

The Emperor's New Clothes

National Assessments Based on Weak “College and Career Readiness Standards”

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The Emperor's New Clothes

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Executive Summary

During the past year, academic experts, educators, and policy makers have waged a confusing and largely invisible war over the content and quality of Common Core's proposed high school exit and grade-level standards. Some critics see little or no value to national standards, explaining why local or state control is necessary for real innovations in education and why "one size doesn't fit all" applies as strongly to the school curriculum as it does to the clothing industry. On the other hand, some supporters believe so strongly in the idea of national standards that they appear willing to accept Common Core's standards no matter how inferior they may be to the best sets of state or international standards so long as they are better than most states' standards. In contrast, others who believe that national standards may have value have found earlier drafts incapable of making American students competitive with those in the highest-achieving countries. No one knows whether Common Core's standards will raise student achievement in all performance categories, simply preserve an unacceptable academic status quo, or actually reduce the percentage of high-achieving high school students in states that adopt them.

All these alternatives are possible because of the lack of clarity about what readiness for college and workplace means – the key concept driving the current movement for national standards – and what the implications of this concept are for high school graduation requirements in each state and for current admission and/or placement requirements in its post-secondary institutions. There has been a striking lack of public discussion about the definition of college readiness (e.g., for what kind of college, for what majors, for what kind of credit-bearing freshman courses) and whether workplace readiness is similar to college readiness. According to Common Core's own draft writers, these college readiness standards are aimed at community colleges, trade schools, and other non-selective colleges, although Common Core hasn't said so explicitly.

Beyond a lack of clarity about what college readiness was intended to mean and for whom, Common Core has yet to provide an evidentiary base for its minimalist conceptualization of college readiness – and for equating college readiness with career readiness. Surveys of higher education faculties and a wide variety of employers in fact provide counter-evidence for the single, undemanding sets of college readiness standards that Common Core is proposing and that the U.S. Department of Education plans to use to guide reauthorization of NCLB. Reports commissioned by the National Assessment Governing Board make clear that we still do not know if college and career readiness are similar constructs.

The major purpose of this White Paper is to show why the particular concept of college and career readiness Common Core is promoting may decrease, not increase, student achievement and harm national economic and scientific competitiveness. In a technical appendix, we show what fundamental changes should be made to Common Core's mathematics and ELA standards before states adopt them so that test developers can develop tests that reflect the level of curricular expectations it claims to offer and make college readiness mean readiness for coursework that is at least as demanding as current college freshman coursework is.

No country expects all its high school students to be capable of authentic college coursework and most try to provide options in the form of alternative high school curricula, different types of high schools, or work programs (e.g., apprenticeships) to satisfy the normal range of interests, skills, and abilities in young adolescents. How might USED's requirement for all high schools to ensure that all students meet standards declared as indicating readiness for non-remedial college work, independent of high school graduation requirements, affect the academic integrity of our high schools and higher education?

The academic and economic implications of Common Core's definition of college and career readiness standards in ELA and mathematics should be receiving extensive examination by every local and state school board in the country, by editorial boards in all major media, and by the U.S. Congress before cash-strapped states are coerced by the USED's criteria for RttT funds, membership in test consortia, or Title I funds into committing themselves to Common Core's standards. That they have not is perhaps the most serious matter of all.

Recommendations Before Adoption of Common Core's Standards

For state boards of education and state legislatures:

- Sponsor public discussions on what college readiness should mean for different types of post-secondary institutions. The type of post-secondary institutions for which Common Core's standards seem to be relevant should be made clear at the time they are adopted.
- Sponsor public discussions on the meaning of merging college readiness and career readiness for their high schools and for the various types of post-secondary institutions in their state.
- Sponsor public discussions on how high school diploma requirements should relate to the results of tests purporting to assess college and career readiness.
- Prepare the necessary resources, financial and other, to realign their teacher certification standards and K-16 education systems over the next year or two. This includes purchase of new textbooks and instructional materials, aligning teacher preparation programs, funding of professional development for veteran teachers as well as professors of teacher education, and the administration of new assessments. So far, it seems that the

federal government will fund only the costs of developing new assessments.

- Establish and carefully monitor state indices of secondary and post-secondary academic achievement such as high school course-taking, AP and IB course-taking, and STEM college enrollment as the implementation of new standards proceeds.

For local school boards and district superintendents:

- Sponsor in-school discussions of what college readiness and career readiness mean in their community.
- Sponsor grade-level discussions of the quality, clarity, and rigor of the proposed grade-level standards.
- Sponsor community discussions of how they can ensure parent input into local curriculum and instruction.

For the U.S. Department of Education:

- Fund the development of additional sets of grade-level standards by additional consortia of states in order to develop common and internationally benchmarked sets of college-ready mathematics and ELA standards appropriate for the upper two-thirds of our students. Consortia should also be funded to develop high school end-of-course assessments based on these mathematics and ELA standards so that all states have a choice of high school end-of-course assessments.
- Defer the development of common assessments until Common Core's standards are piloted for a year or two and validated.
- Defer linkage between accountability measures in the re-authorization of ESEA to Common Core's standards until state departments of education can ensure that the vast majority of teachers in their states

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have the requisite academic background knowledge to teach to them.

- Enhance and carefully monitor federal indices of secondary and post-secondary academic achievement such as high school course-taking and STEM college enrollment as the implementation of new standards proceeds.
- Commit to maintaining the continuation of NAEP and U.S. participation in TIMSS to provide continuing validation against known national and international benchmarks.

For the U.S. Congress:

- Charge NAGB or the National Academies of Science with on-going review and validation of proposed sets of multi-state academic standards against national and international benchmarks.
- Charge NAGB or the National Academies of Science with regular evaluations of assessment systems of multi-state standards.
- Re-authorize ESEA for a limited time--until the first results of those evaluations are available.

For Common Core:

- Provide all grade-level standards with examples and anchor all the “illustrative” titles (with their level of complexity, as determined by Common Core’s new “complexity” formula) to relevant reading standards so that they provide some curricular usefulness, i.e., how each addresses a particular standard.
- Upgrade the college readiness standards to an authentic college readiness level.
- Develop separate sets of career and college readiness standards.

Background

During the past year, academic experts, educators, and policy makers have waged a confusing and largely invisible war over the content and quality of Common Core’s proposed high school exit and grade-level standards. Some critics see little or no value to national standards, explaining why local or state control is necessary for real innovations in education and why “one size doesn’t fit all” applies as strongly to the school curriculum as it does to the clothing industry.¹ On the other hand, some supporters believe so strongly in the idea of national standards that they appear willing to accept Common Core’s standards no matter how inferior they may be to the best sets of state or international standards so long as they are better than most states’ standards.² In contrast, others who believe that national standards may have value have found earlier drafts misconceived, poorly written, and incapable of making American students competitive with those in the highest-achieving countries.³ Regardless of the analyses on which critics’ and supporters’ judgments are based, no one knows whether Common Core’s standards will raise student achievement in all performance categories, simply preserve an unacceptable academic status quo, or actually reduce the percentage of high-achieving high school students in states that adopt them.

All these alternatives are possible because of the lack of clarity about what readiness for college and workplace means – the key concept driving the current movement for national standards – and what the implications of this concept are for high school graduation requirements in each state and for current admission and/or placement requirements in the state’s post-secondary institutions. There has been a striking lack of public discussion about the definition of college readiness (e.g., for what kind of college, for what majors, for what kind of credit-bearing freshman courses) and whether workplace readiness is similar to college readiness (e.g., in what kind of workplaces, in the non-academic knowledge and skills needed).

In addition, questions have been raised about the lack of qualifications of those chosen by the Council of Chief State School Officers (CCSSO) and the National Governors Association (NGA) to write grade-level standards in mathematics and English language arts (ELA), the lack of a rationale for those chosen to develop its “college and career readiness standards,” the non-transparent procedures for developing and writing both types and sets of standards, and the seemingly limited influence of high school and college instructors in mathematics and English on the standards that will affect the course content they teach in states adopting them.⁴ Yet all these concerns may be of secondary importance to the problem looming on the horizon. Common Core’s standards fail to inform test developers or teachers exactly what they expect students to know at each grade level in order for them to be college-ready by high school graduation. Since test developers are to begin their work soon, this should be a pressing concern.

On April 6, 2010, the U.S. Department of Education (USED) released a description of the kind of tests it wants states to develop using \$350 million of stimulus funds. The release claimed an urgent need for “valid and instructionally useful assessments that provide accurate information about what students know and can do and that are anchored in standards designed to enable every student to gain the knowledge and skills needed to succeed in college or the workplace by the time he or she graduates from high school.” In addition, USED wants end-of-course tests for high school that promote “broader and more equitable access to rigorous courses.”⁵ Given the condition of Common Core’s present standards, it is not possible for test developers to design valid and reliable assessments in either mathematics or ELA that ensure students “gain the knowledge and skills” needed for success in college and the workplace or promote “access” to rigorous courses.

The major purpose of this White Paper is to show why the particular concept of college and

career readiness Common Core is promoting may decrease, not increase, student achievement and harm national economic and scientific competitiveness. In a technical appendix, we show what fundamental changes should be made to Common Core’s mathematics and ELA standards before states adopt them so that test developers can develop tests that reflect the level of curricular expectations it claims to offer and make college readiness mean readiness for coursework that is at least as demanding as current college freshman coursework is.

Current Test Development Consortia

In early 2010, states formed six consortia for assessment purposes, with many states participating in more than one. Each consortium was to have a somewhat different approach: some would focus on Computer Adaptive Testing, others on formative assessment intended to guide instruction, and yet others on year-end results required for accountability.⁶ Most consortia were led by states with expertise in one or another aspect of assessment. Conspicuously absent were the testing companies that dominate the market. The one exception was a consortium led by Achieve, Inc., one of three major organizations invited to develop Common Core’s standards (College Board and ACT were the other two, with the National Center on Education and the Economy also represented on both the Standards Development and Draft Writing Teams). Although Achieve, Inc. has not been a major player in assessment work to date, its role in shaping Common Core’s standards has enabled it to propel itself into the major league for assessment.

The six consortia did not last long. There are now only two teams applying for the comprehensive assessment system grants. One, called the Smarter Balanced Consortium, is led by West Virginia, Nebraska, and Oregon, includes about 18 states, and will be managed by Susan

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Gendron, former commissioner of education in Maine, with technical assistance from Stanford University's Linda Darling-Hammond.⁷ The other, called the Partnership for Assessment of Readiness for College and Career, is led by Florida, Massachusetts, and Louisiana, and will be managed by Achieve, Inc., headed by Michael Cohen. To be eligible for bidding on these grants, a consortium must include at least 15 member states, five of which as so-called "governing states" cannot belong to more than one consortium and are committed to using the assessment system developed by the consortium.

USED also issued a solicitation for high school end-of-course assessments. So far, only the National Center on Education and the Economy (NCEE) is aiming for this assessment grant, and the description of this competition appears to have been created with NCEE in mind.⁸ To be eligible for this grant, a consortium needs to include only five governing states; the NCEE consortium had a membership of only seven states as of January so it easily qualifies on that criterion. If the two consortia for the grade-level comprehensive assessment system formally merge, as has been persistently rumored, there may be no competition in either competition.

Types of Assessments

A. Differences between Summative and Formative Assessments

There are two major types of assessments used in K-12 schools, summative and formative.⁹ Summative assessments are intended to evaluate the overall results of a program. They are typically given at the end of a major period of time like the school year, and their results often carry consequences for students and schools. In other words, they are high-stakes assessments. In contrast, formative assessments are given at various points throughout a program, usually by teachers, and are intended to help them make instruction more effective. Formative assessments

have no implications for accountability and are considered "low-stakes" or "no-stakes" assessments.

The different purposes for these assessments strongly affect their characteristics. Formative assessments typically cover only recently studied content. They must be relatively easy and quick to administer and be able to provide rapid feedback so that teachers can adjust their teaching as needed. They do not require objectivity or reliability because they serve chiefly to refine teachers' knowledge of their own students.

Summative assessments, on the other hand, are administered for accountability and hence must be fair. They must be sufficiently objective and reliable so that students get about the same score regardless of who scores the test or the number of times they take the test. Summative assessments have to be valid in the sense that they assess faithfully only the intended constructs.¹⁰ For example, mathematics assessments must assess knowledge of the mathematics studied, not general reading or writing skills. And they must assess the complete domain of knowledge studied.

Because summative assessments must be fair, they need to be administered and scored in a uniform way. And because they are typically administered to very large groups of students, it helps if their scoring can be automated. Consequently, most summative assessments use multiple-choice or short open-response test items that can be rapidly and objectively scored. Although many educators have regularly expressed concern that multiple-choice test items and perhaps even short open-response items do not properly assess student learning, thorough reviews of the psychometric research do not support this criticism.¹¹

In the early 1990s, a few states tried to replace summative tests relying on multiple-choice and short open-response items with performance assessments – large tasks often done across several testing sessions and under non-uniform conditions or student portfolios, another type of performance assessment. California's experience

in 1993-1994 with performance assessment,¹² Maryland's experience in the 1990s with performance assessment,¹³ and Vermont's and Kentucky's experiments with student portfolios¹⁴ convincingly demonstrated that performance assessments are insufficiently reliable for accountability and extremely costly in time and money. Lawrence Picus, a member of the Smarter Balanced Consortium, estimated the cost of Kentucky's experiment with student portfolios to be between \$850 and \$1,800 per tested student in 1996 dollars.¹⁵ Brian Stecher, another member of the Smarter Balanced Consortium, summarized his findings on their use for accountability as follows:¹⁶

The evidence supports the conclusion that flexible portfolios ... have not achieved sufficient reliability or validity to be used for the purposes of accountability. The shortcomings derive in large part from the difficulty of developing scoring rubrics that are general enough to apply to widely different pieces, but specific enough to produce agreement among raters. This weakness, coupled with the wide variation in individual performance, leads to scores that do not appear to reflect the constructs the portfolios were designed to measure. ...

Perhaps the best role for portfolio assessment is not as an accountability measure, but as a classroom-based assessment tool to help students and teachers improve diagnosis and instruction. This use may maximize the positive aspects of portfolios while minimizing their negative effects.

Those who emphasize formative assessments tend to prefer performance tasks, student portfolios, and other kinds of relatively subjective assessments, preferably designed and evaluated by teachers, while those more focused on accountability tend to prefer tests that can be speedily and inexpensively administered, and quickly and objectively scored. The Partnership favors the latter kind of tests, while the Smarter Balanced Consortium favors the former kind of tests.

Interestingly, Smarter Balanced Consortium also claims drastically reduced costs for performance assessments—so that they end up cheaper than current tests with only multiple-choice and short open-response items. This is very hard to believe, and what it uses for support is based on highly questionable assumptions.¹⁷

Although Secretary Duncan's team dreams of a single national assessment system that serves both formative and summative purposes and includes different kinds of summative assessments, any new system needs to be valid, reliable, affordable, and manageable. It also needs to help strengthen, not weaken, the school curriculum. Everything we know about development, administration, and use of assessments gives us pause regarding the feasibility of this new hybrid.

B. Implications of Different Types of Summative Assessments

In March 2010, Secretary Duncan indicated that in the next re-authorization of the Elementary and Secondary Education Act (No Child Left Behind) states will be held accountable for getting all high school students college-ready, while the grades 3 to 8 assessment results will be treated more like signposts on the way to readiness rather than milestones for which schools will be held accountable. This suggestion responds to complaints about the way NCLB "micromanages" schools, but it also allows more leeway for misunderstanding what children are learning. Even current assessments, which are relatively reliable, do not predict future achievement very well, as is suggested by studies of the growth model that has been piloted in many states.¹⁸ If NCLB's re-authorization permits such relatively unreliable tests as performance assessments to be used for grade-level accountability, their results may delude us that K-8 students are on track to being college-ready. In actuality, they may be far from it for at least two reasons. Performance assessments are less reliable than the assessments currently in use, and their predictive power is likely to be lower chiefly because large-grained

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items cannot sample the breadth of the domain of knowledge studied.

Regardless of the kinds of summative assessments schools use, their capacity to serve as even relatively reliable or valid measures of students' knowledge and skills in common mathematics and ELA tests will be impaired by three major weaknesses in Common Core's standards: the opaque language of its College and Career Readiness Standards (CCRS) for ELA, the absence of examples clarifying the intellectual level and meaning of many ELA and mathematics standards, and the muddled definition of the kind of post-secondary institutions the readiness standards are aimed at.¹⁹ All readers are told is that college and career readiness means "ready for first-year credit-bearing, postsecondary coursework in mathematics and English without the need for remediation" – a meaningless and thus very problematic definition given the range of post-secondary institutions in this country. Until these three weaknesses are addressed, any summative assessments and end-of-course examinations based on Common Core's readiness standards are more apt to weaken than strengthen our inconsistent high school curricula and do more harm than good to this nation's future economy and welfare.

Common Core's Mysterious College and Career Readiness Standards (CCRS)

According to Achieve's comments on Common Core's March 2010 drafts, the standards are "focused, coherent, clear and rigorous; internationally benchmarked; anchored in college and career readiness; and evidence and research based."²⁰ To the contrary, its grade-level and college and career readiness standards are still none of the above. What is intriguing is that everything Achieve presents on its website about Common Core's standards addresses only its grade-level

standards. Not a word about the content or role of the far more significant CCRS, developed by its Standards Development Work Group in the spring and summer of 2009 and released in draft form in September 2009. Since then, the CCRS have been slightly revised but never assigned a clear academic level, and their role with respect to grade-level assessments has never been clearly identified.²¹

A. What They Are in Mathematics and English Language Arts

The September 2009 version of the CCRS for mathematics designated content that is far short of what is traditionally taught in Geometry and Algebra II courses. Consequently, the CCRS were criticized as insufficient for college admission. The CCRS in mathematics are barely mentioned in the March 2010 draft (see p. 42). However, a chart on p. 3 in Appendix A delimits their scope graphically with a red dotted line placed vertically slightly before the end of a box presumably containing full Algebra II course content.²² The text on p. 42 indicates that the CCRS comprise only non-STEM standards. Since Common Core's standards for Geometry and Algebra II courses include at least 16 marked STEM, its current CCRS for mathematics point to an academic level that is lower than just slightly below Algebra II and Geometry as defined, e.g., by California's content standards for both courses. This is before a cut score or achievement standard has been determined for tests based on the CCRS.

The September 2009 version of the CCRS for ELA listed over 40 so-called standards; unlike those for mathematics, they contained almost no substantive academic content. There were 18 for Reading alone. These 18 have been slightly revised and reduced to 10. The most serious problem with them is that they are mostly not standards. They are, instead, mostly content-free generic skills – skills that could apply to reading passages at any grade level – skills that can be developed only by exposure to a coherent curriculum shaped by

authentic academic standards. Not only do these culture-free and mostly content-empty skills-called-standards provide no hint of a particular academic level, they are incapable of generating consistently teachable grade-level standards with consistent interpretations (the Appendix includes an extensive discussion of these problems).

B. What They Mean Practically

Why Race to the Middle? noted that the academic level of Common Core's college and career readiness standards was lower than what most four-year state colleges require for admission, but we could not explain the reasoning behind this low level.²³ The clearest statement of the meaning of this concept that we have found appears in the minutes of the March 23 meeting of the Massachusetts Board of Elementary and Secondary Education. Jason Zimba, a member of the mathematics draft-writing team who had been invited to speak to the Board, stated, in response to a query, that "the concept of college readiness is minimal and focuses on non-selective colleges."²⁴ Earlier, Cynthia Schmeiser, president and CEO of ACT's Education Division, one of Common Core's key partners, testified to a U.S. Senate Committee that college readiness was aimed at such post-secondary institutions as "two- or four-year colleges, trade schools, or technical schools."²⁵ These candid comments raise professional and ethical issues. The concept is apparently little more than a euphemism for "minimum competencies," the concept that guided standards and tests in the 1980s, with little success in increasing the academic achievement of low-performing students. The case for authentic academic or content standards grew directly out of the failure of the minimum competencies movement. Did Common Core's draft-writers know nothing about the history of this movement?

Moreover, it seems that this meaning for college readiness was intended only for low-achieving high school students who are to be encouraged to seek enrollment in non-selective post-secondary

institutions. Despite its low academic goals and limited target, this meaning for college readiness was generalized as the academic goal for all students and offered to the public without explanation. It should have been made clear to the states signing agreements to adopt these standards that Common Core's college and career readiness standards were not intended to strengthen the high school curriculum in mathematics or ELA for most of our students and to increase the number of students who could meet the academic demands of selective colleges and technically sophisticated workplaces.

For example, it is impossible to reconcile California's application for Race to the Top (RttT) funds with the compact signed in April 2010 by all its public colleges and universities requiring uniform admission requirements that are more demanding than Common Core's college readiness standards. It is possible that those who wrote and are revising the original RttT application were simply unaware of Common Core's target for these standards. But imagine the confusion that will be encountered by the huge range of high school students deemed college-ready by minimalist college readiness tests who will seek to enroll in California public colleges with their more demanding admission requirements.²⁶

Lack of Evidence for a Minimalist Meaning and for Equating College and Career Readiness

Beyond the lack of clarity from the outset about what college readiness was intended to mean and for whom, Common Core has yet to provide a solid evidentiary base for its minimalist conceptualization of college readiness--and for equating college readiness with career readiness. Moreover, it knew from the outset that it had no evidence on both issues. Surveys of higher education faculties and a wide variety of employers in fact provide counter-evidence for

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the single, undemanding sets of college readiness standards that Common Core is proposing and that the USED plans to use to guide reauthorization of NCLB.²⁷ Reports commissioned by the National Assessment Governing Board (NAGB), which we discuss below, make clear that we still do not know if college and career readiness are similar constructs.

A. Counter-Evidence in the 2004 American Diploma Project

In 2004, Achieve, Inc. presented two sets of high school exit standards, one for mathematics and one for English, as part of the American Diploma Project (ADP).²⁸ These two sets of standards were approved by high school educators, faculty members from two- and four-year institutions, and front-line managers in high-growth, highly skilled occupations as indicating what graduating students need to know and be able to do for success in the workplace or college (see its Methodology and Acknowledgment sections). These standards provide the framework for a “default core curriculum” for the schools because, Achieve, Inc. argued, it “worked closely with two- and four-year postsecondary leaders in five partner states to determine the prerequisite English and mathematics knowledge and skills required for success in entry-level, credit-bearing courses in English, mathematics, the sciences, the social sciences and humanities.” Accepted by over three dozen states by 2009, ADP’s standards thus codify the knowledge and skills that Achieve found were needed for credit-bearing coursework at state colleges and universities and for high-growth, highly skilled “good” jobs, jobs that “pay enough to support a family well above the poverty level, provide benefits, and offer clear pathways for career advancement through further education and training.”

ADP’s high school exit mathematics standards make it clear that high school graduates should have passed courses in first year algebra, geometry, and second year algebra as well as taken coursework in data analysis and statistics.

Common Core’s version of college and career readiness in mathematics is far below the standards set by ADP.

ADP’s high school exit English language arts standards also go far beyond what Common Core’s considers college readiness standards in English language arts. The ADP standards require, among other things, completion of a major research paper from six to ten pages in length. Like Common Core’s standards, ADP’s standards require English courses that stress both informational and literary texts, but ADP’s standards also provide clarity on their content. Its first three are:

H1. Demonstrate knowledge of 18th and 19th century foundational works of American literature.

H2. Analyze foundational U.S. documents for their historical and literary significance.

H3. Interpret significant works from various forms of literature: poetry, novel, biography, short story, essay and dramatic literature; use understanding of genre characteristics to make deeper and subtler interpretations of the meaning of the text.

The first two do appear in Common Core’s standards, slightly altered, but in grades 9/10, where most of this country’s foundational documents and major literary works cannot be addressed at an appropriate depth by most students. They do not appear in the grade-level standards for 11 and 12 or in Common Core’s college and career readiness standards for ELA.

B. Counter-Evidence in *Understanding University Success*

David Conley’s 2003 report *Understanding University Success* is the result of a two-year study in which more than 400 faculty and staff members from 20 research universities participated in extensive meetings and reviews “designed to identify what students must do to succeed in entry-level courses at their

institutions.” According to the report, national academic content standards documents were analyzed and used for comparison, peer reviews were employed to hone the standards and ensure their validity, while consultants with expertise in standards development contributed suggestions for improvement.” The report claims to “represent the most comprehensive and thoroughly grounded set of standards for college success yet developed” (p.8).²⁹ Six standards are listed for Reading and Comprehension for English (pp. 20-24). Below are the middle two, indicating the content expected by English or humanities faculty.

C. Successful students are able to understand the defining characteristics of texts and to recognize a variety of literary forms and genres. They:

C.1. comprehend the salient characteristics of major types and genres of texts, such as novels, short stories, horror stories, science fiction, biographies, autobiographies, poems and plays.

C.2. understand the formal constraints of different types of texts and can distinguish between, for example, a Shakespearean sonnet and a poem written in free verse.

C.3. are able to discuss with understanding the effects of an author’s style and use of literary devices to influence the reader and evoke emotions. This includes devices such as imagery, characterization, choice of narrator, use of sound, formal and informal language, allusions, symbols, irony, voice, flashbacks, foreshadowing, time and sequence and mood.

C.4. are able to identify archetypes, such as universal destruction, journeys and tests and banishment, which appear across a variety of types of literature, including American literature, world literature, myths, propaganda and religious texts.

C.5. are able to discuss with understanding themes such as initiation, love and duty, heroism and death and rebirth that appear

across a variety of literary works and genres.

C.6. use aesthetic qualities of style, such as diction or mood, as a basis to evaluate literature that contains ambiguities, subtleties or contradictions.

D. Successful students are familiar with a range of world literature. They:

D.1. demonstrate familiarity with major literary periods of English and American literature and their characteristic forms, subjects and authors.

D.2. demonstrate familiarity with authors from literary traditions beyond the English speaking world.

D.3. demonstrate familiarity with major works of literature produced by American and British authors.

None of these details appears in Common Core’s college and career readiness standards for ELA. Conley’s research clearly does not support a minimalist meaning for college readiness. Instead, his more comprehensive college-ready standards counter Common Core’s only definition of college readiness: “ready for first-year credit-bearing, postsecondary coursework in mathematics and English without the need for remediation.” Clearly, students with a lack of knowledge in just these two of the six standards in Reading and Comprehension in English would require remediation.

C. Misinterpreted Evidence from ACT Surveys

ACT’s surveys of what instructors at all educational levels see as their students’ academic limitations inadvertently contributed to the development of Common Core’s content-empty and culture-free college and career readiness standards for ELA because ACT failed to ask about and distinguish the knowledge base as well as the skills these instructors expect of high school and college students. Based on a survey

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of almost 36,000 middle school, high school, and post-secondary instructors of both regular and remedial courses across the curriculum in 2005-2006, ACT reported that the inability to read complex texts was the major deficiency instructors perceive in their students.³⁰ ACT leaped to the conclusion that high school students do not receive sufficient or adequate instruction in how to read more difficult and complex works and then recommended that they be given more instruction in reading comprehension strategies – as well as “more opportunities to read challenging materials” – to be ready for entry-level college coursework.

Nonetheless, nothing in ACT's surveys led logically to the conclusion that more instruction in reading comprehension strategies or skills--or reading more complex texts--was the solution. ACT neglected to note there are major disputes in the research literature about what type of comprehension strategies improve a student's understanding of the text, how much instruction should be provided, and if certain types of students benefit more than others.³¹ ACT could just as easily have conjectured that current teaching methods in the schools were contributing to the deficiency and that different teaching methods might be more fruitful. Moreover, since ACT did not find out what those it surveyed saw as a needed knowledge base for high school or college level work, it could not suggest that perhaps different ideas about the content of an English curriculum might also be more fruitful. Unfortunately, ACT's unwarranted conclusions and recommendations greatly contributed to the wrong-headed idea that college and career readiness standards for ELA should consist of generic content-free skills.

D. Inadequate or Insufficient Evidence for Equating College and Career Readiness

The National Assessment Governing Board (NAGB), perhaps the most authoritative body on large-scale assessment, has sought for over five years to determine whether “preparedness for postsecondary education” and “preparedness for

postsecondary training for occupations” are one and the same. Its efforts were charted out in a 2006 report that carefully defined “preparedness.”³² On the one hand, it noted that:

ACT, Inc. has concluded that those entering college or workforce training programs after graduation...need to be educated to a comparable level of readiness in reading and mathematics...[and that Achieve, Inc. suggests there is a convergence of] the English and mathematics that graduates must have mastered by the time they leave high school...to succeed in high-performance, high-growth jobs (p. 6).

On the other hand, it also noted that Paul Barton, former director of the Policy Information Center at Educational Testing Service, argued against the proposition that “...those not going to college need to be qualified to enter [traditional academic] college credit courses in order to enter the workforce.” Barton also published a report in 2006 demonstrating that job preparedness and college preparedness are not the same thing.³³ In early 2009, for NAEP's 20th anniversary, Barton prepared a speech for NAGB essentially repeating this point.³⁴

In June 2009, a NAGB-appointed Technical Panel on 12th Grade Preparedness presented its report.³⁵ Because it found insufficient evidence to resolve the debate, the Panel recommended empirical studies to determine whether college and workforce preparedness are identical and suggested three different scenarios that could result from further studies (pp. 12-13).

As of 2010, NAGB clearly does not consider the question answered and the debate resolved. Thus, it is not at all clear why Common Core from the outset has consistently presented the equation of college and career readiness as evidence-based and as an established fact, particularly since key members of its ELA draft-writing committee and Validation Committee are also members of NAGB or its Technical Panel. Moreover, the Association for Career and Technical Education has weighed

in noting that while “career-ready core academics and college-ready core academics are essentially the same,” “to truly be career-ready, students also need to be able to apply academics in context, and some academic skills need more attention and development.”³⁶

Unintended Consequences of Minimalist College and Career Readiness Standards

A. In English Language Arts

Common Core’s content-empty and culture-free college and career readiness standards for English Language Arts are apt to have at least two negative consequences. One is its potentially negative influence on Advanced Placement (AP) course-taking.

Many states and school districts across the country have begun to encourage or mandate more AP course-offerings, including the two AP English courses: Literature and Composition and Language and Composition. They have done so to introduce more academic rigor into high school coursework and to improve students’ reading and writing skills. The number of students now taking these two AP courses has significantly increased over the past decade; the number taking the AP English Literature and Composition test, for example, more than doubled, from about 145,500 in 1997 to over 320,000 in 2008.³⁷ Increased enrollment in these two AP English courses means that more high school students are exposed to demanding texts. Although the College Board (CB) no longer prescribes the specific texts the AP English teacher must use, it must approve the teacher’s syllabus before the course can be taught as an AP course.

Costs for encouraging or mandating AP coursework vary across states, depending on state requirements. For example, in 2003, the Arkansas legislature mandated the teaching

of AP courses in all high schools. They must offer and teach at least one AP course in each of the four core areas—English, mathematics, science and social studies—beginning with the 2008-2009 school year. Later legislation required making AP courses available through distance learning and payment of all test-taking fees by the state. Arkansas also requires AP teachers to take CB’s professional development in order to be certified to teach an AP course. It encourages teachers of Pre-AP English courses to participate in this professional development. The legislature commendably sought to increase the number of students in all demographic groups at the state’s post-secondary institutions, to decrease the number of students requiring remedial coursework in English, reading, and mathematics as college freshmen, and to accelerate completion of an undergraduate degree program as well as increase graduation rates. The cost to Arkansas has been high. In fiscal year 2008, the state budgeted about \$1.8 million for AP test fees, teacher training, and rewards to schools, according to the Arkansas Department of Education.

It is not clear what will happen to the investments made by states like Arkansas in trying to strengthen student preparation for authentic college coursework in grade 11 or 12 if students are deemed college-ready by a test given in grade 10 or 11. Will able students be motivated to stay in high school and enroll in an AP course as a junior or senior? And does a grade 10 or 11 test for college readiness conflict with an initiative by the USED to increase by 50 percent the number of U.S. high school students participating in AP or college-level classes by 2016? Does the right hand know what the left hand is doing? It seems likely that a high school exit test of college readiness and the “Board” exams NCEE plans to develop to give students an opportunity for “special diploma” in grade 10 (both of which, unless we can right the course, will reflect Common Core’s standards for college readiness) will reduce AP course enrollment in English, mathematics, and science.

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Common Core's college and career readiness standards in ELA are also apt to have a deleterious influence on students' informational reading. Contrary to the ELA draft writers' beliefs, a central problem in the schools is not just what English teachers assign but how they teach what they assign. Requiring them to assign more informational texts (whether or not they are progressively more complex) – and thus teach fewer literary texts – is unlikely to improve students' skills in reading informational texts so that they are better prepared for college reading. Relatively content- and culture-free standards and the tests based on them cannot make non-AP English teachers teach the analytical reading required on AP tests. Instead, Common Core's current standards will let them use the non-analytical approaches now dominating their pedagogy for even more informational texts than they now assign. This scenario is based on both a national and a state survey of how over 400 English teachers in grades 9, 10, and 11 approach the study of literature and non-fiction.³⁸

The survey asked about the content and pedagogy of courses for the middle third of our students – the students who are often placed in remedial English or reading courses in college or fail to graduate from two- or four-year post-secondary institutions within a reasonable number of years. It found that teachers of standard and honors courses largely use non-analytical approaches in studying non-fiction as well as literature (i.e., a reader response or a historical, cultural, or biographical approach). In fact, the teaching of analytical reading skills may take place chiefly in AP or pre-AP English courses because analytical reading is expected on AP tests and stressed in the CB's professional development for AP teachers. An under-use of close, analytical reading to understand a text, especially non-fiction, and an over-use of personal, biographical, cultural, or historical approaches to understand either imaginative or non-fiction texts in K-12 may better explain the high remediation rates in post-secondary English and reading courses, not to mention high failure rates on AP English tests,

than the conclusions American College Testing (ACT) drew from its own survey, noted earlier.

B. In Mathematics

Common Core's notion of college readiness in mathematics will have at least three serious consequences in our high schools. They stem from the psychological and practical issues that high schools will face in addressing Common Core's minimalist meaning for college readiness in mathematics courses. The first consequence will be the need for high school mathematics departments to offer two types of advanced mathematics coursework beyond Algebra I. They will need to do this because Common Core eliminated many challenging standards in Geometry and Algebra II from its college readiness standards and labeled the challenging standards as only for STEM-intending students. These two types of Geometry and Algebra II classes, one for STEM-intending students, the other for non-STEM-intending students, will separate students in grade 9 or 10 based on what they think they will major in four to six years later. Even if, as many high school mathematics teachers have suggested, the label is changed from STEM-intending to "calculus-intending," the psychology of grade 9 students will not change. They still will not know at that age whether they are calculus-intending (unless, of course, they have parents to guide them).

The second consequence – limited options for most students – is more serious. Since most students in grade 8 or 9, especially those without knowledgeable parents, won't know that they need to aim for STEM-intending courses in order to satisfy admission requirements for selective engineering or other colleges or to be better prepared for freshman mathematics courses in selective institutions, many will undoubtedly aim for the advanced mathematics courses that satisfy Common Core's minimalist definition of college readiness. Without a clear sense of what they need for a mathematics-dependent major in college, it is not unreasonable to predict that

many American students will simply opt for the easier mathematics courses in grades 10 and 11, not realizing that they have prematurely limited their options. Most high school students do not know what they will major in, and even after they enter college, at least 50 percent, possibly as many as 80 percent, change their major.³⁹

The third consequence is the practical reality of what most high school mathematics departments can offer because of faculty size and scheduling issues. Given that they will have to provide the courses that reflect the tests based on Common Core's mathematics readiness standards, they may find it difficult to provide enough of the more challenging Geometry and Algebra II courses for STEM-intending students to accommodate the complex scheduling issues facing the typically smaller number of students who take advanced courses across many if not all subjects. It would not be surprising if the number of American high school students who actually complete the more demanding STEM-intending sequence decreases regularly once schools implement the mathematics courses based on Common Core's college readiness standards and the tests addressing these courses.

Concluding Comments

Standards are supposed to drive assessment, not the converse. Since testing also drives curriculum and instruction, both of which are matters of local control by law, vague or content-poor standards enable test developers to exert a significant influence on both curriculum and instruction without public scrutiny or local feedback. Common Core's college readiness standards in mathematics and its grade-level mathematics standards (see the Appendix) are so vague, and its college and career readiness standards for ELA so empty of markers for specific literary and non-literary content, that, with only a few exceptions in its grade-level standards, they will

mean whatever test developers intentionally or unintentionally choose to make them mean.

The USED is ambitious in what it wants: it wants assessments not only to assess but also to "enable" learning, "promote" access to advanced coursework, and "ensure" graduation. But it is almost impossible to assess what students know and can do and to cause major (and all positive) changes in the educational process as well. And it is completely unreasonable to hope to do that without academic objectives that are understood and agreed to by the broad public. It is also irresponsible to try to do so without soliciting broad public discussion of the possible effects of Common Core's standards and assessments on all high school students, rather than only those whom Common Core has targeted with minimal academic requirements, and on the structure of post-secondary education.

Common Core's effort to develop college and career readiness standards reflects the belief that every student should graduate from high school academically prepared to go to college.⁴⁰ However, this belief (whether or not those who hold this belief understand it) implicitly equates earning a high school diploma with being college-ready – two distinct concepts. For at least a century, graduation from an American high school has signified readiness for informed and responsible American citizenship, not college. As Paul Barton comments in his 2009 paper for NAGB, "the history of secondary education [in this country] has been one of recognizing and accommodating an emerging diversity of interests and goals – or of denying that diversity, which I think is the tendency in the current wave of advocacy of high school reform in which one highly rigorous curriculum prepares *all* high school students to qualify for credit courses in college."

If earning a high school diploma by definition means being college-ready, it then becomes socially undesirable, educationally ridiculous, and politically impossible to fail large numbers

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of high school students in courses they have been required to take to prepare for college-level work, especially if they do not want to go to college. Those promoting the Common Core State Standards Initiative solved this obvious problem in the only way, we suspect, they thought it could be solved--by defining college readiness down and avoiding clarity on its academic level, in the drafts and in public discussion. They clearly knew they were defining college readiness down, as Jason Zimba's comments indicate.

It is disturbing that the public has not been informed that much stronger definitions of college readiness exist and have already been agreed to by many of the same states now being asked to subscribe to a minimalist definition. Agreement to use the California Early Assessment Program, one well-known set of college readiness benchmarks, has recently been expanded to include all the state's public colleges and universities in recognition of its successful track record. Their academic level is above the level of Common Core's college readiness benchmarks. In 2010, 14 states will administer the American Diploma Project's college- and career-ready assessments.⁴¹ These end-of-course Algebra II tests are also above the level of Common Core's definition of college readiness.⁴²

Our public schools have traditionally been a major focus of local self-government and local community engagement. Our institutions of higher education have traditionally reflected individual state-level policies. How might USED's requirement for all high schools to ensure that all students meet standards declared as indicating readiness for non-remedial college work, independent of high school graduation requirements, affect the academic integrity of our high schools and higher education? As Paul Barton comments, "I am quite sure that being ready to take an entry level mathematics course in a typical local community college is not the same degree of readiness required at Stanford or MIT. Schools of higher education vary by type—community colleges, open universities, selective

liberal arts colleges, research universities, and postsecondary proprietary vocational and technical schools." This reality is nowhere acknowledged by Common Core, yet the general public surely does not interpret the college in "college readiness" as referring to community colleges.

No country expects all its high school students to be capable of authentic college coursework and most try to provide options in the form of alternative high school curricula, different types of high schools, or work programs (e.g., apprenticeships) to satisfy the normal range of interests, skills, and abilities in young adolescents. Unfortunately, dominant voices in this country perceive expansion of non-college-bound curricula or specialized high schools as non-egalitarian even though these options may be highly desired by adolescents and their parents as evidenced, for example, by waiting lists for Massachusetts' regional technical high schools. The academic and economic implications of Common Core's definition of college and career readiness standards in ELA and mathematics should be receiving extensive examination by every local and state school board in the country, by editorial boards in all major media, and by the U.S. Congress before cash-strapped states are coerced by the USED's criteria for RttT funds, membership in test consortia, or Title I funds into committing themselves to Common Core's recent draft standards. That they have not is perhaps the most serious matter of all.

We have been especially puzzled about why the organizations in charge of the Common Core initiative, as well as all the other organizations that have been funded to promote knowledge and approval of its proposed standards, have uniformly refrained from discussing the significant educational distinctions that are being blurred by the notion of college-ready standards, from expressing any concern about defining college readiness down for all students, and, far more important, from responding publicly to the

critical analyses that began to come out in the fall of 2009.

The Gates Foundation has funded CCSSO and NGA to develop common standards and a variety of organizations – the National Association of State Boards of Education, Alliance for Excellent Education, James B. Hunt, Jr. Institute for Educational Leadership and Policy Foundation, National Parents and Teachers Association, and Council of State Governments – to develop public relation campaigns to promote approval of Common Core’s standards among education policy makers and the public at large. Gates also awarded grants in February 2010 to another large set of organizations and institutions to “support the development and testing of prototype classroom assessments and instructional tools in math and literacy... aligned with Common Core’s college- and career-ready standards for math and literacy.” Gates seems to be sure that “these standards will provide clear and consistent guidelines for teachers, school leaders, and parents on what students need to know at each grade level to be prepared to succeed at college-level work.”⁴³ Gates has also just funded a validity study on the academic level of Common Core’s college readiness standards.

The Gates Foundation undoubtedly believes that it is acting in the best interests of our K-12 students, that any set of national standards in mathematics and ELA would be better than those in most states now, and that it is in the best position to help organizations to develop the instructional tools and assessments that schools may need to use – to show to future researchers that they have implemented Common Core’s standards properly and sufficiently. But when private organizations—in this case, a single one—provide funds for the entire spectrum of policy making on goals and standards for public education—from the original vision, committee memberships for developing and reviewing standards, committee procedures, public information, drafts, final versions, their evaluations, validation of goals and standards, and media campaigns to shape public opinion

and legislative bodies – it is inherently unhealthy, even if Common Core’s standards had turned out to be first class, internationally benchmarked, and applicable to all students in all states. It is not the case that public debate has been overtly stifled or suppressed. It has simply not occurred so far, and it is not clear why searching questions have not been asked by otherwise responsible legislators, community leaders, media commentators, as well as the nation’s teachers at all educational levels. If they have been asked, why have they not found their way into the public square?

National reporters could have performed an enormous public service if they had simply explored and reported on the critiques prepared by the Massachusetts Department of Elementary and Secondary Education on Common Core’s January and March drafts standards – one of the many states with much to lose if they are coerced into adopting inferior standards. Critiques prepared by public agencies are public information. Moreover, state board members in all states can ask for copies of critiques prepared by their own department staff and discuss them publicly. Finding out what concerns were expressed by states with the best sets of standards in mathematics and ELA (e.g., California, Indiana, Massachusetts, and Minnesota) would have brought to public attention the content issues and policy questions embedded in Common Core’s draft standards and moved public knowledge forward, from endless abstract discussions of why national standards may or may not be a good idea to why Common Core’s standards might benefit some but not all students and negatively affect K-12 and higher education.

For example, a cursory look at the beginning of the 22-page critique sent by Massachusetts DESE staff in April 2010 would have raised important questions.⁴⁴ Why were the first two recommendations “Raising students’ content knowledge must be the foremost purpose of these standards” and “Defining the bars for “college and career readiness”... with clarity is imperative”? Further reading might have led

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reporters to: “We suggest removing the label “standards” from [the CCRS] and making the cumulative K-12 standards the true ‘backbone’ of the document.” Or to: “A third clear pathway needs to be included that illustrates a progression that leads to Calculus while in high school. Further explanation is needed to provide readers options that compress the K-8 standards to appropriately prepare a student for Algebra I in grade 8 and describe how this leads to a pathway to calculus in high school” (p. 8). Reporters might also have pondered the curricular implications of the following comment: “Although the mathematics standards are presented by conceptual categories in the main document, reviewers overwhelmingly requested to see these standards presented by courses that were familiar to them using the traditional course titles: Algebra I, Geometry, Algebra II, Precalculus, etc.” (p. 13).

If the media had begun to provide more and regular information on the specifics of the critiques of the CCRS since the first set was “leaked” in July 2009, it would be clear why Senator Lamar Alexander said at a Senate Hearing in April 2010 that “he’d be open to several different sets of common standards.” As an example, “Massachusetts could join with other states in one consortium, while Iowa and other states could join another. He said that approach might be easier—and lead to a more challenging set of standards—than if nearly all states try to get on board with the same set of standards and assessments.”⁴⁵

The absence of cogent public discussion on the academic and economic implications of Common Core’s definition of college and career readiness standards in ELA and mathematics is more serious now that common assessments are being developed. It is clear to those promoting different assessment models that Common Core’s minimalist college and career readiness standards enable test developers, rather than academic content experts or parents, to determine curriculum and instruction at the local, state, and national level.⁴⁶ Test designers understand that the “instructional value of the common assessment

systems—both summative and formative—will be directly related to the degree to which states are willing to accept curricular consistency.” Test designers understand that they must determine the “sequence and content of instruction” to make common assessments worthwhile—that the “desire for shared and highly instructionally useful assessments requires a willingness to utilize a common curriculum.”

Since Common Core’s standards do not provide a framework for any particular curriculum, at least in ELA, curriculum frameworks will need to be developed by the assessment consortia, whether they use the “balanced assessment system model” described by Linda Darling-Hammond and Ray Pecheone, the “high level model” described by Stephen Lazer, the “American examination system” model described by Lauren Resnick and Larry Berger, or the “state consortium for board examination systems model described by Marc Tucker. All note the need for assessments that are “curriculum-based” as well as “standards-based,” as if the two weren’t supposed to be conjoined so that state boards and the public would know what they were buying when they adopted Common Core’s standards. They are conjoined in other countries.

That is why a standard’s meaning needs to be anchored with a clear example of teachable content. Standards documents are the only documents that are extensively reviewed in public meetings around the country. Once standards are approved, a curtain falls and the general public is not privy to the sausage-making of assessment, trusting professionals to execute faithfully what the public has blessed. But if standards are opaque or have no examples to pin interpretations down, then the public effectively forfeits its right to direct the public school curriculum and will not know if and when its academic or civic goals have been corrupted.

Recommendations Before Adoption of Common Core's Standards

A. For state boards of education and state legislatures:

- Sponsor public discussions on what college readiness should mean for different types of post-secondary institutions. The type of post-secondary institutions for which Common Core's standards seem to be relevant should be made clear at the time they are adopted.
- Sponsor public discussions on the meaning of merging college readiness and career readiness for their high schools and for the various types of post-secondary institutions in their state.
- Sponsor public discussions on how high school diploma requirements should relate to the results of tests purporting to assess college and career readiness.
- Prepare the necessary resources, financial and other, to realign their teacher certification standards and K-16 education systems over the next year or two. This includes purchase of new textbooks and instructional materials, aligning teacher preparation programs, funding of professional development for veteran teachers as well as professors of teacher education, and the administration of new assessments. So far, it seems that the federal government will fund only the costs of developing new assessments.
- Establish and carefully monitor state indices of secondary and post-secondary academic achievement such as high school course-taking, AP and IB course-taking, and STEM college enrollment as implementation of new standards proceeds.

B. For local school boards and district superintendents:

- Sponsor in-school discussions of what college readiness and career readiness mean in their community.
- Sponsor grade-level discussions of the quality, clarity, and rigor of the proposed grade-level standards.
- Sponsor community discussions of how they can ensure parent input into local curriculum and instruction.

C. For the U.S. Department of Education:

- Fund the development of additional sets of grade-level standards by additional consortia of states in order to develop common and internationally benchmarked sets of college-ready mathematics and ELA standards appropriate for the upper two-thirds of our students. Consortia should also be funded to develop high school end-of-course assessments based on these mathematics and ELA standards so that all states have a choice of high school end-of-course assessments.
- Defer the development of common assessments until Common Core's standards are piloted for a year or two and validated.
- Defer linkage between accountability measures in the re-authorization of ESEA to Common Core's standards until state departments of education can ensure that the vast majority of teachers in their states have the requisite academic background knowledge to teach to them.
- Enhance and carefully monitor federal indices of secondary and post-secondary academic achievement such as high school course-taking and STEM college enrollment as implementation of new standards proceeds.
- Commit to maintaining the continuation of NAEP and U.S. participation in TIMSS to

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provide continuing validation against known national and international benchmarks.

D. For the U.S. Congress:

- Charge NAGB or the National Academies of Science with on-going review and validation of proposed sets of multi-state academic standards against national and international benchmarks.
- Charge NAGB or the National Academies of Science with regular evaluations of assessment systems of multi-state standards.
- Re-authorize ESEA for a limited time--until the first results of those evaluations are available.

E. For Common Core:

- Provide all grade-level standards with examples and anchor all the “illustrative” titles (with their level of complexity as determined by the new “complexity” formula) to relevant reading standards so that they provide some curricular usefulness, i.e., how each addresses a particular standard.
- Upgrade the college readiness standards to an authentic college readiness level.
- Develop separate sets of career and college readiness standards

Appendix: What Is Missing in Common Core’s Grade-Level Standards

To understand the kinds of changes that need to be made in Common Core’s grade-level standards so that test developers can create valid and reliable tests and schools can develop curricula with common and high academic expectations, we need to look briefly at the theory behind standards-based approaches to curriculum and assessment. In this theory, standards are the key element that drives the rest of education system. Standards are supposed to express what a community expects its children to “know and be able to do” and what its teachers should teach to in their classrooms. Standards do not constitute the classroom curriculum (i.e., a teacher’s syllabus) or the school curriculum (the details of what is studied from grade to grade), nor do they specify methods of instruction (how a teacher chooses to teach to a standard). Standards constitute the substantive framework guiding the choice and sequence of the academic content of the classroom and school curriculum. Once a community and its teachers have agreed on their school’s intellectual objectives, the community can readily support what its teachers do. The theory behind a standards-based approach to curriculum and assessment thus rests on the assumption that there is broad understanding and general approval of the content standards--by teachers as well as by parents and the public at large. However, this assumption cannot be met if the standards shaping the content of school curricula and common assessments are susceptible to a variety of interpretations or do not serve their intended function (i.e., do not point to authentic academic content).

A. For Mathematics

Almost by definition, a mathematics standard indicates mathematical content. But, it may not be written clearly enough and it may need an example to guide its interpretation. What Common

Core’s grade-level mathematics standards lack are insufficient examples to guide their interpretation. Good examples of what a standard means serve several functions. They may make the technical language of mathematics clearer to the public. They also guide test developers and textbook publishers to the precise intention of the standards writer. To paraphrase an old saying, a good example is worth 1000 hours of debate over what the standard actually means.

Common Core’s first draft of college and career readiness standards was published in September 2009. It provided over 100 examples for four of eleven mathematics standards.⁴⁷ In December, Common Core provided another 30 examples for a statistics standard.⁴⁸ Criticism of their quality appeared in a short summary report provided by Common Core,⁴⁹ as well as in an online op-ed by one of the authors.⁵⁰ No examples were provided in subsequent drafts of the mathematics standards. They remain on Common Core’s website, but the March draft does not refer to them and they may have been withdrawn.

Let us explain in detail why examples matter. Here is a grade 3 Number Operations standard in Common Core’s March draft: “*Solve one- or two-step word problems involving the four operations*” (standard 3-NOP-8). Below are four possible test items, drawn from California, Massachusetts, and Hong Kong assessments, which could be used to assess this standard:

Test Item 1: A company has 6 big trucks. Each truck has 18 wheels. How many wheels is this in all? A. 24 B. 96 C. 108 D. 116

Test Item 2: Maurice drinks four 8-ounce glasses of milk every day. How many pints of milk does he drink each day? (1 pint = 16 ounces) A. 2 pints B. 4 pints C. 16 pints D. 32 pints

Test Item 3: These two number sentences are true: $+ = 6$ and $\Delta + = 12$

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Which of the following values for Δ and \square make both number sentences true?

- A. $\Delta = 3$ and $\square = 9$
- B. $\Delta = 4$ and $\square = 8$
- C. $\Delta = 15$ and $\square = 3$
- D. $\Delta = 9$ and $\square = 3$

Test Item 4: Which of the following is equal to 32×6 ? A. 8×29 B. 9×18 C. 2×106
D. 4×48

As can be seen, the four test items interpreting this grade 3 standard exhibit very different mathematical concepts and levels of difficulty. The first is a straightforward single-step arithmetic problem. The second is a straightforward two-step arithmetic problem. The third is a complex symbolic two-step problem that requires both arithmetic skills and algebraic understanding, while the fourth requires arithmetic skills and an understanding of number theory concepts. Without examples to show which type of task the standard expects students to understand and at what level of difficulty, it will be the test writer who decides on one of them, possibly misconstruing what the standard writer or the public had in mind.

Here is another illustration of standards needing good examples. A grade 8 standard says: "Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection" (8-EE-10). A high school standard says: "Solve systems of linear equations algebraically and graphically, focusing on pairs of linear equations in two variables (A-REI-15)." For all intents and purposes, these two standards seem identical. Yet one is a grade 8 standard and the other is a high school standard. How can we decide if there is any difference between them? Perhaps one of them intends to solve word problems that can be modeled by a system of linear equations? Perhaps one expects relatively complex forms of equations? Perhaps one is intended for non-linear equations that can be linearized by substitution?

Or perhaps they are simply the same and reflect no growth between middle school and high school? Without exemplars we simply do not know, and test makers have no guidance.

Summary: Common Core's mathematics standards suffer from insufficient clarity and a lack of examples to guide test makers or teachers to the precise meaning intended by the standards writers. In fact, the only one of the mathematicians on the National Mathematics Advisory Panel who speaks up publicly because he is not on a Common Core writing or feedback group has described the March draft as "unusable" because "so many items in the Common Core Standards can be read with very different meanings by different people."⁵¹ The near absence of public discussion by mathematicians (and other content experts like accountants, scientists, engineers, and economists) on the many content issues in Common Core's mathematics drafts has allowed the public square to be filled by the voices of a variety of non-content experts, leaving the general public and legislators with no clear understanding of the meaning and rigor of Common Core's standards and thus with no possibility for informed consent. Test writers will therefore have to provide their own interpretations of its standards. When a significant gap occurs between what the public expects them to mean and what test makers may make them mean, e.g., when test items are released, angry words are bound to arise.

B. For English Language Arts

1. Standards with consistent interpretations

To help test developers avoid possibly inconsistent interpretations from year to year, Common Core's grade-level reading standards need intelligible and sensible academic content and examples of specific texts. They also need to be pedagogically implementable. Examples of specific texts or authors may not be needed if the academic content is both intelligible and sensible and if the standards can be addressed pedagogically by ordinary teachers. We illustrate this point with

a set of standards from the 2001 Massachusetts English Language Arts Curriculum Framework and examples of test items based on them.

General Standard 16: Myth, Traditional Narrative, and Classical Literature

Grades 5/6: Compare traditional literature from different cultures.

Grades 5/6: Identify common structures (magic helper, rule of three, transformation) and stylistic elements (hyperbole, refrain, simile) in traditional literature.

Grades 7/8: Identify conventions in epic tales (extended simile, the quest, the hero's tasks, special weapons or clothing, helpers).

Grades 7/8: Identify and analyze similarities and differences in mythologies from different cultures (ideas of the afterlife, roles and characteristics of deities, types and purposes of myths).

Grades 9/10: Analyze the characters, structure, and themes of classical Greek drama and epic poetry.

Grades 11/12: Analyze the influence of mythic, traditional, or classical literature on later literature and film.

As can be seen, the standards progress from expecting identification and description of thematic, structural, and stylistic elements in specific and well-known kinds of reading appropriate for students in grades 5-8 to expecting analysis of the thematic, structural, and formal elements in general examples of these genres appropriate for high school students. No authors or texts are specified, or need to be; relevant test items have been generated consistently, as well as approved by different groups of teachers, over the years. Here are two test items from the Bay State's grade 8 test and two test items from its grade 10 test for two different years, each item reflecting clearly the grade-level standard on which it is based, and each requiring understanding of the passage selected (not simple recall of facts).

In 2007, a passage from *Gilgamesh* Book III was a test item in grade 8. It is described as follows: "The epic of *Gilgamesh* dates from 1700 BC but was only discovered in AD 1853, buried in the ruins of Nineveh, in present-day Iraq. Written on clay tablets, it relates the life and adventures of a famous king, Gilgamesh, and his best friend, Enkidu. Read the excerpt from *Gilgamesh* and answer the questions that follow." Here is one of the multiple-choice questions:

"Which of the following elements of an epic is established in stanza 1 of the excerpt?

A. the hero's task B. the story's moral C. the gods' character D. the hero's love interest"

In 2008, a passage from *The Iliad* by Homer (translated by Robert Fagles) was a test item in grade 8. It is described as follows: "The following myth is from the Greek epic *The Iliad*. In the myth, Achilles has organized a footrace in which his friends Ajax, Odysseus, and Antilochus run against one another. Read the myth and answer the questions that follow." Here is one of the multiple-choice questions:

"Read lines 47– 49 in the box below.

Foul, by heaven! The goddess fouled my finish!/Always beside Odysseus—just like the man's mother,/rushing to put his rivals in the dust.

What is the reason for Ajax's frustration?

- A. He is disappointed in the way he ran.
- B. He believes Odysseus's mother helped Odysseus win.
- C. He thinks the goddess Athena's interference made him lose.
- D. He wishes he had been competing against an easier opponent."

In 2007, a passage from Edith Hamilton's *Mythology* was a test item in grade 10. It is described as follows: "In this chapter from *Mythology*, author Edith Hamilton retells the story of King Ceyx and his faithful wife, Queen

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Alcyone. Read the myth and answer the questions that follow.” Here is one of the multiple-choice questions:

“According to paragraphs 6–7, what motivates Alcyone to return to the headland?

- A. She plans to take a journey across the sea.
- B. She hopes to find a cure for her sleeplessness.
- C. She wishes to ask the oracle about her dream.
- D. She wants to be close to her drowned husband”

In 2009, a passage from the *Aeneid* by Virgil (translated by Robert Fagles) was a test item in grade 10. It is described as follows: “After being defeated by the Greeks and cast out of Troy, members of the Trojan army are forced to wander the Mediterranean and look for a new home. The Trojans, including the narrator, Aeneas, and his father, Anchises, attempt to settle on the island of Crete, but the gods visit Aeneas in a dream to reveal their intentions for his people. Read the excerpt from Virgil’s *Aeneid* and answer the questions that follow.” Here is the open response question for this test item:

“Based on the excerpt, describe the Trojans’ relationship with the gods. Support your answer with relevant and specific information from the excerpt.”

2. Standards without consistent interpretations

Grade-level standards, Common Core’s March draft tells us, “translate” a skill into “grade-appropriate terms.” However, many of its “translated” skills for 6–12 cannot be interpreted consistently by teachers or by test developers. And several critical ones are placed at the wrong grade level.

The first four standards below address college and career readiness standard #9 (“Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare

the approaches the authors take”). The next four standards mostly “build on” college and career readiness standard #6: “Assess how point of view or purpose shapes the content and style of a text.”

Almost all of these eight standards have been slightly changed for Common Core’s final draft, officially released on May 14, and the final version, to be officially released on June 2 (including one change in grade level). We did not use the May 14 or final version of these particular grade-level standards because the May 14 draft was labeled confidential (and “leaked” on May 17). The “confidential” nature of this May ELA draft and a forthcoming May mathematics draft is simply one more indication of the problem with transparency that has affected the entire process Common Core has used for developing national standards. Substantively, the slight alterations in wording that were made to these eight grade-level standards for the May 14 final draft, which made them read more smoothly, did not eliminate the problems these and many other grade-level standards present for consistent interpretation, teachability, and grade-level appropriateness.

For Literature in 6-12

“Analyze a specific case in which a modern work of fiction draws on patterns of events or character types found in traditional literature (e.g., the hero, the quest).”

“Compare a fictional portrayal of a time, place, or character to historical sources from the same period as a means of understanding how authors use or alter history.”

“Analyze a wide range of nineteenth- and early-twentieth-century foundational works of American literature, comparing and contrasting approaches to similar ideas or themes in two or more texts from the same period.”

“Analyze how an author draws on and transforms fictional source material in a specific work (e.g., how Shakespeare draws on a story from Ovid or how a later author draws on a play by Shakespeare).”

The first standard above presents several obstacles to consistency in interpretation. Teachers must do two different things before they can teach to the standard. They must find a modern work of fiction that has some kind of antecedent in a traditional text and then find out if this traditional text was assigned in an earlier grade. They may need to assign both a traditional text as well as a related modern work of fiction to address this standard. However, the draft-writers give no hint of what modern works of fiction could be used and what antecedents are found in traditional texts. Moreover, the standard is not appropriate for the middle grades. It jumbles two of the Massachusetts standards above, one in the middle grades requiring the reading of traditional epic literature, the other in the upper secondary grades requiring the reading of texts composed later in time showing the influence of earlier themes, characters, and/or events. How test developers will choose to address all these pedagogical problems remains to be seen, but it is highly likely that how they address them will guide middle grade teachers across the country as to what should be in their curriculum so they can teach to this standard.

The second standard above presents pedagogical and curricular obstacles for teachers to overcome in order to teach to it. In addition to reading the selected text itself, students must also read a broad swath of historical material contemporary to its content or context in order to understand how the author has used or altered history. To do this requires two kinds of analyses: how the author has drawn on historical material and—far more challenging—how the author has changed history, assuming there is a historical portrayal of a time, place, or character version that can be considered the “right” or “true” one. How test developers will address this standard remains to be seen, but whatever they do will undoubtedly set the model teachers across the country will use to address this inappropriate standard for the middle grades.

The third standard above poses severe interpretive obstacles. It would have been a good standard if it consisted of only the main clause—and was placed in grades 11/12, not 9/10. But, what does it mean to examine how two texts from the same century (not the same literary period, apparently) address similar themes or topics? What are different ways of addressing a theme? What pool of possible ways to address a theme does the standard-writer have in mind? This standard begs for clear examples of what the standard-writer wants students to do and learn. More problematic, however, is its misplacement in grades 9/10. American literature is frequently taught in grade 11, in tandem with the study of U.S. history at that grade level. Moreover, many foundational works of American literature (e.g., by Emerson, Thoreau, Melville, Hawthorne) are more accessible to most students in the upper secondary grades. The placement of this standard in grades 9/10 means that it will likely not figure into the high school exit test, seemingly to be based on grades 11/12 standards and the empty CCRS.

On the other hand, the fourth standard above, which is about inspirational sources for an author’s work and is suitable for grades 11/12, leaves it entirely up to teachers to figure out how to develop students’ skill in identifying sources for authors’ texts in the absence of general guidelines to the content of the curriculum from the elementary grades on. Both teachers and test developers are on their own.

Interpretive problems abound in the grade-level standards in grades 6-12 for Informational as well as Literature texts.

For Informational Text in 6-12

“Compare and contrast one author’s point of view on events with that of another (e.g., a memoir written by and a biography on the same person).”

“Describe an author’s point of view or purpose in a text and analyze how the author

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distinguishes his or her point of view from that of others.”

“Analyze documents of historical and literary significance, including seminal U.S. documents (e.g., the Declaration of Independence, the Preamble to the Constitution, the Bill of Rights for their premises, purposes, and structure.”

“Analyze how various authors express different points of view on similar events or issues, assessing the authors’ assumptions, use of evidence, and reasoning, including analyzing seminal U.S. documents (e.g., *The Federalist*, landmark U.S. Supreme Court majority opinions and dissents).”

The first standard above for informational text is not intelligible because of the example given. The standard expects students to compare two different persons’ views on an event. Yet, the example is about “point of view,” a literary element referring to the narrator’s stance—in this case, a first-person recollection of an event and a third-person account of what that memoirist thought about the event. How a teacher or test developer will interpret this standard is anyone’s guess.

The second standard above for informational text is not consistently interpretable and borders on unintelligibility. The first part of the standard expects students to describe an author’s point of view, meaning position or perspective, in an informational text. So far so good. But the second part of the standard expects students to analyze how the author distinguishes his or her position from that of unknown others. Who or where they are is anyone’s guess. Are they to be mentioned in the text itself and their positions described there? Without a few examples, this standard invites myriad interpretations.

It is quite clear what the third standard above for informational text addresses, but it has been misplaced in grades 9/10. U.S. history is most frequently taught in grade 11 because that is the optimal grade for making the Constitutional

period and our seminal political documents accessible to the vast majority of our students. The placement of this standard in grades 9/10 means that it will likely not figure into the high school exit test, seemingly to be based on grades 11/12 standards and the culturally empty CCRS.

The fourth standard above for informational text is for grades 11/12 and could have been a capstone academic standard asking students to apply the basic principles and purposes in the political documents they studied in grades 9/10 to an understanding of contemporary issues. But it was unfortunately turned into a conceptual dump, mixing analysis of the grounds and goals of political advocacy (e.g., *The Federalist*) with analysis of the grounds and goals of legal reasoning (e.g., Supreme Court decisions). Test developers and teachers may easily interpret this standard inconsistently and differently from year to year. Moreover, as a “translation” of a skill on “point of view,” it appears to invite personalization of decision-making based on legal principles, and possible discreditation of the concept of law itself. It is not worthy of a national high school standard.

Summary: Common Core’s grade-level standards for ELA illustrate at least three key problems for curriculum and test developers: (1) many are unintelligible and cannot be interpreted at all unless clear examples are given for each; (2) many otherwise intelligible standards related to a particular college and career readiness standard have no clear or consistent intellectual aim, and (3) many are placed at an inappropriate grade-level. These problems will lead to a mismatch between what teachers may teach, from class to class and from grade to grade, what test developers may decide to assess, and what the public expects of its public schools. Needless to say, all grade-level standards in a national document should address intelligible and worthy academic objectives at appropriate grade-levels for developing the skills conveyed by the college and career readiness standards. All these grade-level standards should also contribute to the development of responsible, informed citizens.

Endnotes

1. Neal McCluskey, “Behind the Curtain: Assessing the Case for National Curriculum Standards,” Cato Institute, 2010. http://www.cato.org/pub_display.php?pub_id=11217

2. For example: “They’re good, solid — indeed very ambitious — academic standards for primary and secondary schooling, at least in the two essential subjects of English and math. Students who attained them would be better off — readier for college, readier to get good jobs, readier to compete in the global economy — than most are today” Chester E. Finn Jr., “Back to Basics,” National Review Online, March 16, 2010. <http://article.nationalreview.com/427893/back-to-basics/chester-e-finn-jr>

3. R. James Milgram & Sandra Stotsky, “Fair to Middling: A National Standards Progress Report,” Pioneer Institute White Paper # 56, March 2010. http://www.pioneerinstitute.org/pdf/100402_fair_to_middling.pdf

4. Ze’ev Wurman & Sandra Stotsky, “Why Race to the Middle?” Pioneer Institute White Paper # 52, February 2010. http://www.pioneerinstitute.org/pdf/100223_why_race_to_the_middle.pdf

5. <http://www2.ed.gov/programs/racetothetop-assessment/index.html>

6. http://www.edweek.org/ew/articles/2010/02/03/20consortia_ep.h29.html

7. <http://www.nga.org/Files/pdf/1004NGACSSOASSESSMENTS.PDF>

8. However, the non-competitive competition seemingly tailor-made for NCEE may become a real competition if the State Collaborative on Assessment and Student Standards and groups coalescing around ACT and the College Board decide to apply for this assessment grant.

9. Diagnostic assessment is another common type of assessment, but it is used in specialized situations and is not discussed here.

10. We focus here on face validity and not on other specialized aspects of validity.

11. See, for example, the remarks by William Mehrens, “Using Performance Assessment for Accountability Purposes in Testing” in Evers, W.M. & Walberg, H.J. (Eds.), “Student Learning, Evaluating Teaching Effectiveness,” Hoover Institution Press, Stanford, CA, 2004, pp 221-241. “In spite of my belief in the importance of procedural knowledge and the importance of doing some assessing by other than multiple-choice testing, I remain puzzled by some of the writings regarding this “new” performance testing. Some suggest that multiple-choice tests are indirect and what we need are more direct measures of achievement. But cognitive psychologists focus on processes (such as metacognitions) that are not amenable to direct measurement. Some think the problem is that multiple choice tests do not cover a broad enough domain. But performance tests will access narrower domains—perhaps in more depth. Some are concerned with the curriculum-test mismatch and the efforts of educators to change the curriculum to increase the match—these people generally see measurement-driven instruction as a bad thing.” ... “While continuing the research, performance advocates should not be overselling what performance assessment can do. Wiggins has suggested, ‘It’s wrong to say [performance assessments] were oversold; they were overbought.’ I do not see it that way. I think they have been both oversold and overbought.”

12. Harold O’Neil, Richard S. Brown, “Differential Effects of Question Formats in Math Assessments on Metacognition and Affect,” Technical Report 449, CRESST, 1997.

13. Ronald K. Hambleton et al, “Psychometric Review of the Maryland School Performance Assessment Program,” Abell Foundation, 2000; Unpublished “MSPAP Content Review Panel Report” by W.M. Evers et al., Abell Foundation 2000.

14. D. Koretz, B. Stecher, S.Klein, D. McCaffrey, “The Vermont Portfolio Assessment Program: Findings

and Implications,” Educational Measurement: Issues and Practices, 1994, 13 (3); R. K. Hambleton,

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R. M. Jaeger, D. Koretz, R. L. Linn, J. Millman, S. E. Phillips, "Review of the Measurement Quality of the Kentucky Instructional Results Information System," 1991–1994. <http://www.lrc.ky.gov/oea/reports/MEASUREMENT%20QUALITY%20FINAL%20REPORT%2091-94.pdf>

15. Table 13 in Lawrence O. Picus and Alicia Tralli, "Alternative Assessment Programs: What Are the True Costs?", CSE Technical Report 441, CRESST, February 1998.

16. Brian Stecher, "Portfolio Assessment and Education Reform," in W.M. Evers and H.J. Walberg (Eds.), "Testing Student Learning, Evaluating Teaching Effectiveness," Hoover Institution Press, Stanford, CA, 2004, pp 197-220.

17. B. Topol, J. Olson, and E. Roeber. "The Cost of New Higher Quality Assessments: A Comprehensive Analysis of the Potential Costs for Future State Assessments," 2010. http://edpolicy.stanford.edu/pages/pubs/pub_docs/assessment/scope_pa_topol.pdf

18. <http://www2.ed.gov/rschstat/eval/disadv/growth-model-pilot/gmpp.pdf>

19. Performance standards ("cut scores," or pass scores, on the common assessments to be developed also have enormous potential to undermine the rigor of Common Core standards, especially because they are likely to be set without public discussion involving legislators, mathematicians, and parents. However, these cut scores promise to be uniform across the nation--a very positive feature.

20. <http://www.achievethecore.org/achievingcommoncore>

21. One author of this White Paper e-mailed Gene Wilhoit, Dane Linn, Chris Minnich, Mike Cohen, and David Conley during March 2010 asking specifically for an explanation of the relationship between the CCRS and the grade-level standards for assessment purposes and has received no information from any of them.

22. Draft Common Core State Standards for Mathematics, 3/9/2010, Appendix A.

23. "Why Race to the Middle?"

24. Minutes of the Regular Meeting of the Massachusetts Board of Elementary and Secondary Education, March 23, 2010, p.5. <http://www.doe.mass.edu/boe/minutes/10/0323reg.pdf>

25. T Testimony to the Senate Health, Education, Labor, and Pensions Committee, April 28, 2008. <http://help.senate.gov/imo/media/doc/Schmeiser.pdf>

26. <http://educatedguess.org/blog/2010/04/22/all-agree-on-value-of-eap/>

27. See criticism of a single set of college readiness standards by, e.g., Jay Greene, "One Size Fits None," *Arkansas Democrat-Gazette*, April 11, 2010 <http://www.arkansasonline.com/news/2010/apr/11/one-size-fits-none-20100411/> and Paul Barton http://www.edweek.org/media/comments_regarding_draft_common_standards_edit2.pdf

28. http://www.achievethecore.org/files/ADPreport_7.pdf

29. On a page titled Knowledge & Skills Foundation, we find: "Students who are ready for introductory literature courses come to the university familiar with a range of world literature. They are aware of major U.S. and British authors—both men and women—and representative literary works from a variety of cultural traditions. These students have had exposure to non-literary sources as well: documents such as the Magna Carta or the Declaration of Independence. With that exposure, students have a better understanding of the range of writing from which their literature courses will draw" (p. 17).

30. American College Testing, "ACT National Curriculum Survey 2005-2006," (Iowa City, IA: ACT, 2007); American College Testing, "Aligning postsecondary expectations and high school practice: The gap defined, Policy Implications of the ACT National Curriculum Survey® Results 2005–2006," (Iowa City, IA: ACT, 2007).

31. Daniel T. Willingham, "The usefulness of brief instruction in reading comprehension strategies,"

American Educator, Winter, 2006-2007. http://archive.aft.org/pubs-reports/american_educator/issues/winter06-07/CogSci.pdf

32. <http://www.nagb.org/policies/PoliciesPDFs/Improving%20National%20Assessment%20of%20Education%20Progress/The%20Future%20of%2012th%20Grade%20NAEP.pdf>

33. <http://www.ets.org/Media/Research/pdf/PICHSWORK.pdf>

34. <http://www.nagb.org/who-we-are/20-anniversary/barton-12th-graders-futures.pdf>

35. <http://www.nagb.org/publications/PreparednessFinalReport.pdf>

36. http://www.actonline.org/uploadedFiles/Publications_and_Online_Media/files/Career_Readiness_Paper.pdf

37. <http://professionals.collegeboard.com/data-reports-research/ap/archived>

38. Sandra Stotsky, "National Survey of Literary Study in Grades 9, 10, and 11," FORUM, a publication of the ALSCW, Spring 2010, forthcoming; S. Stotsky, C. Goering, & D. Jolliffe, "Literary Study in Grades 9, 10, and 11 in Arkansas," Department of Education Reform, University of Arkansas. http://coehp.uark.edu/literary_study.pdf. Trends and findings were identical in both reports, even though different survey firms were used for the over 400 teachers in the national survey and the over 400 teachers in the Arkansas survey.

39. Precise numbers are hard to find. College Board says: "Studies find that most students change majors at least once, and many switch several times before they settle on one." (http://www.collegeboard.com/student/csearch/majors_careers/151170.html) Various web resources report numbers between 50% and 80%.

40. According to Michael Kirst, "While students and parents view college preparation as the main purpose of high school, most teachers disagree and rank mastery of subject areas and life skills as more important. This is one of the key findings from *Deloitte 2009 Education Survey Overview*:

Refining High School as a Launch Pad (<http://collegepuzzle.stanford.edu/?p=701>).

41. "Closing the Expectations Gap: 2010" at <http://www.achieve.org/files/AchieveClosingtheExpectationsGap2010.pdf>

42. For example, it includes solving quadratics in the complex field, geometry of circles, the binomial theorem, division of polynomials, and more, all absent from Common Core college-readiness. See <http://www.achieve.org/files/HighSchoolModelThree-YearTraditionalPlusCourseSequence.pdf>

43. <http://www.gatesfoundation.org/press-releases/pages/math-and-literacy-grants-improving-student-achievement-100218.aspx>

44. Massachusetts Department of Elementary and Secondary Education, "Overall Impressions of the March 10, 2010, Public Comment Draft of the Common Core State Standards in English Language Arts and Literacy in History/Social Studies and Science and the Public Comment Draft of the Common Core Standards for Mathematics," April 8, 2010.

45. <http://www.edweek.org/ew/articles/2010/04/29/31eSEA-standards.h29.html>

46. "A Fresh Start: Creating the Next Generation of Assessment Systems. A report based on the National Conference on Next Generation Assessment Systems, March 8-9, 2010," Center for K-12 Assessment and Performance Management at ETS. <http://www.k12center.org/events.html>

47. At that time Common Core labeled strands as standards. In later revisions, it labeled the various organizing schemes alternately as "standards," "headings," "clusters," or "domains."

48. <http://www.corestandards.org/Standards/MathExamplesList.htm#top>

49. Although many people see these examples as illustrative, a number of respondents questioned their suitability for a high-stakes assessment. The Summary of Public Feedback is available at <http://www.corestandards.org/Files/CorePublicFeedback.pdf>

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50. http://articles.sfgate.com/2009-12-22/opinion/17353504_1_math-standards-remedial-classes-years-of-high-school-math

51. "One Math Professor's Take on the Common Standards" at http://blogs.edweek.org/edweek/curriculum/2010/04/one_math_professors_take_on_co.html

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