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Broadening the Definition of College and Career Readiness: A Holistic Approach

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Recent research shows that Americans value education (Newport & Busteed, 2013), and that education yields economic benefits for individuals (Carnevale, Rose, & Cheah, 2011; OECD, 2013a) and for the country as a whole (Hanushek & Woessmann, 2008; OECD, 2013a). The majority of new jobs created in the United States by the year 2018 are projected to require at least a college degree (Bureau of Labor Statistics, 2013; Carnevale, Smith, & Strohl, 2010), but the United States will produce far too few college graduates to fill these openings.

Even if the United States did produce a sufficient number of college graduates, other research strongly suggests that many would be unprepared for the world of work. Large international studies (e.g., OECD, 2013b) and survey research by Casner-Lotto and Barrington (2006) involving US employers demonstrates that a substantial percentage of US college graduates are not prepared to adequately perform in entry-level positions. Importantly, this general lack of readiness is evident even before individuals enter the workforce. The high remediation rates and relatively low graduation rates for college students suggest that many students do not graduate from high school ready for college (US Department of Education, 2013a, 2013b). Compounding these problems is the fact that about 20% of US students fail to even earn a high school diploma (*Education Week*, 2013). In summary, far too many US students lack college and career readiness (CCR).

Typically, discussion and standards surrounding CCR center on a student's standing on core academic skills such as mathematics and English language arts (ELA). The thesis of this report is that the readiness issue can be remedied in part by broadening this discussion in two ways. First, discussion around CCR can be broadened to include students' standing on cross-cutting capabilities and noncognitive skills, as evidence suggests that these skills are also crucially important for education and work success (see Section 3 of this report). Second, discussions of students' CCR should happen at much younger ages. Although a student's CCR level typically is not assessed until late in high school, research shows that college and career success can be predicted, and thus intervened upon, much earlier (e.g., Heckman, Humphries, & Kautz, 2014).

Current Definitions of CCR

Traditional indicators of core academic skills, such as high school grade point average (HSGPA), class rank, scores on the ACT college readiness assessment and the SAT, and the rigor of coursework, have typically been used to define CCR, even though the various definitions of CCR employ unique sets of indicators (ACT, 2004; Berkner & Chavez, 1997; Greene & Winters, 2005; Wiley, Wyatt, & Camara, 2010). Differences among the various definitions of CCR often lead to different conclusions about whether a student is ready for college and a career as well as vastly different implications about the readiness of US

students more generally. These definitions vary on many factors, such as the indicators included, the operational definition of college success (e.g., grades, grade point average [GPA]), and the model used for reporting CCR.

It is important to note that these conceptualizations of CCR do not address the areas for improvement proposed above. First, they are typically focused on students in the 11th grade, rather than earlier grades. Second, they focus solely on selected core academic knowledge and skills, without considering noncognitive skills or other cross-cutting cognitive capabilities. These conceptualizations represent missed opportunities as a growing body of research has now demonstrated that both cognitive and noncognitive skills are important to success in education and the workforce, as discussed in this report.

Multidimensional Model of CCR and Success

Although cognitive predictors tend to be most strongly related to work success (e.g., supervisor performance ratings), noncognitive predictors such as personality, career interests, and self-beliefs are also reliable predictors of performance in the workplace (Barrick & Mount, 1991; Judge & Bono, 2001; Nye, Su, Rounds, & Drasgow, 2012; Schmidt & Hunter, 1998). Likewise, although cognitive skills tend to be the best predictors of academic performance (e.g., GPA), noncognitive skills can also reliably predict academic performance (Poropat, 2009; Richardson, Abraham, & Bond, 2012). In fact, the personality trait conscientiousness was found in one study to predict college GPA as well as does cognitive ability (Poropat, 2009).

When performance and other work-related outcomes are defined more broadly, noncognitive skills take on added predictive validity. For example, on the job, several noncognitive skills are related to important aspects of performance such as helping coworkers and being cooperative. Relatedly, negative behaviors, such as lack of cooperation, deviant behavior, and withholding effort, also offer predictive validity (Berry, Ones, & Sackett, 2007; Borman, Penner, Allen, & Motowidlo, 2001). Noncognitive skills predict important outcomes as well, such as job satisfaction and the intention to quit (Kristof-Brown, Zimmerman, & Johnson, 2005; Zimmerman, 2008). Relatedly, both cognitive and noncognitive skills predict college retention (Radunzel & Noble, 2012; Robbins, Lauver, Le, Davis, Langley, & Carlstrom, 2004).

Once again, it is important to note that many of these outcomes can be predicted at earlier ages than what is the typical focus of current practices, and this is true when considering both cognitive and noncognitive skills (Judge, Higgins, Thoresen, & Barrick, 1999). The relative lack of attention paid to noncognitive skills as compared to cognitive skills is somewhat surprising given their clear predictive value. The following information considers several possible barriers to using a more holistic approach to CCR.

Barriers to a Holistic Approach to CCR

There are several possible reasons that noncognitive skills have received little attention in education and have been excluded from the national discourse on CCR; two will be discussed here. First, although some standardized assessments of noncognitive skills are available nationally (e.g., the ACT Interest Inventory, the Learning and Study Strategies Inventory [LASSI], ETS SuccessNavigator), they are used primarily for guidance and self-diagnostic, rather than decision-making, purposes. A second important reason these measures have not been widely adopted is that they are relatively

"fakeable" and coachable. That is, the "right" answer is often easily detected by the examinee (for example, agreeing to an item that states, "I work hard"), and thus examinees can claim to perform behaviors that they typically do not perform. Several possible solutions to the faking problem have been developed and are undergoing testing. As such, there is some hope that problems associated with using measures of noncognitive skills will soon be resolved.

Moving Toward a More Holistic Approach to CCR Across the K–Career Continuum

Moving forward, the ACT goal in establishing a holistic approach to CCR is to better assist students and adults in identifying and navigating potential barriers at key transition points throughout the K–Career continuum. ACT is developing an expanded framework that has been empirically tested and includes knowledge and skills related to success in education and in the workplace. This expanded framework includes skills in at least four domains:

- Core academic skills in mathematics, science, and English language arts (ELA) based on an expanded definition of the skills and mapped to learning progressions from kindergarten through career (K–Career).
- Cross-cutting capabilities such as critical thinking and collaborative problem solving, and information and technology skills.
- Behavioral skills related to success in education and the workforce, such as dependability, working effectively with others, adapting, and managing stress.
- Education and career skills needed to successfully navigate educational and career paths, including self-knowledge of abilities, likes and dislikes, values, etc., knowledge about majors and occupations, and a variety of skills related to educational and career exploration, planning, and decision making.

Each of these skills will be clearly articulated at important transition points throughout the K–Career continuum. The ultimate goal in developing a more holistic view of CCR is to provide individuals with feedback that is more personalized and developmentally appropriate and to offer insights in the form of actionable information, empowering students to reach their full potential.

Introduction

A hallmark of the US education system is the opportunity afforded to students to pursue education and career paths of their own choosing. This flexibility and autonomy, however, has drawbacks. Students must navigate a series of complex and often disconnected environments, as well as numerous decision points, before they attain a fulfilling career. At every transition between K–12, postsecondary, and the workforce, obstacles can delay, and also derail, a student's ability to achieve success. Some students fail to graduate from high school. Many more graduate but are ill-prepared for the next phase. To gauge whether students are on track for college and work, nationally, the focus has been almost exclusively on core academic skills in mathematics, English language arts (ELA), and sometimes science, as the determinants of College and Career Readiness (CCR). However, deficiencies in other areas are just as likely to interfere with success. These other areas include cross-cutting capabilities, which are cognitive skills that can be applied to several academic areas. These include skills such as critical thinking, self-directed learning (study skills), and skills needed to acquire and apply information using technology. "Noncognitive" skills are also important for success, such as behaviors, attitudes, and education and career planning skills. Proficiency in these areas, in combination with core academic skills, can increase a student's chance to reach his or her full potential.

Standards-based education reform was intended in part to address the large number of students graduating from high school ill-prepared for college and work. The Common Core State Standards (CCSS) are designed to help align K–12 education with the demands of college-level work in ELA and mathematics (2012). The Next Generation Science Standards (NGSS) intend the same for science (2013). Many other standards have preceded these efforts, beginning with the CCR Standards first released by ACT in 1997 (ACT, 2007), Standards for Success (Conley, 2003), and the American Diploma Project (2004). With a robust offering of standards available, the question remains as to whether these existing standards adequately cover the knowledge and skills students need to be ready for college and work. These standards address the core academic skills required to transition from high school to college and work, but they do not address all of the obstacles and challenges that students may encounter as they navigate through the education system and into their careers. If we want to prepare students to succeed in their educational and career pursuits, we must pay equal attention to the full spectrum of knowledge and skills proven to be essential for success, including those that lie beyond the core academic domains.

The purpose of this paper is to demonstrate that while core academic skills are necessary, they are not sufficient for academic and workplace success, and that a holistic approach to CCR is needed. The paper is divided into five sections. Section 1 summarizes the current evidence on both the importance of having a well-educated nation and the reality that the current educational system is leaving a large percentage of students unprepared for college and work. Potential solutions to better foster CCR are proposed. Section 2 describes previous attempts to operationalize CCR and their limitations, notably the narrow focus on core academic skills. Section 3 includes a review of the existing empirical evidence on the predictors of educational and workplace success, and clearly indicates that success in education and at work is a function of a wide range of cognitive and noncognitive skills. Section 4 addresses some of the barriers that have impeded the inclusion of noncognitive skills in definitions, assessments, and reporting of CCR. In Section 5, ACT's move toward a more holistic approach to CCR is described.

Section 1

The Importance of Education

A recent poll conducted by the Gallup organization found that the overwhelming majority of Americans believe a college education is important in today's society (Newport & Busteed, 2013). Only 6% of Americans said a college education was "not too important." A full 70% said it was "very important," a figure that was below 40% in 1979. The clear connection between furthering one's education and attaining a fulfilling career may explain these results, as another Gallup poll found that 96% of Americans think education beyond high school is either "somewhat" or "very important" for landing a good job (Gallup, 2013). These survey findings mirror actual employment trends. In 2007, 89% of all jobs in the United States required a high school diploma or higher, and 51% required post–high school training (Carnevale, Smith, & Strohl, 2010). These requirements have steadily increased in importance since at least 1973, when only about two-thirds of all jobs in the United States required a high school diploma or higher.

Supporting these findings, a recent study of adult skills by the Organisation for Economic Co-operation and Development (OECD, 2013a) found that literacy, numeracy, and problem-solving skills are linked to positive work outcomes, such as employment and earnings. For workers in the United States, the study revealed about a 12% increase in an individual's wages for every standard deviation increase in skills. In a similar vein, individuals who attain a higher level of education tend to earn more over their lifetime (Carnevale, Rose, & Cheah, 2011). Over the course of a 40-year career, those with just a high school diploma earn on average $1 million less (in 2009 dollars) than those with a bachelor's degree and nearly $2 million less (also in 2009 dollars) than those with a graduate degree (Carnevale et al., 2011).

Education yields an economic return not only for the individual but also for the country as a whole (Hanushek & Woessmann, 2008; OECD, 2013a). Hanushek and Woessmann (2008) looked at the 40-year growth rate of gross domestic product (GDP) in 50 countries as it related to the average years of schooling in each country. They found that each additional year of schooling increased the average GDP growth rate by about 0.37%. When replicating the above analyses with average test score performance by country, these researchers found a 1% improvement in GDP growth for every half standard deviation increase in international student achievement test scores. Note that in the realm of economic growth, 1% is a very large number; GDP growth in the United States is currently hovering around 2.3%. Taken together, these results clearly support the strategic value of ensuring that each citizen receives an education that enables participation in the emerging economy. Two problems with providing high-quality education are described as follows: (1) the current education system is not producing enough college-educated workers to drive growth in the economy, and (2) many graduates of the current US educational system are not adequately prepared—they do not have the necessary skills—to succeed.

Failing to Achieve CCR

Shortages of skilled workers. The United States is currently experiencing a "skills gap" and will continue to do so for the foreseeable future (Carnevale et al, 2010). Specifically, the US economy will create 46.8 million new jobs by 2018, of which 63% will require a college degree or other postsecondary credential. With only 41% of adults currently having a college degree, a shortfall of

workers with an associate's degree or higher of about three million is projected. Similarly, from 2012 to 2022, the occupations that require a master's degree for entry are expected to experience the greatest expansion; whereas occupations that require a high school diploma or less will have the least job growth (Bureau of Labor Statistics, 2013).

Given the projected shortage of skilled workers, many of those jobs may need to be filled by college graduates from other countries. For example, a recent report by the Information Technology Industry Council found that in science, technology, engineering, and mathematics (STEM) occupations, nearly half of all workers in the United States holding a graduate degree were born outside the country (2012). Although the United States was once the clear world leader in terms of the percent of its citizenry obtaining college degrees, this is no longer the case. In 2008, the United States was third (behind Canada and Japan) in the percent of 25- to 64-year-olds obtaining at least an associate's degree (Carnevale & Rose, 2010). A closer inspection of the 25- to 34-year-old age group reveals that the United States is falling even further behind the rest of the world. Just 42% of US citizens in this age group have a college degree, ranking the United States tenth behind South Korea, Canada, Japan, New Zealand, Norway, Ireland, Denmark, Belgium, and Australia. By comparison, South Korea, Canada, and Japan all have at least a 55% degree attainment rate.

College graduates unprepared for the workforce. Simply increasing college completion rates will not totally resolve the skills gap. Many US students who are graduating from college lack the skills necessary to be successful on the job. Results of the OECD study showed that "[b]y international standards, despite a relatively high level of educational qualifications, the basic skills of adults in the United States are relatively weak. Unlike many other countries, there has been little sign of improvement in recent decades. The skills of young people are little different from those of their parents" (OECD, 2013b, p. 3).

Likewise, survey findings indicate that employers believe a large percentage of their newly hired college-educated employees lack skills for entry-level jobs. A 2006 survey[1] of 431 employers from across the United States found that a third of employers rated college-educated entry level employees as "deficient" in their preparation. Another survey found that 60% of 302 employers surveyed believe that two-year colleges and universities could use at least some improvement in preparing students for the workforce, and even more responded that four-year colleges and universities could use at least some improvement (Hart Research Associates, 2010). Additionally, a 2011 survey of 2,000 US companies found that two-thirds of companies reported difficulties finding qualified people to fill some of their open positions (Manyika et al., 2011). In 30% of these companies, several positions had remained unfilled for at least six months. Similarly, a survey of 1,123 executives in the manufacturing industry across all 50 states found that 55% were experiencing a moderate shortage of qualified workers in their industry, and an additional 12% were experiencing a serious shortage (Deloitte and the Manufacturing Institute, 2011).

A recent ACT report on the state of work readiness in the United States resonates with these findings, concluding that, "[a] higher level of education does not always guarantee work readiness" (ACT, 2013, p. 4). The report summarizes research showing that similar core academic skills are required for college and work, but clearly different levels of skill in these areas may be required across different occupations. In addition, the report concludes that noncognitive skills (e.g.,

[1] The survey was conducted by the Conference Board, Corporate Voices for Working Families, the Partnership for 21st Century Skills, and the Society for Human Resource Management.

teamwork) and cross-cutting capabilities (e.g., applied technology) are related to success at work. One implication of these findings is that many individuals who attain a college degree still may lack proficiency in skills required to succeed at work. In the absence of an increased effort to align the skills and capabilities taught in school with the skills and capabilities needed to be ready for work, a great percentage of the workforce will continue to be unprepared for work even if college completion rates increase.

High school graduates unprepared for college. One reason so many students are graduating from college ill-prepared for the workforce is that they are entering college with significant skill deficiencies—a point at which it may be too late to remedy deficiencies and to get them back on track. Specifically, national statistics indicate that even though college enrollment has been steadily increasing since the 1950s,[2] a substantial proportion of enrollees never earn a college degree (US Department of Education, 2013a). Of students who enrolled for the first time at a four-year degree granting institution in 2005, only 59% had graduated six years later. The outlook is even bleaker for institutions with open admission policies, with only 31% of students graduating within six years. A similar story can be told for two-year degree granting institutions.

Higher education presents a broader range of choices and potential pitfalls than high school and, as such, there are myriad reasons why a student may not make it through to degree attainment. One particularly pervasive reason, however, is that many students are simply not academically ready to meet the demands of a college education. This is clearly demonstrated by the fact that about 20% of first-year undergraduate students in the 2007–2008 school year took remedial[3] courses; the rate is even higher at two-year institutions (US Department of Education, 2013b). This high remediation rate is a signal that the US K–12 education system is graduating many students who are not college ready (ACT, 2004).

Corroborating the statistics on remedial course enrollment, findings from a survey of professors also indicate that high school graduates are not adequately prepared for college. Only 26% of college instructors said the students they teach are "Well" or "Very Well" prepared for college-level work in the area they teach, and only 16% said that local K–12 alignment efforts were "Very Effective" (ACT, 2013b). In fact, one-third of these instructors said they were unaware of any such efforts to improve the alignment between K–12 and college.

Research has also shown that many noncognitive variables, such as motivation, interest, self-efficacy, and goals, are related to persistence in higher education (Allen & Robbins, 2010; Nye, Su, Rounds, & Drasgow, 2012; Robbins et al., 2004; Schmitt, Keeney, Oswald et al., 2009). Clearly, many high school graduates are not prepared for college. Perhaps more troubling is the fact that many students do not even advance that far in their educational career, failing to even finish high school.

High school dropouts. Though high school graduation rates have been increasing, one out of every five students still fails to earn a high school diploma (Education Week, 2014). Moreover, graduation rates in the United States tend to vary by region with the Midwest and the East Coast generally having higher graduation rates and areas such as the Southeast having lower graduation rates

[2] According to the National Center for Education Statistics (NCES), enrollment in degree-granting institutions increased by 11% from 1991 to 2001, and another 32% between 2001 and 2011 (US Department of Education, 2013). This increase is happening for all age groups, for both males and females, as well as for underrepresented minority students.

[3] Remedial (sometimes called developmental) education consists of "courses in reading, writing, and mathematics for college students lacking those skills necessary to perform college-level work at the level required by the institution" (Parsad, Lewis, & Greene, 2003, p. 1). The goal of these courses is to prepare students to earn a degree by eliminating their academic deficiencies.

(US Department of Education, 2013a). About 15% of high schools within the United States have annual graduation rates of less than 50% (Balfanz & Letgers, 2004). A large portion of US minority students drop out of high schools often labeled "dropout factories," and a high proportion of students attending these schools live in poverty. In fact, poverty is one of the strongest predictors of high school departure (Balfanz & Letgers, 2004). Even though current statistics indicate that high school graduation rates are at their highest since the 1970s, roughly a million students are still dropping out of high school each year (*Education Week*, 2013).

Effectively Fostering CCR

The data clearly indicate that at every point along the K–Career continuum, students are falling off the track to being ready for college and work. This next section describes two ways to help more students stay on track and ultimately achieve success in school and at work. First, students should be provided with feedback that highlights their strengths along with areas for development along a broader spectrum of skills; a sole focus on core academic skills presents an incomplete picture of a student's CCR. Such feedback can be diagnostic and developmental. Second, students should be given such feedback early and often. Clearly, waiting until high school to provide such feedback is often too late to effectively remedy most skill deficiencies because many students fall off track much earlier in their academic career. "Catching up" is challenging, particularly for at-risk students (Dougherty, 2014).

Broadening the definition of CCR. Standards that have been developed to help educators identify skills that students need to improve have generally focused narrowly on mathematics and ELA, in large part because these core academic domains are viewed as more easily attributed to schools and specific teachers and thus more amenable to accountability. Differentiated course taking occurs in other academic domains (e.g., foreign language, humanities, science, arts), which translates to a much more complex accountability model for high schools. Also, cross-cutting capabilities, such as critical thinking, collaborative problem solving, information and technology skills, and noncognitive skills, such as behaviors, planning, goal setting, and self-knowledge, are not uniquely associated with a specific course and cannot be easily attributed to teacher performance or school effectiveness. Such skills may be as essential to long-term success, but they have been largely neglected because current models of CCR appear oriented primarily to holding teachers and schools accountable, rather than focused on student development.

Data from workforce surveys signal that a broader definition of CCR is needed if the goal is to adequately prepare students for work. For example, in one survey of 431 US employers, skills not traditionally considered core academic skills were more frequently rated as "very important" than were core academic skills (Casner-Lotto & Barrington, 2006). Specifically, oral communication, teamwork, work ethic, and critical thinking were all more frequently listed as "very important" than were knowledge of writing in English, the English language, mathematics, and science.

Similarly, 52% of executives identified their employees' inadequate problem-solving skills as a serious skills deficiency; 40% identified inadequate basic employability skills, including work ethic; whereas only 30% cited inadequate mathematics skills (Deloitte and the Manufacturing Institute, 2011). Finally, in yet another survey, an overwhelming majority of employers indicated that colleges should place more emphasis on written and oral communication (89%), critical thinking (81%), complex problem solving (75%), ethical decision making (75%), teamwork (71%), and innovation and creativity (70%) (Hart Research Associates, 2010).

In general, the results from these surveys indicate that employers are less concerned with the core academic preparation of graduates than they are with the cross-cutting capabilities and noncognitive skills. The perceived importance of such skills has led to the current "21st Century Skills" movement, in which several organizations have created skills frameworks that emphasize this broader array of important skills, such as the growing importance of applied skills related to use of information and communication technology in our society (Binkley et al., 2012; Partnership for 21st Century Skills, 2014). In addition, recognition of the importance of developing skills in students so that they can successfully navigate their education and career pathways has also resulted in development of standards for that purpose (American School Counselor Association, 2004; National Career Development Association, 2009).

Earlier feedback. Another mechanism through which CCR can be more effectively fostered is earlier feedback. Early conceptions of CCR focused exclusively on students who had completed high school, but there is increased recognition that students can benefit from feedback given much earlier that will signal whether they are on track to CCR. Research shows that students who are off-track can be identified at much earlier points in time, both in core academic domains as well as broader skills and behaviors (Allensworth, 2005; Neild & Balfanz, 2006; Heckman et al., 2014). Several large-scale longitudinal studies[4] of children indicate that warning signs for students at risk for dropping out of high school can be seen in early childhood. For instance, at ages two, 12, and 14, eventual high school dropouts were much more likely than high school graduates to have parents who were divorced or separated (Heckman et al., 2014). Additionally, as early as one year of age, eventual dropouts experienced less parental investment—material (e.g., access to books), cognitive (e.g., being read to), and emotional (e.g., being disciplined)—than was experienced by eventual high school graduates beginning at one year of age. A study of eighth- and ninth-grade students in Philadelphia public schools found that dropping out of high school could be predicted accurately by factors such as poor attendance rates, failing to earn a sufficient number of course credits, and being held back in earlier grades (Neild & Balfanz, 2006).

In a 2008 research report, ACT demonstrated that CCR can be predicted based on cognitive skills as early as eighth grade. Based on students graduating from high school in 2005 and 2006, eighth grade ACT Explore®[5] scores were a strong predictor of CCR in 11th and 12th grade. The report concludes that, "…increasing eighth-grade students' academic achievement by Grade 8 and helping them get on target for college and career readiness would result in greater improvement in college and career readiness than their simply taking additional standard courses or advanced/honors courses in high school or earning higher grades in high school" (p. 36). Collectively, this research not only demonstrates that students who may be at risk or off-track for CCR can be identified very early in school, it also suggests that opportunities exist to intervene and ensure students develop the range of skills necessary for CCR prior to high school.

In sum, in order to adequately prepare students to succeed in today's workplace, definitions of CCR will need to encompass a broader range of knowledge and skills. While it is arguably easier to focus on core academic domains, which are more directly attributed to school and/or teacher effectiveness and can be assessed using traditional measures, the wider range of knowledge, skills, and behaviors

[4] Children of the National Longitudinal Survey of Youth 1979, the National Longitudinal Survey of Youth 1979 and 1997, and the National Education Longitudinal Survey.

[5] ACT Explore contains four curriculum-based assessments: English, Mathematics, Reading, and Science. ACT Explore is based on the major areas of high school and postsecondary instructional programs and measures the skills and knowledge needed for college success.

that have been empirically linked to success both in college and the workplace must be considered in order to more effectively foster the readiness of individual students. To gauge whether students are on track to achieve CCR, a comprehensive framework should be created that describes in detail the full range of skills necessary for success, offering individuals clarity about what they need to know and be able to do at key transition points along the K–Career continuum. Before expanding on the knowledge, skills, and behaviors necessary for success in school and at work, a brief review of how CCR has been defined is discussed as follows in Section 2.

Section 2

Definitions of College and Career Readiness

Efforts to assess and track the CCR of US students have extended beyond learning what proportion of students has earned high school diplomas. Various definitions of CCR have been proposed; each is unique though all share the common goal of evaluating whether students are graduating from high school prepared for college and work. Some approaches to defining and measuring CCR have employed rational methods whereas others have developed empirically based benchmarks. A brief summary of these efforts follows.

In an early example, NCES developed a college qualification index that defined five levels of readiness based on the distribution of HSGPA, class rank, National Educational Longitudinal Study (NELS) scores, ACT/SAT scores, and academic coursework among four-year college students (Berkner & Chavez, 1997). The five levels—very highly qualified, highly qualified, somewhat qualified, minimally qualified, and marginally or not qualified—corresponded to the performance of students in four-year colleges scoring in the top 10%, 25%, 50%, and 75%, and the bottom 25% of each of these measures, respectively.[6] Students only had to achieve one of the criteria (e.g., HSGPA ≥ 3.7) to be classified into the relevant level (e.g., very highly qualified). Based on this classification system, 64.5% of 1992 high school graduates were at least minimally qualified; only 21.4% were deemed very highly qualified.

Researchers with the Manhattan Institute for Public Research also examined college readiness rates, though a different set of criteria and a different model for classification were employed (Greene & Winters, 2005). To determine readiness, the authors examined whether a student earned a high school diploma, completed a minimum set of course requirements—four years of English, three years of mathematics, and two years each of natural science, social science, and foreign language—and could read at a basic level or above on the NAEP reading assessment. Unlike the NCES model (1997), in which classification was based on meeting at least one cut score, the Manhattan Institute (Greene & Winters, 2005) employed a conjunctive rule in which students had to meet all three criteria to be considered CCR. Given this distinction, it is not surprising that they concluded that a much smaller percentage of students—34%—were ready for college. Both of the definitions of CCR described above set benchmarks for readiness irrespective of their relationship with actual college performance. Therefore, whether students who were deemed "college ready" were actually successful in college—and alternatively, whether students deemed "not ready" were actually unsuccessful—remained unexamined.

Given the lack of empirical evidence to support these initial conceptualizations of CCR, other definitions have emerged based on predictive models and approaches to formulate CCR benchmarks that are empirically based. Specifically, ACT released a seminal paper, *Crisis at the Core: Preparing All Students for College and Work* (2004), that illustrated that the majority of high school graduates are not ready for college-level work. This was shown by developing empirically derived benchmarks to identify students who have a high likelihood of being successful across

[6] For example, the cut scores or benchmarks for the "very highly qualified" category were HSGPA of 3.7, 96th percentile class rank, 97th percentile on NELS, and an ACT® college readiness assessment score of 28 or SAT score of 1250. An adjustment for the rigor of a student's high school coursework was also included so that students who took at least four years of English; three years each of science, mathematics, and social studies; and two years of a foreign language were moved into the next higher level of qualification. Students in the top two levels who did not complete rigorous coursework in high school were moved down one level.

two-year and four-year colleges based on their performance on the ACT® college readiness assessment (ACT, 2004; Allen & Sconing, 2005). A 2007 study explored the use of SAT scores to set similar benchmarks for success at four-year colleges (Korbin, 2007). Both the ACT and the College Board (SAT) benchmarks were based on the predictive relationship between scores on their respective college admission tests and performance in the first year of college, though the two organizations took slightly different approaches (Camara, 2013).

ACT derived subject-specific benchmarks by calculating the ACT test score associated with a 50% probability of earning a B or higher (which also mapped onto a 75% probability of a C or higher) in the most typical credit-bearing course in the subject area completed by freshmen across a nationally representative sample of two-year and four-year colleges. For example, the ACT Mathematics Benchmark was derived based on the relationship between ACT Mathematics test scores and grades in a college algebra course. Grades in English composition, biology, and social science courses formed the bases of benchmarks related to scores on the ACT English, Science, and Reading Tests.[7] The ACT focus on entry-level, credit-bearing courses was in response to the high rates of remediation reported for students who otherwise went through the K–12 system with little or no indication that they were academically underprepared for college (Camara, 2013).

Data support the value of the ACT College Readiness Benchmarks, as students who meet them earn higher grades in typical first-year courses. Research also shows that meeting the benchmarks is linked to higher first-year grade point averages (FYGPAs), second-year retention rates, and college graduation rates (ACT, 2010; Radunzel & Noble, 2012). In 2013, only one in four ACT-tested high school graduates (26%) met all four benchmarks (ACT, 2013).

The College Board benchmark is also based on the relationship between SAT scores and performance in the first year of college, but it was developed by linking assessment scores to FYGPA rather than to specific course grades. Specifically, the College Board benchmark was estimated based on the SAT composite score[8] (SAT Math + Critical Reading + Writing) associated with a 65% probability of earning a FYGPA of a B– or higher (Wyatt, Kobrin, Wiley, Camara, & Proestler, 2011). Similar to the ACT results, data support the use of the College Board benchmark in that students who meet the benchmark have more positive college outcomes—not only do they achieve higher FYGPAs, they are also more likely to enroll in college, return for their second year, and have higher four and six year graduation rates (College Board, 2012; Kobrin, 2007; Mattern, Shaw, & Marini, 2013; Wyatt et al., 2011). In 2013, 43% of SAT-tested high school graduates met this benchmark, which is considerably higher than the 26% reported as meeting all four ACT benchmarks.

The discrepancy in the rates of CCR estimated by the ACT and College Board benchmarks is largely attributable to differences in the methodology employed. Specifically, ACT sets a level of proficiency in each subject area. If the definition of CCR is the percent meeting all four benchmarks, then the model is a conjunctive one. It could be argued that students can be successful in college without meeting each benchmark, but for the purpose of this section, we will use the standard of meeting all four benchmarks as the definition of CCR. To meet the College Board benchmark, students simply

[7] The ACT College Readiness Benchmarks were updated in 2013 based on more current data. The new analyses revealed no change in the English and Mathematics Benchmarks of 18 and 22, respectively. The Reading Benchmark increased from 21 to 22, and the Science Benchmark decreased from 24 to 23 (Allen, 2013).

[8] In 2007, the College Board released benchmarks based on the previous version of the SAT, which did not include a writing section benchmark, and were determined based on the composite score of SAT Math + SAT Verbal (Kobrin, 2007).

need a total SAT score of 1550. Many different combinations of scores and vastly distinct profiles (e.g., 800 Math + 450 Critical Reading + 300 Writing as compared to 520 Math + 520 Critical Reading + 510 Writing) can lead to the conclusion that the student is college ready.

Researchers have proposed a multidimensional model of CCR that employs HSGPA, academic rigor, and admissions test scores (Wiley, Wyatt, & Camara, 2010; Wyatt, Wiley, Camara, & Proestler, 2011). Students had to meet the benchmarks for all three criteria to be considered CCR; and not surprisingly, this approach concluded that only 31.9% of the 2009 SAT-tested cohort were college ready (Wiley et al., 2010). However, it is likely that a compensatory model that balances success among the three predictors would be equally effective in predicting CCR. Table 1 illustrates a summary of the CCR benchmarks reviewed and how these definitions affect estimates of the readiness of US high school graduates for college and career.

Table 1 Comparison of CCR Benchmark Definitions

Source	NCES	Manhattan Institute	ACT	College Board	Wiley et al.
Method	Rational Benchmark	Rational Benchmark	Empirical Benchmark	Empirical Benchmark	Empirical Benchmark
Readiness Indicators	HSGPA, class rank, NELS, ACT, SAT	HS diploma, core curriculum, NAEP	ACT Test scores	SAT Composite Score	SAT Composite Score, HSGPA, academic rigor
Success Indicator	n/a	n/a	Course Grade	FYGPA	FYGPA
Level of Success	n/a	n/a	B	B-	B-
Probability of Success	n/a	n/a	50%	65%	65%
% CCR (Cohort)	64.5% (1992)	34% (2002)	26% (2013)	43% (2013)	32% (2009)

These various definitions of CCR illustrate that a variety of issues must be considered when developing benchmarks, beginning with deciding whether to use rational or empirical benchmarks. If empirical benchmarks are developed, decisions about the expected outcome, the desired performance, and the probability of success need to be made (Camara, 2013). An additional consideration is the type of methodology to employ for reporting CCR rates (e.g., compensatory, conjunctive). Each of these various elements can have a profound impact on the results and the conclusions that may be drawn, underscoring the need for thoughtful consideration of how to define CCR to ensure meaningful generalizations.

The advent of the Common Core State Standards and the resulting formation of two multistate assessment consortia, Partnership for Assessment of Readiness for College and Careers (PARCC) and Smarter Balanced Assessment Consortia (SBAC), have intensified interest and debate around CCR (Camara, 2013; SBAC, 2012). Specifically, the two consortia are each developing new assessments that will be aligned to the Common Core State Standards. The ultimate goal is to use

the new assessments to evaluate the CCR of high school students as well as to provide diagnostic information at earlier grades about whether students are on track for CCR. Setting benchmarks for CCR as students transition to college and establishing benchmarks at earlier grades to indicate whether students are on track has been a focal discussion point (Camara, 2013; Camara, & Quenemoen, 2012; SBAC, 2012).

Today, CCR benchmarks are reported on the ACT, the SAT, and several state assessments, and PARCC and Smarter Balanced will report benchmarks in 2015. The National Assessment of Educational Progress (NAEP) has also been used as a metric for tracking readiness at the national level (US Department of Education, Institute of Education Sciences, 2014). In the near future, it is quite plausible that a half-dozen separate methodologies and definitions will be used to report on the CCR of students across states and nationally. While all such indicators will likely attempt to benchmark readiness in terms of postsecondary success, they also will likely employ different empirical criteria, methodology/models, and/or judgments about the knowledge and skills required for success. Moreover, given the content specifications of the assessments that are currently used, or will be used to determine CCR, all indicators likely will focus exclusively on core academic skills, and most[9] will only consider student performance in mathematics and ELA.

A related concern is whether readiness for college is the same as readiness for a career (or a job) and whether the two should be combined into a single concept, often labeled CCR. The research described above has focused exclusively on college students and college outcomes. A limited number of studies have been conducted evaluating whether the level of knowledge and skills needed for college readiness and career readiness that are measured by such assessments are the same. The findings of such research have been generally inconclusive. Academic assessments can certainly predict generalized cognitive skills associated with work outcomes and success, but the specific mathematics, reading, and writing skills (e.g., statistics vs. geometric reasoning), as well as their importance, would likely differ across careers. Subject matter experts have generally failed to agree on such issues across careers (ACT, 2006; 2013b; ADP, 2004; Loomis, 2011; Kilpatrick, 2012).

Research indicates that a minimum level of proficiency with the core academic skills in mathematics, reading, and writing that are needed for college readiness is important for the vast majority of jobs[10] (ACT, 2013). However, the issue becomes more nuanced when focusing on particular types of occupations/career paths or on specific majors for which different profiles of knowledge and skills may be required. Others have attempted to address this issue in more detail, but such a discussion is beyond the scope of this report.[11] Still, more precise conceptual definitions of college readiness and career readiness are needed in order to support validity arguments associated with the assessments and accountability systems being developed.

[9] The ACT College Readiness Benchmarks include math, reading, science and English. A few states have, or are attempting to, benchmark their science assessments to college readiness (e.g., Texas).

[10] Using a database of skill profiles for thousands of jobs across the country, ACT found that nearly three-quarters (73 percent) of these jobs require at least a level 3 score on the ACT WorkKeys® Reading for Information, Applied Mathematics, and Locating Information assessments.

[11] See ACT (2006); ADP (2004); Camara (2013); Camara and Quenemoen (2012); Conley (2012); Kilpatrick, 2012; and Loomis, 2011.

Limitations of Current CCR Assessment Systems

CCR benchmarks have focused attention on the misalignment between the expectations and requirements for high school and postsecondary success, but the attention is often paid too late in the developmental process to benefit students. Preparation for, and assessment of, CCR should begin earlier than 10th or 11th grade,[12] and it should focus on the much broader range of skills associated with success. The narrow definitions used in current CCR systems, which focus solely on core academic skills (i.e., ELA, mathematics, science), stand in contrast to the growing body of research indicating that success in school and at work is a function of not only core academic skills but other factors, such as critical thinking, motivation, work ethic, and interests. Taking a broader view of the predictors of success is not a new idea (Campbell, 1990a; 1990b; Campbell, McCloy, Oppler, & Sager, 1993; Camara, 2005a, 2005b; Conley, 2007).

In a similar vein, a broader view of what constitutes success and our indicators of measures of success is also needed. The CCR benchmarks described above are based on the level of knowledge and skills needed for a reasonable likelihood of success in first-year college courses. However, persistence in college, cumulative grades, and progression to graduate or professional school are also valuable indicators of college success. Many educators and policymakers argue that the true measure of college success is degree attainment (Mattern et al., 2014). A definition of work success remains elusive. Possible metrics include training program performance, promotion and progression of employment, job performance, tenure, job satisfaction, and salary. Each metric results in vastly different benchmarks of readiness, along with differing caveats regarding interpretation. Clearly, attention to both the predictor and the outcome is needed to foster an improved understanding of CCR.

In the next section, research findings are reviewed that address what students need to know and should be able and willing to do, beyond core academic skills, in order to be successful in college and at work. The argument "what you test is what you get" has been used to advocate for performance-based assessments, more rigorous standards, or other types of reforms to educational assessments (Herman & Linn, 2013). This same argument applies to the breadth of how to construct and define CCR. If CCR focuses solely on core academic skills like mathematics and ELA, which can be more directly tied to school and teacher effectiveness, this same argument would suggest that other skills and behaviors essential for success in navigating college and careers will be neglected and success will continue to elude many students. Broadening the definition of CCR may help clarify how current educational systems can prepare students for college and the workforce.

[12] ACT and the College Board mapped back their college readiness benchmarks to performance on their eighth- and 10th-grade assessments (ACT, 2006; College Board, 2013; Proctor, Wyatt, & Wiley, 2010). However, giving feedback in eighth grade may still be too late (ACT, 2008; Dougherty, 2014). Only a very small percentage of students who are off-track in eighth grade will graduate from high school ready for college. This is particularly true for at-risk students, underscoring the need for interventions earlier in elementary and middle school. The development of ACT Aspire™, which is a longitudinal assessment system designed to assess and track students from third through 10th grade and provide diagnostic information and on-/off-track indicators, will help mitigate this issue.

Section 3

Multidimensional Model of CCR and Success

This section reviews the literature on the predictors of workplace and educational success, focusing primarily on reviews and meta-analyses.[13] Reviewed predictors include core academic skills, cross-cutting capabilities, and noncognitive skills. The terms cross-cutting capabilities and noncognitive skills encompass a variety of characteristics, including, but not limited to, collaborative problem solving, critical thinking, dispositional self-efficacy, goal setting, information and communication technology skills development, personality, psychosocial factors, self-knowledge, socio-emotional learning, and vocational interests. The findings of this literature review show that core academic skills, cross-cutting capabilities, and cognitive ability generally predict traditional performance-based indicators of success better than do noncognitive skills. However, when a more comprehensive definition of success is employed, noncognitive skills become more important and sometimes even more predictive than cognitive skills. Further, noncognitive skills provide incremental validity above and beyond cognitive skills in predicting even the more traditional indicators of success. Table 2 provides some examples of the wide variety of predictors and outcomes that can lead to better understanding and assessment of CCR, categorized by domain (i.e., education, work), predictor (i.e., cognitive, noncognitive), and outcome (i.e., traditional versus nontraditional) and highlighting the commonality and uniqueness across school and at work.

Table 2 Indicators of College and Career Readiness and Success

Domain	Predictors		Outcomes	
	Cognitive	Noncognitive	Traditional	Nontraditional
College	Cognitive Ability HSGPA Test Scores	Absenteeism Academic Self-Efficacy Academic/grade goals Achievement Needs Behavioral Problems Fit (interest-major) Goal Orientation Interests Motivation Personality Self-Regulation Social Engagement Study Skills Test Anxiety	FYGPA Course Grades Credentials/Licensure	Dropped Out Engagement Expelled Graduation Persistence Retention Satisfaction Timely Degree Completion
Career	Critical Thinking Collaboration Skills ICT Cognitive Ability Degrees/Credentials Work Samples	Fit Integrity Interests Personality Self-efficacy Self-esteem Values	Job Performance Job Training Performance	CWB Employment Fired Intention to Quit Job Satisfaction Job Tenure OCB Promotion/Advancement Salary Turnover/Quit Job

Note. ICT = information and communication technology skills; CWB = counterproductive work behavior; OCB = organizational citizenship behavior.

[13] Meta-analysis is a statistical methodology in which similar studies are quantitatively aggregated to test the pooled data for statistical significance.

Predicting Traditional Indicators of Success

Workplace success. Cognitive predictors, in particular cognitive ability, are among the strongest, if not *the* strongest, predictors of overall job performance across a variety of job situations (Colquitt, LePine, & Noe, 2000; Hunter, 1980, 1983; Judge, Higgins, Thoresen, & Barrick, 1999; Schmidt & Hunter, 1998; Schmidt & Hunter, 2004). Schmidt and Hunter (1998) conducted a meta-analysis of 85 years of research in one of the most comprehensive reviews of the validity of 19 selection methods for predicting job performance. Of all the selection methods investigated, the researchers found that tests of cognitive ability were clearly the most predictive of job performance. This finding has been demonstrated across several meta-analyses (Schmidt & Hunter, 2004), and for job training performance in addition to supervisor-rated job performance (Colquitt et al., 2000). Furthermore, cognitive ability predicts job performance across levels of job complexity and difficulty, although it is, in fact, more predictive of performance for highly complex jobs (Hunter, 1983).

Research has shown that several noncognitive skills also predict important work outcomes. For example, a large body of literature has developed around the hypothesis that personality predicts job performance and attainment (Barrick & Mount, 1991; Barrick, Mount, & Judge, 2001; Judge, Higgins, Thoresen, & Barrick, 1999; Lindqvist & Vestman, 2011; Ones, Viswesvaran, & Schmidt, 1993; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007; Salgado, 2003; Schmidt & Hunter, 1998; Van Iddekinge, Roth, Raymark, & Odle-Dusseau, 2012). The most widely used taxonomy of personality is the "Big Five," which states that personality consists of five broad dimensions (See Ashton et al., 2004, for a six-dimensional structure). These dimensions are: (1) *extraversion*—tendency to be outgoing, assertive, and energetic, (2) *agreeableness*—tendency to be kind, cooperative, and generous, (3) *conscientiousness*—tendency to be organized, responsible, and hard-working, (4) *emotional stability*—tendency to be free from anxiety, worry, and tension, and (5) *openness to experience*—tendency to be imaginative, curious, and insightful. (See John & Srivastava, 1999 for a thorough review of the "Big Five" taxonomy). Each of these dimensions has been shown to be at least somewhat predictive of important outcomes with some being more predictive of performance outcomes than others.

For instance, meta-analyses have found that traits such as conscientiousness and emotional stability consistently predict job performance (Barrick & Mount, 1991; Barrick, Mount, & Judge, 2001; Salgado, 2003). Of these dimensions, conscientiousness is the best predictor, although measures of personality typically do not have strong relationships with job performance. In addition, integrity tests, which target the tendency to behave honestly, also predict job performance (Ones, Viswesvaran, & Schmidt, 1993; Van Iddekinge, Roth, Raymark, & Odle-Dusseau, 2012). Importantly, both conscientiousness and integrity provide incremental validity in the prediction of job performance beyond cognitive ability (Schmidt & Hunter, 1998). Finally, a study of a nationally representative sample of 18- and 19-year-old Swedish men found that a 25-minute interview designed to measure characteristics such as responsibility, independence, outgoingness, persistence, emotional stability, and initiative was a better predictor of wages and unemployment 14–21 years later than were measures of cognitive ability (Lindqvist & Vestman, 2011).

Self-beliefs and vocational interests also help predict job performance. For example, self-esteem (an overall evaluation of self-worth) and generalized self-efficacy (the belief in the capability for success) were shown in one extensive meta-analysis (Judge & Bono, 2001) to predict job performance. Vocational interests, too, have been found to predict job performance. Briefly, the predominant

model of interests states that vocational interests can be categorized into six types: *Realistic* (e.g., working with things), *Investigative* (e.g., science), *Artistic* (e.g., creative expression), *Social* (e.g., helping people), *Enterprising* (e.g., leadership), and *Conventional* (e.g., structured business roles; see Holland, 1997, for more detail). A recent meta-analysis of 60 studies found that interests moderately predicted job performance such that those who reported higher levels of interest performed better on the job (Nye, Su, Rounds, & Drasgow, 2012). Furthermore, the relationship was stronger when interests were congruent with jobs (e.g., a person with investigative interests worked in a job requiring investigation). As with personality, meta-analysis has demonstrated that interests provide a small amount of incremental validity to the prediction of job performance beyond cognitive ability (Schmidt & Hunter, 1998).

Academic success. Similar to career success, cognitive skills have typically been shown to be very strong predictors of traditional definitions of academic success (Poropat, 2009; Richardson, Abraham, & Bond, 2012). In a comprehensive meta-analysis of predictors of academic performance at all levels of schooling, Poropat (2009) found that core academic skills (e.g., ACT/SAT scores) were strong predictors of course grades at each educational level (i.e., elementary, secondary, and postsecondary; see also Richardson et al., [2012] for a recent meta-analysis of college performance only). National validity studies have reached the same conclusion with results indicating that ACT and SAT scores predict college GPA throughout the college career (Mattern & Patterson, 2011a; Patterson & Mattern, 2011; Radunzel & Noble, 2012), and performance on the GRE and the Miller Analogies Test predict academic performance in graduate and professional school (Kuncel, Hezlett, & Ones, 2001; Kuncel, Hezlett, & Ones, 2004; Linn & Hastings, 1984). Additionally, meta-analysis has demonstrated that study skills provide incremental validity above college admissions tests for the prediction of first-year college GPA (Credé & Kuncel, 2008). Others have described similar validity evidence that supports the use of admissions tests for undergraduate, graduate, and professional programs across a variety of criteria, including grades, retention, and graduation (Camara, Packman, & Wiley, 2012).

Of course, stories abound about students who may have failed academically despite having strong cognitive skills, while other students may have succeeded despite deficits in cognitive skills. Consistent with these stories is a growing body of research evidence suggesting the crucial importance of taking noncognitive skills into account to better understand and predict academic success. In terms of personality, Poropat (2009) found that each of the "Big Five" dimensions of personality predicted academic success in elementary school. Although most dimensions became less predictive of success in later school years, conscientiousness remained a strong predictor. In fact, Poropat found that conscientiousness predicted academic performance in college just as well as did cognitive skills. In addition, Richardson et al., (2012) found that conscientiousness provided incremental prediction of college GPA above and beyond SAT/ACT scores and high school GPA (see also O'Connor & Paunonen, 2007; Trapmann et al., 2007, for meta-analyses of the relationship between personality and performance in college).

Strong meta-analytic evidence exists that motivational factors such as vocational interests, goals, and achievement needs are related to academic performance (Nye et al., 2012; Robbins, Lauver, Le, Davis, Langley, & Carlstrom, 2004; Roseth, Johnson, & Johnson, 2008). For instance, vocational interests are moderately correlated with academic performance in college, and these correlations are stronger when interests are congruent with the student's major (Nye et al., 2012). Finally, extensive meta-analyses conducted by Robbins et al., (2004) and Richardson et al., (2012)

found that academic goals (e.g., commitment to goals), grade goals, test anxiety, and achievement motivation each predicted college GPA incrementally over other predictors such as high school GPA and ACT/SAT scores.

Research on ACT Engage® (formerly known as the Student Readiness Inventory), which assesses motivation, social engagement, and self-regulation, clearly illustrates the importance of noncognitive skills above and beyond academic skills in the prediction of future academic success (Casillas, Robbins, Allen, Kuo, Hanson, & Schmeiser, 2012; Robbins et al., 2004). Figure 1 highlights the fact that high ACT Engage scores (measured in seventh or eighth grade) may even compensate for lower ACT Explore® scores for some students. Specifically, students with high ACT Engage scores but ACT Explore scores in the middle two quartiles had higher high school GPAs (HSGPAs) (mean = 3.01) than students with low ACT Engage scores and ACT Explore scores in the top quartile (mean = 2.57). A similar pattern of results emerged when alternative indicators of success, such as college enrollment, college GPA, and retention, were examined.

Another important consideration in predicting academic success is how students view themselves: Do they feel they are capable of achieving success in school? Results from two meta-analyses found that academic self-efficacy, or the belief that one can succeed in school, predicts academic performance above and beyond traditional predictors of college success (Brown et al., 2008; Robbins et al., 2004), indicating that variables related to self-confidence are clearly important for academic success.

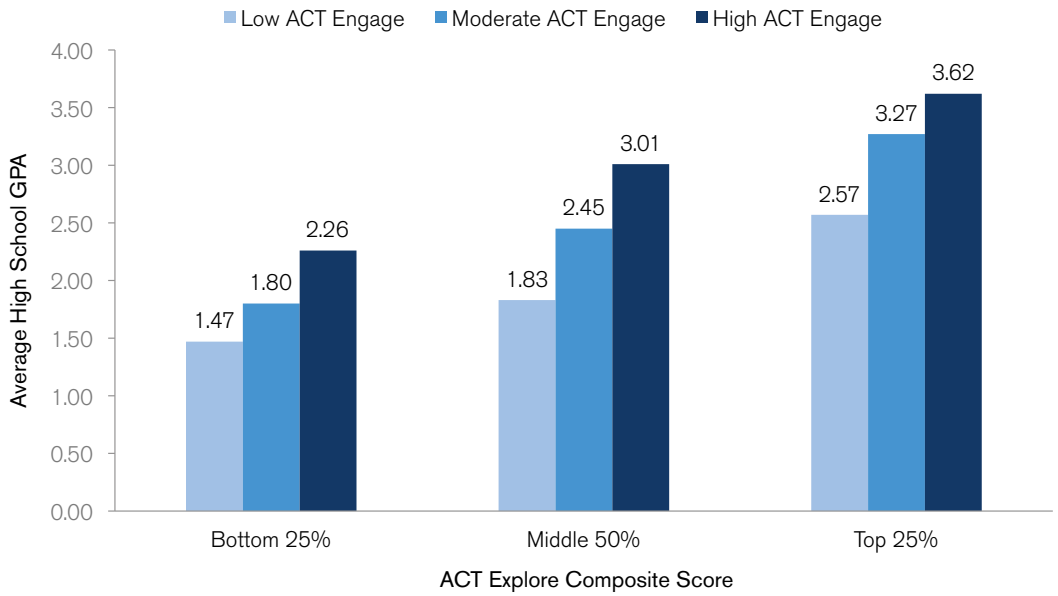

Figure 1. Average HSGPA by ACT Explore and ACT Engage Scores

Predicting Nontraditional Indicators of Success

Workplace success. Industrial-organizational psychology has long recognized that performance on the job requires more than just completing tasks in a timely manner with sufficient quality. Campbell (1990a) advanced an eight-factor model of performance that includes task-specific behaviors, non-task-specific behaviors, oral communication, effort, personal discipline, teamwork, and supervisory or leadership and managerial skills. Similarly, contextual performance goes beyond just task performance and includes "…behaviors that contribute to the psychological, social, and organizational context of work" and has been shown to be an important component of job performance (Borman, & Motowidlo, 1993). In essence, behaviors associated with contextual performance make employees' jobs easier or more difficult by influencing the environment within which they must work. A great deal of research is available that focuses on organizational citizenship behavior (OCB), and counterproductive work behavior (CWB).

Valued by organizations—especially as it relates to customer service, teamwork, and managing others—OCB includes positive behaviors such as helping coworkers, being cooperative, and putting forth extra effort to get the job done. Although little research has been conducted investigating the relationship of cognitive skills to OCB, several meta-analyses have demonstrated that noncognitive skills are consistently related to OCB (Borman, Penner, Allen, & Motowidlo, 2001; Chiaburu, Oh, Berry, Li, & Gardner, 2011; Hurtz, & Donovan, 2000; Judge, Rodell, Klinger, Simon, & Crawford, 2013; Nye et al., 2012; Organ, & Ryan, 1995). The meta-analysis by Nye et al., (2012) found that interests were related to OCB, and that these relationships were substantially stronger when interests were congruent with jobs. Furthermore, with the exception of openness to experience, each of the "Big Five" personality dimensions reliably predicted OCB (Judge et al., 2013). These four dimensions predicted OCB better than they predicted performance on job tasks, providing evidence that these noncognitive skills may take on additional importance when the definition of success is expanded.

By contrast, CWBs include behaviors such as a lack of cooperation, deviant behavior, and withholding effort (Motowidlo, 2003). Organizations are exceedingly interested in minimizing CWBs as they have been linked to costly organizational outcomes such as theft, absenteeism, and safety violations. Once again, several meta-analyses have demonstrated that noncognitive skills predict CWB (Berry, Ones, & Sackett, 2007; Judge, Klinger, Simon, & Yang, 2008; Nye et al., 2012; Ones et al., 1993; Salgado, 2002; Van Iddekinge et al., 2012). Nye et al., (2012) found that interests were related to CWB, although in this case, the relationships were not larger when taking into account interest-job congruence. In addition, emotional stability, agreeableness, and conscientiousness reliably predicted both deviant behaviors toward individuals (e.g., violence, gossip, theft) and toward the organization (e.g., lack of effort, damaging company property, sharing confidential information) (Berry et al., 2007). Furthermore, in Project A of Campbell's research (1990b), which included approximately 800,000 soldiers enlisted in the US Army, personality predicted personal disciplinary problems and adherence to regulations better than did cognitive ability (McHenry et al., 1990). Integrity tests have also demonstrated moderate relationships with CWBs (Ones et al., 1993; Van Iddekinge et al., 2012). Similar to the findings described above regarding personality and OCBs, integrity tests are better predictors of CWBs than they are of performance on job tasks, again suggesting the value in considering these noncognitive skills when considering broader definitions of success (Ones et al., 1993).

Job satisfaction has also been studied in depth as a key work outcome of concern. As with OCB and CWB, research shows that job satisfaction is consistently predicted by noncognitive skills, while the relationship of job satisfaction to cognitive ability is rarely examined. Meta-analyses have found that job satisfaction is predicted by: each of the "Big Five" personality traits except openness to experience (Judge & Bono, 2001; Judge, Heller, & Mount, 2002), the extent to which a person's values and interests fit the job and the organization (Kristof-Brown, Zimmerman, & Johnson, 2005), self-esteem (Judge & Bono, 2001), and generalized self-efficacy (Judge & Bono, 2001). Furthermore, a longitudinal study demonstrated that occupational self-esteem predicted career satisfaction after seven years of experience, whereas college GPA was unrelated to career satisfaction (Abele & Spurk, 2009).

One possible outcome of job dissatisfaction is leaving the job (via the intention to quit) (Zimmerman, 2008), and noncognitive skills have also been shown to predict job tenure and persistence-related outcomes. Meta-analyses have shown that noncognitive skills predict some of the likely antecedents to the decision to leave the job (Alarcon, Eschleman, & Bowling, 2009; Van Iddekinge, Putka, & Campbell, 2011; Zimmerman, 2008). For instance, emotional exhaustion on the job is predicted by self-esteem, generalized self-efficacy, locus of control, optimism, emotional stability, extraversion, conscientiousness, and agreeableness (Alacron, et al., 2009). Additionally, intention to quit is predicted by all of the "Big Five" personality dimensions except openness to experience (Zimmerman, 2008), interests (Van Iddekinge et al., 2011), and person-job and person-organization fit (Kristof-Brown et al., 2005). Personality predicts the intention to quit incrementally over cognitive ability, and interests further predict incrementally above and beyond both cognitive ability and personality (Van Iddekinge et al., 2011). Finally, personality, vocational interests, and interest-job congruence predict persistence on the job and turnover (Nye et al., 2012; Salgado, 2002).

The value of noncognitive skills is evident when the definition of success is expanded beyond traditional indicators of job performance. That said, greater focus and rigor has been applied to research on outcomes and criterion measures of performance in work settings (see Motowidlo, 2003) than to educational research. Research examining an expanded outcome space for academic success, summarized in the Section 4, is much more limited.

Academic success. Of the less-traditional outcomes that have been examined in academics, the majority of research has focused on persistence and graduation. Perhaps not surprisingly, cognitive skills are of crucial importance for each of these outcomes. Students with higher HSGPAs and ACT/SAT scores have a better chance of persisting and graduating from college than students with lower academic credentials (Bowen, Chingos, & McPherson, 2009; Mattern & Patterson, 2011b; Radunzel & Noble, 2012; Robbins et al., 2004). This is true for students at both two-year and four-year colleges (Radunzel & Noble, 2012). Furthermore, and probably not surprisingly, college GPA is the single best predictor of college persistence (Pascarella & Terenzini, 2005). This is reasonable because grades, as a measure of student achievement, incorporate both cognitive (i.e., learning) and noncognitive (i.e., motivation, dependability) components when used as a predictor of later success. Finally, other academic skills (e.g., study skills) predict persistence incrementally over predictors such as HSGPA and ACT/SAT scores (Robbins et al., 2004). While persistence and graduation are clearly impacted by cognitive skills, they are not the only important predictors that should be considered.

The Robbins et al., (2004) meta-analysis provides strong evidence to support the claim that noncognitive skills are important factors in college persistence. Specifically, results reveal that

achievement motivation, academic goals, and academic self-efficacy are all correlated with persistence, and academic goals and academic self-efficacy predict incrementally above and beyond cognitive predictors. Interests also predict persistence (Nye et al., 2012); and, once again, these relationships are stronger when interests are congruent with college major. Corroborating these findings, Allen and Robbins (2010) found that interest-major congruence as well as motivation—as measured by the 10-item academic discipline scale of ACT Engage—predict timely degree attainment (graduating in four years from four-year colleges, and in two years from two-year colleges) above and beyond prior test scores and college GPA. A likely antecedent to college persistence is absenteeism. A study of students from 10 universities found that behaviors such as leadership and ethics predicted student absenteeism, as did a situational judgment test (SJT) designed to measure several behavioral skills (Schmitt et al., 2009).

Early Indicators of CCR

The research previously discussed suggests that rather than focusing on core academic skills, a more holistic approach is essential if the desire is to help students improve their prospects for the future. The bulk of the literature already reviewed in this report focused on success at work and in college, largely because the most extensive research on noncognitive skills has been conducted at those levels. However, providing people with guidance about their strengths and weaknesses just prior to their entering college or the workforce may be too late. Fortunately, evidence from longitudinal studies indicates that individuals who may be at risk can be identified much earlier in life.

In the realm of cognitive skills, longitudinal studies of children as young as age six have found that future high school dropouts score substantially lower on achievement tests and significantly higher on measures of behavioral problems than do high school graduates (Heckman et al., 2014). The likelihood of dropping out of high school can also be predicted highly accurately in the eighth grade using mathematics and English grades (Neild & Balfanz, 2006). ACT (2008) found that scores on the eighth grade ACT Explore test were strong predictors of readiness for college in 11th and 12th grade. Furthermore, a 10-year longitudinal study found that cognitive ability scores for 10th grade students predicted academic attainment and earnings 10 years later (Lleras, 2008). Finally, childhood cognitive ability predicted wages, occupation status, and job satisfaction 60 years later (Judge, Higgins, Thoresen, & Barrick, 1999).

Several longitudinal studies attest to the usefulness of noncognitive skills for predicting long-term success in school and at work (see Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007 for a comprehensive review of personality as a predictor). Moon (2012) found that, at age six, those who would eventually drop out of high school scored significantly higher on measures of behavioral problems than high school graduates. Research also indicates the importance of conscientiousness in children. Attention skills (considered to be related to future conscientiousness) at the age of school entry predicted future achievement test scores incrementally over school-entry academic skills (Duncan et al., 2007 as cited in Almlund, Duckworth, Heckman, & Kautz, 2011); childhood conscientiousness predicted job satisfaction, wages, and occupational status above and beyond cognitive ability 60 years later (Judge et al., 1999); and teacher ratings of 10th grade students' work ethic predicted educational attainment and earnings incrementally over cognitive ability 10 years later (Lleras, 2008). Furthermore, a meta-analytic summary of longitudinal studies of elementary school students revealed that self-beliefs such as self-efficacy, self-esteem, and self-concept (general beliefs about the self that influence actions) predicted later academic achievement, such

as test scores and grades, even after controlling for prior achievement (Valentine, DuBois, & Cooper, 2004). Finally, the vocational preferences of gifted 13-year-olds predicted their college major 10 years later incrementally over cognitive ability (Achter, Lubinski, Benbow, & Eftekhari-Sanjani, 1999). The fact that future success can be accurately predicted at such an early age offers hope that at-risk children can be identified and provided with interventions. Focusing solely on core academic skills may result in failing to identify and help at-risk students and adults who have strong academic skills but need help developing the other skills that are essential to CCR.

Section 4

Barriers to a Holistic Approach to CCR

> Scholastic aptitude admits of other things than intelligence; to succeed in his studies, one must have qualities which depend on attention, will, and character; for example, a certain docility, a regularity of habits, and especially continuity of effort. A child, even if intelligent, will learn little in class if he never listens, if he spends his time playing tricks, in giggling, in playing truant. (Binet, 1916, p. 254)

Section 3 reviewed compelling evidence that to be ready to succeed in college and at work requires more than just having core academic skills. Yet, current definitions of CCR tend to focus solely on core academic achievement. One may wonder if definitions of CCR lack indicators of these other skills because their value has only just recently been recognized. Interestingly, the creator of the first standardized intelligence test, Alfred Binet, acknowledged nearly 100 years ago the limitation of focusing solely on intelligence, as indicated in the quote above, which suggests that this is not newfound knowledge.

Some have argued that there are historical reasons that may have deterred the teaching of these other student characteristics (Heckman et al., 2014). The secularization of the K–12 public educational system following the US Supreme Court decision in 1948 to mandate the separation of church and state may have led to the belief that the development of character was no longer under the purview of the public educational system. The current education reform movement, including the No Child Left Behind legislation and the more recent adoption of the Common Core State Standards, has further restricted the focus of what is taught in the classroom (Hamilton, Stecher, Marsh, McCombs, & Robyn, 2007). The pendulum may now be swinging in the opposite direction through developing and implementing many school-based programs with the very goal of integrating development of academics, behavior, and character, as research has clearly shown that they are interrelated and jointly influence subsequent learning and performance (Flay & Allred, 2010). More recently, a special section of *Education Week* (June 5, 2014) underscored this notion for teachers, researchers, and policymakers alike, emphasizing the need to focus not only on academics but also on engagement and motivation in order to truly foster student learning.

Clearly, educators recognize the value of noncognitive skills. This is evident in the longtime practice of giving conduct grades and detentions/suspensions for poor behavior. Even at the postsecondary level, colleges and universities often include interviews, essays, and letters of references as part of the admission application process to glean some of these additional skills (Clinedinst & Hawkins, 2009). Even though educators recognize the importance of these additional skills, they are rarely formally taught; moreover, they are excluded from definitions of CCR.

One issue surrounding the inclusion of these skills in definitions of CCR concerns available assessments. Measures of noncognitive skills are often locally developed and subjectively scored with limited, if any, research evidence to support the reliability and validity of their scores' uses (Highhouse, 2008; Mattern, Kobrin, Patterson, Shaw, & Camara, 2009). Standardized measures of these traits have demonstrated efficacy and validity in research studies and in their limited

operational use, but they have not been widely adopted as standardized assessments in education.[14] A discussion of a few examples of emerging approaches to more systematic assessment of noncognitive skills follows.

ACT Engage was developed in 2005 to measure a student's level of motivation, social engagement, and self-regulation (ACT, 2007; Casillas et al, 2012). ACT Engage is available to students in middle school and high school, and to students matriculating to college, but it is taken only by a small percentage of students nationally at each level.

First developed in 1987, LASSI is popular in higher education as a diagnostic tool that identifies study skills deficiencies among enrolled students (Weinstein, Schulte, & Palmer, 1987). In response to the need to provide earlier feedback and assist students with the high school to college transition, a high school version was also developed.

ETS has introduced the Personal Potential Index (Kyllonen, 2008), which is a standardized recommendation letter designed to improve the graduate school admission decision process by assessing knowledge and creativity, resilience, communication skills, planning and organization, teamwork, and ethics and integrity. More recently, ETS developed SuccessNavigator (Markle, Olivera-Aguilar, Jackson, Noeth, & Robbins, 2013), which is designed to identify at-risk college students with the goal of improving retention and graduation rates. Neither the Personal Potential Index nor SuccessNavigator has been widely adopted.

Despite years of research, other efforts to measure student qualities, such as the perseverance, study skills, and self-monitoring skills of undergraduates and law school students, have not resulted in any operational assessments (Andberg, 2007; Schmitt et al., 2009; Shultz & Zedeck, 2011).

Despite the limited use of these standardized measures, it is indisputable that skills that extend beyond core academic skills are viewed as important by admissions officers. A survey of college admissions officers found that after grades and test scores, the next most important factors in the college admission process are these personal characteristics gleaned from essays, a student's demonstrated interest, and teacher/counselor recommendations (Clinedinst, Hurley, & Hawkins, 2011).

Adoption of noncognitive assessments in the workplace has been more widespread than in schools. Based on a survey of 1,627 human resource managers in 2001, 8% of employers use interest inventories, 14% of employers use managerial assessments, and 13% of employers use personality assessments (American Management Association, 2001). Even so, assessment of cognitive skills and abilities is still more prevalent with 41% of employers testing basic literacy and/or math skills and 20% of employers using cognitive ability assessments. A more recent poll indicated that 71% of human resource professionals believe personality assessments are useful for predicting work outcomes, however, only 18% use personality assessments when hiring or promoting employees (Society for Human Resource Management, 2012). These findings may help explain the survey results described in Section 1, which found that employers are more concerned with the levels of noncognitive skills their newly hired employees demonstrate as compared to their core academic preparation. Specifically, if employers are using measures of cognitive skills to make hiring decisions,

[14] ACT does administer its Interest Inventory for free when examinees register for the ACT and therefore data on nearly two million students is collected annually. The large percentage of ACT-tested students who complete the Interest Inventory affords the opportunity to provide more integrated, personalized feedback by taking into account the students' achievements, interests, and educational and career plans.

then it is likely that applicants who are offered a job will have these skills. Likewise, selection batteries that do not include noncognitive measures allow for the possibility of hiring applicants with poor noncognitive skills.

Issues to consider in high-stakes decisions. The "fakeability" and coachability of many of the available noncognitive measures (e.g., personality) are often primary barriers to implementation, especially if assessments are to be scaled up on a national level (Griffith & Converse, 2011; Lievens, Buyse, Sackett, & Connelly, 2012). Specifically, concern with using some of these alternative measures for high-stakes decision making—such as admitting students to college, hiring a job applicant, or evaluating a teacher's effectiveness—is that it is possible for responders to fake, or intentionally distort, their responses in order to present themselves more favorably. Consider, for example, a typical conscientiousness item: "I work hard," with response options ranging from strongly agree to strongly disagree. An individual who wants to be accepted to college or hired can easily infer that the "right" answer is "strongly agree." The question is not whether these types of measures can be faked but whether individuals do fake and, if so, what the consequences are for faking. Based on multiple pieces of evidence, Griffith and Converse (2011) estimated that roughly 30% of applicants in a selection setting fake. Based on this estimate and a selection ratio of 30%, Sackett (2011) estimated that more than half of applicants selected based on their faked scores would have not been selected based on their honest responses. Clearly, faking can have a significant impact on decisions made at the individual level.

Though not driven by the self-promotion intent, as is the case with faking, lack of self-awareness can have equally deleterious effects on the usefulness of these alternative measures. A large body of research drives home the point that individuals are often poor judges of their own skill levels (Dunning, Heath, & Suls, 2004). Specifically, on average, individuals tend to believe they are above-average as compared to their peers (Mattern, Burrus, & Shaw, 2010). This over-estimation is most severe among those who are below-average (Austin & Gregory, 2007; Ehrlinger, Johnson, Banner, Dunning, & Kruger, 2008, Kruger & Dunning, 1999; Mattern et al., 2010). Therefore, self-report measures of these additional skills are susceptible to invalid responses, due to both intentional and non-intentional processes, and this may be exacerbated in high-stakes decision contexts (Burrus, Naemi, & Kyllonen, 2011).

Potential Solutions to Faking Issues

Innovative item types. Given the concern with invalid responding for many measures of noncognitive skills, which often employ a self-report, Likert-type format, much research has been devoted to developing item types and measures that are less prone to faking, such as forced-choice item types, situational judgment tests, and other-report measures (ACT, 2007; Kyllonen, 2008; McDaniel, Morgesen, Finnegan, Campion, & Braverman, 2001; Stark, Chernyshenko, & Drasgow, 2005). For example, both ACT and ETS have created measures that use ratings from teachers to assess students' noncognitive skills, such as academic discipline and perseverance, mitigating concerns around socially desirable responses (ACT, 2007; Kyllonen, 2008). Use of these measures may be limited for some intended purposes (e.g., using teacher raters for teacher evaluation applications). Other-report formats may also be useful when there is concern about the students' level of self-awareness; the ratings provided by others can additionally serve a formative purpose by promoting self-awareness via others' feedback.

Other item types have been created to reduce socially desirable responses. One promising example is the forced-choice item format (Christiansen, Burns, & Montgomery, 2005; Heggestad, Morrison, Reeve, & McCloy, 2006; Stark et al., 2005). Rather than asking individuals to rate themselves on the traditional single dimension (e.g., "I work hard"), this format requires respondents to choose which statement is more descriptive of themselves among an item pair that has been matched in terms of social desirability and the level of the trait (e.g., "I work hard" versus "I work well in teams"). This format is more difficult for respondents to fake successfully. Findings from the military, which has successfully used forced-choice personality measures operationally for selection purposes, indicate that the personality scores are predictive of important outcomes such as attrition (Stark, Chernyshenko, & Drasgow, 2010). These findings show promise for applying these measures to high-stakes applications in education and work.

Additional item formats that may be less prone to faking/invalid responding include situational judgment tests and biographical data (biodata), both of which have been extensively researched and validated in both the workplace and educational contexts (Lievens, Buyse, & Sackett, 2005; McDaniel et al., 2001; Mumford & Owens, 1987; Oswald, Schmitt, Kim, Ramsay, & Gillespie, 2004). Situational judgment items include a description of a scenario, in written, audio, or video format, followed by a list of response options from which respondents are asked to make a selection (e.g., select the best option or the option that typifies how they would most likely handle the situation). Biodata items ask respondents about past behaviors and experiences in a standardized manner. Specifically, a typical biodata item asks about the frequency with which the respondent performed a certain behavior (e.g., worked late) over a certain period of time (e.g., last month). While generally less fake-resistant than the aforementioned item types, research has found that using elaboration or asking respondents to provide details to verify their response, can minimize distortion on biodata items (Schmitt & Kuncel, 2002). Other less-commonly employed item formats that hold promise based on research findings include self-estimates of how others would respond to an item (Prelec, 2004), conditional reasoning tests (James, 1998), and vignettes to anchor the self-assessment (King, Murray, Salomon, & Tandon, 2004). Gaming may also be a means for assessing certain cognitive skills and behaviors and might better engage students in assessment activities. The growing body of research on item types suggests that developing reliable, valid, and fake-resistant assessments of these additional student characteristics for high-stakes situations may be possible.

Change in Paradigm: Accountability Versus Student-Centered Development

Regardless of the extent to which the response distortion issues are resolved, changing how assessments are used will be important in order to fully realize the value of assessing noncognitive skills that promote student learning. That is, if the purpose of assessment is focused on holistic, developmentally relevant insights for individuals and educators rather than on school and educator accountability, then formative information concerning the individual's development would benefit greatly. Diagnostic information detailing individuals' strengths and areas for development across not only academic skills but also cross-cutting capabilities and an array of noncognitive skills to provide personalized, integrated insights holds great promise for effectively using such assessments. Skills across these various dimensions are essential for student learning and success along the K–Career continuum. Given their joint influence on learning and the compound effect over time, if skills in any of these areas need to be developed but are not identified early and acted upon, the discrepancy

between where one should be and where one is may be too great to effectively remedy and get the individual back on track to CCR (Cunha & Heckman, 2007; Dougherty, 2014; Masten & Cicchetti, 2010). A focus on helping students realize their true potential clearly points to the importance of adopting and implementing a broader definition of CCR beyond core academic skills.

Section 5

Moving Toward a More Holistic Approach to CCR Across the K–Career Continuum

Research clearly shows that college and career success is multidimensional and has been assessed using a wide variety of indicators. Grades, persistence, engagement, and graduation are all viewed as important outcomes for college success (Camara & Quenemoen, 2012; Schmitt et al., 2009) and have shown that universities and colleges value many qualities beyond academic success in developing and educating their students, including leadership and perseverance. Similarly, performance on the job and success in the workplace are viewed as multidimensional in nature. Research demonstrates that job performance can be defined by multiple criteria and employers often differ in the value attributed to specific outcomes and behaviors (Campbell et al., 1993). Organizations not only value task performance as an important component of workplace success but also other outcomes, such as OCBs and CWBs (Motowidlo, 2003). If all of these various dimensions are important components of success, it follows that readiness and preparation should similarly be focused on a broad and diverse set of individual differences, including core academic skills, cross-cutting capabilities, and noncognitive skills.

To foster academic and work success, it is necessary to have a holistic definition of CCR that focuses on the development of the knowledge and skills that can improve an individual's chance of success across a range of outcomes in postsecondary and work settings. A more comprehensive approach to assessment, designed to proactively identify and accurately measure the multiple dimensions of readiness and assist students in their development throughout the kindergarten through career continuum, can support the implementation of such a model.

Throughout this report, evidence is presented that indicates: (1) educators, policymakers, and employers have embraced a broad repertoire of skills as critical for success in education and work; and (2) including more elements from that broad repertoire of skills can indeed provide incremental validity beyond core academic skills in predicting CCR. Yet, teaching, learning, and assessing students in kindergarten through 12th grade has continued to focus too narrowly on core academic skills, leaving some critics to argue that the current accountability model is narrowing curriculum, teaching, and thus learning in schools (Hamilton, Stecher, Marsh, McCombs, & Robyn, 2007).

To support teaching, learning, and assessment based on a more holistic view of CCR, an expanded framework is required that includes skills in at least four broad domains:

- Core academic skills in mathematics, science, and ELA, based on an expanded definition of the skills and mapped to learning progressions from K–Career.
- Cross-cutting capabilities such as critical thinking, collaborative problem solving, as well as information and technology skills.
- Behavioral skills related to success in education and the workforce, such as dependability, working effectively with others, adapting, and managing stress.
- Education and career skills needed to successfully navigate one's educational and career path, including self-knowledge of one's abilities, likes and dislikes, values, etc.; knowledge about majors and occupations; and a variety of skills related to educational and career exploration, planning, and decision making.

Core academic skills have been identified in the Common Core State Standards, and other similar academic standards are already well developed and are being implemented in schools. Standards for the many other important domains are largely absent, however, from discussions of CCR and from large-scale assessment. To promote the implementation of this broader view of CCR, a framework must define the wide array of skills and provide a roadmap of the relevant knowledge and skills important for readiness across the developmental continuum. Such a framework will allow educators and students to more clearly understand the precursors of education and work success and will facilitate the development of a wider range of assessments to track student progress. Specifically, through clear articulation of each of the domains, and by connecting the knowledge and skills needed for success to useful and practical assessment, students will receive insights that can drive action. For example, showing students the ways in which they are off track for readiness and the skills they need to build to achieve their goals can motivate them to build those skills. To promote the adoption of such a holistic view of CCR, these insights will need to be linked to supporting interventions and professional development.

The ultimate goal in developing a more holistic view of CCR is to provide more comprehensive, personalized, and developmentally appropriate feedback to individuals, offering timely insights in the form of actionable information to help people achieve education and workplace success. ■

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