

Focusing
on the
Essentials
for College
and Career
Readiness

*Policy
Implications
of the ACT
National
Curriculum
Survey®
Results
2009*

ACT®



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ACT is an independent, not-for-profit organization that provides assessment, research, information, and program management services in the broad areas of education and workforce development. Each year we serve millions of people in high schools, colleges, professional organizations, businesses, and government agencies, nationally and internationally. Though designed to meet a wide array of needs, all ACT programs and services have one guiding purpose—helping people achieve education and workplace success.

Introduction

Given the urgent dialogue today about what ought to be taught in the nation's high schools as the United States works to remain competitive in the global economy of the 21st century, the ACT National Curriculum Survey® 2009 contributes a wealth of valuable findings that can inform the discussion.

The ACT National Curriculum Survey, conducted every 3 to 5 years, collects data about what entering college students should know and be able to do to be ready for college-level coursework. We make the results of each survey public in recognition that ACT's data can help educational stakeholders make more informed decisions about college readiness standards and about the alignment of those standards with assessment and curricula.

Closing the gap between postsecondary expectations and high school practice has become a priority among national and state policymakers. With the passage of the American Recovery and Reinvestment Act of 2009 (ARRA), the Council of Chief State School Officers and the National Governors Association's NGA Center for Best Practices joined to coordinate the Common Core State Standards Initiative, a state-led effort to develop and adopt a common set of state standards. These standards will be aligned with college and work expectations, include rigorous content and skills, and be internationally benchmarked. The evidence and research base for these standards will be drawn from the work of national educational leaders, including ACT.

Preliminary results of the Common Core State Standards Initiative are consistent with what ACT has long advocated (and long demonstrated in its own College Readiness Standards™): fewer but deeper high school standards focusing on what is essential for college success. In states that adopt the Common Core State Standards, this will be a big change in direction: not only will curricula and instruction become more directed toward college and career readiness, but the assessments that states choose also need to measure college and career readiness. ACT, through the ACT National Curriculum Survey and other research, will monitor these efforts closely and use these results to help inform our assessments and ensure that they meet the needs of college and career readiness. At the same time, the results of the National Curriculum Survey will continue to inform ongoing efforts to develop, refine, and update common academic standards such as the Common Core State Standards.

This report highlights findings of the ACT National Curriculum Survey 2009 that are particularly relevant to current education policy efforts. The complete survey results are available in the report titled *ACT National Curriculum Survey 2009*, available for download at <http://www.act.org/research/curricsurvey.html>.

In this report, key findings of the survey are highlighted, followed by the implications of these findings for education policy and practice. The final section of the report presents action steps suggested by the findings and implications. The Appendix contains detailed information about the survey sampling process.

Highlights of Survey Findings

Survey findings are presented in two groups: those new to the 2009 survey and those that replicate findings from the previous (2005–2006) version of the survey.

New findings

1. High school teachers are substantially more likely than college instructors to believe that high school graduates are ready for college-level reading.

High school teachers and college instructors were asked how many of their students are prepared to handle the demands of the reading material required for their discipline. The differences in perception were quite significant, as shown in Figure 1.

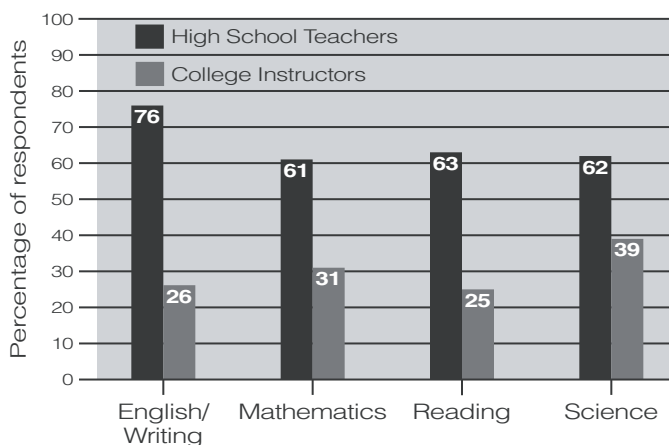


Figure 1: Percentages of Educators Reporting that More than Half of Their Students Are Ready for College-Level Reading

Overall, approximately two thirds of high school teachers reported that more than half of their students are ready to read at the level needed for college work in their content area. College instructors clearly disagreed, with only about one third reporting that a majority of their students read at this level.

2. Overall, both high school teachers and college instructors place less emphasis on the importance of skills such as financial literacy, health literacy, and media literacy than on skills directly related to the content areas of English, mathematics, reading, or science.

Given the current interest in what are sometimes referred to as “21st century student outcomes”—a combination of specific skills, content knowledge, expertise, and literacies that some experts believe students need to master to succeed in work and life in the 21st century—a special collection of items specifically asking about the importance of these outcomes was included in the survey. The outcomes rated highest by both high school teachers and college instructors across the content areas included reading, English and language arts, writing, communication skills, mathematics, science, and critical thinking and problem-solving skills. Among the outcomes rated lowest by both groups were financial literacy, health literacy, and media literacy.

3. Although science and mathematics educators at both the high school and college levels place a high value on the importance of reading skills, the great majority of them spend little or no time teaching their students strategies for reading the materials they assign.

In the survey section discussed in the previous finding, mathematics and science educators at both the college and high school levels rated reading among the top five most important “21st century student outcomes.” However, when asked in another section of the survey how much time they spent teaching strategies for how to read the materials required in their courses, 80 percent of college science instructors, 78 percent of college mathematics instructors, 71 percent of high school science teachers, and 66 percent of high school mathematics teachers reported spending either no time at all or only a little time teaching these strategies. So although these educators place a high value on reading, too few of them are reinforcing that value by teaching targeted reading strategies to their students.

4. High school teachers and college instructors affirm that readiness for college and readiness for workforce training require a comparable level of knowledge and skills.

High school and college instructors were asked their opinions about how much the knowledge and skills for college readiness and workforce-training readiness overlap. Seventy-one percent of responding high school teachers and 78 percent of college instructors replied either “a great deal” or “completely.” Only 1 percent of responding high school teachers or college instructors replied “Not at all.”

This finding is consistent with ACT’s report *Ready for College and Ready for Work: Same or Different?*, which presented empirical evidence showing that the level of knowledge and skills needed for college readiness is comparable to the level needed for entry into workforce training programs for jobs that pay a living wage.

5. High school teachers believe that they or their colleagues reduce academic expectations for students who are not bound for college.

High school teachers were asked: “To what degree do you believe secondary teachers reduce academic expectations for students they perceive are not college bound?” Forty-two percent of high school teachers replied either “a great deal” or “completely.” Only 6 percent reported that there is no reduction in expectations. This result implies that high school students who indicate that they are not going on to college may not be held to the same standards as their college-going peers. This implication suggests that high school teachers may be reducing academic expectations for some students despite their strong belief (reported in the previous finding) that the skills needed for entry into workforce training are just as demanding as those needed for college.

Replications of earlier findings

6. As was true in the 2005–2006 survey, what high school teachers view as important is less targeted and specific than what college instructors expect entering college students to know.

As in previous ACT National Curriculum Survey results, college instructors viewed a smaller percentage of content and skills (57 percent) as being of higher importance (rating of 3 or 4) than did high school teachers (67 percent; see Figure 2). College instructors also viewed more content and skills (43 percent) as being of no importance (rating of 0) or of lower importance (rating of 1 or 2) than did high school teachers (33 percent).

The finding that college instructors target fewer skills as being of high importance is consistent with recent policy statements and findings raising concerns that some states require too many standards to be taught and measured, rather than focusing on the most important standards for students to attain. The long lists of content topics and skills may defy teachers' efforts to teach them in detail within the confines of a single school year. It may be that the extensive demands of state standards force high school teachers to treat all content topics as important, sacrificing depth to breadth. Because the postsecondary survey results indicate that a more rigorous treatment of fundamental content knowledge and skills needed for credit-bearing college courses would better prepare students for postsecondary education and work, states would likely benefit from examining their state standards and, where necessary, reducing them to focus only on the knowledge and skills that research shows are essential to college and career readiness and postsecondary success. States can also look to the results of the Common Core State Standards Initiative for help focusing their standards.

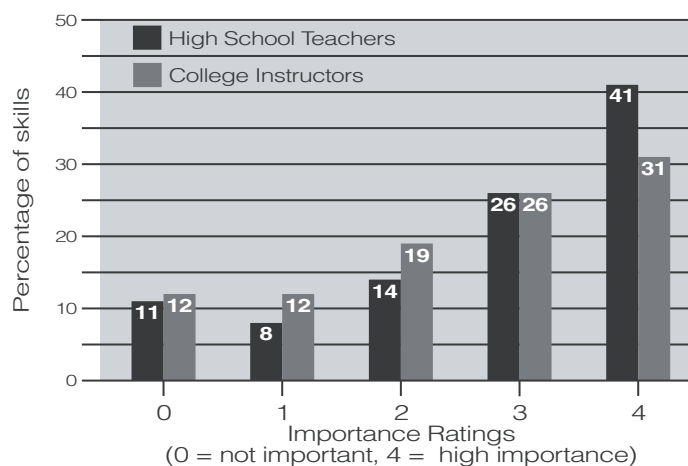


Figure 2: Percentages of Skills Rated 0 to 4 by High School Teachers and College Instructors

7. Misalignments persist between college instructors' expectations and high school teachers' evaluations of student readiness for college.

We asked high school teachers and college instructors about how well their state's learning standards and graduation requirements prepare students for college in their content area.

Both groups were also asked how ready students are for college-level work in their content area. As in previous ACT National Curriculum Survey results, high school and college instructors revealed dramatically different perspectives on these questions.

- As Figure 3 shows, 71 percent of high school teachers reported that their state's standards prepare students "well" or "very well" for college, while only 28 percent of college instructors reported this.

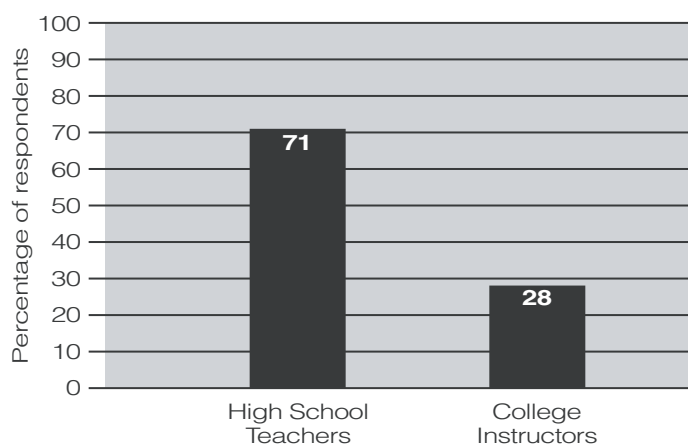


Figure 3: Percentages of Educators Reporting that Their State's Standards Prepare Students Well or Very Well for College

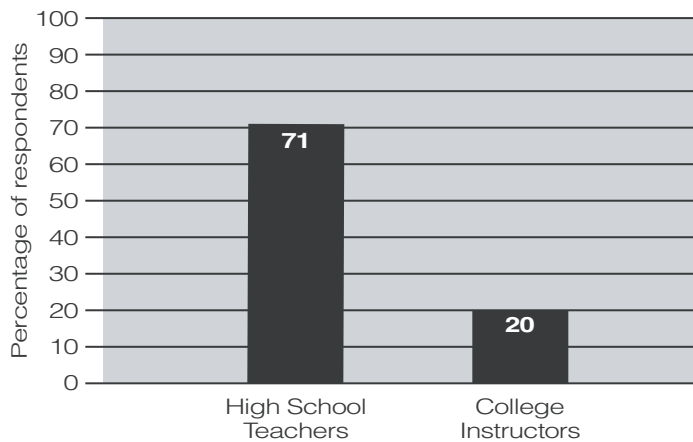


Figure 4: Percentages of Educators Reporting that Their State's Graduation Requirements Prepare Students Well or Very Well for College

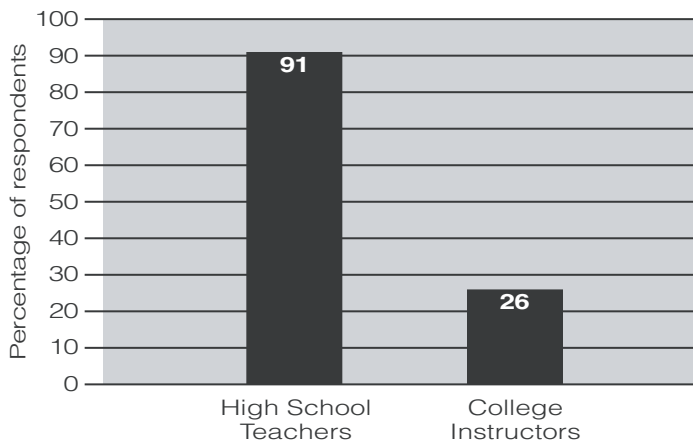


Figure 5: Percentages of Educators Reporting that Their Students Are Prepared for College-Level Work in Their Content Area

- As shown in Figure 4, 71 percent of high school teachers felt that their state's graduation requirements prepare students well or very well for college, compared to 20 percent of college instructors. (Fifty-five percent of college instructors responded "poorly" or "very poorly.")
- Figure 5 shows that 91 percent of high school teachers reported that their students are prepared for college-level work in their content area. In contrast, only 26 percent of college instructors reported that their students arrive prepared.

8. College science instructors consistently rate science content topics lower in importance than do high school science teachers.

Of the top 21 content or skill items rated most highly by college science instructors, 10 were science process skills (such as how to accurately interpret data, how to make appropriate experimental design decisions, how to reach the appropriate conclusions when presented with results of experiments, and how to appropriately evaluate given models and scientific explanations); 10 were fundamental, subject-specific science content topics; and only 1 was an "advanced" science topic (understanding and applying the mole concept). For high school teachers,

the 20 highest-rated skills were content topics, several of them advanced. In fact, of the top 50 highest-rated survey items for high school teachers, only 2 were process skills.

College science instructors' rating of process skills as more important than advanced science content topics, and high school teachers' rating in the opposite way, are responses consistent with past ACT National Curriculum Survey results. These results reveal a substantive difference between high school science teachers' perceptions of what is most important and college science instructors' estimates of what content and skills entering students need to have to succeed in science at the college level.

9. In contrast to college mathematics instructors, high school mathematics teachers tend to rank advanced topics as being more important than fundamentals.

When ranking groups of mathematics content and skills (known as strands), high school teachers ranked advanced topics, such as Functions, more highly than fundamental topics, such as Basic Operations and Applications, while college instructors did the opposite (see Table 1).

Table 1 Mathematics Educators' Rankings of Mathematics Strands (1 = Most Important, 8 = Least Important)		
Rank	High School Teachers	College Instructors
1	Expressions, Equations, and Inequalities	Basic Operations and Applications
2	Graphical Representations	Expressions, Equations, and Inequalities
3	Functions	Numbers: Concepts and Properties
4	Numbers: Concepts and Properties	Graphical Representations
5	Basic Operations and Applications	Functions
6	Properties of Plane Figures	Measurement
7	Measurement	Properties of Plane Figures
8	Probability, Statistics, and Data Analysis	Probability, Statistics, and Data Analysis

This contrast can be seen more vividly by comparing the content and skills rated most important by high school Algebra II teachers to those rated most important by postsecondary College Algebra instructors (Table 2).

Table 2 Rank Ordering of Highest-Rated Mathematics Content and Skills by High School Algebra II Teachers and College Algebra Instructors (1 = Most Important, 10 = Least Important)		
Rank	Algebra II (High School)	College Algebra
1	Solve quadratic equations	Perform addition, subtraction, multiplication, and division on signed rational numbers
2	Evaluate quadratic functions based on function notation	Solve routine first-degree equations
3	Apply rules of exponents	Add and subtract simple algebraic expressions
4	Factor quadratics	Locate points in the coordinate plane
5	Understand the concept of function	Solve routine two- or three-step arithmetic problems ¹
6	Add, subtract, and multiply polynomials	Evaluate algebraic expressions by substituting integers for unknown quantities
7	Evaluate linear functions based on function notation	Solve linear equations and inequalities in one variable
8	Use mathematical symbols correctly	Exhibit knowledge of elementary number concepts (e.g., rounding, decimal ordering, pattern identification, absolute value, primes, and greatest common factor)
9	Find solutions to systems of linear equations	Recall basic facts, definitions, formulas, and algebraic procedures as needed to solve a problem ¹
10	Find domain, range, and inverses of functions	Apply rules of exponents
11		Comprehend the concept of length on the number line

¹ This item and the next two were tied.

The content and skills rated most important by the high school teachers are clearly more advanced than those rated most important by the college instructors, including numerous items related to functions, quadratic equations, or systems of linear equations. College instructors, meanwhile, valued fundamental skills such as those related to simple algebraic expressions, arithmetic operations, elementary number concepts, or basic facts and formulas. The only skill common to both lists is “Apply rules of exponents.”

10. ACT’s tests measure the content and skills that educators identify as important for college and career readiness.

The results of the ACT National Curriculum Survey affirm that the knowledge and skills that are important for readiness and success in college and in workforce training are being adequately represented in ACT’s EXPLORE®, PLAN®, and ACT® tests. The knowledge and skills being measured by the tests and the relative emphasis accorded to each are consistent with those rated as important and necessary by high school and college instructors.

Implications of Survey Findings

The primary findings of the ACT National Curriculum Survey 2009 have a number of implications for educational policy and practice:

1. High school learning standards are still not sufficiently aligned with postsecondary expectations.

Compared to high school teachers, college instructors continue to rate fewer content and skills as being of higher importance, and more skills as being of little or no importance, in the courses they teach. And too many of the skills rated as important by high school teachers are not the fundamentals of each discipline that college instructors insist their students must have mastered by the time they enter credit-bearing college courses. In mathematics, this is illustrated by the finding that high school mathematics teachers rate advanced topics more highly than fundamental topics; in science, high school teachers tend to rate content topics more highly than process skills.

In addition, far smaller percentages of college instructors than of high school teachers report that their state’s standards or graduation requirements sufficiently prepare high school graduates for postsecondary education or that recent high school graduates are prepared for college-level work.

These findings suggest that high school standards are still not focused on the essential knowledge and skills needed for college and career readiness. ACT’s College Readiness Standards, as well as efforts such as the Common Core State Standards Initiative, offer a blueprint for states looking to align their state learning standards with the requirements of credit-bearing, first-year college courses.

2. Not enough is being done to prepare high school graduates for the specific demands of college-level reading.

Across the curriculum, college instructors and high school teachers also differ on whether high school graduates are prepared for college-level reading assignments, with far more high school teachers than college instructors reporting that graduates are prepared. At the same time, while college mathematics and science instructors agree that reading is one of the most important skills needed for success in the 21st century, overwhelming majorities of them report spending little or no time teaching reading strategies in their courses.

These findings suggest that when it comes to learning the skills necessary for handling the college reading load, students may be getting shortchanged both in high school and in credit-bearing college courses. Targeted instruction in reading strategies across the curriculum is still apparently the exception rather than the rule.

3. Despite some experts' opinion to the contrary, content-area knowledge is still considered more important to student success in the 21st century than other types of skills.

Both high school teachers and college instructors consider English, reading, mathematics, science, and writing to be more important "21st century student outcomes" than such skills as financial or media literacy. While these latter types of skills are no doubt worthwhile for high school and college graduates to possess, our survey results suggest that they are not critical for entry-level access to or success in postsecondary education.

4. High schools need to promote the common expectation of college and career readiness for *all* graduates.

High school teachers and college instructors agree that college readiness and workforce-training readiness require a comparable level of knowledge and skills. However, survey results suggest that, to a large extent, high school teachers appear to be reducing academic expectations for students who have indicated that they do not plan to go to college. If all high school graduates have not been encouraged to aspire to high academic expectations, too many of them may find that the world that awaits them after high school will demand higher-level skills than they have managed to acquire.

Action Steps for Policymakers

In order for high school teachers and high school administrators to focus most effectively on the essentials for postsecondary success, policymakers must provide them with the necessary resources and support, including professional development opportunities and the ability to interact with state departments of higher education on such tasks as vertical alignment and curriculum and standards mapping. Based on the findings of the ACT National Curriculum Survey 2009, we believe that school improvement efforts must be initiated or increased in the following areas:

Revise high school graduation standards to focus on fewer—but essential—college and career readiness standards.

Substantial gaps still exist between what high school teachers believe is important for college readiness and success and what postsecondary institutions require of their entering students in entry-level courses. State standards should focus on communicating the essential knowledge and skills needed for postsecondary education and not try to define all content and skills that might be covered by the high school curriculum. It is less important for state standards to reflect all of what students can be exposed to in high school and more important to focus at a deeper level on the most essential knowledge and skills for college and career readiness.

Mandate a rigorous core curriculum for *all* high school graduates, whether they are bound for college or work.

In a world where two thirds of new jobs will require some kind of education or training after high school, states need to abandon the century-old assumption that some students are “college material” and others are not. True, not every high school graduate will enroll in college, but it makes no difference: these days, all graduates need the same level of knowledge and skills, whether they enroll in a two- or four-year college, are hired for a job that offers a career path at a self-supporting wage, participate in an apprenticeship or related training, or join the military. To ensure that they master the knowledge and skills to succeed after high school, ACT recommends that students take a core curriculum consisting of at least four years of English and at least three years each of mathematics, science, and social studies.

While it is important for all high school graduates to be ready for college and career, they need not all take exactly the same courses. College- and career-ready skills can be taught and learned in a variety of contexts.

Focus the content of high school courses.

Having appropriate and aligned standards, coupled with a core curriculum, will adequately prepare high school students for postsecondary education only if the courses are focused on the essentials for college and career readiness. That is, taking the right *kinds* of courses matters just as much as, if not more than, taking the right *number* of courses. Otherwise, students will be lulled into thinking that they are prepared when, in fact, they are not; they will have taken all the “right” courses in high school but still will have to take remedial, non-credit-bearing courses during their first year of college.

Teach targeted reading skills across the high school curriculum, as well as in college.

Teachers in each high school content area should devote time to teaching strategies that help increase students’ comprehension of college-level materials in their particular content area. Colleges should also emphasize the importance of reading by teaching entering students the specific strategies required to handle the demands of the reading materials assigned in credit-bearing courses.

Focus on fundamental mathematics skills and science process skills in the high school curriculum.

In keeping with the need to focus high school instruction on the essential skills needed for college and career readiness, high school mathematics teachers should avoid focusing on advanced content to the exclusion of the fundamentals that will provide their graduates with the rigorous understanding of mathematics knowledge needed for success in credit-bearing, entry-level college mathematics courses.

Similarly, rather than spending too much time on science content topics, high school science teachers should also provide their students with extensive opportunities to learn and apply the science process skills that college science instructors expect their entering students to have mastered by high school graduation.

Appendix: Description of Survey Sample and Process

The ACT National Curriculum Survey is a one-of-a-kind nationwide survey of educational practices and expectations conducted by ACT every 3 to 5 years. ACT surveys thousands of middle school/junior high school and high school teachers and college instructors in English/writing, mathematics, reading, and science for the purpose of determining what skills and knowledge are currently being taught at each grade level—and which are considered essential for college readiness. Table A1 gives the numbers of survey participants at each educational level.

Table A1 ACT National Curriculum Survey 2009 Participants	
Educational Level	Number of Participants
Middle school/junior high	1,335
High school	2,761
College	2,831
College remedial	753
Total	7,680

ACT uses the results of the ACT National Curriculum Survey to guide the test development of ACT's EXPLORE (8th and 9th grade), PLAN (10th grade), and the ACT (11th and 12th grade), the curriculum-based longitudinal assessment components of ACT's College and Career Readiness System. ACT conducts the survey to ensure that its assessments are measuring the current knowledge and skills that instructors of credit-bearing, first-year college courses identify as important for success in each content area.

For the 2009 ACT National Curriculum Survey, we sent more than 55,000 surveys to a nationally representative sample of middle/junior high school, high school, and college instructors who teach courses in English/writing, mathematics, reading (including English language arts and social studies), and science (including Biology, Chemistry, Physics, and Earth/Space Science) in public and private institutions across the United States. We also included a sample of instructors of college remedial courses in English/writing, mathematics, and reading. We included these instructors because they should be uniquely qualified to identify the critical skills and knowledge that high school graduates are typically missing and the set of knowledge and skills that, when emphasized, result in student readiness for success in entry-level college courses. The response rates by content area ranged from 9 percent to 20 percent, with an overall response rate of 14 percent.

All educators surveyed were asked to perform two primary tasks. First, they were asked to **rate** *discrete* content knowledge and skills with respect to how important each is to student success in the content area. (Specifically, high school teachers and remedial instructors were asked to rate the importance of each content or skill in a given class they teach, while college instructors were asked to rate the importance of each content or skill as a prerequisite to success in a given class they teach). These results allow for comparison of high school teachers' views of the importance of course outcomes with college instructors' expectations of what is needed for success in their courses. Given the current interest in what are sometimes referred to as "21st century student outcomes," a special collection of items specifically asking about the importance of these outcomes was also included in the survey.

The educators rated the importance of skills and knowledge using a 5-point scale (0 = not important, 1 = low importance, and 4 = high importance). ACT uses importance-rating results to guide decisions about the knowledge and skills to be measured on EXPLORE, PLAN, and the ACT and in what proportions. When college instructors' and high school teachers' ratings disagree, greater consideration is afforded to the college instructors' ratings to make sure that ACT's tests measure knowledge and skills critical to college and career readiness. If a particular skill or knowledge currently on EXPLORE, PLAN, or the ACT is rated as unimportant, or if an untested skill or knowledge is rated in the moderately important range or beyond, the ACT National Curriculum Survey results provide the validity evidence to make a corresponding change in our test specifications. Importance-rating results are used to help guide evaluation of the overall emphases the knowledge and skills receive in each test.

Second, the educators were asked to **rank** *groups* of content and skills, known as strands, with respect to their relative importance to student readiness for college.

In addition, we asked all participants except college instructors to indicate whether or not they teach a particular content or skill and, if so, whether they teach it as a standard part of their course or as part of a review of material that should have been learned earlier. Participants were also asked to provide information about themselves and the course about which they responded: the number of years they have taught the course, a description of their teacher certification, what texts and reading materials they use in their course, the amount of instructional time they spend on reading strategies, their perceptions of the degree of overlap between college and workplace readiness demands, their perceptions about academic expectations for students who are not bound for college, and their perceptions of student readiness in reading and in college-level work in their discipline. Finally, we asked the participants for information about their state's assessments, graduation requirements, and standards.

To help schools derive maximum benefit from their participation in ACT programs and services, ACT maintains a staff of consultants in regional offices. If you need additional ACT information or assistance, please contact the ACT office that serves your state.

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