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Replacing Remediation with Readiness

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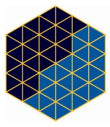

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Abstract

This paper critically examines traditional means of assessing college students' need for remediation and suggests as a replacement an expanded definition of college readiness, where readiness is more complex than rudimentary content knowledge and more multifaceted than a single cut point. The paper presents and explains four dimensions of readiness that should be assessed, considers types of additional measures and methods needed to collect such information, offers a model for a student profile that captures and communicates this richer information, suggests some of the ways this information might be put to use by schools and students and the changes that would result from doing so, and considers the challenges involved in doing so.

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1. Introduction

Incoming college students are currently considered to be either remedial or college ready—a false dichotomy that is in need of a fundamental rethinking, not merely a technical fix. At the heart of this rethinking should be the idea that all students are college ready and remedial to varying degrees when judged in relationship to a broader definition of college readiness. With a wider range of data collected, readiness could be assessed as a matter of degrees, not as an absolute. These data would be collected via assessments and performance measures that are more directly representative of college readiness. Ultimately, this richer dataset would create a profile of college readiness that could guide students during high school and then help match them with interventions designed to support their success in college. The dataset would also inform a range of programmatic and policy decisions.

With a new definition of readiness, the "remedial" label disappears entirely in favor of a continuum of strengths and weaknesses across four domains that are key to college readiness. Essentially all students are found to be in need of improvement to some degree and, hopefully, college ready to some degree as well. Knowing where students fall along the continuum enables students to take steps to increase their readiness and guides institutional responses and state and national policies aimed at increasing student success rates in entry-level credit-bearing courses.

This paper critically examines traditional means of assessing the need for remediation and suggests as a replacement an expanded definition of college readiness, where readiness is more complex than rudimentary content knowledge and more multifaceted than a single cut point. The paper presents and explains four dimensions of readiness that should be assessed, considers types of additional measures and methods needed to collect such information, offers a model for a student profile that captures and communicates this richer information, suggests some of the ways this information might be put to use by schools and students and the changes that would result from doing so, and considers the challenges involved in doing so.

2. The Nature of the Problem

Remediation, both as a concept and as a set of programs, is not working well, and the success rate for students in the current classification-driven system is not encouraging (Clery & Topper, 2008; Bailey, Jeong, & Cho, 2010; Florida Department of Education Office of Program Policy Analysis and Governmental Accountability, 2007), particularly as the pool of incoming college students becomes more varied (U.S. Department of Education, 2010). As more high school students pursue postsecondary education, the proportion with predictable and sometimes severe gaps in their readiness to engage in study at the postsecondary level also grows (Hussar & Bailey, 2009).

Today's high schools already struggle to adequately prepare the vast majority of students for college. By ACT's measure, only 22% of all students taking its exam achieve a score that indicates college readiness (ACT, 2008). How will high schools cope with a new generation that contains more students who will be first in their families to continue their education beyond high school (Chen & Carroll, 2005)? First-generation students have disproportionately populated remedial programs to date (Wirt, Choy, Rooney, Provasnik, Sen, & Tobin, 2004). If students continue to exit high school ill-prepared for college and place into skill-development programs that they struggle to complete, the outlook for reduced remediation rates in the future is not good (Bailey et al., 2010).

Many postsecondary systems and individual campuses have undertaken an array of programs to better analyze student readiness and address identified shortcomings of entering students. These programs include multiple assessments, re-testing, intensive refresher courses, learning communities, enhanced academic advising, targeted orientation opportunities, cohort models, and summer bridge programs, among others (Achieving the Dream, 2010; Adams, 2010; Brock, Jenkins, Ellwein, Miller, Gooden, Martin, MacGregor, & Pih, 2008; Zachry, 2008). Most two-year institutions and many four-year institutions provide learning assistance centers that are open to all students (Perin, 2004). Pathway programs, groupings of courses that a cohort of students take together, and freshman seminars are becoming more common at four-year campuses as vehicles to provide support to entering students. All of these approaches tend to operate with minimal information on individual student skills and deficiencies and more from general theories regarding shortcomings in entering students. The potential effectiveness of these programmatic approaches is limited by their idiosyncratic nature and fragmentation. If all of these approaches could be brought together under one organizing framework, their effectiveness could be evaluated more precisely in relation to a common set of readiness criteria calibrated to the knowledge, skills, behaviors, characteristics, and strategies necessary to succeed in entry-level courses.

The U.S. postsecondary education system is probably the most liberal in the world in providing students well-defined and easily identifiable avenues for pursuing a college education. But there is a tension between this policy of near-universal access on one hand and readiness standards and criteria on the other (Attewell, Lavin, Domina, & Levey, 2006; Perin, 2006). Preserving the balance requires careful attention to and accommodations for underprepared students who are motivated to pursue a postsecondary education without lowering the standards and expectations associated with an entry-level college course.

The U.S. postsecondary education system is also among the most decentralized in the world. This combination of high access and low centralization means that it is difficult to depend on any consistency among postsecondary institutions on any of a broad array of factors related to preparation, placement, and admissions. The same can be said about the U.S. secondary education, for which governance is distributed among 50 states and over 15,000 independent school districts. Each is free to make its own programmatic decisions. This extreme variation is not a problem for students who have access to resources and savvy about the workings of this complex, opaque system. It is problematic for secondary students from schools or families that lack this "college knowledge," the privileged information that is necessary in the U.S. for college success but not explicit or public in nature (Conley, 2005; McDonough, 1997).

The Problem of High School-College Discontinuity

One of the reasons that students struggle when they move from high school to college is that the two learning environments differ in so many ways. Understanding the full range of these differences is a crucial step in designing effective remediation programs. The place where the differences between high school and college first become apparent to students is the entry-level college course. This is where many students find out how ill-prepared they are, not just in their content knowledge but also in the ways that they learn, study, manage their time, and organize and apply what they are taught.

An entry-level college course has several critical components that distinguish it from a secondary school course. Researchers at the Educational Policy Improvement Center have identified the following major characteristics of entry-level college courses from analyses of syllabi; surveys of instructors; and reviews of tests, assignments, and student work (Conley, Aspengren, Gallagher, & Langan, 2006; Conley Aspengren, Gallagher, & Nies, 2006; Conley, Aspengren, & Stout, 2006; Conley, Aspengren, Stout, & Veach, 2006; Conley, McGaughy, Cadigan, Flynn, Forbes, & Veach, 2008; Conley, McGaughy, Cadigan, Forbes, & Young, 2009).

These courses cover more material and do so at a more rapid pace than do their high school counterparts, even those courses bearing the same or similar names. Although much of the information in a college course may be similar or the same as the information presented in a similarly named high school course, the college course presents this material in a more conceptually complex fashion. Students are not merely expected to memorize factual or procedural information; they are expected to apply and use the information in non-routine ways. They may be asked to solve a problem with no obvious solution, interpret a situation, reach a conclusion, or explain a dilemma or contradiction. They are often asked to apply a general principle to a specific situation in a way that may have been explained in class but not applied to this exact situation—in other words, to reason inductively.

In college courses, students are expected to work independently, to manage their time on their own, and to seek help when they need it. The reading load in college courses is significantly greater than in high school courses, and the material may be more technical in nature. College texts require specialized reading skills that may not have been taught in high school. Students have to write more and to do so more frequently, and to utilize writing styles they may not have encountered very often in high school, often encountering assignments that require skillful use of expository, descriptive, and analytic modes. Often students are assumed to have already mastered certain skills, such as how to interpret data to read a chart or graph, and are expected to apply these skills without being instructed specifically how to do so in the course. College courses make more assumptions about prior or prerequisite knowledge and about the ability of students to transfer knowledge or skills from one setting to another without explicit instruction.

Entry-level courses almost always expect students to possess a range of attributes and behaviors that can be summed up as self-management skills. Students are expected to be able, without prompting by their instructors, to record assignments, manage their time in order to complete assignments, know how to study alone and with a group, be generally aware of their skill and achievement level in the subject area and any areas where they may need to improve or seek help from the instructor or elsewhere on campus, be motivated to learn or at least to do what it takes to complete a course successfully, and to be sufficiently persistent to deal with problems or assignments that cannot be solved easily or quickly.

College courses often ask students to work together in teams with a more diverse group of students than they encountered in high school to solve problems or make presentations (National Survey of Student Engagement, 2004, 2006, 2009). Students are expected to base their opinions on solid logic or sources they can cite, to know how to engage in give-and-take discussions with the instructor and fellow students, and to be able to accept feedback, critique, and constructive criticism amicably and productively.

The Problem of Dichotomous Models of Readiness

The current operational definition of a remedial student is one who fails to meet the standards for enrollment into an entry-level credit-bearing course, generally as applied to English, composition, and mathematics. The definition is notable for its lack of specificity or benchmarking. A student could conceivably be designated remedial at one institution and drive down the road to another institution and not be remedial any longer. No real mechanism or standard exists to establish comparability between various institutional definitions of what constitutes remedial performance versus readiness for a credit-bearing course. In fact, the Getting Past Go project to establish a national database of placement practices, including assessments used, cut scores required, and completion standards used to determine if students have meet academic standards, indicates just how complex the system is nationally (Vandal, 2010). Ironically, analysis of college transcript data from the National Educational Longitudinal Study (NELS:88) reveals that many students with limited academic skills do not take remedial coursework at all, while "substantial numbers" of students with strong high school backgrounds do (Attewell et al., 2006).

The Problem of Placement Tests

In practice, a test of some sort generally is used to set the cut point. The tests come in two basic types: the more familiar commercially available versions offered by several different testing companies, most notably College Board's ACCUPLACER® or ACT's COMPASS® and ASSET®; and locally designed tests, generally created by a faculty member at the institution or another institution in the system.

Each has its own problems. The commercially produced tests are justifiable from a measurement perspective, but they do not have any specified or consistent cut score or level that designates readiness for credit-bearing courses. And although their producers provide detailed direction on how to set cut scores (Morgan & Michaelides, 2005), the process necessarily incorporates an element of judgment and variability. Each institution that uses the test is free to set its own cut score level, based on the method it chooses, and in fact most do exactly this. This results in different operational definitions of remedial-level at schools within the same state and the same postsecondary system (Boylan & Saxon, 2001; Brown & Niemi, 2007; Ewell, Boeke, & Zis, 2008), a particularly odd notion if we assume that entry-level, credit-bearing, general-education courses should be roughly comparable across institutions in terms of challenge level and general content coverage and if these courses are used for transfer purposes, particularly from two-year to four-year institutions. If they are not comparable, then we must entertain the idea that the tests do not, in and of themselves, differentiate between students who are college ready and those who are remedial. They simply array students along a continuum, and institutions then determine,

hopefully not arbitrarily, where to place a cut point that distinguishes a remedial student from a non-remedial student.

Locally constructed tests offer an alternative to commercially produced instruments (Brown & Niemi, 2007). These "home grown" tests have one distinct advantage: there is local ownership of them. Often, the test is authored by faculty at the institution, which results in high familiarity with and confidence in these instruments. Ideally, the instruments align well with the content of that institution's entry-level courses, and these exams may require more complex or authentic student work products.

However, it is difficult for local high schools to know much, if anything, about what is on these tests or to prepare students for them, and college students may be unfamiliar with the test format and unclear about the significance of a particular score (Behringer, 2008; Hughes & Scott-Clayton, 2010; Nodine, Bracco, & Venezia, in press; Safran & Visher, 2010). Although the development process and psychometric properties of these tests are not as well documented as those of commercial tests, they are nevertheless used to make significant high-stakes decisions about student placement into, or access to, entry-level courses. Consistency across multiple institutions is very limited, and the effectiveness of these measures is often established largely based on anecdotal evidence.

Placement testing can be vulnerable to misclassification errors because the distinction point between college ready and remedial can vary greatly based on what is tested and how well students have to perform on the test (Boylan & Saxon, 2001). Placement tests provide very little useful diagnostic information about the specific academic deficiencies that students may have (Boylan, 2009). The exam score is not designed to provide insight into the specific nature of and reason for any deficiency. It is not clear if the student simply has forgotten material learned previously and needs only to refresh his or her memory, or if he or she has never been exposed to the material in the first place. The test cannot determine if the student needs a small amount of focused review or a re-teaching of the material from scratch. It may not be clear if the problem is lack of content knowledge or lack of study skills. In short, while tests may identify deficiencies, they are not particularly useful in helping to identify how to remedy any particular deficiency.

Even within the domain of content knowledge, the tests do not necessarily cover all the necessary or important topics. Although testing companies are going to great lengths to refine placement tests via computer-adaptive models and diagnostic student reports, the content that is assessed may not be sufficient to cover the full array of knowledge, skills, attitudes, and behaviors associated with postsecondary readiness and success (Conley, 2003a, 2003c; Conley & Brown, 2003; Seburn & Conley, 2009).

Testing companies do conduct research on the relationship between their remedial measures and student performance in entry-level courses, and institutions can defend the decisions they make regarding the tests they employ and the cut scores they designate (ACT, 2010; Mattern & Packman, 2009; College Board, 2010). The problem is that the lack of consistency and clarity across much of postsecondary education makes it impossible to define consistently what constitutes *remedial* and what constitutes *ready*. For example, California community colleges were found to have at least 94 different remedial standards (Brown & Niemi, 2007).

The institutionalization of a single test or single cut score model is one possible solution to all of this variation. This approach would have significant effects. Parsad et al. (2003) note that 92% of two-year institutions currently use placement exam scores to determine students' remediation status. Hughes and Scott-Clayton (2010) report that states are trending toward standardization of state exams and cutoff scores based on recommendations from influential organizations such as the National Center for Public Policy and Higher Education and the Southern Regional Education Board (2010). If cut scores are to be standardized in any fashion, extreme care will need to be given to issues of misclassification. The single score from a placement test is unlikely ever to be reflective of college readiness in a true, significant, and general fashion.

The current variation in placement methods and cut scores makes it difficult for high schools to refer to placement exams for ideas about what constitutes college readiness, and very few high schools take placement test requirements into account to any significant degree. Unless the message about what it means to be college ready becomes clearer and more detailed, it seems unlikely that much progress will be made in reducing remediation rates. Placement tests as currently constituted do little to help establish clear standards to promote the alignment of high school instruction with college readiness standards.

A study of the alignment between the major commercial placement tests (for an overview of these tests, see Table 1) and the Texas College and Career Readiness Standards (TCCRS) provides a general overview of the relationship between these tests and a set of comprehensive college readiness standards developed by Texas secondary and postsecondary faculty. Two admissions tests and four placement tests were analyzed (ACT®, COMPASS, ASSET, SAT®, ACCUPLACER, THEA®) to ascertain their coverage and challenge level in relation to the TCCRS. The study found considerable similarity among content coverage and cognitive challenge in the admissions and placement tests reviewed (Seburn & Conley, 2009); no one test emerged as superior (see Table 2 for details).

Table 1: General Characteristics of Major Placement Tests

COMPASS	• Untimed • Some calculators allowed at the discretion of the institution for certain sections • Scores and institution-designed placement message available upon completion • Student Advising Report can include placement based on institution cut scores and support services messages • Institution access to student demographics, customized list reports, summary reports, and research reports that identify patterns for recruitment and retention
ASSET	• Paper-and-pencil • Timed: 175 mins (25 mins per section) • Calculators allowed except for numerical skills section • Immediate score reports, student advising reports, educational planning reports, and transfer planning reports available via 1) self-score answer documents, 2) machine-score answer documents used with a scanner, 3) microcomputer database system software • Success Seminars suggested for ASSET delivery, which include orientation with assessment, immediate scoring, and advising services • ASSET system includes four research services for institution use: 1) Entering Student Descriptive Report, 2) Returning Student Retention Report, 3) Course Placement Service, 4) Underprepared Student Follow-Up Report
ACT	• Paper-and-pencil • Timed: 2 hrs 55 mins, plus 30 mins for optional writing test • Some calculators allowed • Usually used for admissions but used by some schools for placement[a] • Cost: $33 registration, $48 including writing • Students may take the ACT up to 12 times • Administered six times a year according to national schedule • Scores available online according to national schedule
ACCUPLACER	• Online computer-adaptive • Untimed multiple choice; untimed or timed essay • Use of additional materials such as calculators, textbooks, and dictionaries determined by site regulations • Score report upon completion • Test by appointment • Diagnostic available for separate diagnostic assessments
SAT	• Paper-and-pencil • Timed: 3 hrs 45 mins • Some calculators allowed • Usually used for admissions but used by some schools for placement[a] • Cost: $47 (not including subject tests) • Score Choice options to select which scores by test or by test date to send • Scores available online according to national schedule

[a]Secondary to College Articulation Committee, 2008

Table 2: Relationship of Major Placement Tests to the Texas College and Career Readiness Standards

	COMPASS	ASSET	ACT	ACCUPLACER	SAT
Created By	ACT	ACT	ACT	College Board	College Board
Assessment Features					
Number of Items	varies	192[a]	215[a]	90	171
Computer Adaptive	√			√	
Diagnostic Report Possible	√			√	
Challenge Level					
Item Rigor, Math[b]	1.06	1.02	1.03	1.08	1.08
Item Rigor, English/Language Arts[b]	1.08	1.08	1.16	1.21	1.21
Cognitive Demand, Math[b]	1.56	1.50	1.84	1.39	2.05
Cognitive Demand, English/Arts[b]	1.42	1.28	1.37	1.64	1.46
Alignment with TCCRS Standards					
Numeric Reasoning	√	√	√	√	√
Algebraic Reasoning	√[c]	√[c]	√	√	√
Geometric Reasoning	√	√	√	√	√
Measurement Reasoning				√	
Probabilistic Reasoning			√[d]		√
Statistical Reasoning			√		√
Functions	√	√	√	√	√
Problem Solving and Reasoning				√[e]	
Communication and Representation			√		
Connections					
Writing	√	√	√	√[f]	√
Reading	√	√	√	√	√
Research					
Key Cognitive Strategies					
Foundational Skills					

[a]Number of items does not include optional writing assessment. [b]Scores were drawn from the Texas Test Alignment Project Final Report (Seburn & Conley, 2009) with Rigor measured on a scale of 1–3 and Cognitive Demand on a scale of 1–4, 1 being least rigorous or least demanding. [c]For algebra, COMPASS includes pre-algebra, algebra, and college algebra while the ASSET measures elementary, intermediate, and college algebra. [d]ACT measures "understanding simple descriptive statistics." [e]ACCUPLACER measures applications and problem solving. [f]ACCUPLACER measures sentence skills.

Coverage levels were similar among all of them. Challenge levels differed somewhat; college admissions tests were found to be somewhat more challenging than placement tests. The study concluded that no one test provided information on the full range of TCCRS and each generated a somewhat different profile of readiness based on the content covered and emphasized within the test. Particularly lacking was information on student key cognitive strategies and higher-order thinking in addition to some specific content knowledge areas.

Placement tests generally assess comprehension of short literary and nonfiction passages. This type of written material represents only a small, non-representative sample of the types of reading students are expected to do in college, much of which is increasingly in the form of primary source documents in addition to textbooks full of technical information and terminology. The reading passages found in placement tests have been characterized by those who have reviewed them as having levels of difficulty appropriate for students in middle school or early high school (Achieve, 2007; Seburn & Conley, 2009). Writing is tested on ACCUPLACER and COMPASS (optionally on ASSET) via brief essays that do not provide much insight into the range of writing styles students are typically expected to employ or the assignments they are expected to complete in their courses. Some institution-specific writing exams are better potential measures because they require more authentic written products that reflect college classroom expectations more directly (Achieve, 2007).

Performance on mathematics placement tests may not be the best means to determine students' potential to succeed in college because many non-mathematics courses do not require the specific knowledge tested on the placement exams. Instead, many expect students to be able to engage in data interpretation that requires general quantitative and analytic reasoning (Cullinane & Treisman, 2010). Placement tests in mathematics tend to cover number sense, measurement systems, arithmetic, and basic algebra (Achieve, 2007), areas that may not show up directly in many courses that instead require a different set of quantitative skills.

It is becoming more apparent that students are expected to be able to utilize in non-mathematics courses a range of mathematical skills not well assessed by placement tests (Conley, 2005; Cullinane & Treisman, 2010). With increasing frequency, students are expected to interpret statistical data; understand simple and complex tables, charts, and graphs; and conduct basic quantitative analyses in the context of other disciplines. They may be asked to do this in economics, biology, sociology, physiology, or business. They need strong data analysis and interpretation skills because instructors in these courses do not teach these skills; they assume students already have them.

The current regimen of placement testing, then, is certainly sufficient to ascertain if an individual is literate in a basic way and acquainted with a rudimentary set of mathematical principles and techniques. In part for this reason and due to the variation in cut scores noted previously, the discrimination power of these tests around a criterion point is not great (Martorell & McFarlin, 2007). Admissions and placement test scores are most useful at the extremes; students who do very poorly will probably struggle in almost any college course, and students who do very well have the skills to handle college-level reading and mathematics (ACT, 2006). They are less useful for communicating to students the range of skills necessary to succeed in all entry-level courses or for determining the readiness of any individual student to do so.

The California State University's Early Assessment Program (EAP) provides an object lesson on the use of placement test scores to reduce remediation. The EAP is a well conceived effort to let high school students know during their junior year if they are on a track to avoid remediation (California State University, 2006; Kirst, 2003). By adding questions to the California Standards Test (CST), which is taken by all high school students, CSU can guarantee that students who score above a certain point on the supplemental questions in combination with the CST score will not have to take remedial courses at any CSU campus to which they are admitted.

Early research at one CSU campus suggests this approach may be yielding successful results (Howell, Kurlaender, & Salvetti, 2008). However, systemwide results have been less consistent. Over the four years that the EAP has been administered, remediation rates in the CSU system have remained constant overall, although some campus-level improvements have been noted (California State University, 2009a). This does not mean that EAP is not a viable strategy; it only means that this approach alone is not sufficient to reduce remediation to the level desired by the CSU governing board. This suggests that the test items may be a useful start toward a solution but that additional effort will need to be made to bring down remediation rates further. Interestingly, the mean high school grade point average for all freshmen in the CSU system who tested at the remedial level was 3.29 (California State University, 2009b), suggesting that high school grades approaching a B+ are not sufficient to ensure college readiness in and of themselves.

3. A Comprehensive Readiness Model as a Solution

While testing organizations and colleges devote a great deal of energy to interpreting the results of existing placement tests based on cut scores (ACT, 2010; Council on Postsecondary Education, 2009; Martorell & McFarlin, 2007; Mattern & Packman, 2009), only recently has serious attention been paid to the need to define the domain of knowledge, skills, attitudes, and behaviors required to be ready to succeed in postsecondary studies (Achieve, The Education Trust, & Thomas B. Fordham Foundation, 2004; Conley, 2003b; Council of Chief State School Officers & National Governors Association, 2010a, 2010b; Texas Higher Education Coordinating Board & Educational Policy Improvement Center, 2009). "Ready" is beginning to be redefined as more complex than a single cut score on an admissions or placement test.

Given the difficulties and limitations associated with the current test-based, single-score model, what are the elements of a more comprehensive model of readiness? The model includes four major components (Conley, 2007): 1) development of key cognitive strategies; 2) mastery of key content knowledge; 3) proficiency with a set of academic behaviors; and 4) a sufficient level of "college knowledge," or knowledge about what postsecondary education requires.[1] The model has been validated in observations and analyses of entry-level college courses and of high schools that prepare a better-than-expected proportion of students for postsecondary success (Conley, Aspengren, Gallagher, & Langan, 2006; Conley, Aspengren, Gallagher, & Nies, 2006; Conley, Aspengren, & Stout, 2006; Conley, Aspengren, Stout, & Veach, 2006; Educational Policy Improvement Center, 2009). What follows is a condensed explanation of each of the four dimensions.[2]

Key cognitive strategies involve thinking about and applying key content knowledge in sophisticated ways. Examples include:

- formulating a problem and developing hypotheses and strategies to solve it;
- conducting research to inform the solution of the problem;
- collecting the appropriate information and evaluating the credibility and relevance of the sources used;

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[1] For a more complete treatment, see: Conley, D. (2010). *College and career ready: Helping all students succeed beyond high school*. San Francisco, CA: Jossey-Bass.

[2] This summary of the four-dimension model is excerpted from: Conley, D. (in press). Increasing the capacity of secondary schools to make more students college and career ready. *Principal Leadership*.

- interpreting findings from the research in relation to the problem, and analyzing and evaluating those findings to determine how well they contribute to the explanation or solution of the problem;
- communicating findings by organizing them into a useable format and constructing a logical means to present them; and
- doing all of the above with precision and accuracy that requires the student to constantly monitor for errors and confirm the accuracy of everything presented or stated.

Key content knowledge consists of the big ideas of the academic disciplines, organized into a structure that enables learners to understand and retain this information. Specification of key content knowledge comes from studies of the content of entry-level college courses at two-year and four-year institutions. These studies make it clear that students do not need to know everything before they go to college, but they do need to master a strong set of foundational knowledge and skills very well.

Academic behaviors are self-management skills students must master to do well in any type of postsecondary learning environment. They include time management; study skills, including using study groups; goal setting; self-awareness of academic strengths and weaknesses; and persistence with challenging academic tasks. These can be seen to some degree as measures of maturity, but they can and must be developed systematically throughout secondary school to be in place by the time students get to college.

Finally, college knowledge is awareness that college is different from high school, that students must pay attention to numerous details and make many decisions in order to apply to, receive financial aid for, and be accepted by the right postsecondary institution. In short, college knowledge is access to all the "privileged knowledge" held by those who have easy access to college by virtue of their position in society but hidden from those who would be first in their families to attend a postsecondary program. Schools must make this information explicitly available to all students, and particularly to those who will only be exposed to it in school and not at home.

In this conception, readiness is a continuum, not a cut point, and students may be considered ready in one area but not another. Mastering content knowledge alone may not be sufficient if a severe deficiency in one of the other dimensions is present. In contrast to policies based on cut scores, this model moves away from a "remedial/not remedial" decision about any given student—a tremendously important difference. If this conception of readiness were applied, both open enrollment institutions and those with admission

criteria would focus on ascertaining the degree to which each student was college ready and the areas in need of support or improvement.

This paper focuses solely on the placement aspects of this conception and ignores the interesting and complex implications for admissions that derive from the use of a readiness profile. It is not my intent that the profile as described in this paper be viewed as a tool to restrict enrollment at two-year institutions. Instead, I seek to illustrate the palliative effects and the potential benefits of the profile's use as a means for institutions to gauge student readiness for college success in ways that are actionable and addressable by the student and the institution.

Under the readiness continuum notion, everyone is ready for college in some ways and not as ready or not sufficiently ready in others. The remedial label disappears and is replaced by the identification of specific knowledge, skills, and behaviors that can be addressed systematically with help from the institution. This is particularly important at two-year open-enrollment institutions, whose students who would show particularly wide variation across the four readiness dimensions.

The Role of Better Data and Assessments as a Key Element in the Solution

Others have pointed out the need for more comprehensive information on developmental education students (Boylan, 2009; Boylan, Bonham, & White, 1999; Maxwell, 1997; McCabe, 2003), suggesting a wide range of additional data that would be useful in creating a more comprehensive picture of developmental education students. This paper argues that this is true for all students and that the wider range of data necessary to aid developmental education students is unlikely to be generated unless it is generated for all students.

The recent and rapid adoption by nearly 40 states of the Common Core Standards, along with the impending development of common assessments to accompany these standards, creates an opportunity to specify a clearer and perhaps more comprehensive picture of college readiness for all students. The Common Core Standards extend from kindergarten through the end of high school, but they culminate with College and Career Readiness Standards in mathematics and English that are calibrated against what it takes to be ready to succeed in entry-level college courses.

The Educational Policy Improvement Center (2010a) has a study underway to ascertain the validity of these standards as measures of college and career readiness by comparing the expectations of nearly 3,000 entry-level course instructors and the content of

their courses to the Common Core Standards College and Career Ready Standards (CCRS). This study is somewhat unusual because the CCRS in mathematics and English will be compared to 25 courses, most of which are not English or mathematics courses. Of this total, nearly half will be from certificate and associates programs offered at two-year institutions, and many of the rest will be from science and social science courses. In addition, the study will gather information about the degree to which entry-level courses expect students to be able to apply a range of cognitive strategies and learning skills that are elements of the four-dimension model of college readiness.

If the CCRS are found to be the basis for preparation broadly for postsecondary coursework, then the common assessments being designed by two consortia of states to measure them could conceivably be used for a range of diagnostic purposes and even for some decisions relative to college readiness. More than 30 states have agreed in principle to use the results of the common assessments as their state testing system. The U.S. Department of Education's *Blueprint for Reform* (2010) includes a requirement that the results of the common exam be used as the basis for determining college readiness and that students who achieve a specified score be designated college ready and exempt from remedial courses. If these requirements are implemented, students taking the common assessments while in high school will receive a score before graduating that theoretically signals how well prepared for college they are and whether they are on track for a remedial placement.

Each consortium is also proposing a number of performance tasks in addition to computer-based or computer-adaptive testing, although the tasks play different roles in each consortium's model. The inclusion of performance tasks does, however, create the possibility of capturing information in areas standardized tests cannot, such as the ability to write an expository essay, to solve a complex problem that takes an entire class period to complete, to organize information to make a logical argument or support an opinion, to develop a hypothesis when presented with conflicting or ambiguous information on a problem or phenomenon, or a host of other tasks that integrate a wider range of thinking skills with specific content knowledge. While it is by no means certain that the consortia have these sorts of tasks in mind, the inclusion of more complex measures of this nature could lead to increased emphasis in high school on the development of cognitive strategies and work habits more consistent with tasks students will encounter in college courses.

State high school exams may also have the potential to provide useful data. Many states have developed high school end-of-course exams; California and Texas are particularly notable examples (Brown & Niemi, 2007; Kirst, 2003). These exams focus primarily on content knowledge in a given subject area. Although most states utilize traditional standardized multiple-choice formats, the end-of-course model has the potential

to generate more information than can placement tests in reading, writing, and mathematics. The end-of-course exam model could conceivably be expanded to include more "through-course" measures, such as assignments and term papers, that could be graded by teachers using scoring guides calibrated against college readiness in addition to state high school exit criteria.

Some states have also adopted requirements that all students complete culminating projects or senior assignments that could conceivably be scored in ways that generate information useful for placement decisions. More cognitively challenging assignments would serve as a source of information about areas that are not included in commercial placement tests. Both end-of-course exams and culminating projects offer the potential to generate additional information on college readiness in states that adopt and implement the common assessments as well as states that do not.

Considerable discussion is occurring more generally about potential new assessment models and systems. Some of this has been spurred by the Common Core Standards and common assessments, but some of it is being generated by testing companies themselves in recognition of the need to continue to pursue new methods of assessing student performance in comprehensive ways that connect to the classroom more directly. For example, the Center for K–12 Assessment and Performance Management at the Educational Testing Service (ETS) produced the report *A Fresh Start: Creating the Next Generation of Assessment Systems* (2010). The report describes four different conceptual approaches to assessment systems that utilize multiple methods for collecting a wider range of data and making more precise discriminations and determinations about what students do and do not know. While none of the models explicitly addresses the issue of placement or remediation, each assumes that better decisions could and would be made about student readiness at each step and level in the educational system.

The Educational Policy Improvement Center (2010b) has developed and field-tested an assessment system that is focused on measuring the key cognitive strategies necessary for college and career readiness. The College-readiness Performance Assessment System (C-PAS) spans grades 6–12 and utilizes performance tasks that are embedded directly into classroom instruction as its primary means of determining student performances relative to criteria linked to college and career readiness. The tasks require considerable thought and effort and take anywhere from several days to three weeks to complete. Teachers score the tasks using common scoring guides that contain criteria derived from research on the cognitive demands of college courses. The scoring guides measure five "aspects": problem formulation, research, interpretation, communication, and precision and accuracy. Each aspect has two components, for a total of ten points available to be earned per task. Task

difficulties vary and are organized along four benchmark levels, at approximately grades 6, 8, 10, and 12.

The C-PAS model allows students and teachers to gauge performance at each benchmark level in relation to college readiness criteria as well as progress being made across benchmark levels longitudinally. Students ascertain if they are developing the kinds of cognitive strategies they will need to do well in college courses. This approach provides information in an area overlooked by other assessments geared to college preparation. An embedded assessment of this nature also helps guide curriculum and instruction toward deeper exploration of content matter in place of superficial coverage, the type of teaching that leads to lower retention by students of the key content knowledge.

Computer-adaptive testing systems can potentially generate more focused information on readiness in a given content knowledge area. Oregon and a few other states have adopted this approach for state testing, and ACCUPLACER and COMPASS are commonly used adaptive computer-based tests. The adaptive tests have the advantage of allowing more to be learned about students' strengths and weaknesses in specific skill areas, a capability that is not taken fully exploited when the emphasis is on determining a cut score. As computer-adaptive testing becomes more widespread, the potential exists to create tests that generate more detailed diagnostic profiles that indicate content and skill mastery areas in greater detail rather than tests that generate a cut score as efficiently as possible.

The content of the computer-adaptive tests can be altered relatively easily because new paper forms need not be printed. Item Response Theory (IRT) creates more options for combining items without having to conduct extensive norming studies on each test form. Vertical scaling creates the ability to array students along a continuum that conceivably could be extended from the current K–12 scales to ones that include first-year college performance levels. This combination of computer adaptive tests, IRT models, and vertical scales presents the possibility of greater adaptation and customization of tests to different populations and different institutional profiles and needs. While all these methods exist currently, they would need to be redesigned to achieve the goal of obtaining higher quality diagnostic information on college readiness in specific content areas for individual students.

For example, through the use of online technologies and adaptive models, the range of reading passages used to determine readiness could be expanded to include more excerpts from textbooks and greater use of source documents drawn from the subject areas to gauge students' strategic reading abilities. Similarly, in mathematics, greater use of technology makes it possible to add items that require more manipulation of data, generation of charts and graphs, analysis of datasets, use of animations that illustrate more

complex mathematical concepts, thereby creating problems that require more thought and consideration in order to solve.

Online systems also offer the possibility of capturing more information about how students think about complex problems as well as how long they take to solve basic problems. This information helps institutions gauge how well students really understand problems and how strong their basic skills are. All of this information helps create a much more detailed and useful picture of the likelihood that a student will be able to succeed in courses that require a particular knowledge or skill set.

A final additional source of information could come from high schools directly. Teachers could report on a range of student academic behaviors, such as time management, study skills, persistence, effort, and goal orientation. These could be recorded as simple numeric scores on forms that contain rating directions, submitted online in conjunction with regular grading systems, and transmitted as an element of the high school transcript. The Educational Policy Improvement Center (2010c) is working on a system that would permit teachers and students to record this type of information online and use it for individual student goal-setting purposes and as a measure of overall college readiness for a school.

This type of information would only be advisory in nature, but when averaged across multiple teachers and adjusted to reflect trends across a student's entire academic career, it could be extremely helpful to college counselors, advisors, and tutors, and to students themselves. High school students could be asked to record their own observations of their behaviors in these same categories and then be allowed to compare self-ratings to teacher perceptions to help promote self-awareness, the degree to which a student's assessment of her or his behaviors is consistent with the observations of third parties.

One potential benefit of this rich dataset is the ability to triangulate data sources in order to enhance the confidence that any particular determination is correct. Evidence of writing proficiency, underdeveloped in the current placement test model, could be gleaned from several different sources, including both traditional tests of grammar and sentence construction and authentic writing assignments scored against a common metric to allow for comparability. This would create a general picture of a student's writing skills, which could be useful in a variety of settings, as discussed in section 4.

4. Challenges Implementing This Solution

Given the substantial time and resources that would be required to assemble the profile, it would be imperative that it serve multiple purposes. First and foremost, the profile should provide the institution with a better idea of the needs of incoming students. Two-year and four-year open-enrollment institutions, in particular, could use this information to place students into entry-level courses and provide much more targeted support to students in the form of refresher courses, online self-guided units, workshops, and seminars on specific skills, such as time management. The profile would also help guide an advisor's interactions with an incoming student, making the advisor more aware of the student's individual strengths and areas in need of improvement.

Second, the profile should provide students with a better sense of how they stand relative to college readiness. At open-enrollment institutions, this would have to be done with the help of an advisor so that students with significant challenges to overcome would not become disheartened. But in the vast majority of cases, the reports could serve to link students directly to resources and supports and to suggest ways that students could take control of their own readiness by cultivating particular behaviors and by acquiring or building specific knowledge and skills.

Third, results from the profiles should be shared with the high schools the students attended. High school teachers and counselors currently do not know how well their students perform on placement tests, so they cannot do much to help prepare students better in successive years, even if they would like to. It is currently rare for high school teachers to change anything in their courses to prepare students better for the placement tests or college success. This is at least part of the reason that remediation rates do not seem to decline even when high school course requirements for graduation are increased (Wirt et al., 2004).

The profile also opens the door to more sophisticated uses that require institution-level action. For example, some postsecondary systems have begun to develop "reference courses"—detailed, explicit syllabi for a set of entry-level courses most often taken by incoming students.[3] These reference courses can be thought of as "content maps" that specify what students are going to be expected to know and be able to do. They can be used to state with some specificity the prerequisite knowledge and skills necessary for success in the course. These specifications can then be used by high schools to design courses and in-

[3] The Educational Policy Improvement Center has developed reference courses for 18 common entry-level college courses. As of September 2010, these await final approval and release by the Texas Higher Education Coordinating Board.

course assessments that are more closely and explicitly aligned with the content of the entry-level college courses. This leads to more detailed and fine-grained information that can be fed into the profile to enable students to better understand how ready for college they are and enable high schools and colleges to ascertain how well their programs align to enhance student readiness.

If they knew how well their courses were aligned, two-year and four-year colleges could direct students to particular courses where it appeared they were likely to do well. If students chose to enroll in courses for which they did not seem to be prepared, colleges could provide them with a set of specifications detailing prerequisite knowledge for the course and access to online review programs designed to help them acquire the necessary knowledge or skills. Through simple strategies of this nature, student success might be improved.

Challenges for Campuses Implementing This Solution

If it becomes possible to generate more complex, multidimensional profiles of student readiness for college, each institution would know a great deal more about its entering class. This would allow each campus to make strategic decisions about allocating resources to support the incoming class.

Many colleges already do this, but not in an entirely systematic fashion. For example, many campuses offer intensive orientation, or "bridge," programs during the summer (Kezar, 2001). Each campus develops its own version with its own focus (Zúñiga & Stoever, 2008), and while many positive results have been observed, the success of these programs as vehicles for enhanced retention and completion-to-degree appears to be mixed (Kezar, 2001).

The success of these programs could conceivably be increased with a focus on a systematic and consistent set of readiness knowledge and skills. For example, do students know how to record and organize their assignments? Can they develop a study plan? Are the texts going to be too complex for them? What kind of assistance are they likely to need with their written work? Do they seem likely to be able to plan and manage a program of study without the help of academic advisors? Will they be able to set up their financial aid accounts and complete necessary paperwork? All of these are areas that contribute to student ability or inability to complete the first year of college successfully. Having consistent institutional information on how well entering students do in these areas would help hone bridge programs and allow additional means to evaluate their impact and success.

The profile information could be shared with individual instructors of entry-level courses as well. These instructors may initially require support from campus academic learning centers to learn how to scaffold their assignments to support students who need extra help while maintaining high expectations. Instructors could then adjust assignments in ways that provided some scaffolding in needed areas. For example, they could provide recommended timelines for completing assignments if students need assistance with time management, or they could institute more frequent quizzes and assignments earlier in the term to help students manage their studying better and enable them to gauge their readiness for the course early on.

It seems clear that students are spending less time studying now than 40 years ago (Babcock & Marks, 2010) and that the best way to increase effort is to make expectations clear and then support students to exert the effort. A profile could generate information on student effort and also provide a means by which students could document the relationship between the effort they expend and the results they achieve.

Ideally, students would become more aware of their own strengths and weaknesses as they enter college, and colleges would match students with the resources they need. Instructors would participate in this process by making reasonable adaptations to their courses and connecting students to a range of support resources based on what their profiles tell them they need to do to succeed in each course.

This richer dataset will support a much wider and more robust range of institutional research activities. The causes of success and failure, both for students and for college programs, will be much more evident. Increasing the number and nature of data points would allow for the identification and measurement of more variables, which is essential when attempting to identify the causes of variance in a system such as a college. This deeper dataset would also allow instructors to better gauge the effects of changes they make in their own courses over time.

Ultimately, the profile information should contribute to course redesign processes that result in courses that are more supportive of student success. Postsecondary institutions can legitimately be expected to design programs in ways conducive to and consistent with student success. This creates the potential for a value-added model of college education that demonstrates students are acquiring a set of identifiable knowledge and learning skills.

Policy Changes Necessary to Implement This Solution

This model of a comprehensive profile that captures readiness on all four key dimensions would be challenging to implement under the current system. This approach requires a number of policy and procedural changes in the relationship between high schools and colleges and what each does to ensure the readiness of incoming students.

The first and perhaps most obvious ingredient to making this model work is to obtain a much richer dataset for each individual student. States would need to set data collection expectations for schools that include all aspects of college and career readiness. States would also need to expect high schools and colleges to utilize this information for a variety of purposes. This would lead to changes not only in placement policies but also eventually in admissions. All of this would also lead toward redesign of courses themselves, at both the high school and college levels, so that coursework generates the necessary assessment and performance data in a relatively consistent fashion statewide. Some of these changes are already in motion, but the full scope of policies of this magnitude requires careful planning, implementation, and evaluation.

Setting the target is the first step. Moving to fill in all the boxes in the matrix of desired data points is the next step. This requires the development of new measurement methods and the adaptation of existing assessment methodologies. Now is the time to specify a broader set of goals for high school assessment and to collect information more systematically for the purpose of ascertaining college readiness.

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