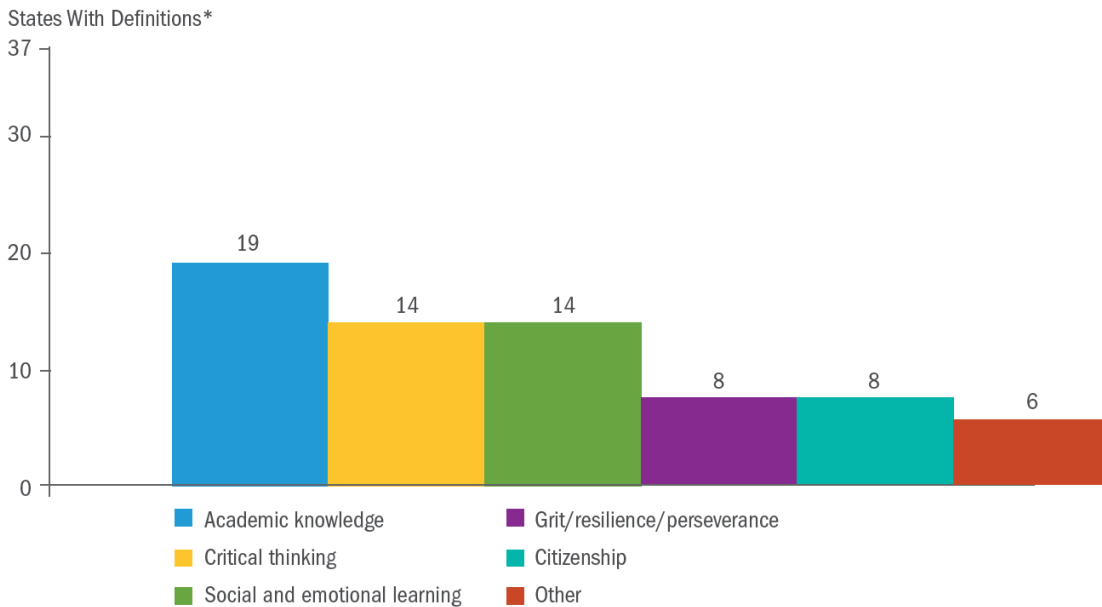
Distribution of these components among the 37 states identified by Mishkind (2014) is presented in Figure 2. Similar reports reflecting the state definitions under ESSA have not yet been published.

This memorandum treats “readiness” and “preparedness” synonymously, although states may make distinctions between them. Treatment of the terms is not consistent from state to state, with some referencing “readiness” only as a link to college placement tests’ established readiness benchmarks, while others treat readiness more generally. This memorandum is concerned with documenting the ways that states address readiness, so both terms were used in its preparation and no distinctions were made between them.

⁴⁷ See <https://www.ed.gov/k-12reforms/standards>.

⁴⁸ See <https://www.ecs.org/50-state-comparison-states-school-accountability-systems/>.

⁴⁹ Definition adopted in 2010, see <https://www.education.ne.gov/nce/careerreadinessstandards/>.



*Includes D.C.

Figure 2. Components of state definitions of “College and Career Ready”

Typical Measures of Readiness

While states are exploring expanded definitions of readiness, their federal peer review submissions indicate that, for the most part, academic or college readiness is the aspect that is measured. Academic readiness is typically measured by traditional assessments, and work or career readiness is considered either synonymous or is described as a set of traits or characteristics that extends beyond academic readiness. States assume academic readiness is a necessary component of preparation for both college and career. Most states do not include measures of non-academic readiness in their accountability systems.⁵⁰

1. State Accountability Tests

States are required under ESSA to test students in grades 3-8 and high school in ELA and mathematics. Some statewide assessments are administered on computers while others are administered via paper and pencil. These assessments are typically a mix of multiple-choice and short constructed response (students provide a brief written response) items. Some state tests also include multiple-select items (which are selected response items with potentially more than one correct answer), essay or extended constructed response items (longer writing pieces), or technology enhanced items (TEIs). TEIs must be computer administered and may include matching, drag-and-drop, ordering, or other tasks that are more readily performed in the computer administered environment.

⁵⁰ See <https://www2.ed.gov/admins/lead/account/stateplan17/statesubmission.html>, for a full description of states’ peer review submissions.

Most statewide summative assessments are based on the Common Core State Standards for (CCSS) ELA and mathematics. The figure below, from the Association for Supervision and Curriculum Development (ASCD),⁵¹ shows the state level adoption of the CCSS as of 2018. States highlighted in green are adopters, Minnesota, (highlighted in blue) adopted the ELA but not mathematics standards. States highlighted in gray did not adopt the CCSS. This graphic shows there is more agreement among states than not regarding what academic content students should learn in school, at least for ELA and mathematics.

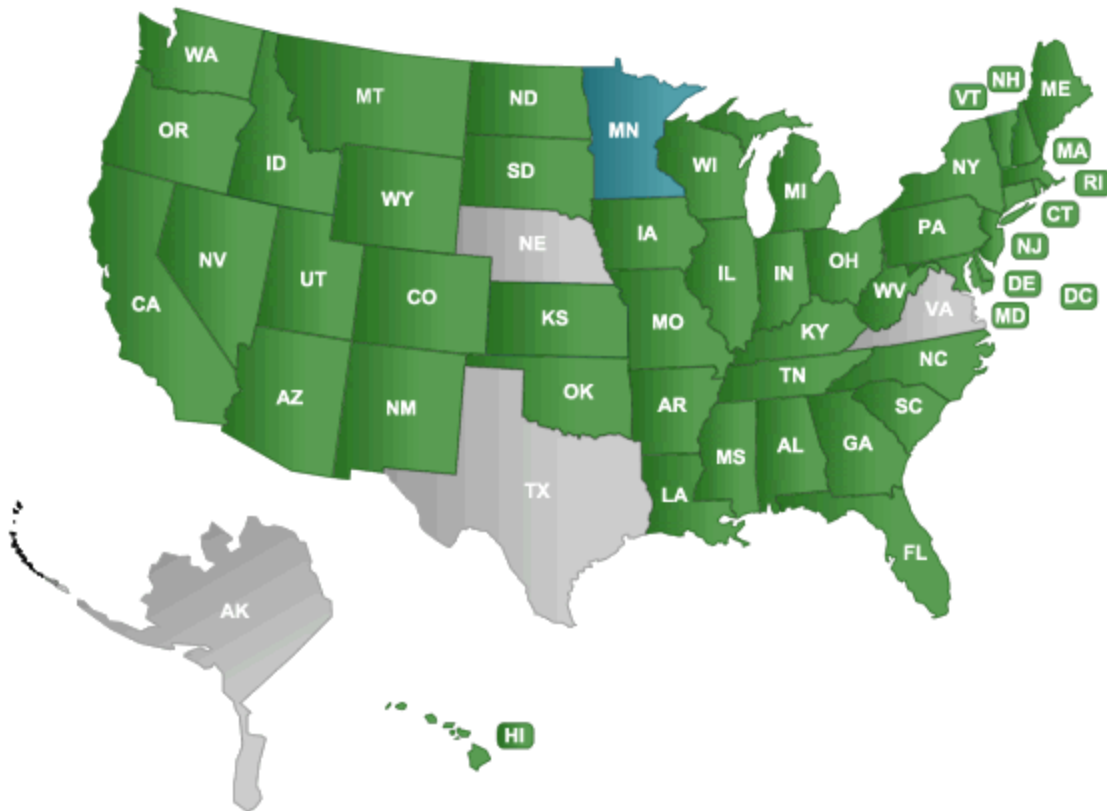


Figure 3. CCSS adoption, by state.

In addition to largely agreeing on tested content, states have been steadily moving toward asking students to perform more complex and challenging tasks on summative tests. The testing consortia, Smarter Balanced Assessment Consortium and the Partnership for Assessment of Readiness for College and Career (PARCC), require a great deal of strategic thinking (critical thinking, reasoning, and developing a plan) and even extended thinking (thinking to investigate a problem and synthesize information) in a substantial portion of their assessment items. Figure 4 compiles information on the level of complexity among several summative state tests (Porter, 2018). This research was compiled from studies conducted by HumRRO (Schultz, Wiley, Michaels, & Dvorak, 2016), the Thomas B. Fordham Institute (Doorey & Polikoff, 2016) and Rand (Faxon-Mills, Hamilton, Rudnick, & Stecher, 2014).

⁵¹ See <http://www.ascd.org/common-core-state-standards/common-core-state-standards-adoption-map.aspx>

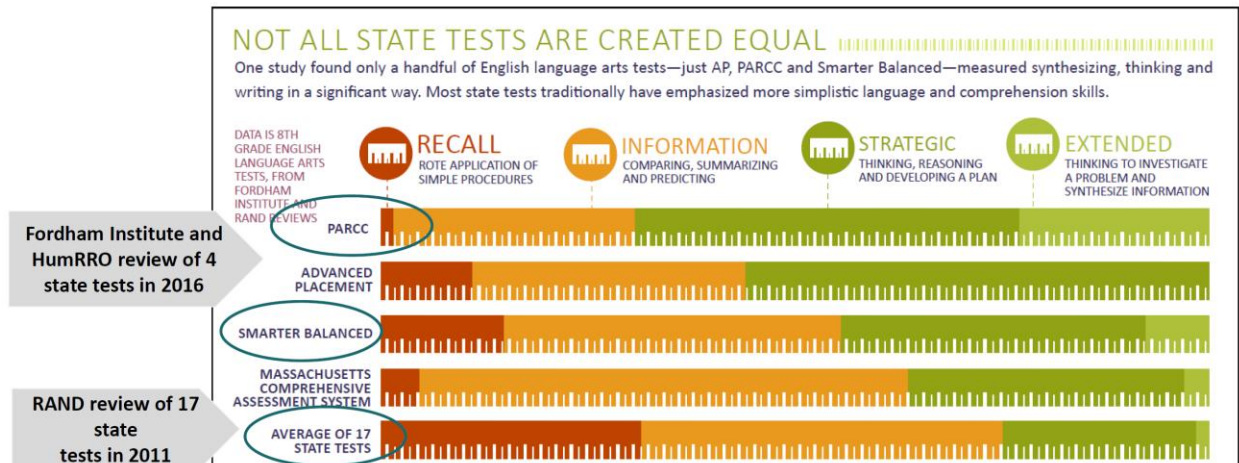


Figure 4. Cognitive complexity of state assessments.

States have adopted challenging content standards and state assessments have become increasingly more complex. However, comparability of students' scores across states remains challenging. Unless states use a common assessment with common proficiency definitions (such as those states in consortia), students' proficiency may depend on the state where they were tested. To address comparability, states participate in reading and mathematics testing on the National Assessment of Educational progress (NAEP).⁵² NAEP is a complex suite of assessments based on rigorous academic frameworks documents. NAEP tests do not report individual student scores, but report at the state level based on samples of students. The National Center for Education Statistics (NCES) produces maps between state and NAEP proficiency standards, allowing states to compare the rigor of their standards using a common assessment.⁵³ States often reference the NAEP Mathematics and Reading Frameworks and the NAEP proficiency standards when they design their own assessments.

2. High School GPA

Student academic performance is also tracked by grade point average (GPA), a simple transformation of the letter grades they receive for their courses. GPA is not typically tracked at the state level as part of accountability, but grades are commonly used as an indicator of college readiness and GPA is a required component on most college applications. Some states, notably Kentucky, use grades to determine supplemental funding provided to help students pay for college. The Kentucky Educational Excellence Scholarship (KEES) program rewards students who graduate with at least a 2.5 GPA, and the amount of money provided to students goes up if their GPA is higher.⁵⁴

The measure of GPA includes more than academic knowledge (Farrington, Roderick, Allensworth, Nagaoka, Keyes, Johnson, & Beechum, 2012). The requirements for achieving strong grades in classes also incorporates perseverance, compliance, and time management. Depending on the nature of their classes, students may also need to demonstrate their ability to

⁵² See <https://nces.ed.gov/nationsreportcard/>.

⁵³ See <https://nces.ed.gov/nationsreportcard/studies/statemapping/#>.

⁵⁴ See <https://www.kheaa.com/website/kheaa/kees?main=1>. Students can increase their KEES scholarships with high test scores as well (e.g. ACT, Advanced Placement, International Baccalaureate, Cambridge Advanced International).

collaborate with others, communicate their ideas, and even to construct products. Grades are more far-reaching than summative tests. However, grades are not standardized from teacher to teacher, school to school, or district to district, and they are not typically used by states in their accountability computations.

3. Course Requirements/Completion

States require that all students complete a certain number of courses in specific subjects prior to graduation. These required courses include ELA, mathematics, science, and social studies; however, they may also include arts, health, physical education, foreign language, or others. The Education Commission of the States (ECS) maintains a website that details all states course requirements for graduation.⁵⁵ In addition to state requirements, districts may add their own requirements for earning a high school diploma.

4. End-of-Course Assessments

States may use either summative tests for high school students administered in particular grades, or they may tie testing to the completion of courses, or both. When states choose to use end-of-course (EOC) exams, they are most often tied to English 10 or 11, and to either Algebra 1 or Algebra 2 courses. For example, PARCC created assessments for multiple English and mathematics courses for states, including subject-specific mathematics courses like Algebra and Geometry, as well as Integrated Mathematics. These types of tests limit the amount of content to be assessed to that addressed by a single course (as opposed to the full range of high school standards), but they assume all courses with a common name cover essentially the same content. States may require or encourage schools to use the assessment scores as part of student's grades, or as a course completion requirement. EOC assessments may be used for state accountability computations.

Even states who use EOC exams vary greatly on the number of EOC exams offered, the courses for which they are offered, and whether EOC exams are used for accountability. For example, a state may use an Algebra 2 EOC exam for high school accountability, but offer an Algebra 1 EOC exam that is not used. For states with science accountability in place for high school, this is further complicated by course taking patterns (science courses do not follow a particular sequence and students may not take certain science courses). Some states provide EOC exams for Biology for accountability, and require that all students take a biology course, while others require a more general science exam administered at a particular grade level. Others require the Biology EOC exam, but supplement it with other science content to address physical and earth/space sciences.

5. Graduation Exit Exams

The following thirteen states used high school graduation (or exit) exams as of 2017; Florida, Indiana, Louisiana, Maryland, Massachusetts, Mississippi, New Jersey, New Mexico, New York, Ohio, Texas, Virginia, and Washington⁵⁶. Exit exams require that students demonstrate some minimum level of academic competency, typically in ELA and mathematics, as a condition of graduating. Students who do not pass the exams do not receive a high school diploma. While not specifically designed to indicate college or career readiness, high school exit exams help certify to employers that graduates can be expected to have a minimum level of competency in

⁵⁵ See www.ecs.org

⁵⁶ See <https://www.fairtest.org/graduation-test-update-states-recently-eliminated>

the tested subjects. These types of exams are controversial for several reasons, including the argument that they may reduce graduation rates and increase dropout rates, and they may test content that is commonly found in middle school standards rather than in high school. Exit exams tend to focus on literacy and numeracy, rather than the more complex high school standards. The literature is mixed on these topics and too extensive to adequately review here. Arkansas, Arizona, Georgia, Idaho, Minnesota, Oklahoma, Rhode Island, and South Carolina had graduation exams, but they recently terminated the requirement for high school graduation. California, Nevada, and Pennsylvania currently have a moratorium on graduation tests.

6. College Entrance Exams

College entrance exams are another commonly used type of assessment of readiness for specific courses in colleges or universities. Common examples of entrance exams include College Board's Accuplacer⁵⁷ assessments, ACT's Engage⁵⁸ assessments (ACT previously promoted a placement test called Compass), and a multitude of college- and university-created placement tests. While not typically used statewide, these assessments provide indications for higher education of the likelihood that students will successfully complete specific courses. Results from these assessments may be used to place students into non-credit remedial courses at a college or university.

In the early years of its reporting as part of state accountability systems, college entrance exams were frequently used as an indicator of college and career readiness. For example, the Southern Regional Education Board (SREB) presented changes in average SAT composite scores as an indication of trends in college and career readiness (SREB, 2012). As the concept of readiness for college and career has become better articulated, it is clear college entrance exams may not be the most appropriate tool for measuring career readiness.

The ACT and SAT programs are very clear about their intended purposes. The ACT is designed to measure "academic readiness for college."⁵⁹ Similarly, the SAT measures what students "need to succeed in college."⁶⁰

Approximately half of states' accountability systems incorporate college entrance exams as an indicator of college and career readiness. Typically, student performance (e.g., meeting established benchmarks) is measured, but in a small number of states only rates of participation in these exams is reported. In no states are college entrance exams the sole indicator of college and career preparedness. Typically, these scores are reported along with several other indicators, such as performance in advanced coursework (e.g., AP or IB classes), as well as performance on WorkKeys®,⁶¹ earning credentials or certifications, and/or performance in career and technical education classes (American Institutes for Research, 2018).

College entrance exams have the benefit of large, well-established bodies of validity evidence, and as such may be viewed as a cost-effective resource for measuring postsecondary preparedness. However, one potential concern is the extent to which the content knowledge and skills measured by these exams aligns with the content standards adopted in accordance with state law. Most states have adopted standards that are closely related to the CCSS. ACT

⁵⁷ See <https://accuplacer.collegeboard.org/>

⁵⁸ See <http://www.act.org/content/act/en/products-and-services/act-engage-college.html>

⁵⁹ See <https://www.act.org/content/act/en/products-and-services/the-act.html>.

⁶⁰ See <https://collegereadiness.collegeboard.org/sat/inside-the-test>.

⁶¹ See <http://www.act.org/content/act/en/products-and-services/workkeys-for-educators.html>.

(2010) conducted an evaluation of the alignment between its College Readiness Standards and the CCSS and found substantial levels of alignment in terms of reading and mathematics, with weaker alignment in writing. Similarly, the College Board found strong alignment between the SAT and common core anchor standards in reading, writing, language, and mathematics (Vasavada, Carman, Hart, & Luisier, 2010). However, a recent study by Assessment Solutions Group found it would not be appropriate to allow school districts in Florida to opt to use the ACT or SAT in lieu of its state assessment (Roeber, Olson, & Topol, 2018). Currently, 25 states require all high school students to take the ACT or SAT, and 12 states use the ACT or SAT for accountability.⁶²

College entrance exams such as ACT and SAT identify cut scores, or benchmarks, to assist in defining and evaluating student progress toward, and achievement of, adequate levels of college preparedness. States may be required by law to identify benchmarks specific to their own state. For example, the Wisconsin Department of Public Instruction convened panels of educators and other stakeholders to evaluate ACT benchmarks and determine the appropriateness of identifying state-specific benchmarks (Wisconsin Department of Public Instruction, 2015).

Academic Readiness Measures Beyond ELA and Mathematics Achievement

Academic preparation for college and career involves more than preparation in ELA and mathematics. High school students take at least 20 courses in grades 9–12, and only eight of those courses are typically required to be English or mathematics courses.⁶³ Students also take courses in science and social studies. They may take classes in the arts, technical courses, foreign language courses, and others. The NCLB and ESSA helped create a focus on English and mathematics, but now states have largely adopted the Next Generation Science Standards (or similar state-specific, three-dimensional science standards) and many have also adopted social studies standards. Many states have begun to test these subjects as part of their accountability systems.

1. Science Assessments

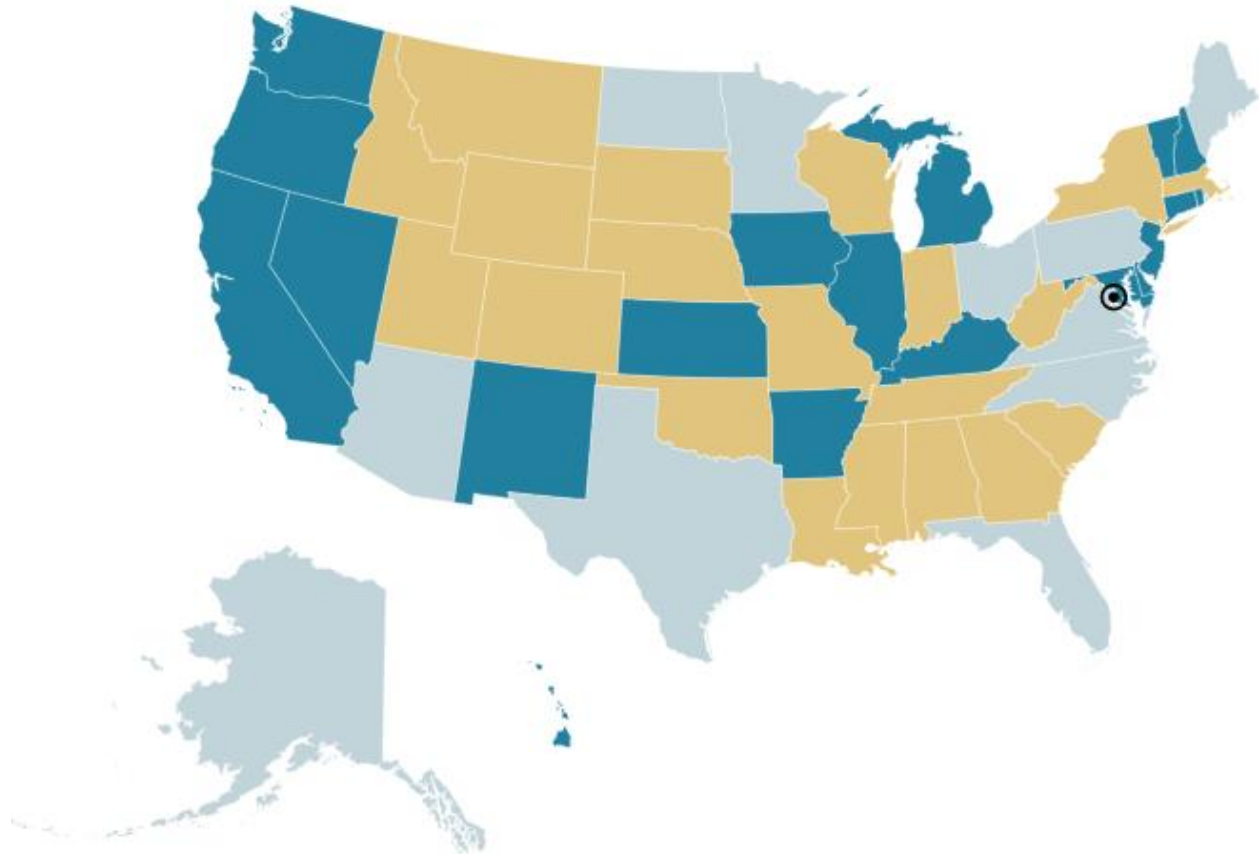
Nearly two-thirds of U.S. students live in states that have education standards influenced by the *Framework for K–12 Science Education*⁶⁴ and/or the *Next Generation Science Standards (NGSS)*⁶⁵. Figure 5 shows these states in blue and yellow (blue states have adopted NGSS, yellow adopted their own standards based on National Research Council [NRC] frameworks). Both documents promote a more complex phenomenon-based view of science and stress students' capacity to use their science knowledge in unfamiliar contexts. They address science and engineering principles, cross-cutting concepts, and content knowledge and expect those ideas to intersect for students through rich science instruction.

⁶² For a complete list of states requiring ACT or SAT see <https://www.edweek.org/ew/section/multimedia/what-tests-does-each-state-require.html>.

⁶³ See www.ecs.org

⁶⁴ See <https://www.nap.edu/read/13165/chapter/1>.

⁶⁵ See <https://www.nextgenscience.org/>.



- Nineteen states and the District of Columbia (representing over 36% of U.S. students) have adopted the Next Generation Science Standards (NGSS). The 19 states are Arkansas, California, Connecticut, Delaware, Hawaii, Illinois, Iowa, Kansas, Kentucky, Maryland, Michigan, Nevada, New Hampshire, New Jersey, New Mexico, Oregon, Rhode Island, Vermont and Washington.
- Twenty states (representing 29% of U.S. students) have developed their own standards based on recommendations in the NRC Framework for K-12 Science Education. The 20 states are Alabama, Colorado, Georgia, Idaho, Indiana, Louisiana, Massachusetts, Mississippi, Missouri, Montana, Nebraska, New York, Oklahoma, South Carolina, South Dakota, Tennessee, Utah, West Virginia, Wisconsin, and Wyoming.

Figure 5. State science standards summary.

Most states test science once in elementary school (usually at grade 4 or 5), once in middle school (usually in grade 7 or 8), and once in high school (usually in grade 11 or as an end-of-course biology assessment). Science assessments are only now catching up to the adopted science standards. Some states (e.g., Kentucky) have implemented highly complex phenomenon-based assessments for science (similar to scenario-based tasks used in NAEP). These assessments are similar to passage-based ELA assessments, where students are given a passage to read and then answer questions requiring them to interpret or interact with the passage. In science, students would be given a thorough description of some scientific phenomenon, which may include experimental results, data tables, graphs or charts, or other information referencing the problem the students are expected to help solve. Students demonstrate their understanding of science content by interacting with the phenomenon. Phenomenon-based assessments can take longer to develop, may be more expensive than more traditional tests, and may take longer for students to complete. States are struggling with

the structure of science assessments, how to ensure alignment to complex three-dimensional standards, and how best to report science scores for students, as well as for schools.

2. Social Studies Assessments

Historically, states have not adopted common social studies standards or tests of social studies. While there is a growing trend for states to adopt social studies standards (see above), assessments of social studies remain less common than ELA, mathematics, or science. Social studies assessments, when administered, are typically given at the same grade levels as science. The content of state-wide social studies tests is based on standards that vary considerably from state to state. Some states use EOC assessments of US History in high school, while others test social studies more broadly at specific grade levels.

The National Council for Social Studies (NCSS) has published social studies standards, but they have not been widely adopted by states or included as the basis for assessments in state accountability systems. The NCSS has identified five disciplines of social studies: history, geography, civics and government, economics, and psychology. Those disciplines address ten themes of social studies, including:

- Culture
- Time, continuity, and change
- People, places, and environments
- Individual development and identity
- Individuals, groups, and institutions
- Power, authority, and governance
- Production, distribution, and consumption
- Science, technology, and society
- Global connections
- Civic ideals and practices

Career or Work Readiness

There is growing acceptance of the notion that readiness for college and readiness for career are distinct but overlapping constructs. Patelis (2018) notes there are sets of skills at the intersection of career and college preparedness. Similarly, ACT has developed an integrated framework that defines the core academic skills for readiness from kindergarten through one's career.⁶⁶ The common thread here is that there are key academic components that are common to postsecondary readiness in general, whether a student opts to continue learning in a postsecondary educational setting or in a more applied, workplace-based setting.

⁶⁶ See <http://www.act.org/content/act/en/college-and-career-readiness.html>.

Career preparedness includes three major skills needed to perform work: (a) core academic skills; (b) employability skills; and (c) technical, job-specific skills (ACTE, 2010). *Academic skills* include foundational academic knowledge in mathematics, ELA, and science or technology, including the application of these skills, which were described in the prior section of this memo. *Employability skills* are skills that are critical to workplace success and include critical thinking, adaptability, problem solving, oral and written communication, collaboration and teamwork, creativity, responsibility, professionalism, ethics, and technology use. *Technical skills* represent job-specific knowledge and skills needed to enter a career.

Next, some indicators of career readiness that are being used or being considered by states and districts are presented. Because many states are currently exploring career readiness indicators, due at least in part to expanded flexibility in ESSA for using such measures, there is not clear documentation currently available on which districts within which states are using these indicators.

1. Assessments of Career or Work Readiness

The Center on Education Policy (2013) found via survey that 36 of 46 participating states assessed students on academic skills related to career readiness. Smaller numbers reported assessing students on technical skills (33 states) and employability skills (28 states). They found the tests most commonly used to assess employability skills and/or applied academic skills were the Armed Services Vocational Aptitude Battery (ASVAB) and WorkKeys® assessments. The ASVAB tests are designed to measure verbal, mathematics, science and technical, and spatial domains. WorkKeys® “measure foundational skills required for success in the workplace” via several assessments including applied mathematics, graphic literacy, workplace documents, applied technology, and business writing, among others.⁶⁷

A smaller number of states reported administering the National Occupational Competency Testing Institute (NOCTI) assessments. NOCTI offers a Workplace Readiness assessment to assess employability skills at the high school level, as well as tests of employability skills that are targeted toward middle school students.⁶⁸ Currently, 11 states use NOCTI in some capacity, but their use of the assessments is varied. Some require full census testing in high school, while others make the NOCTI assessments available for school or district use.

In fall 2017, the Center for Educational Testing and Evaluation (CETE) conducted its first operational administration of the Career Pathways Assessment System (cPass® assessments), which are designed to measure “both the knowledge and skills needed for specific career pathways.”⁶⁹ In addition to a general Career and Technical Education (CTE) assessment, cPass® offers assessments of Comprehensive Agriculture; Power, Structural, and Technical Systems; Animal Systems; Plant Systems; Horticulture; Manufacturing Production; Comprehensive Business; Finance; Accounting; and Drafting. Currently, Kansas and Colorado are members of the collaborative that oversees administration of the cPass®.

Still other states have developed their own career readiness assessments. For example, Kentucky developed the Kentucky Occupational Skills Standards Assessment (KOSSA), which

⁶⁷ See <https://www.act.org/content/act/en/products-and-services/workkeys-for-employers/assessments.html>.

⁶⁸ See <http://nocti.org/BlueprintCategoryLinks.cfm?category=Employability%20Skills>.

⁶⁹ See <https://careerpathways.us/>.

assesses a combination of academic, employability, and occupational skills specific to each of more than 30 career pathways.⁷⁰

2. Industry Certifications

Achieve, Inc. found substantial variability of states' approaches to incorporating industry certification into educational policy and processes (Muller & Beatty, 2009). Some states guide students along a CTE pathway, ensuring they complete the course requirements that will best prepare them for achieving certification within their preferred industry. Other states allow districts to develop approaches that meet their specific needs. Among the more innovative programs are the tiered diploma system developed in Florida that offers a credential-based graduation option and the "Core 40 with technical honors" diploma offered in Indiana.

3. Descriptors of Traits or Characteristics

While not written into statute or as part of the accountability computations, some states have published traits or characteristics of college and career ready students that go beyond academic expectations. These traits or characteristics may include citizenship, financial responsibility, goal setting, problem solving, and reasoning, among others. For example, in 2013, Michigan produced a list of *Characteristics of Career and College Ready Students*. Michigan's source documents include the Michigan Literary Standards, National Research Council (NRC) Science and Engineering Practices, Michigan Social Studies Grade Level Content Expectations (GLCE) and High School Content Expectations (HSCE), Michigan Mathematics Practices, Michigan Visual, Performing and Applied Arts (VAPAA) Guidelines, and Career and Technical Education (CTE) Career Ready Practices. Under each source document, Michigan then lists the specific characteristics gathered from each source, grouped into four main headings (a) Technology and Tools, (b) Argument and Reasoning, (c) Communication and Collaboration, and (d) Problem Solving.⁷¹ Other states have addressed attributes of readiness in similar ways (e.g., Kentucky, Nebraska). According to ED, six states plan to use an art access/participation, or well-rounded education measure, in their accountability systems.⁷² States' plans tend to focus on the school level, measuring access or participation rates, rather than on individual student's preparedness.

4. Social and Emotional Skills Assessment

Social and emotional skills assessment is a relatively new field for estimating students' academic preparedness. The ACT Tessera⁷³ is focused on the holistic growth of the "whole child." It measures students' social and emotional learning skills and provides data to help schools support goal setting and promote continuous improvement. ACT Tessera includes indicators of grit, teamwork, resilience, curiosity, leadership, and school climate. It uses a combination of self-report and forced choice and situational judgment test items to ensure accurate reporting and minimize student "faking." Reports are provided at the student and school levels, and both students and schools receive recommended resources and strategies to address areas requiring increased focus.

⁷⁰ See <https://education.ky.gov/CTE/kossa/Pages/default.aspx>

⁷¹ Downloaded July 3, 2018 from https://www.michigan.gov/documents/mde/Characteristics_of_Career_College_Ready_Students_v4.11.13_417952_7.pdf

⁷² See <https://www.ecs.org/50-state-comparison-states-school-accountability-systems/>

⁷³ See https://pages2.act.org/Tessera-Brochure-Learn-More.html#_ga=2.261599630.22546774.1532353457-1600368859.1524168013

5. Service Learning/Applied Experience

Service learning, for which students engage in projects or activities to improve their communities or address social problems where they can apply their learning, is increasingly reported as a requirement for high school graduation. To date, only Maryland and Washington D.C. have statewide service learning requirements; however, 19 other states allow districts to require service learning as a graduation requirement. A full description of service learning requirements for graduation by state can be found at the Education Commission for the States website (<http://ecs.force.com/mbdata/mbquest3RTE?Rep=SL1301>).

6. Interest or Suitability Inventories (Career Exploration)

Although they do not require interest or suitability inventories for career exploration, many states indicate these tools are available and they may provide links to them for interested students. Their use may also be promoted at the district or school levels. Some of these tools provide information at the classroom or school level, but the information provided varies greatly from one tool to the next. In addition, many colleges and universities encourage students to complete interest inventories or surveys prior to applying for admission or choosing a major. They may promote this activity through interaction with high school guidance officers or others with access to high school students nearing graduation.

When available, survey results are used to help students explore the fit between their interests or traits and potential future jobs or college major fields of study. These types of surveys have been used for a long time and there are a wide variety currently available to students. Some of the oldest are based on personality traits, with the personality traits matched to specific careers or job categories. Examples include the Myers-Briggs Type Indicator (MBTI) (Myers & McCaulley, 1985), Keirsey Temperament Sorter (1998), and Strong Interest Inventory (Donnay, 1997). These indicators of traits and their relation to jobs have been used for more than 50 years, with the Strong Interest Inventory used since 1927. The Five Factor Model (FFM) of personality traits is more commonly used today in business and industry, and it has been linked to academic performance indicated by grade-point-average (GPA) in high school and college (Poropat, 2009). These types of inventories assume the traits or interests are not (or are very minimally) mutable. They focus on using information about the students to match them with careers or job families that are best suited to their specific characteristics.

Below are some specific interest inventories/platforms that are currently in use.

6a. ASVAB Career Exploration Program (CEP)

A comprehensive career planning program, the ASVAB Career Exploration Program (CEP) is the only career planning resource available to high schools nationwide that offers high school students the opportunity to explore all paths to career satisfaction—education, work, training, military, and/or certification—because the ASVAB CEP assesses academic ability and career interests.⁷⁴ The ASVAB CEP first helps students identify skill strengths based on their ASVAB multiple-aptitude skills test results and then links those skill strengths with an interest inventory that highlights work-related interest areas where students are most likely to succeed. ASVAB's *Find Your Interests Inventory* is based on Holland's occupational codes: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC).⁷⁵ The Holland Codes refer to a theory of career choice based on personality type. Finally, students access a catalog of careers with

⁷⁴ See <https://www.asvabprogram.com/>

⁷⁵ See <https://www.hollandcodes.com/>

relevant occupational data and a full suite of future-oriented planning tools that help them develop an action plan to share with parents and educators.

Equipped with an understanding of their skills and interests, students can explore careers that coincide with their skill-interest profile and their aptitudes. Participation is voluntary. Students in grades 10–12 and college are encouraged to use the ASVAB CEP to identify their skill strengths and explore potential careers that require those skills.

Students gain access to career exploration tools after they receive their scores. Then, they can independently explore any careers that interest them, including those found in the military. The Department of Defense (DoD) sponsors ASVAB CEP with a two-part mission: to provide a career exploration service to U.S. youth and to provide qualified leads to military recruiters. Participants have no obligation to military service, but 11th–12th grade students who choose can use their scores to explore enlistment. ASVAB CEP is provided to students at no cost. Currently, 12 states use military testing or enlistment as an indicator for accountability in their ESSA plans. Kentucky, for example, provides students multiple options for demonstrating postsecondary readiness, including a military readiness route that includes ASVAB and military enlistment.

6b. Career Cruising

Career Cruising's (<https://public.careercruising.com/en/>) online interface engages students in exploring their interests and aspirations through interactive games starting in K–2, followed by career activities and assessments in later grades. Career Cruising connects the real world to the classroom with current career and labor market information, salaries, and educational pathways. With this resource, students can explore skills like financial literacy and goal-setting through video interviews, role-playing activities, and more. Using Career Cruising for K–12, students discover how their strengths and interests align with careers that inspire them, and build the academic plan to get them there. Career Cruising helps students understand how the schoolwork they do today impacts the life they live beyond graduation.

Career Cruising for K–12 starts by engaging elementary-aged students through a light-hearted yet informative career education program. There are two interactive game experiences, one for grades K–2 and one for grades 3–5. Students are introduced to many careers through animated characters and solve career-related mysteries as they progress through a fictional town, learning as they go. The experience results in students being more informed about different careers and gaining a basic understanding of academic and career planning, which sets the stage for them to transition to the full Career Cruising program as they move to middle and high school.

Students begin with comprehensive assessments to reveal their own strengths and interests. Then, from the database of hundreds of careers, a select list of careers is presented to the student matching his/her strengths and interests based on his/her answers. Students explore those career possibilities through multiple pathways, including interviews, job descriptions, salary expectations by region, and more. A data library gives students access to college and technical school details, including applications, tuition, enrollment, and more. Students can see which courses will best prepare them for their desired path. Customized for specific graduation requirements, course planning means that students pick their classes in alignment with their career and postsecondary goals. Students can record their goals, save preferred jobs, and track college applications in a digital portfolio. Students make their choices by test-driving career options to see how choices they make might impact their future. Financial literacy lessons help them understand the importance of financial planning and role-playing activities help pull together everything they learn.

6c. Additional Career Interest Inventories and Planning Tools

There are several other career interest inventories and career planning tools on the market that can and are being used by schools. A few examples include Kuder,⁷⁶ Naviance,⁷⁷ World of Work Inventory,⁷⁸ and ACT Engage.⁷⁹ Increasingly, career interest exploration begins as early as kindergarten and is typically provided in an online environment (see World of Work and Career Cruising).

Conclusions

Most states have adopted a definition of college and career readiness and require schools to test students using measures of readiness as part of their statewide testing programs. Definitions of readiness are typically encompassing and do not differentiate between college and career, although there is commonly a focus on academic preparation for college. Typically, states measure ELA and mathematics achievement and use those scores as the main indicators of readiness.

When states do address career paths specifically, they typically rely on WorkKeys® or narrowly defined industry credentials. Other aspects of career or work readiness, when they are addressed at all, are measured using participation rates or information about access at the school level. There is very little information generated at the student level specific to career readiness in most states.

States are increasingly demonstrating that they value social and emotional learning, but there are no widely used large-scale measures of non-cognitive skills. According to a panel of state education leaders who met at the Council of Chief State School Officers' National Conference on Student Assessment in 2018, these skills are viewed as essential for both college and career. Skills in communicating, collaborating, creative problem solving (individually or on teams), among others, were listed as essential tools for success in a multitude of careers. The panel also indicated that these skills are very difficult to define and measure.

States are making progress towards addressing college and career readiness, but to date, their efforts have been narrow and focused on academic preparation for college, and primarily on ELA and mathematics. States tend to treat career readiness as synonymous with college readiness. When states include career readiness in their accountability systems, they tend to use narrow indicators, or they only address non-cognitive skills at the school level. The construct of readiness encompasses more than academics, and despite some progress by the states, none have fully addressed college and career readiness in their assessments and accountability systems, and information about students' readiness remains incomplete.

⁷⁶ See <https://www.kuder.com/>

⁷⁷ See <https://www.naviance.com/>

⁷⁸ See <http://www.wowi.com/>

⁷⁹ See <http://www.act.org/content/act/en/products-and-services/act-engage-students-parents.html>