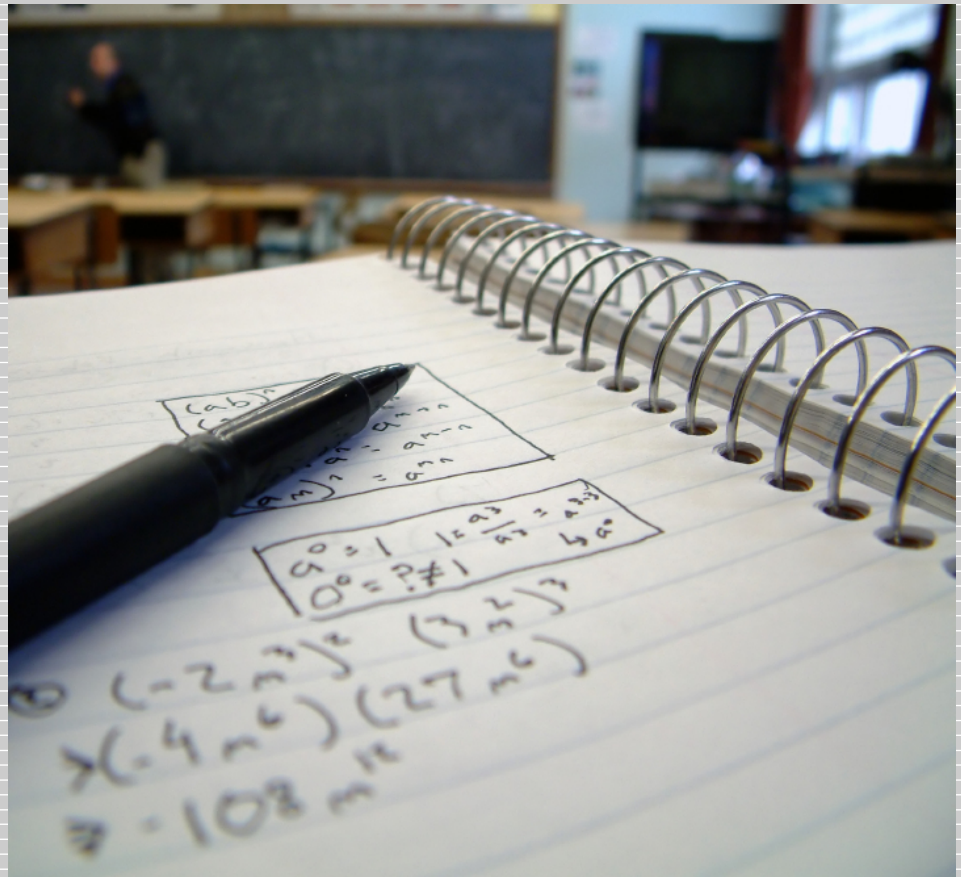


Preparation Matters



The National Center for Educational Achievement (NCEA) is an ACT-owned non-profit, non-partisan organization. Our goal is to support efforts to reach excellence in education—to raise academic expectations and to promote the practices that will help more students reach college/career readiness. We have been working over the last decade to build a continuous cycle for improvement based on an honest and diligent focus on student performance, the careful examination of effective practices of proven high-performers, and using what is learned to support targeted improvement planning and implementation.

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Introduction

In *Orange Juice or Orange Drink?*, the authors provided evidence that many students are receiving credit for courses with little indication that they have learned the content implied by the course titles (Dougherty, Mellor, & Jian, 2006). Yet in pursuit of the goal of preparing all students for college and careers, many policymakers have focused on the very strategy that the *Orange Juice* paper implied may not work: simply putting students into courses with the right titles. This paper discusses the inadequacy of strategies based on student course-taking unless policymakers also pay sufficient attention to course *rigor* and to students' *academic preparation* in elementary and middle school that makes them ready to benefit from rigorous courses in high school.

Student Course-Taking as a College and Career Readiness Strategy

The strategy of enrolling all students in the right courses dates back at least to the influential report *A Nation at Risk* (National Commission on Excellence in Education, 1983), in which the authors proposed that all students take at least 4 years of English, 3 years of mathematics, 3 years of science, and 3 years of social studies by high school graduation. By 2005, 65 percent of high school graduates took at least this set of courses, up from 14 percent in 1983 (Snyder, Dillow, & Hoffman, 2007). By 2008, 19 states treated these courses as recommended or required for high school graduation (Achieve, 2008).

The emphasis on course-taking is based on the commonsense idea that students are unlikely to learn algebra or U.S. history if they do not take a class in the subject. An extension of this approach in recent years has been the effort to encourage high school students to take advanced courses, such as Advanced Placement (AP), International Baccalaureate (IB), and dual credit college courses. As part of this effort, the federal government and private donors have invested significantly in programs to encourage minority and disadvantaged students to sign up for AP courses and exams.

Course Completion May Not Reflect Student Learning

The fundamental goal of course-taking is not academic credit on paper, but actual student learning. In practice, course-taking strategies have often focused on encouraging students to enroll in and complete courses with the right titles.

Yet few would be impressed by a statistic that 100 percent of a group of first-grade students earned course credit for participating in a reading program if none of those students learned how to read.

So if students earn credit for academic core courses, does that mean that they have mastered the content that the course titles imply? Unfortunately, recent research indicates that this is not necessarily the case. For example, researchers from ACT found that for students who completed exactly three years of mathematics in high school—two years of algebra and one year of geometry—only 16 percent met the College Readiness Benchmark on the ACT Mathematics test. Students had to take an additional full year of mathematics in high school to have a better than 50 percent chance of meeting this benchmark. Likewise, students completing three years of high school science had only a 26 percent chance of meeting the ACT College Readiness Benchmark in Science (ACT, 2007b, p.9).

These patterns also apply to advanced courses. For example, using data on Texas students, the authors found that out of low-income students completing and earning credit for academic Advanced Placement courses, only 13 percent—fewer than 1 in 7—passed any academic AP tests. The corresponding passing rates on academic AP tests were 14 percent for Hispanic students and 11 percent for African American students (Dougherty & Mellor, in press).¹ In general, there have been relatively few constraints against giving a course an “advanced” or “college preparatory” label even if the normal content one might expect for such a course is not taught or if students receive credit without learning that content.

Thus, in the absence of direct evidence of student learning, educators and policymakers cannot assume that students earning credit for the right courses have learned the right content. For students to learn the right content, that content must actually be taught in their courses and students must be adequately prepared to learn it. We refer to those two conditions as the need for course *rigor* and for student academic *preparation*.

The Need for Rigor in High School Courses

Rigor means that students are taught the right content in the course—for example, a course in algebra II addresses the essential content needed for mastery of that subject. States and school systems should identify essential content based on an analysis of what prepares students best for further learning in high school, college, and skilled occupations (ACT, 2006; 2007a).

¹“Academic” AP tests were those in English, mathematics, science, and social studies topics, excluding foreign languages and the fine arts. Academic AP test passing rates thus do not reflect the high percentage of Hispanic students passing the AP Spanish language test.

In the 1980s, *The Shopping Mall High School* (Powell, Farrar, & Cohen, 1985) and similar books documented the lack of challenging content in many high school courses. Evidence from recent reports indicates that this problem is still with us (ACT, 2007b; Dougherty, Mellor, & Jian, 2006). Educators in some high schools do a poor job of teaching even their better prepared students. In many cases this problem results from the lack of clear state and local standards for what students are expected to learn. In other cases, school systems have not attended to the other elements that make for good instruction, such as ensuring that teachers have strong content knowledge and pedagogical skills and are supported by knowledgeable leaders, a collaborative environment, appropriate instructional materials, and good assessment, data, and intervention systems (Dougherty & Rutherford, in press; Smith & O'Day, 1990).

The failure of schools, school systems, and states to define appropriate standards for high school courses has been a major influence in the move to AP and IB courses, with their externally defined standards and end-of-course exams. Yet defining the standards does not by itself ensure their implementation in the classroom. With this in mind, in 2006 the College Board began auditing the syllabi of all courses carrying the Advanced Placement label to make sure that they follow the AP course standards.

Academic Preparation Matters

Efforts to maintain course rigor are likely to be constrained by students' level of academic preparation. Having a large population of poorly prepared students forces high school teachers to spend a large percentage of time teaching what should have been learned in elementary and middle school. This leaves less time to teach new material. "Algebra II" is less likely to be algebra II if the students signing up for the course have not learned pre-algebra or algebra I.²

Other researchers have described the poor academic preparation of many students entering high school, particularly in areas with high concentrations of disadvantaged students, and the "extreme degree of difficulty" that those students' lack of preparation places on the schools (Neild & Balfanz, 2006).³ For example, about half of 9th-grade students in non-selective neighborhood high schools in one large urban district scored at the 6th-grade level or below in reading on a standardized test, and a similar percentage were at or below the 6th-grade level in mathematics (Balfanz, McPartland, & Shaw, 2002).

Strong evidence that preparation matters appears in studies that link earlier and later student academic outcomes. For example, the same study of students in non-selective neighborhood high schools found that 43 percent of students who

² One common solution is to have students who are academically behind take the regular course and a parallel catch-up course simultaneously. Because of time limitations, this solution is difficult to implement across all of a student's core high school courses.

³ High school and college readiness for many students entails social preparation as well—being taught the behavioral habits and attitudes that make for good students and successful adults. See ACT (2008b), Tough (2006), and Whitman (2008).

entered 9th grade with reading and mathematics skills at or below the 6th-grade level were not promoted to the 10th grade—a major predictor that those students would eventually drop out (Neild & Balfanz, 2006). A 2008 ACT report found that 8th-grade achievement is the single strongest predictor of college readiness by 12th grade—stronger than students' background characteristics, completion of advanced and honors courses, or high school grade point average.

In the authors' own research using data on Texas and Arkansas students, only two or three percent of students in the lowest academic preparation group in grade 8 made it to college and career readiness targets by grades 11 or 12 (Dougherty & Mellor, 2008).⁴ Putting this group of students into more advanced courses or into higher performing high schools created only modest improvement in these percentages. In the authors' analysis using AP data, students were disaggregated into four academic preparation categories based on their 8th-grade test scores (Dougherty & Mellor, in press). Only the well-prepared students in the top category had a better than one in ten chance of mastering Advanced Placement content in high school.

Learning theory also supports the importance of prior academic preparation. Students interpret new information in the light of the prior information in their possession (Bransford, Brown, & Cocking, 2000; Willingham, 2006). They should be exposed to material of increasing difficulty that challenges them but does not simply frustrate or confuse them by assuming prior knowledge that they do not have. The period of exposure to new information should be adequate for learning to take place, and sufficient time must be allocated for repetition and review. Crammed knowledge is quickly forgotten (Willingham, 2002). All of these considerations show the necessity of academic preparation over a sustained period of time, as would be provided by a coherent, aligned curriculum that prepares students systematically over the preschool, elementary, middle, and high school years.

Conclusion

Efforts to improve college readiness by concentrating on student access to courses with the right titles—while paying too little attention to the content of those courses or how well students are prepared—are likely to produce disappointing results. States and local school systems must define clear standards for the essential content in each core academic high school course, and take the comprehensive set of additional steps needed to ensure that these standards are reflected in strong teaching in the classroom (Dougherty & Rutherford, in press; Smith & O'Day 1990).

⁴ The analysis used state test data in Texas and EXPLORE and ACT data for Arkansas.

Yet course rigor is difficult to maintain when students are unprepared to learn rigorous content. To avoid imposing an “extreme degree of difficulty” on even the best high school teachers and to give students enough time to learn complex material, school systems must pay adequate attention to student academic preparation. This entails defining academic standards in elementary and middle school to prepare students well for high school, college, and careers; and establishing the systems needed to ensure that students can reach those standards, beginning in the early elementary grades.

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