What Studies Say About College Readiness

BY RAFAEL HELLER

For as long as there have been public schools in the United States, Americans have wrestled over the mission of those schools. Should their guiding purpose be to turn new immigrants into loyal citizens? To prepare children for active participation in democratic life? To sort them by aptitude and steer them into appropriate occupations?

When it comes to such basic questions about the goals of public education, things have never been clear or settled. But that could be changing. From a wide range of education advocacy groups, associations, think tanks, and state and federal policymakers, one now hears a remarkably consistent message: The most critical mission for K-12 education is to prepare students for higher education. Among school reformers, "college readiness" has become a ubiquitous rallying cry.

But for all of the recent buzz about college readiness, it is difficult to say what that term means, how such readiness might be measured, or what schools might do to produce it. The topic could use some careful analysis, which is why EWA has chosen to devote this research brief to the current debates around, and research into, efforts to ensure that the majority of the country's young people receive a K-12 education that truly prepares them to succeed in college.

The goal of this document is to anticipate some important questions that journalists might want to ask about college readiness, to describe the relevant research, and—at the conclusion of each section—to give a bottom-line summary of key findings.

A caveat is in order, though: Depending on how "research" and "college readiness" are defined, the number of relevant studies could range anywhere from the tens to the hundreds or even thousands. Rather than trying to cover every angle, this brief zeroes in on four questions that EWA sees as central to current policy debates in this area. And rather than surveying hundreds of studies, it focuses on several lines of research—and roughly three dozen published reports—that seem to be particularly influential today.

> "For all of the recent buzz, it is difficult to say what 'college readiness' means and how it might be measured."

? What does "college readiness" mean, exactly?

In one sense, students become "ready" to enroll in college as soon as they acquire a diploma from an accredited high school, or earn a General Educational Development, or GED, high school equivalency credential.[1] But the numbers tracking how students fare in college suggest that mere credentials are not necessarily enough to prove they are prepared. For example, among students who enrolled for the first time at four-year colleges in 2001, only 56 percent had earned a degree six years later,[2] and rates were considerably lower among low-income students and some minority groups, including African-Americans and the fast-growing category of Hispanics. According to a pair of 2010 reports from the Education Trust, roughly 49 percent of Latino and 40 percent of African-American college students earn a bachelor's degree within six years.[3]

Having conducted a wide-ranging survey of the existing research on high school coursetaking patterns, academic performance, and college outcomes, Johns Hopkins University sociologist Robert Balfanz predicts that the majority of today's college-bound students are likely to struggle when they get to campus. The evidence suggests that "somewhere between a third and a half of high school graduates leave high school prepared

[1] However, even this sense of "readiness" is beginning to blur, as increasing numbers of students are choosing to participate in "dual-credit" programs, allowing them to take one or more college courses while still enrolled in high school.

[2] ACT, 2010; Wiley et al., 2010.

[3] Education Trust, 2010a, 2010b; National Academy of Sciences et al., 2011.

with a reasonable chance to succeed in college," he concludes.[4]

If high school diplomas and other comparable credentials do not guarantee the ability to succeed in college, it might be better, the argument goes, to define readiness as the ability to do college-level work.[5] In practice, though, these two meanings of readiness cannot be neatly separated. Short of dropping students into a first-year undergraduate class to see how they perform, colleges have no choice but to rely on some sort of proxy—or "indicator," as researchers like to say—for readiness, whether it takes the form of a high school diploma, test scores, grades, letters of reference or a combination of such things. All of which is to say that questions about the meaning of college readiness inevitably come around to questions about how best to measure and certify students' knowledge and skills.

The problem is that it turns out to be quite tricky to predict how well people will perform in college or whether they will stick with it through graduation. Over the past several decades, Americans have come to think of the SAT, and increasingly the ACT, as important parts of the college-application process, providing valid and useful information about students' academic readiness in general and their suitability for highly selective colleges in particular. But in recent years those exams have begun to lose some of their luster, with a number of studies showing that such tests are only somewhat useful in predicting individual college students' first-year grades, which is all that they are designed to predict.[6]

Students' high school grade point averages, especially in core academic classes, appear to provide a far better indicator of how well they are likely to do in college courses. For example, having conducted a number of studies of the academic performance of students in the University of California system, researchers Richard Atkinson and Saul Geiser conclude that:

> *"[A]dmissions tests add an increment of about six percentage points to the explained variance in cumulative college GPA, over and above about 20 percent of the variance that is accounted for by high-school GPA and other academic and socioeconomic factors."*[7]

Note, however, that even if high school GPA is used to supplement students' test scores, that combination removes only a modest portion of the guesswork involved in predicting college performance.

Many researchers believe that college readiness can be measured far more accurately by exams that measure what's actually taught—i.e., how well students learned what was in the curriculum—rather than tests that try to gauge their general aptitude. Evidence does suggest that subject-specific tests, such as the Advanced Placement and International Baccalaureate exams, or end-of-course tests' provide better measures of college-readiness. However, it is not clear whether such tests are viable on a nationwide scale, although that is a goal of the consortia now working to develop assessments based on the Common Core State Standards.[8]

And there's yet one more reason why it has been difficult to create a precise definition of college readiness. Much of the research to date has aimed to identify and measure the specific academic skills that contribute to the success of first-year college students; such skills include reading comprehension, writing and the ability to solve quadratic equations. (For more, see question 3 below.) However, University of Oregon researcher David Conley has found that a variety of other factors have at least as much influence on college students' success as do the purely academic factors on which most researchers have focused. Those other factors include intellectual habits of mind, such as inquisitiveness; self-management skills, such as budgeting sufficient time for assignments; and knowledge about higher education, such as understanding how to choose an appropriate college.[9]

Broadly speaking, notes Conley, "College readiness can be defined… as the level of preparation a student needs to enroll and succeed—without remediation—in a credit-bearing general education course at a postsecondary institution that offers a baccalaureate degree or transfer to a baccalaureate program."[10] However, he goes on to explain—and increasingly, other researchers are coming around to his position—if one wants to gauge students' readiness to go to college, it's only somewhat useful to look at indicators such as the high school courses they've taken, the grades they've earned in those courses, the test scores they've received in core subjects, the degree to which their high school curriculum "aligns with" first-year college courses, or even the scores they've received on curriculum-based exams like the AP. It is better, Conley says to look at a much wider range of indicators, touching on both academic and nonacademic characteristics. And few states, he adds, have even begun to develop or use such indicators.[11]

! *It can be said:*

It's difficult to define precisely what it means to be "college ready." In the abstract, it refers to the knowledge and skills that first-year college students need in order to pass introductory, nonremedial classes. In practice, though, the meaning of college readiness depends on how one chooses to measure it—e.g., by the number of course credits students have earned, by their ACT or SAT scores, by their level of intellectual curiosity, by how much they understand about the world of higher education, etc.

[4] Balfanz, 2009; Greene and Forster, 2003.
[5] A question worth asking, but which hasn't been extensively studied by researchers, is to what extent the meaning of "college-level work" varies by institution. In short, the student who is ready for first-year coursework at East-West Technical Institute may not be ready for first-year coursework at Yale. See Roderick et al., 2009.
[6] Geiser, 2009; Niu and Tienda, 2010; Allensworth et al., 2008.
[7] Atkinson & Geiser, 2009.
[8] Atkinson & Geiser, 2009; Bishop, 2010.
[9] Conley 2004; Fletcher and Tienda, 2009a; Fletcher and Tienda, 2009b; Roderick et al, 2008; Kirst and Venezia, 2005; Porter and Polikoff, 2011.
[10] Conley, 2011a.
[11] See Conley, 2011a and 2011b for descriptions of current efforts to design such indicators. For examples of states and organizations that have developed college readiness standards that focus strictly on academic factors, see Wiley et al., 2010; Rolfhus et al., 2010; Achieve, 2010.

? Is "college ready" the same as "college and career ready"?

For many education policymakers and reformers, the preferred phrase is "college and career" ready. For example, President Obama has argued that the next version of the Elementary and Secondary Education Act, of which No Child Left Behind is the current iteration, should "require all states to adopt and certify that they have college- and career-ready standards in reading and mathematics." [12] In fact, many states—such as Kentucky, Massachusetts, Texas and Virginia—are now in the midst of major "college and career readiness" initiatives.

The pairing of those terms is fairly ambiguous, however. The phrase could be interpreted in at least four quite different ways, and reporters would be well-advised to ask sources precisely which meaning they have in mind.

First, and least likely, when advocates call upon schools to promote "college- and career-readiness," they could have in mind the sort of dual-track curriculum—one for students who appear to be college-bound and the other for students who seem to be headed straight into the workforce—that was common for much of the previous century. However, recent decades have seen a sharp decline in the numbers of students enrolled in distinct, nonacademic career programs, and such programs have few supporters today. According to one study, as recently as 1982, nearly a quarter of the nation's high school students were pursuing a mainly vocational course of study, but that proportion had fallen to less than 5 percent by the year 2000.[13]

Second, and more plausibly, "college and career readiness" could mean that while all students should be required to complete a college-prep curriculum, schools should also provide students with robust career and technical education programs—or CTE, which is the term now preferred over "vocational" education—and/or opportunities for students to enter into apprenticeships with local businesses and tradespeople. That is, college-readiness and career-readiness can be viewed as distinct but complementary goals, with the latter entailing not a second-rate, nonacademic track but, rather, a valuable addition to the regular college prep curriculum, according to one study.[14] This has, in fact, become an increasingly popular model: The numbers of high school students completing both an academic course of study and at least one CTE concentration doubled between 1982 and 2000, rising from 10 to 20 percent of all high school students.[15]

Third, and even more likely, when advocates talk about "college and career readiness," they might be referring to the integration of academic and work-related studies. Over the past two decades, the blending of college and workforce preparation has been a chief goal of federal policymaking and investment in career and technical education. For example, today's "2+2" programs are specifically designed to link the last two years of high school with two-year postsecondary training programs. It has become increasingly common for CTE teachers to blend the study of traditional academic content, such as algebra and chemistry, with the study of work-related subjects, such as auto mechanics and the building trades, so as to ground the academic work in engaging, real-world activities.

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While CTE often has a negative reputation among some policymakers, parents and others who assume that such programs steer students away from postsecondary education, research suggests that when it comes to preparing students for college, integrated programs are at least as effective as strictly academic preparation. Particularly influential has been a long-term study of Career Academies—in which students in grades 10-12 pursue an integrated curriculum, focusing on both traditional academics and a career-related theme—that the Manpower Demonstration Research Corporation (MDRC) has conducted since 1993. The study used an experimental research model that compares the performance of students who have been randomly assigned to participate or not participate in the program. MDRC found not only that Career Academy students were just as likely to earn postsecondary degrees as students in regular academic programs but also, as an added benefit, had greater long-term success in the workforce.[16]

However, it is another, and fourth, meaning of "college and career readiness" that appears to be most central to current policy debates.[17] Rather than calling upon schools to pursue both academic preparation and workforce training or to integrate the two, the phrase is often intended to blur the distinction, suggesting that the skills needed to succeed in the 21st-century workforce are the very same skills that are needed to succeed in college. In other words, rather than calling for schools to pursue two related goals (readiness for college and readiness for careers), many advocates seem to be saying that there really is only one kind of readiness, it applies to both college and careers, and students achieve it by completing a college prep curriculum.

This last use of the phrase can be traced back to two sources in particular. The first was a 2005 report from the American Diploma Project, a collaboration among Achieve Inc., the Fordham Foundation, and the Education Trust.[18] The second was a 2006 report from ACT, which is best known for its college entrance examinations but increasingly active as a research firm, as well.[19] Each found that the reading and

[12] White House Office of the Press Secretary, 2010.
[13] NCES, 2000.
[14] Lerman et al, 2009.
[15] NCES, 2000.
[16] Kemple, 2001; Kemple, 2004; Kemple, 2008.
[17] Grubb and Oakes, 2007.
[18] American Diploma Project 2005; Achieve, 2004.
[19] ACT, 2006; ACT, 2007.

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math skills that employers and economists identify as most critical to the success of new workers overlap with the skills that were identified by college faculty and/or validated by ACT data as most critical to success in the first year of college.

Recently, scholars and organizations have begun to challenge the notion that the demands of college and the workforce are one and the same, or that the ADP and ACT surveys are rigorous or expansive enough to provide enough evidence to back up that claim. For example, the Association for Career and Technical Education has argued that while some of the core academic skills might overlap, careers tend to require much more experience in and understanding of how to apply academic content, as well as various "employability skills" and specific "technical skills" that college prep curricula rarely emphasize.[20]

For journalists, though, the facts of the case—is college readiness the same as career readiness or not?—might be less interesting than the ways in which the phrase is used rhetorically. For the American Diploma Project and like-minded reformers, the point of conflating the two kinds of readiness is to reinforce their larger argument about the mission of the public schools, high schools in particular.

In past decades, it was often said that the schools should have a two-fold mission, providing an academic curriculum to college-bound students and a less academic, and perhaps more vocational, course of study for those likely to head straight into the workforce. But if the public can be persuaded that college and good jobs require the same preparation—i.e., that readiness is readiness, whatever young people intend to do after high school—then it will no longer have reason to support two distinct courses of study. In short, by treating the phrase "college and career readiness" as the default term, it may be possible to blend the two in the public imagination, which will, in turn, strengthen the case for a single college/career-ready curriculum and undermine the position of those educators who would steer some children into a distinct, nonacademic course of study.

Conversely, for those who do wish to make a case on behalf of discrete workforce preparation programs, it's crucial to maintain a distinction between college and career readiness. After all, if it were widely accepted that high school algebra, say, prepares students equally well for both college calculus and postsecondary training in auto mechanics, then what would be the added value of a high school auto mechanics program? In fact, why would high schools offer such career programs at all?

In short, if the public no longer views "career readiness" as a meaningful category unto itself, then it won't be likely to support separate investments in apprenticeships, Career Academies, and other forms of career and technical education. As a matter of self-preservation, then, advocates for such programs have good reason to describe "college readiness" and "career readiness" as two different, but complementary and/or integrated, goals.

! *It can be said:*

While research shows there is some overlap in the skills necessary to succeed in college and careers, the term "college and career readiness" often is used as a tool for debating the role of high schools. It might not be entirely clear what people mean by "college readiness," but the term itself is more or less value-neutral. When advocates talk about "college and career readiness," though—or when they make a point of dropping "and career" from the phrase—there might be strategic reasons they do so, such as their support for or indifference to career and technical education.

? What academic knowledge and skills are most critical to success in college?

Perhaps the simplest way to find out what knowledge and skills new college students need is to ask their professors. Indeed, in a major three-year study, involving more than 400 faculty and administrators at 20 universities, David Conley found that faculty in all departments tend to view two overarching academic skills—the ability to write well and the ability to select and use appropriate research methods—as critical to students' success.[21] Additionally, faculty said that some narrower kinds of knowledge and skill are important in their specific subject area classes. English professors, for example, focused on the ability to analyze and interpret literature, and math professors argued that students need a solid grounding in algebra, which serves as a foundation for

[20] Grubb and Oakes, 2007; Darche et al., 2009; Lerman and Packer, 2010.

[21] Conley, 2003. Unfortunately, notes Robert Balfanz (2009), student writing doesn't appear to be a priority at many schools. According to data from the National Survey of Student Engagement, "Just 2 percent of the high school students reported reading as much material outside of class as college students do, and only 8 percent of high school seniors reported doing as much writing—in both the number of papers and their length."

advanced studies in several math- and science-intensive fields.[22] This sort of survey- and interview-based research has been complemented by studies that analyze students' high school course-taking patterns, test results and actual college outcomes. Particularly influential have been a pair of reports[23] that rely on data from the U.S. Department of Education's National Education Longitudinal Study, which followed a large, nationally representative sample of students from 1988, when they were in 8th grade, until 2000. The factor that best explains which of those students went on to attend and complete college, researcher Clifford Adelman found, was the "quality and intensity of [their] high school curriculum," as indicated by the numbers of credit hours they earned in core courses in English, math, social studies, the sciences and other subjects.

Further, Adelman noted, a key variable associated with college outcomes was the highest-level math class each student had taken in high school. Algebra II appeared to be the pivotal course, serving as a sort of "gateway" to success in higher education, particularly for students who went on to take more advanced math and science courses when they got to college.

Adelman has cautioned, however, that it's not the course title that matters—if it were, then schools would simply decide that every low-level geometry class would henceforth be known as "calculus."[24] While NELS data don't provide information on the actual content of the courses listed in students' transcripts, one can assume that what really made a difference for those students was the content they studied and the skills they mastered whatever the given classes happened to be named. Indeed, a second, oft-cited finding from Adelman's reports is that new college students who struggled with basic skills such that their colleges required them to take remedial courses in more than one subject area were much less likely than their peers to complete a degree program. Being assigned to take even a single class of remedial reading in particular drastically reduced a student's likelihood of earning a degree—only 30 percent of those who took one or more remedial reading classes earned a diploma within eight years. To put it another way, Adelman found that a lack of mastery in math, writing and especially reading skills seems to be an especially powerful indicator of un-readiness for college, no matter how many core courses the given student passed in high school.[25] A similar note of caution—i.e., it's the content and skills that matter, not the course title—comes from a recent report by the University of Chicago Consortium on Chicago School Research, which looks back on the effects of the Chicago Public Schools' 1997 decision to require a college prep curriculum, including Algebra I or II in the 9th grade, for all high school students.[26] While coursetaking patterns did change as a result of the policy, students' test scores in math and reading did not improve, and in some ways their performance appears to have suffered. For example, Chicago's high school graduation rates have declined, and there has been no improvement in college enrollment and retention rates among the system's graduates. Apparently, concludes the report, the schools required that all students take advanced courses, but they did little to ensure that those courses would be taught effectively:

> *[T]his research suggests that mandatory and default curriculum policies need to be accompanied by a focused attention to instruction and stronger efforts to improve the academic behaviors—particularly attendance and studying—associated with better school performance. Without improved instruction and engagement, the promise of these well-meaning reforms is likely to go unrealized.*[27]

In recent years, ACT has conducted a series of studies that are similar in approach to Adelman's work but have the advantage of drawing from ACT's own, sizable collection of data from students' college entrance examinations, supplemented by records of students' coursetaking and achievement during the K-12 years and on through college. On the value of completing a rigorous core curriculum and taking advanced math and science courses, ACT's findings are consistent with Adelman's, but they flesh out the picture in more detail. Notably, they suggest that high school students who take advanced math courses, i.e., beyond Algebra II, are only a third to a half as likely to be assigned to remedial math when they get to college. And if the long-term goal is to stay in college and earn a degree, then it appears to be more valuable for high school students to do well in a few advanced math and science courses than to do poorly in a number of them.[28]

Additionally, ACT has identified a specific reading skill—the ability to comprehend challenging, complex texts of various kinds—as particularly important to success in the first year of college. Students whose scores on the ACT college entrance examination met or exceeded a specific benchmark related to text complexity were found to be significantly more likely to enroll in college, earn a C or better in first-year college history and/or psychology, earn a higher overall GPA in the first year, and return to the same college for a second year.[29]

! *It can be said:*

Research suggests that students' success in the first year hinges on two skills in particular: writing and research. Analyses of student transcripts, test scores and actual college performance suggest also that it is critical for high school students to complete an intellectually demanding core curriculum, to do well in high-level math and science courses, including Algebra II, at a minimum, and to become adept at reading and making sense of various kinds of sophisticated, complex texts.

[22] Conley, 2003.
[23] Adelman, 1999; Adelman, 2006.
[24] According to David Conley (2011a), there is good reason for Adelman to be wary. Anecdotal evidence suggests that many high school administrators have in fact tried the lipstick-on-a-pig approach, tweaking course titles in order to make the curriculum appear more rigorous, without actually changing the content of those courses
[25] According to U.S. Department of Education surveys, during the 2007-2008 academic year (the most recent year reported), 31 percent of White, 45 percent of Black, and 43 percent of Hispanic 1st year undergraduates reported having taken at least one remedial course. See Aud et al, 2011.
[26] Mazzeo, 2010.
[27] Mazzeo, 2010, p.11
[28] ACT, 2010.
[29] ACT, 2005.

What other factors—besides being skilled at reading, writing, math and research—are most critical to success in college?

Since the early 2000s, the University of Oregon's David Conley has led a number of influential research studies into both the academic and nonacademic factors that shape students' experiences in higher education. These studies set aside the issue of college affordability—a major research topic unto itself.[30]

Conley agrees that high school coursetaking and academic performance play key roles in deciding whether or not students are ready for college. But, he argues, so do many other factors that Adelman, ACT and other researchers haven't addressed, including what he refers to as "academic behaviors," "key cognitive strategies," and "contextual skills and awareness." For example, do students know how to keep track of their own academic progress, get their work done on time, and get help when they need it? To what extent are they precise and accurate in their work, open to new ideas, and able to reason carefully, argue logically, and identify the nuances of competing perspectives? Do they understand how the financial aid system works, what it means to choose a college major, or how to transfer credit from one institution to another?

To get at such questions, Melissa Roderick and her colleagues at the University of Chicago Consortium on Chicago School Research (CCSR) have studied the progress of several cohorts of Chicago public school graduates, a mainly low-income, minority population. The researchers have used transcripts, enrollment data, surveys and interviews to gauge the extent to which various academic and nonacademic factors have shaped students' college experiences over time.

Of the Chicago high school seniors included in their study, roughly 80 percent said that they intended to earn a four-year college degree, but only about 30 percent actually enrolled in college the following year, and only about a third of those students earned a degree within six years. One reason for such results, CCSR researchers conclude in a 2006 report,[31] is that low qualifications, i.e., high school grades, test scores and coursework completed, make it impossible for many students to gain admission to selective, four-year institutions. (According to some research, low-income students who attend selective colleges are significantly more likely to graduate than are similar students who attend non-selective two- and four-year colleges.[32])

In a subsequent report, however, Roderick and her colleagues argue that poor academic performance and qualifications only partly explain why so few Chicago public school graduates earn college degrees.[33] At least as important, they find, are factors that go under Conley's category of "contextual skills and awareness." Echoing the findings of earlier studies by Kirst and Venezia (2005), the CCSR researchers conclude that the whole college selection and application process—e.g., scheduling campus visits, figuring out whether a college is a good "fit" for one's interests and qualifications, filling out multiple applications, obtaining letters of reference, securing financial assistance, and so on—is a mystery to many low-income students, including many who have strong academic records. Among high school seniors who said that they planned to earn a bachelor's degree, only 41 percent went on to complete all the steps needed to apply and enroll in a four-year college; rates were particularly low for Hispanic students and for students who would be the first in their family to attend college. Further, among those students who qualified for entry to selective colleges, more than half ended up at nonselective institutions, and roughly 17 percent didn't go to college at all.[34] In short, the CCSR's findings have lent strong support to the argument that the definition of "college readiness" should be expanded to include nonacademic factors—in this case, knowledge about the college application process.

As Conley notes, CCSR is one of several organizations that have begun to develop useful and reliable measures of these aspects of college readiness, and it's possible that such tools will become widely available in the coming years.[35] For example, the Educational Policy Improvement Center, which Conley directs, is currently designing an assessment model that relies on trained readers to evaluate the reasoning, argumentation, precision and other qualities found in samples of students' written work, and other new "low-stakes" assessments are designed to gauge students' study skills, time management strategies, knowledge about the college application process, and so on.

It can be said:

Until recently, research on college readiness tended to focus mainly on students' knowledge and skills in core academic subject areas. Increasingly, though, researchers are trying to take into account the much wider range of academic and nonacademic factors—including intellectual habits, self-management skills, and knowledge about higher education—that contribute to students' success in college.

[30] Conley, 2003; Conley, 2007; Conley, 2011a.
[31] Roderick et al., 2006.
[32] Carnevale and Rose, 2004; Alon and Tienda, 2005.
[33] Roderick et al., 2008. Again, it's important to note that the researchers acknowledge that financial pressures play a large role in deciding who goes to college and how long they stay. For the purposes of this research project, however, they've chosen to bracket off the issue of college affordability—what other factors, they ask, determine students' readiness for college?
[34] Roderick et al., 2009.
[35] Conley, 2011a; Conley, 2011b.

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