COLLEGE READINESS

ISSUES IN COLLEGE READINESS

Defining Rigorous Content for ACT's QualityCore™ End-of-Course Examinations

ACT's QualityCore end-of-course examinations are based on rigorous course objectives that are empirically based, derived from an intensive study of targeted high schools, and cross-validated by a selection of teachers in high-performing high schools across the United States.

ACT®

Introduction

Increasing numbers of high school graduates are going to college. Nearly three-fourths of new graduates are continuing on to postsecondary education within two years of leaving high school (Berkner & Chavez, 1997). Many more students follow over the course of their working lives. However, too many of these students must begin college by taking remedial rather than credit-bearing courses. Nearly a quarter of those who start in four-year colleges—and nearly half of those who start in two-year colleges—do not even make it to the second year (Cambiano, Denny, & Devore, 2000).

Although high schools have worked hard to increase the numbers of students who go to college, the challenge now is to determine what can be done to improve students' chances of success once they get there. Adelman (2006) reports that the most reliable predictor of college success is the quality and intensity of the high school curriculum.

Studies have revealed the minimum coursework essential for college success, reflected in ACT's recommended number of core courses: four or more years of English and three or more years each of mathematics, science, and social studies (ACT, 2004).

However, ACT's national college readiness indicators, the ACT College Readiness Benchmarks, show that three out of four ACT-tested 2007 high school graduates who take a core curriculum are not prepared to take credit-bearing entry-level college courses with a reasonable chance of succeeding in those courses.

A recent ACT policy report, *Rigor at Risk*, suggests that students today do not have a reasonable chance of becoming ready for college unless they take a number of additional higher-level courses beyond the minimum core, and that even students who do take these additional higher-level courses are not always likely to be ready for college either (ACT, 2007).

This finding is in part a reflection on the quality and intensity—in other words, the *rigor*—of the high school curriculum. Without improving the quality and content of core courses, it appears that most students need to take additional higher-level courses to learn what they should have learned from a rigorous core curriculum, with no guarantee even then that they will be prepared for college-level work.

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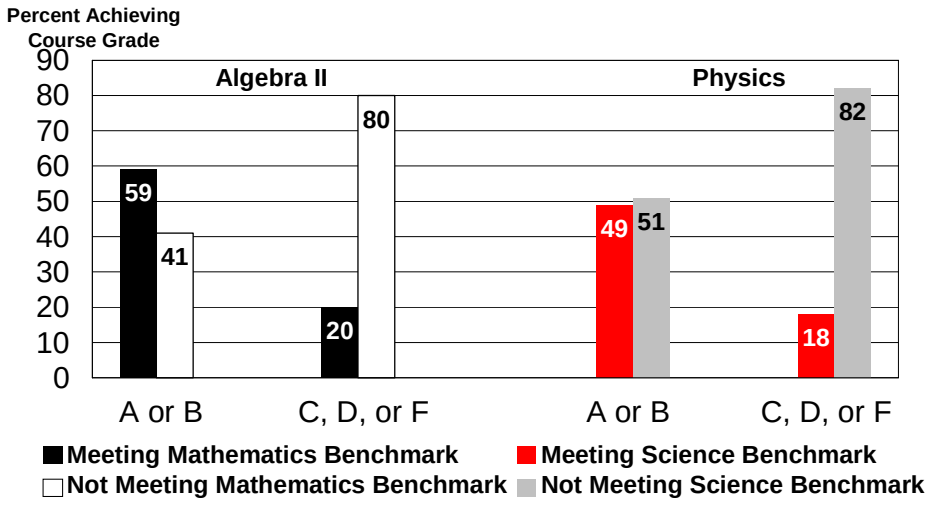
Many high schools use end-of-course examinations to measure course quality. Such examinations are intended to measure a high school's course offerings by assessing how well students have mastered the content considered essential to the courses.

But an end-of-course examination is only as good as the assumptions used in designing it. What is a course's "essential" content? And what does it mean to master it? The end-of-course examinations developed by ACT are derived from assumptions that offer unique and challenging answers to these questions.

In order for students to have the best chance of succeeding in college, the high school courses they take must be of sufficient rigor. In far too many high schools, the content in core courses is watered down, and ACT research shows that too many students who take these courses are not ready for the challenges of college, unable to succeed in credit-bearing first-year college coursework. Nearly half of the ACT-tested high school graduating class of 2007 who earned course grades of A and B in high school Algebra II and Physics "capstone" courses did not demonstrate readiness for entry-level college coursework in mathematics and science as measured by their performance on the ACT Mathematics and Science Tests (see figure). Many of these students will end up dropping out of college and being unprepared for the future (ACT, 2007).

ACT College Readiness Attainment by Course Grades
(2007 ACT-tested Students)



Part of QualityCore, ACT's new instructional improvement program, ACT's end-of-course examinations in English, mathematics, and science are based on end-of-course objectives that are rigorous, empirically based, derived from the syllabi of course offerings at high-performing U.S. high schools with at least 40 percent minority and 50 percent Title I–funded student populations, and validated by a selection of teachers at high-performing high schools across the U.S. Among the goals of the end-of-course examinations are to:

- improve student achievement in high school preparatory courses;

- ensure that course content is focused both on state standards and college and workforce training readiness standards*; and
- provide schools and districts with course-level data about student progress to improve teaching and learning.

The following section explains the process used to develop the rigorous end-of-course objectives measured by the QualityCore end-of-course examinations.

On Course for Success: Model Syllabi

During the 2003–2004 academic year, ACT and The Education Trust collaborated on a study to determine the courses, the level of rigor, and the instructional practices that are most likely to lead to success for students. Success is defined as meeting ACT's College Readiness Benchmarks for English, Mathematics, or Science that predict a grade of B or higher in first-year college courses in English Composition, Algebra, or Biology, respectively. The study focused on ten schools, selected empirically, that are producing graduates who are meeting or exceeding the ACT Benchmarks in proportions greater than those seen nationally. In nine of these ten schools, the student population is made up of at least 40 percent minority-group membership and/or at least 50 percent of students with low-income status. The study, titled *On Course for Success* (ACT & The Education Trust, 2004), attempted to answer the question: What components of high school courses prepare students for successful entry into postsecondary education without the need for remediation?

Courses and teachers at the ten schools were also selected by means of an empirical approach. Each of the participating schools was sent a list of its students who were ready for college—defined as meeting or exceeding one or more of the ACT Benchmarks in two consecutive years. The schools identified the courses each student took and the teachers who taught those courses. The study team eventually focused on 69 courses and teachers with the highest percentages of students meeting the Benchmarks. The teachers were surveyed about their educational experience, teaching philosophy, and instructional practices, and three weeks' worth of their lesson plans and instructional materials were examined. The teachers were also interviewed and observed in their classrooms.

One of the four academic resources that the study found to be a crucial component of all the courses studied was *high-level, college-oriented content*. Successful students in these high schools were enrolled in college-preparatory courses and were learning the skills they need to be ready for college-level work. The content of these courses put students on a trajectory toward college from grade 9 through grade 12.

The study team's analysis of course syllabi, course descriptions, course content (including topics and/or specific objectives covered), pacing charts, and instructional materials for these courses served as the foundation for the

* For a detailed analysis of the comparability between college readiness standards and workforce training readiness standards, see ACT, *Ready for College and Ready for Work: Same or Different?* (2006).

development of model syllabi for the following key high school courses in English, mathematics, and science:

- English 10, 11
- Geometry, Algebra II, Precalculus
- Biology I, Chemistry, Physics

The model syllabi represented syntheses of the materials, e.g., course content, course syllabi, pacing charts, and instructional materials submitted by the 69 teachers participating in the study. The course objectives derived from these materials were the first step in providing real answers to the question of what course rigor looks like and how it can best be taught. These objectives cover the important knowledge of a discipline, the essential ideas that students must master if they are to have a grasp of the field; introduce knowledge and skills in an appropriate sequence; are of increasing intellectual sophistication at each higher level and/or course; represent what is manageable for instruction; and are measurable. These features enable the objectives to: (1) function as a set of organizing statements for an academic discipline, (2) reflect a coherent body of scholarship, and (3) facilitate the development of lesson plans and units. School districts can use the course syllabi, course descriptions, and course objectives to evaluate the rigor of their core course offerings and make changes where necessary to create the conditions for improved college readiness in high schools.

High School Survey

As a next step, we went beyond 69 classrooms to collect validity data from a wider sample of high-performing high schools nationwide. Lists of the course objectives were sent to a nationwide sample of English, mathematics, and science teachers chosen from a list of the 300 highest-performing high schools (i.e., schools in which significant numbers of students met one or more of the ACT College Readiness Benchmarks in two consecutive years). The teachers were surveyed about the importance and relevance of the objectives to college readiness. Teachers in each subject area were asked to indicate whether the knowledge and skills reflected in each objective are essential (that is, must be taught and mastered to prepare students for entry-level college coursework) and/or optional (may be taught to enrich a course), or unimportant and/or not applicable. The teachers were informed that the information they supplied would be used to identify the rigorous knowledge and skills taught in college-preparatory courses.

From the results of the survey, ACT staff refined the course objectives to reflect those that a majority of the responding teachers deemed to be essential. After reviewing all the survey responses, it was determined that the most viable approach to this task was to include in these lists those objectives that a clear majority of the responding teachers in each content area agreed upon as being essential.

It is these final lists of course objectives that form the foundation for the test specifications of ACT's QualityCore end-of-course examination program. As the program grows, ACT will continue gathering empirical evidence to ensure that QualityCore test specifications remain at the leading edge of what constitutes rigorous course objectives in high-performing U.S. high schools.

Conclusion

If students are to have the best chance of succeeding in college, they must take rigorous high school courses. However, in too many high school courses, the content is watered down. ACT's QualityCore end-of-course examinations have therefore been based on rigorous end-of-course objectives derived from courses in high-performing U.S. high schools that have demonstrated positive results. The course objectives have also been validated by a sample of teachers from high-performing high schools across the country. These objectives represent the first empirically based high school preparatory course frameworks that are predicated on a validation showing that they do prepare students for college and that those students do succeed.

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