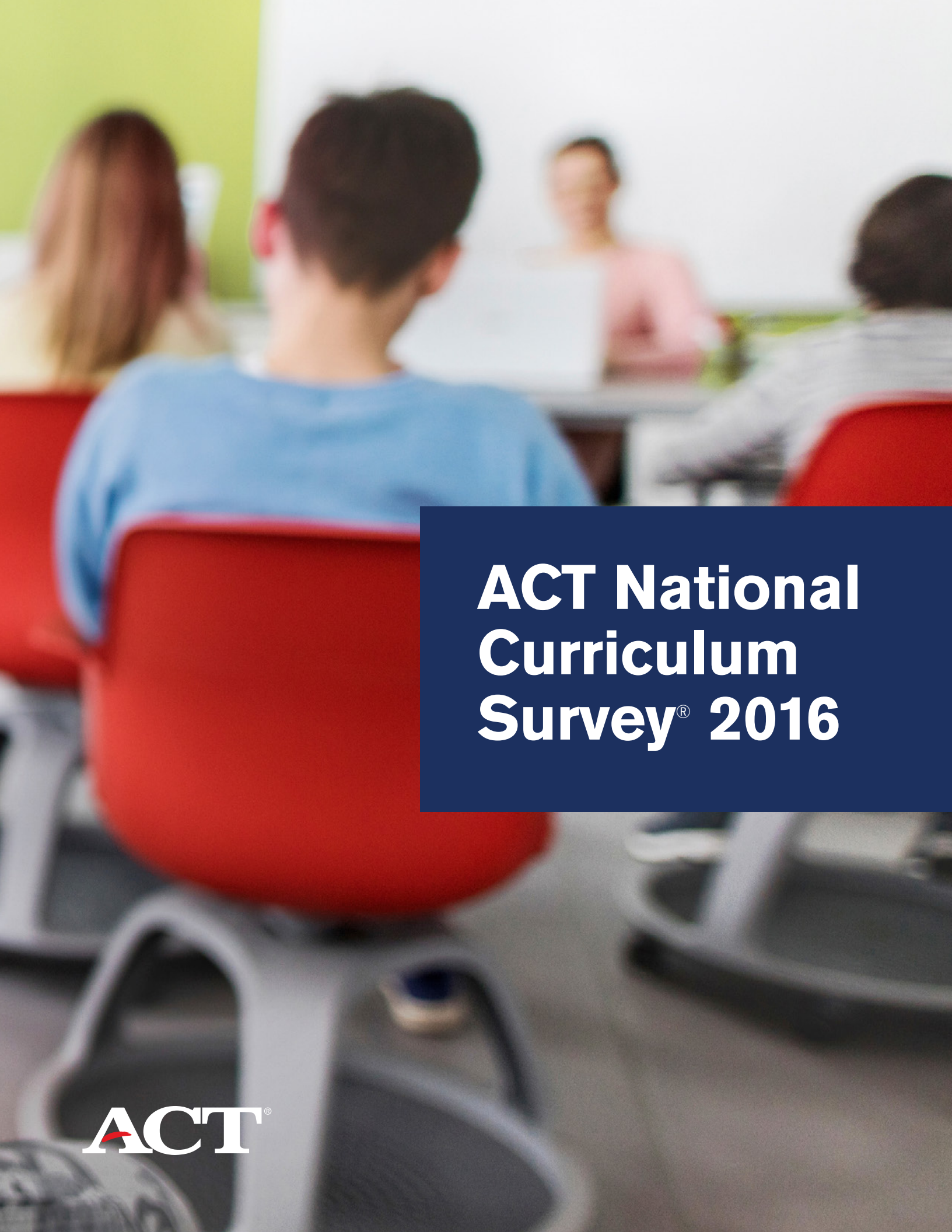

ACT National Curriculum Survey® 2016

ACT®

ACT is an independent, nonprofit 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 associations, 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.

A copy of this report can be found at
www.act.org/research

 5798

ACT National Curriculum Survey 2016

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Chapter 1: Overview

The ACT National Curriculum Survey® is a one-of-a-kind nationwide survey of educational practices and college and career readiness expectations conducted by ACT every few years. ACT surveys thousands of K–12 teachers and college instructors in English/writing, mathematics, reading, and science—and, for the first time in 2016, a national cross-section of workforce supervisors and employees—for the purpose of determining which skills and knowledge in these subjects are currently being taught at each grade level and which skills and knowledge are currently considered essential for college and career readiness.

Also for the first time in 2016, we included questions about which skills from ACT Complete—a holistic, research-based framework that integrates the knowledge and skills that empower people to achieve education and career success—are most integral to college and career success. These included behavioral skills, education and career navigation skills, and dimensions such as core academic skills and cross-cutting capabilities.[1]

ACT uses the results of the ACT National Curriculum Survey to guide the development of ACT assessment solutions, including the ACT® test, ACT Aspire®, and ACT WorkKeys®. 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 or that workforce supervisors identify as important for readiness for targeted workforce training and for success on the job.

ACT makes the results of each ACT National Curriculum Survey public because ACT data can help education and workforce stakeholders make more informed decisions about the skills needed to be successful in postsecondary education and the workplace. Chapter 1 is an overview describing the 2016 survey sample and process. It is followed by chapters presenting findings in each of four areas: English language arts, mathematics, science, and workforce.

An Integrated Framework for Education and Career Success

The ACT National Curriculum Survey is an essential tool in ACT's commitment to ensuring not only that our assessments are valid and relevant on a continuing basis, but also that they provide information enabling students and workers to be fully ready to embark successfully on rewarding college and career journeys. Our complete suite of assessments provides a framework—known as ACT Complete—of cognitive measurements and noncognitive insights spanning the continuum from elementary school through various career stages.

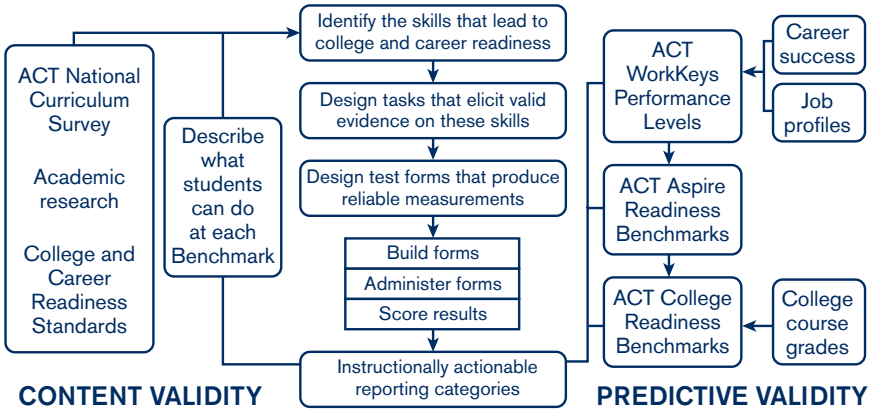
[1] For more information about ACT Complete, see Camara et al. (2015).

ACT Complete integrates the knowledge and skills that empower people to achieve success in both education and career. The framework consists of four domains: core academic skills, cross-cutting capabilities, behavioral skills, and education and career navigation skills. The first two domains focus on what people need to know to be ready for success, and the second two describe how people can best achieve readiness. Areas of emphasis encompassed by these domains include:

- **Core academic skills:** Knowledge and skills necessary to perform essential tasks in the core content areas of English, reading, mathematics, and science
- **Cross-cutting capabilities:** Technology and information literacy, collaborative problem solving, thinking and metacognition, and studying and learning
- **Behavioral skills:** Interpersonal, self-regulatory, and task-related behaviors important for successful performance in educational and workplace settings
- **Education and career navigation skills:** Success factors that help individuals to navigate their educational and career paths by making informed, personally relevant decisions and developing actionable, achievable plans

The Purpose of the ACT National Curriculum Survey

The ACT National Curriculum Survey is a crucial step in the process used to build and regularly update a valid suite of ACT assessments that is empirically aligned to college readiness standards. The survey directly informs the test blueprint for the assessments (see diagram below). Results from the assessments are used to validate ACT's College and Career Readiness Standards as well as its College Readiness Benchmarks. (The diagram represents only this validation cycle; it does not represent how the Standards and Benchmarks were derived.)



ACT provides multiple sources of validation evidence to support the use of assessment results in determining whether students are on target for college and career readiness. ACT begins with research into content validity, which is designed to answer the first of two critical questions: *Does the test measure what it purports to measure?* This process involves the validation of the ACT College and Career Readiness Standards, which are built on a foundation of years of empirical data and continually validated through the ACT National Curriculum Survey as well as regularly occurring external standards reviews.

Equally important is predictive validity. Using actual course performance, we answer a second critical question: *Does the test accurately and reliably predict performance?* Constant monitoring allows ACT to ensure that the answer to both questions is "yes."

Over the past several years, much conversation has taken place about college and career readiness standards. Most of this has emanated from the creation, adoption, and implementation—as well as the politicization—of the Common Core State Standards. ACT was pleased to offer information about readiness to the Common Core development effort, but we should be clear that ACT's college and career readiness assessments have always been based on its own empirical research and longitudinal data.

The ACT College and Career Readiness Standards describe the skills and knowledge that matter most to success beyond high school. Because of ACT's extensive research and validation efforts, its College and Career Readiness Standards capture what is a priority for success in different content areas for college and career. ACT college and career readiness assessments provide reporting categories that align directly with ACT's College and Career Readiness Standards strands to help with score interpretation and to provide actionable insights for improvement.

As the previous diagram indicates, ACT begins development of its assessments by using the dual validity loop and the ACT National Curriculum Survey to establish its test blueprint. This process ensures that our assessments always measure not only what is being taught in schools around the country, but also what demonstrably matters most for college and career readiness. No other assessment is built with the ability to continually assess what matters most, based on the most up-to-date evidence.

ACT's assessments provide the essential information to help get and keep students on the path toward readiness in the most efficient manner possible. Students in schools that administer our assessments, including the ACT and ACT Aspire, spend fewer than four hours taking our assessments, compared to as many as 7.5 hours for those taking our competitors' tests. In an era where over-testing is a significant concern, that's an important distinction.

The science behind our assessments—the evidence base and ongoing research—is critical to answering the key question of what matters most in college and career readiness. The ACT National Curriculum Survey represents ACT's commitment to:

- use evidence and research to develop and validate our standards, assessments, and benchmarks
- maintain a robust research agenda to report on key educational metrics (*The Condition of College & Career Readiness, Enrollment Management Trends Report,* and *The Reality of College Readiness*)
- develop assessments, reports, and interventions that will help individuals navigate their personal path to success along a kindergarten-through-career continuum

Accordingly, the following principles have shaped and will continue to drive our development agenda:

1. Maximize instructional time.
2. Report results in instructionally relevant ways that support clear interpretation within and across content areas.
3. Establish reasonable testing times by assessing what research and evidence show to be the most critical factors for success after high school.
4. Leverage technology to enhance student engagement, produce more meaningful results, and share results in a timely fashion.
5. Increase the emphasis on evidence-centered design, implementing best practices as they mature, and improve our capabilities within the highest-quality design and development processes.
6. Include science as a core academic domain in our assessment batteries.
7. Reflect the reality that there are multiple dimensions of readiness and success (validated by research).

As a nonprofit educational research organization, we will use these principles to drive the development and continuous improvement of ACT's education and workplace solutions, as well as the research agenda associated with them, thereby enabling ACT to fulfill its mission of helping all individuals achieve education and workplace success.

Survey Sample and Process

For the 2016 ACT National Curriculum Survey, we made online survey instruments available via various print and electronic methods (e.g., advertisements, email, social media) and invited participation from educators at the early elementary school, late elementary school, middle school, high school, and college levels 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 invited participation from supervisors and employees at a large variety of businesses. Table 1.1 gives the numbers of survey respondents in each area.

Table 1.1. ACT National Curriculum Survey 2016 Respondents

Area	Number of Respondents
Early Elementary School	1,076
Late Elementary School	1,222
Middle School	1,331
High School	2,717
College	2,252
Supervisors	371
Employees	297
TOTAL	9,266

Education participants were asked to rate discrete content knowledge and skills with respect to how important each is to student success in the content area. (Specifically, K–12 teachers 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 appear in Appendix A. We also asked the K–12 teachers 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. These results appear in Appendix B. Some education participants were also asked other content-related questions depending on the grade level they teach. These results appear in Appendix C.

Workforce participants were asked to rate discrete skills with respect to how important each is to entry-level success in the workplace. These results appear in Appendix D. We also asked workforce participants to indicate how often employees in their workplace use each of these skills on the job. These results appear in Appendix E.

Finally, we asked all participants a number of questions relevant to current education policy issues (e.g., assessments; technology; standards; student characteristics; and obstacles to success). These results appear in Appendix F and are discussed in the companion report *ACT National Curriculum Survey 2016: Education and Work in a Time of Change* (**www.act.org/research**).

Because some content areas were surveyed in larger numbers than others, the values displayed in educational-level totals were averaged across English language arts, mathematics, and science. This ensured that, in these results, no one content area would have more influence than another.

Chapter 2: English Language Arts

This chapter highlights findings from the two English Language Arts portions of the ACT National Curriculum Survey 2016: English/Writing and Reading (as well as findings from the workforce survey that are related to these areas). Respondents in the English/Writing portion included teachers of English language arts in elementary school and middle school; teachers of high school English language arts, writing/composition, and literature courses; instructors of developmental writing at the introductory college level; and instructors of credit-bearing first-year college courses in composition, rhetoric, and English.

The Reading portion surveyed educators in both English language arts and social studies. The English language arts group included teachers of elementary school English language arts; teachers of literature and reading in middle school and high school; instructors of developmental reading at the introductory college level; and instructors of credit-bearing first-year college literature courses. The social studies group included teachers of US history and civics/government courses in high school, and instructors of credit-bearing first-year college courses in American government and politics, US history, and world history.

Finding 1: There is general agreement that students and employees should be able to write for a variety of purposes, audiences, and contexts.

Survey respondents across education and workforce generally indicated support for the idea that students or employees should be able to write for different purposes, audiences, and contexts. K–12 teachers reported teaching all genres and types of writing, with shifts in emphasis from narrative in the elementary grades, to informational in middle school, to argumentative in high school. The majority of instructors of credit-bearing first-year college composition, rhetoric, and English courses strongly agreed with the importance of purposeful use of different writing domains and types of evidence. Workforce supervisors indicated that employees in entry-level positions should be able to write narrative, persuasive, and—most importantly—informational texts.

Audience is another important consideration for writing in both college and workforce-supervisory contexts. Respondents emphasized the importance of understanding one's intended audience and making appropriate adjustments in content and style. College instructors agreed that entering students must be able to "write for specific audiences other than the instructor," while supervisors rated "tailoring communications to enhance understanding" and "reconciling gaps in understanding" as important to an employee's success. Reflecting the importance of both purpose and audience, supervisors also indicated that successful entry-level employees should be able to write concisely, with email and short reports identified as the most common writing tasks.

Finding 2: Middle school and high school teachers appear to value a greater diversity of approaches to writing than do college instructors.

As shown in Figure 2.1, across secondary and postsecondary, college instructors are in the most agreement about which of four given writing activities is most important in the courses they teach, with 47% indicating that their entering students should be most proficient at generating sound ideas for writing. High school teachers are in somewhat less

agreement, with 43% indicating that teaching students to critically analyze source texts is most important, while middle school teachers are the most divided, with approximately equal numbers indicating that three of the four activities are the most important.

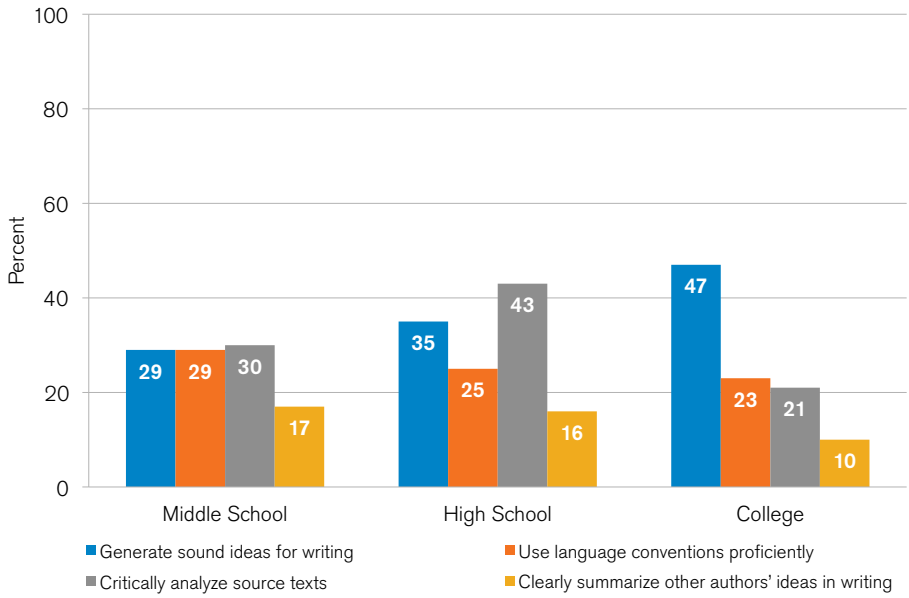


Figure 2.1. Percentages of educators reporting that a given approach to writing is the most important one in their courses

Consistent with the findings of previous ACT National Curriculum Surveys, these comparisons reflect the typically greater diversity of the goals of middle and high school English language arts courses, in which the skills taught are typically more wide-ranging and less targeted than those of credit-bearing first-year college composition, rhetoric, or English courses.

In addition, the high school teachers' responses (and to a lesser extent, those of the middle school teachers) may reflect a stronger emphasis than in the past on source-based writing in many instructional and assessment programs. But if so, the college instructors' results also suggest that, when it comes to the skills most important to readiness for postsecondary coursework, the ability to analyze source texts and (especially) summarize other authors' ideas—both key features of source-based writing—may be less important than the ability to generate sound ideas, a skill applicable across much broader contexts.

Finding 3: Educators across K–12 and college generally agree about which reading skills are most important, but college instructors find their entering students' preparation in many of these skills to be lacking.

Evaluations of the importance of reading skills were largely consistent across educational levels. Instructors of credit-bearing first-year college courses in areas traditionally considered to have heavy reading requirements (English, history, and social science) were asked to rate the

importance of 18 reading skills as prerequisites for success in their courses. At least 90% of the instructors rated five of these skills as being in the top half of a four-point scale:[2]

- Determining central ideas
- Identifying important details
- Drawing conclusions and making inferences
- Evaluating evidence and/or support for an author's claims
- Distinguishing among fact, opinion, and reasoned judgment

More than 85% of K–12 teachers also rated each of these skills in the top half of the importance scale.[3]

However, when we turn to how college instructors evaluate the preparation of their entering students with regard to these skills, the picture looks very different (Figure 2.2).

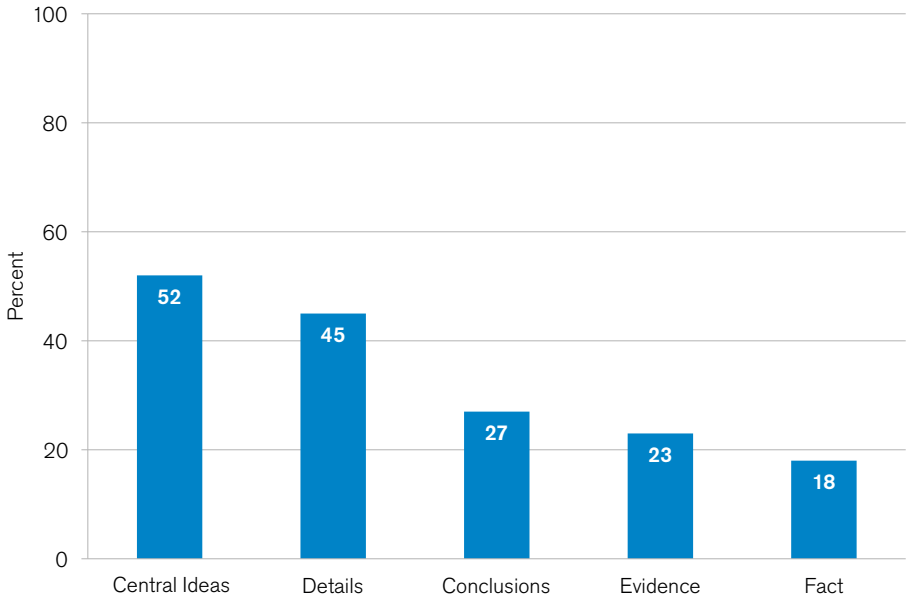


Figure 2.2. Percentages of college instructors rating the preparation of their entering students in a given reading skill in the top half of the scale[4]

No more than about half of the college instructors rated the preparation of their entering students in the top half of the scale for any one of the five skills, with only 18% rating students' preparation at distinguishing among fact, opinion, and reasoned judgment in the top half of the scale.

[2] Here and elsewhere in this report unless stated otherwise in context, respondents were asked to either identify a survey item as Not Important (value of zero) or rate its importance using a scale ranging from 1 (Low Importance) to 4 (High Importance).

[3] The two remaining skills were not included in the early or late elementary school surveys. Regarding the latter of these, elementary teachers were asked about the importance of "distinguishing between fact and opinion" without any mention of reasoned judgment; 68% of early elementary school teachers and 83% of late elementary school teachers rated this skill in the top half of the importance scale.

[4] College instructors were asked to use a four-point scale ranging from 1 (Not Prepared) to 4 (Very Prepared).

Chapter 3: Mathematics

This chapter highlights findings from the Mathematics portion of the ACT National Curriculum Survey 2016 (as well as findings from the workforce survey that are related to mathematics). Respondents in this portion included teachers of elementary school mathematics; teachers of middle school mathematics, pre-algebra, algebra, and geometry courses; teachers of high school courses in pre-algebra, algebra, advanced algebra, pre-calculus, calculus, geometry, statistics, and trigonometry; instructors of developmental mathematics at the introductory college level; and instructors of credit-bearing first-year college courses in calculus, college algebra, college geometry, finite or discrete mathematics, introductory college mathematics/ college preparation, pre-calculus, and probability and/or statistics.

Finding 1: Although implementation of the Common Core State Standards has led to changes in mathematics curricula, significant discrepancies remain between the standards and teachers' instructional practices.

One of the major goals of the Common Core State Standards for Mathematics was to "address the problem of a curriculum that is 'a mile wide and an inch deep'" (Common Core State Standards Initiative, 2016). To this end, several topics traditionally taught at certain early grade levels were omitted from the standards, ostensibly increasing the likelihood that students would have enough time to develop a deep understanding of the topics that remain. Nevertheless, some early elementary school teachers report that they are teaching some of those omitted topics (Figure 3.1).

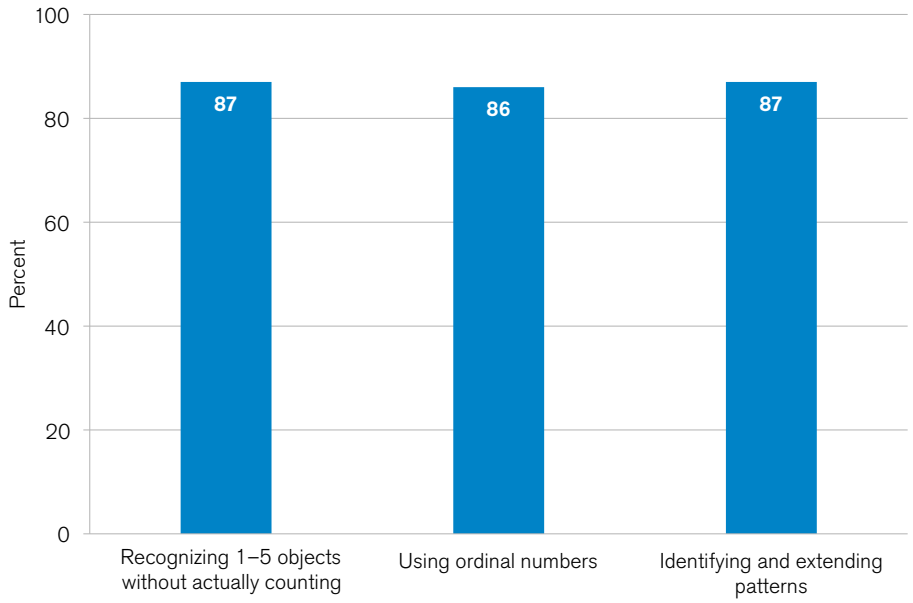


Figure 3.1. Percentages of early elementary school teachers who report teaching selected topics not included in the Common Core State Standards

One reason that early elementary school teachers may be teaching these topics is that they recognize the importance of the topics to mathematical competence: One-third of these teachers also report that fewer than half of their students have an appropriate level of mathematics skills when they enter the grade. Another reason may be that the teachers perceive that without these skills, students will be less well prepared for the demands of later mathematics courses, where they will need to be familiar with some of the omitted topics in order to do the work required in those courses.

The trend toward retaining non-Common Core instructional practices also appears to be broader than this one example. Two to four years have passed since states that adopted the Common Core State Standards for Mathematics began implementing them into their K–12 curricula. But while 80% of the K–12 mathematics respondents reported that the Common Core had been implemented either "a great deal" or "completely" where they teach, some K–12 mathematics teachers—especially high school teachers—report that their instruction has not changed much to accommodate the standards (Figure 3.2).

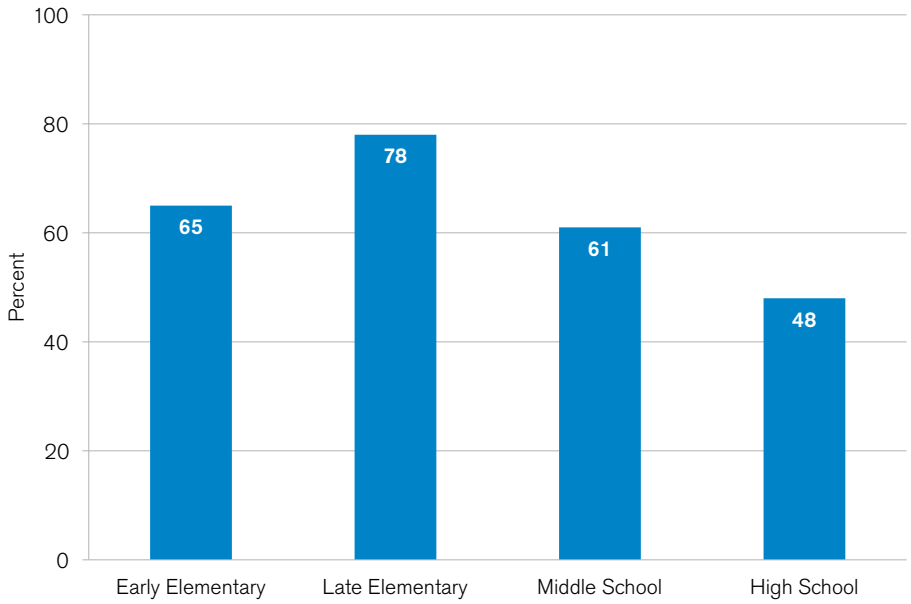


Figure 3.2. Percentages of K–12 mathematics teachers reporting that their instruction has changed "a great deal" or "completely" to accommodate the Common Core State Standards[5]

While more than three-fourths of late elementary school teachers report that their curriculum has changed a great deal or completely, fewer than half of high school teachers say the same. On average, nearly 40% of K–12 teachers feel that their instruction has changed slightly or not at all.

[5] Here and in the next figure, teachers were asked to use a four-point scale: Not At All; Slightly; A Great Deal; Completely.

Another clue to why some teachers have not changed their instruction may lie in their perception of whether the standards are aligned with postsecondary expectations (Figure 3.3).

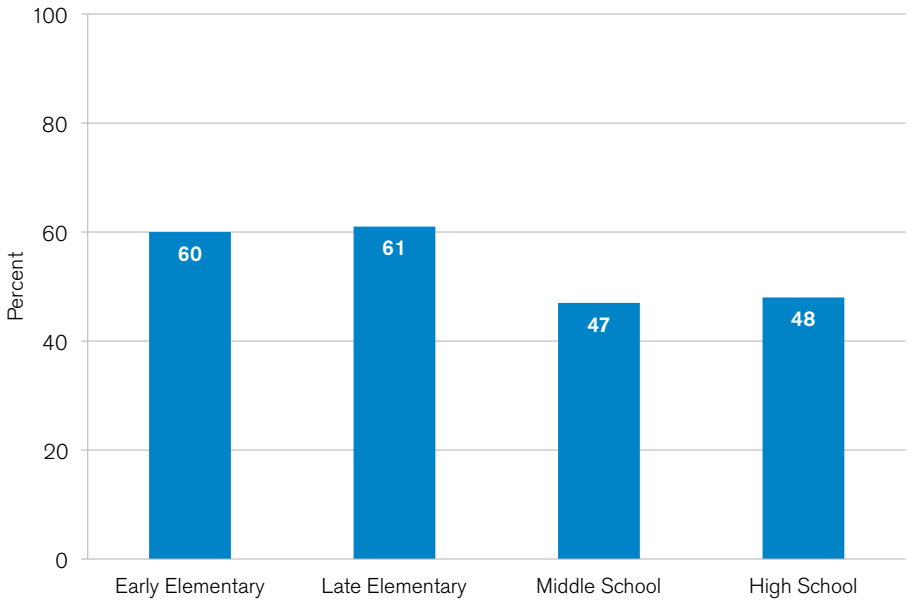


Figure 3.3. Percentages of K–12 mathematics teachers reporting that the Common Core State Standards are "a great deal" or "completely" aligned with postsecondary instructors' expectations regarding college readiness

About 60% of elementary teachers believe that the Common Core for Mathematics is aligned "a great deal" or "completely" with college instructors' expectations for college readiness. Among middle school and high school teachers, the percentages fall slightly below 50%.

Finding 2: Although high percentages of K–12 teachers at all levels value and teach the skill of executing mathematics processes without the aid of technology, most of them also teach students how to use calculators to perform computations and graph equations, and teachers in later grades commonly allow students to use calculators on classroom exams.

There is an ongoing, lively debate among educators over the role technology ought to play in the learning and assessment of mathematics. The ubiquitous presence of devices (e.g., smartphones, tablets, computers) containing applications capable of carrying out computations seems to present a challenge to the traditional emphasis put upon performing computations without technology (i.e., mentally or by hand). To uncover the role of technology in K–12 mathematics classrooms, teachers were asked about whether they teach skills related to the use of various technologies (Figure 3.4).

Figure 3.4. Percentages of K–12 teachers who reported teaching selected technology-related skills

Roughly 80% or more of K–12 teachers report that they teach how to execute mathematics processes without technology, with teachers in late elementary school reporting the highest levels of instruction (93%). It is not until middle school that the percentage of teachers who report teaching calculator or computer use for computation exceeds 80%, while an average of 72% of high school teachers report teaching calculator or computer use for graphing equations.

Over all, the teachers' responses do support the use of calculators on assessments for grade 6 and higher:

- Of the technology-related skills included in the survey, use of calculators for computation was the most widely taught in classrooms across all grade levels. While fewer than 20% of kindergarten teachers reported instructing their students on calculator use for computation, nearly 50% of second-grade teachers did. The rate increases to more than 80% by high school.
- Similarly, about 30% of fourth-grade teachers report teaching calculator use for graphing equations; despite dips in grades 5, 7, and 10, this rate peaks at just over 80% in the latter years of high school.

At the same time, with the advent of computer-based assessment, many students are expected to use equation editor technology to input mathematical equations on computer-based tests. Yet among teachers from late elementary school through high school who were asked about this technology, an average of 36% reported teaching their students how to use equation editor applications. In the context of computer-based assessments, lack of experience with equation editor technology could result in a score that does not reflect a student's true understanding of and facility with mathematics.

Survey respondents were also asked about the value they ascribe to these technological skills (Figure 3.5).

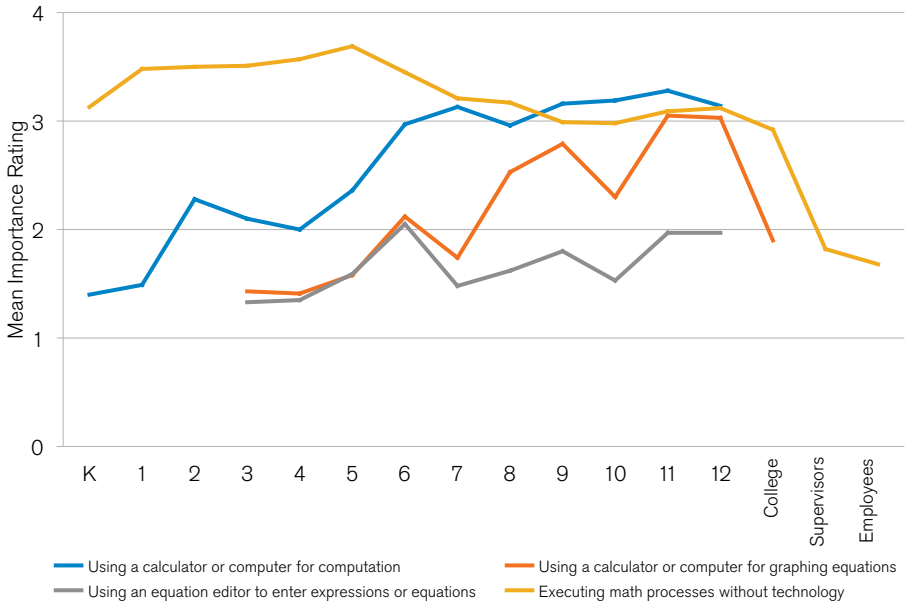


Figure 3.5. Mean importance ratings for selected technology-related skills (early elementary school through workforce)

As might be expected, the mean importance ratings for calculators increase, albeit unsteadily, from early elementary school to high school. An average of about one-third of teachers from late elementary school through high school reported that use of equation editor technology was not important (i.e., a rating of zero), which is perhaps consistent with the low incidence of instruction in this technology shown in the previous figure.

Interestingly, college instructors place less importance on these skills (mean rating of 2.9) than do K–12 teachers (mean rating of 3.3).

Finally, the teachers were asked about the frequency with which they allow students to use technology on exams. Although few elementary school teachers report allowing students to use handheld calculators on exams, about 50% of middle school teachers and on average nearly 90% of high school teachers permit students to use them (Figure 3.6).

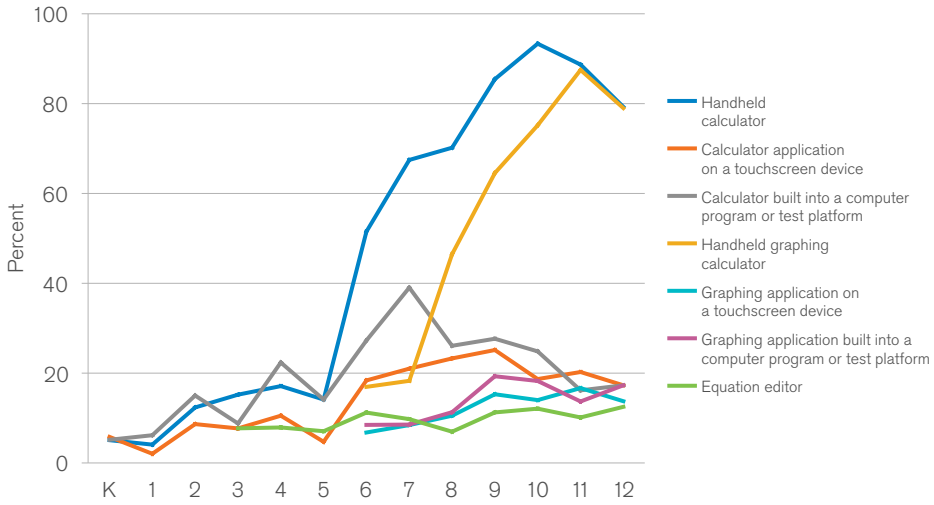


Figure 3.6. Percentages of K–12 teachers who report allowing students to use selected technologies "often" or "always" on exams

Interestingly, the percentages of middle and high school teachers who allow students to use handheld graphing calculators on exams lags behind the percentages who report teaching these skills to their students. Touchscreen devices (e.g., smartphones, tablets) with calculators or graphing applications are also not widely permitted during exams, nor are applications built into a computer program or test platform.

Finding 3: Educators across K–12 and college value the importance of mathematical justification and explanation skills.

Mathematics education reformers have long advocated the importance of all students cultivating their mathematical reasoning and communication skills. The National Council of Teachers of Mathematics introduced process standards to accompany content standards in 1989, and the Common Core State Standards for Mathematics include mathematical practices to be integrated into instruction.

Major processes and practices of mathematical communication can be measured by asking students to justify their conclusions and explain their reasoning. We asked mathematics educators to evaluate the importance of certain justification and explanation skills (Figure 3.7).[6]

[6] Educators were asked about a set of eight skills related to mathematical justifications, loosely categorized as follows: explanation; finding and explaining errors; using or producing examples to support or challenge a justification, statement, or claim; organizing mathematical statements into valid arguments; stating given information; stating conclusions; using general statements; and providing reasoning for mathematical statements or claims (or understanding that justifications require providing such reasoning). In several cases, the wording of a specific skill differed according to educational level.

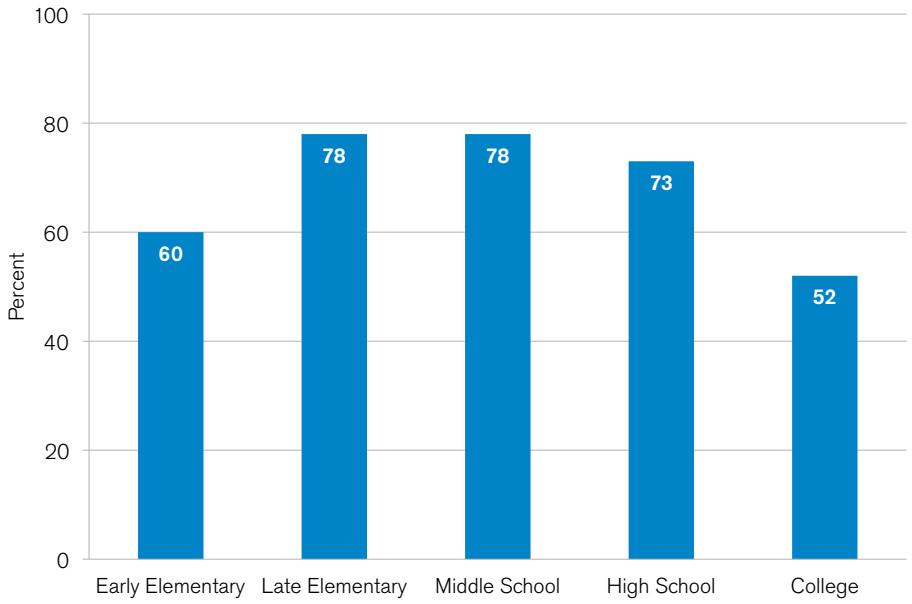


Figure 3.7: Percentages of educators rating justification and explanation skills[7] in the top half of the importance scale

The results show that majorities of educators at all levels value justification and explanation skills. The two skills most often rated in the top half of the importance scale were 1) explaining a justification and 2) understanding that justification requires providing reasons for mathematical statements or claims.

Finding 4: Further streamlining and coordination of STEM-related K–12 curricula may be necessary to best prepare students for college and career in STEM fields.

Preparation for careers in science, technology, engineering, and mathematics—the so-called STEM fields—is of increasing importance in today's society. Aiming education reform efforts at improved STEM preparation is a common thread across various standards-based and other initiatives. In a mathematics context, one reason that STEM instruction is so important is that many of the most important topics and skills in STEM fields are generally taught primarily in mathematics courses: for example, applying fundamental mathematics skills to analyze data and phenomena; interpreting data from tables, graphs and diagrams; and predicting outcomes based on data.

[7] Educators' responses to each of the eight skills were averaged.

The Common Core State Standards for Mathematics introduces statistics and probability topics in grade 6 or 7, while the Next Generation Science Standards (NGSS) call for them in the 6–8 grade band (see shaded area in the next figure). However, many mathematics teachers in grades 4–7 report including certain statistics or probability topics in their curricula earlier than they appear in the Common Core and the NGSS (Figure 3.8).

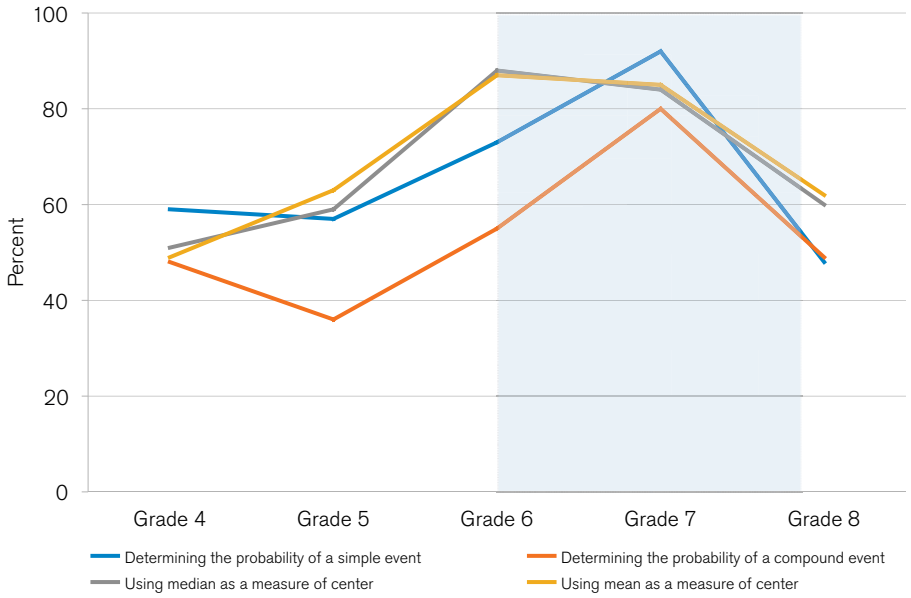


Figure 3.8. Percentages of teachers in grades 4–8 who report teaching selected statistics and probability topics

Perhaps teachers fear that delaying these topics will prevent their students from success in later STEM coursework, or perhaps there is a lack of cross-content coordination with science to streamline what knowledge and skills are required of students at each grade. This may explain the timing (and also the repetition) of statistics topics such as mean and median: While first appearing in the Common Core at grade 6, a significant portion of fourth- and fifth-grade teachers, and an average of 70% of teachers in grades 4–8, report teaching these topics. Likewise, while the Common Core places simple probability in grade 7, nearly two-thirds of teachers in grades 4–8 report teaching this topic.

Another potential obstacle to STEM preparation during the K–12 years is disagreement between secondary respondents on the one hand and postsecondary and workforce respondents on the other about which knowledge and skills are most important in these fields (Figure 3.9).

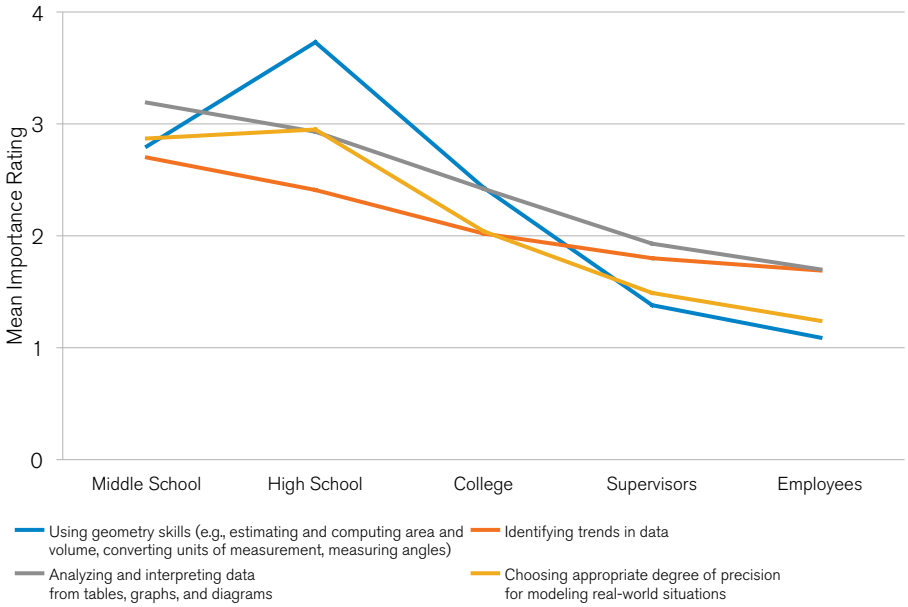


Figure 3.9. Mean importance ratings for selected mathematics skills (middle school through workforce)

Although middle school and high school teachers generally agree about what mathematics skills are important and taught—for example, "identifying trends in data" and "choosing appropriate degree of precision for modeling real-world situations"—college instructors or workforce respondents ascribed much less importance to these skills.

Chapter 4: Science

This chapter highlights findings from the Science portion of the ACT National Curriculum Survey 2016. Respondents in this portion included teachers of elementary school science; teachers of middle school earth science, life science, and physical science; teachers of high school biology, chemistry, earth science, and physics; and instructors of credit-bearing first-year college courses in biology, chemistry, earth science, physics, and physics in an engineering context.

Finding 1: Most early elementary school students receive small amounts of instructional time in science.

The Next Generation Science Standards (NGSS) and the National Research Council's Framework for K–12 Science both call for increasing science education in the early elementary grades (beginning in kindergarten) to increase students' foundational skills in science. The problem is illustrated by studies showing that the time devoted to science instruction in early elementary school has been declining over the last twenty years (e.g., Petrinjak, 2011; Blank, 2012).

According to data from the National Center for Education Statistics, mean science instruction time in grades 1–4 peaked at 180 minutes per week in school year 1994–95 and had decreased to 102 minutes per week by 2011–12. (National statistics for the same period show total instructional time increasing, so the overall percentage of instructional time has decreased even more than the amount.) The results of the ACT National Curriculum Survey suggest an even bleaker picture: On average, respondents in grades 1–4 report a median time for science instruction of only 118 minutes per week.

At the same time, survey results also show a steep increase in median instructional time in science after grade 4 (Figure 4.1).

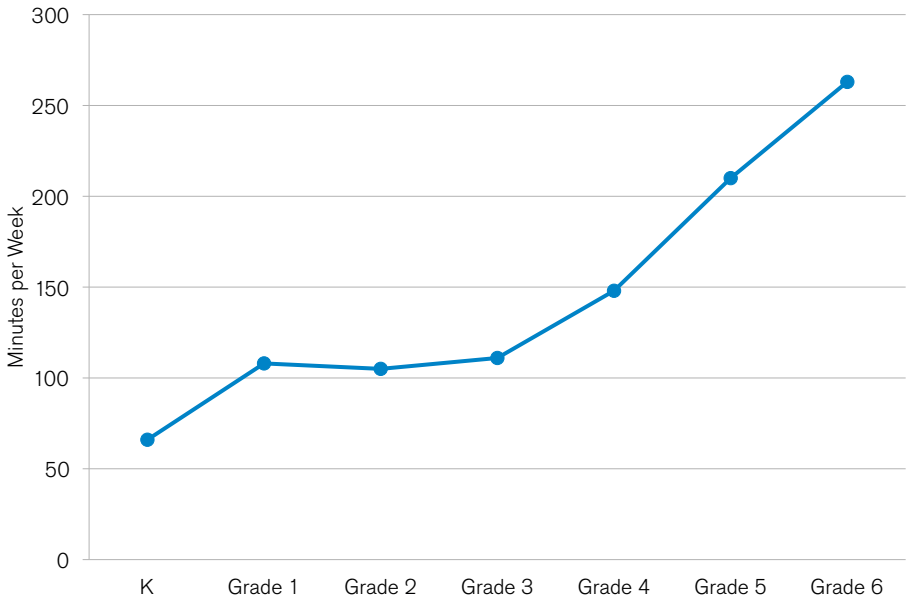


Figure 4.1. Median instructional time in science reported by ACT National Curriculum Survey 2016 respondents in grades K–6 (in minutes per week)

It is therefore worth asking whether students in grades 1–4 will be prepared for this increase, given the small amounts of time allotted to science instruction in these grades.

Further, the survey shows great variability in the amount of science instruction in early elementary school: Nearly half (49%) of K–3 teachers reported providing 90 minutes or less per week, while about 9% reported providing at least 200 minutes per week. Although the NGSS and the National Research Council framework do not state how much time is necessary to meet their learning objectives, it seems highly unlikely that students who receive less than 90 minutes of instruction in science per week could do so. Further research is needed to determine the amount of time necessary for students to not only be exposed to science standards in elementary school, but also to master the appropriate material so that they can meet significant benchmarks in science as they progress toward the goal of being college and career ready in science by the end of high school.

Finding 2: Engineering appears to have relatively less importance in the science classroom.

Over the past two decades, beginning with the National Science Education Standards in 1996 and most recently with the NGSS, science educators have stressed the need for students to become proficient in engineering and engineering practices (scientific investigation skills relevant to engineering, as distinct from engineering content). ACT National Curriculum Survey results show some evidence that a slight increase in emphasis on engineering practices may be occurring.

On average, science educators rated the engineering practices included in the 2016 survey as more important than their counterparts rated the engineering practices included in the 2012 survey, although less so as grade level increases (Figure 4.2).

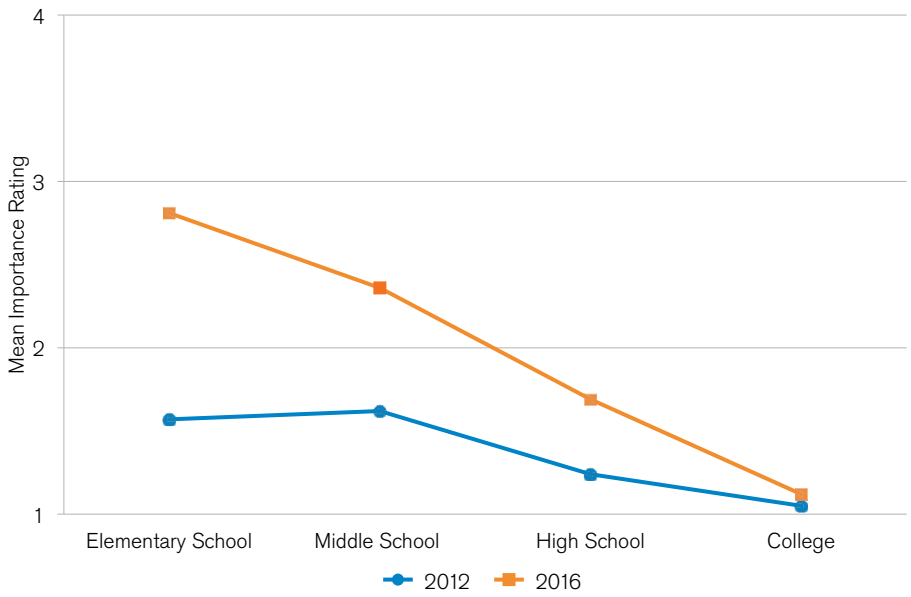


Figure 4.2. Mean importance ratings for engineering practices (2012 and 2016)

Overall, engineering appears to be of much greater importance in elementary school and middle school than in high school or college—especially the latter, where it is of extremely low importance, barely more so than in 2012. But even so, educators at all levels rated the engineering practices included in the 2016 survey as by far the least important skills for success in their courses.

Finding 3: There is more to preparation for science coursework than science content knowledge.

Although 54% of postsecondary instructors reported that at least half of their students enter their courses with an appropriate level of science skills, only 16% agreed that students enter their class well prepared to succeed in the course.

This apparent disparity between having science skills and lacking preparation could be explained in part by the responses that college science instructors provided to questions about obstacles to student success. Science educators were asked to rank a set of ten skill areas, from greatest to least, according to the relative likelihood that weakness in each area would contribute to a poor outcome for a student (i.e., failing to complete the course or earning a failing grade). Figure 4.3 shows the top half of the averaged rankings assigned by the college instructors: The greatest obstacle was study skills (33% of instructors), followed by critical thinking (22%) and conscientiousness (18%). Content knowledge and problem solving were fourth and fifth, respectively.

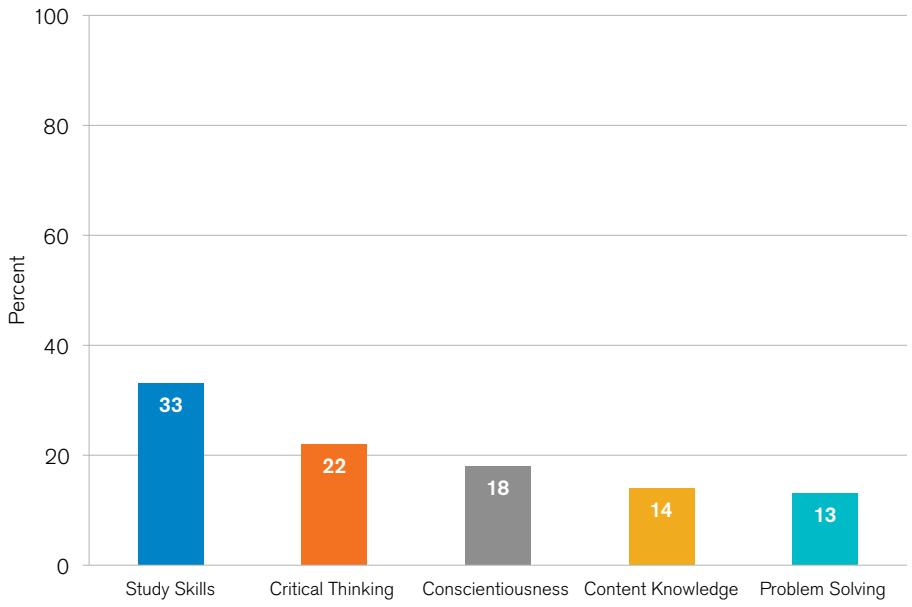


Figure 4.3. Percentages of college science instructors reporting that weakness in a given area is most likely to contribute to a poor outcome for a student (five highest-ranked skill areas of ten)

Science teachers in late elementary school, middle school, and high school each had the same five skill areas as the college instructors in the top halves of their averaged rankings, but in differing orders (Figure 4.4).

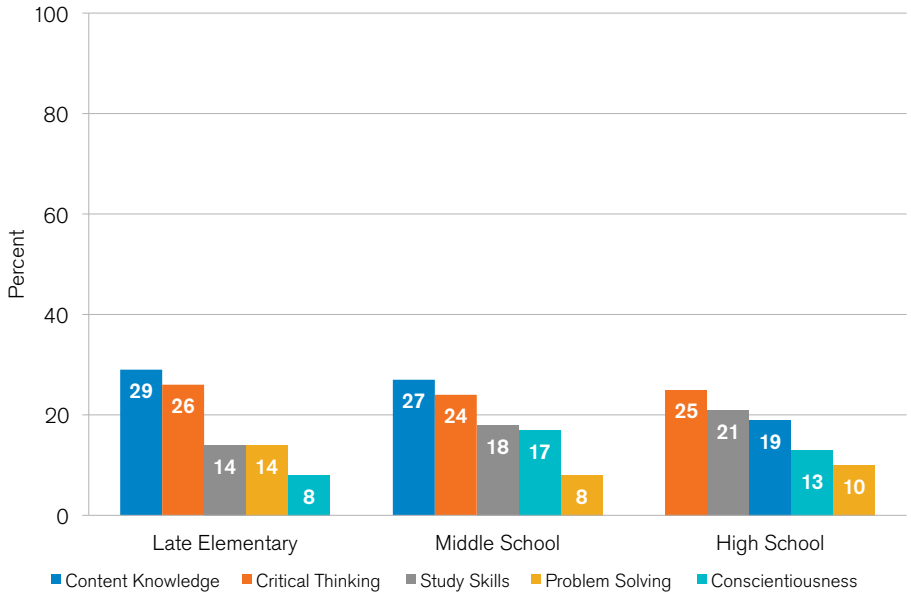


Figure 4.4. Percentages of late elementary school, middle school, and high school science teachers reporting that weakness in a given area is most likely to contribute to a poor outcome for a student (five highest-ranked skill areas of ten for each educational level)

In contrast to the college instructors, science teachers in late elementary school and middle school ranked content knowledge highest. But high school teachers ranked it third, suggesting that the emphasis on content knowledge as a necessary component of success in science coursework decreases from late elementary school through college.

Finding 4: On average, a slight majority of K–12 teachers are familiar with the NGSS, but much greater majorities believe that the standards will have an impact on the content of their courses.

On average, 51% of K–12 science teachers report being familiar with the NGSS (Figure 4.5). Familiarity was highest among middle school teachers and lowest among teachers in early elementary school.

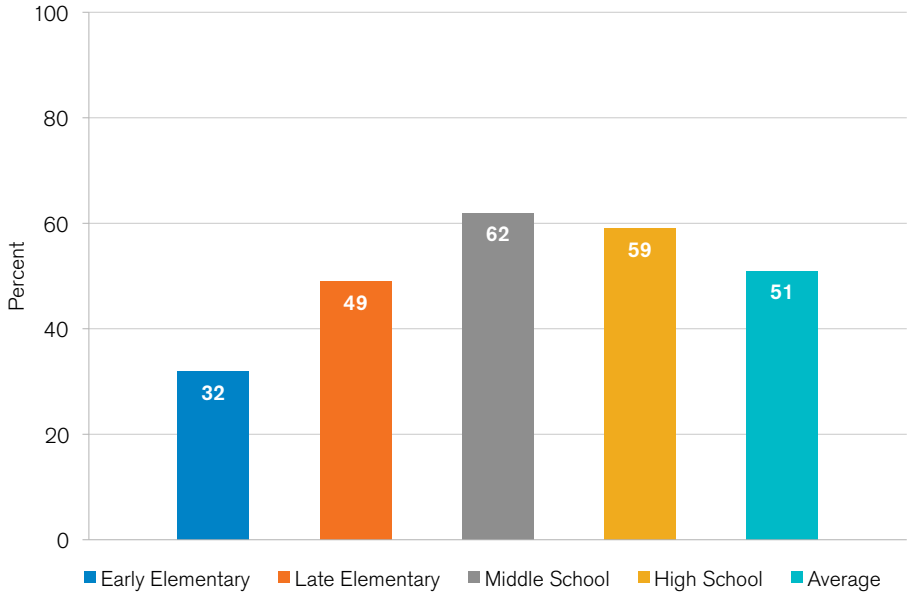


Figure 4.5. Percentages of K–12 science teachers who "agree" or "strongly agree" with the statement "I am familiar with the NGSS"[8]

Among teachers who reported being familiar with the NGSS, large majorities appeared to believe that the standards will have an impact on the content of their courses, with 66–79% (depending on grade level) believing that this would happen during the current school year and 83–96% believing it would happen over the next few years (Figure 4.6).

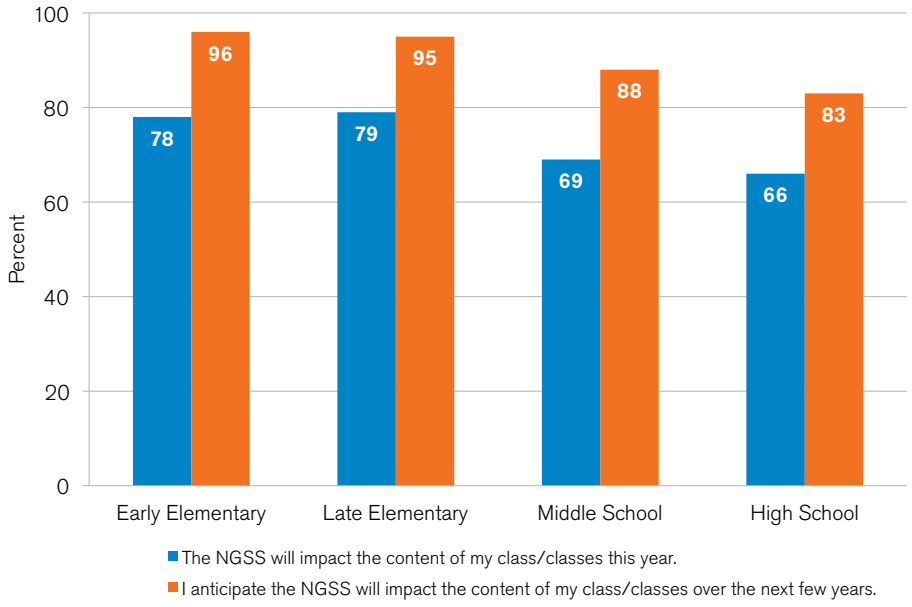


Figure 4.6. Percentages of science educators who "agree" or "strongly agree" with selected statements about the NGSS

[8] Here and in the next figure, teachers were asked to use a four-point scale: Strongly Disagree; Disagree; Agree; Strongly Agree.

Finding 5: Science educators believe that science achievement is best assessed using science assessments.

Science educators in middle school, high school, and college responding to questions in the ACT National Curriculum Survey 2016 regarding their opinions of how best to assess student achievement in science overwhelmingly prefer the latter form of assessment (Figure 4.7).

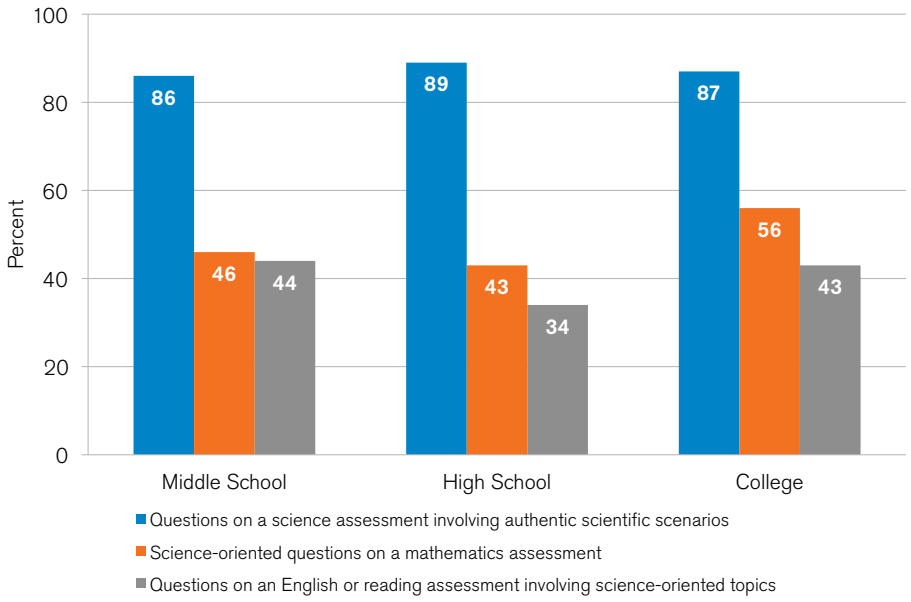


Figure 4.7. Percentages of science educators who "agree" or "strongly agree" with selected statements of opinion on science education[9]

More than 85% of all respondents in each group surveyed (middle school teachers, high school teachers, and college instructors) agreed or strongly agreed with the statement that the best way to assess science achievement is by means of questions on a science assessment involving authentic scientific scenarios. Of the other two choices, science-oriented questions on a mathematics assessment were viewed slightly more favorably than those on an English or reading assessment—perhaps understandably, given the close relationship between science and mathematics.

[9] Educators were asked to use a four-point scale: Strongly Disagree; Disagree; Agree; Strongly Agree. In the survey instrument, the three phrases quoted in the figure legend each complete the sentence "Science achievement is best assessed by . . ."

Chapter 5: Workforce

This chapter highlights findings from the Workforce portion of the ACT National Curriculum Survey 2016. Respondents in this portion included supervisors and employees at a large variety of businesses across the country.

Finding 1: Workforce respondents highly value nonacademic skills in preparing individuals for success in the workplace.

According to ACT research, readiness for workplace success is not limited to academic achievement. Other dimensions, including behavioral skills (interpersonal, self-regulatory, and task-related behaviors important for successful performance in educational and workplace settings), education and career navigation skills (the personal characteristics, processes, and knowledge that influence individuals as they navigate their educational and career paths), and cross-cutting capabilities such as technology and information literacy, collaborative problem solving, thinking and metacognition, and studying and learning, are critical for employee achievement (Camara et al., 2015).

Workforce respondents were asked to rate the importance of twelve nonacademic employee characteristics as preparation for success in the workforce. Results were expected to increase understanding of the criticality of each skill across a large quantity of jobs. With a better understanding of which skills are considered most integral, the assessment field should have a better idea of which skills are in the highest demand for employment testing. In addition, differences in the perceived importance of skills for supervisors and employees could highlight areas in which 1) employees are unaware of the skills necessary to rise within an organization, or 2) supervisors are unaware of the skills most vital to those who work for them.

Both supervisors and employees rated the same four characteristics most highly, in nearly identical percentages (and in the same order), suggesting a general consensus that the skills rated most important are in fact the most vital for entry-level success in the workplace (Figure 5.1).

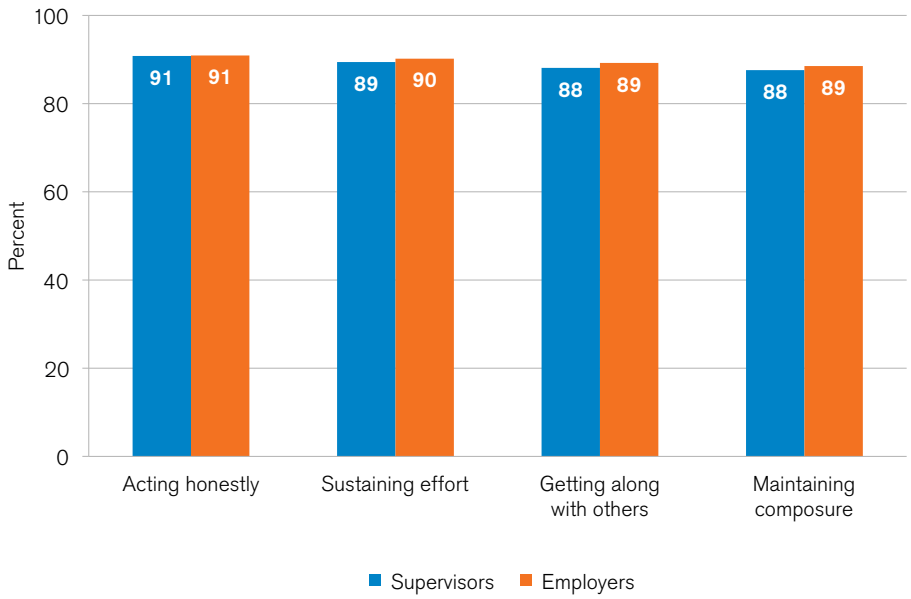


Figure 5.1. Percentages of workforce respondents rating selected characteristics in the top half of the scale with respect to their importance to preparation for success in the workforce[10]

All four of these characteristics are behavioral skills:

1. Acting honestly (e.g., acting sincerely and genuinely, treating others fairly)
2. Sustaining effort (e.g., staying focused, persisting through challenges, completing work)
3. Getting along with others (e.g., cooperating with other employees, working effectively in groups)
4. Maintaining composure (e.g., remaining calm when stressed, being confident)

The presence of "acting honestly" at the top of both lists is consistent with research indicating that this characteristic has one of the strongest correlations with manager ratings of employee performance, and that individuals who act in an honest manner perform at a higher level across task-based scenarios than those who do not (e.g., Johnson, Rowatt, & Petrini, 2011).

Supervisors and employees were also asked to rate a set of ten skill areas, both academic and nonacademic, according to the likelihood that weakness in the area would contribute to a poor outcome for an employee: for example, voluntary or involuntary turnover or failing to be promoted. Across both groups of respondents, three of the five highest-rated skill areas were nonacademic (Figure 5.2).

[10] Percentages have been rounded to the nearest whole number; characteristics with identical percentages in each respondent group were arranged according to their non-rounded values.

The eight characteristics not shown in the figure were: recognizing how what has been learned during education/training experiences is applicable to one's work (5th-highest for supervisors, 6th-highest for employees); understanding what is needed to achieve one's career goals (6th for supervisors, 9th for employees); keeping an open mind (7th for both groups); awareness of one's own strengths and weaknesses (8th for supervisors, 5th for employees); socializing with others (9th for supervisors, 8th for employees); having clear, identified career goals (10th for both groups); recognizing that career planning is necessary throughout one's work life (11th for supervisors, 12th for employees); and flexibility towards changing one's job or career direction (12th for supervisors, 11th for employees).

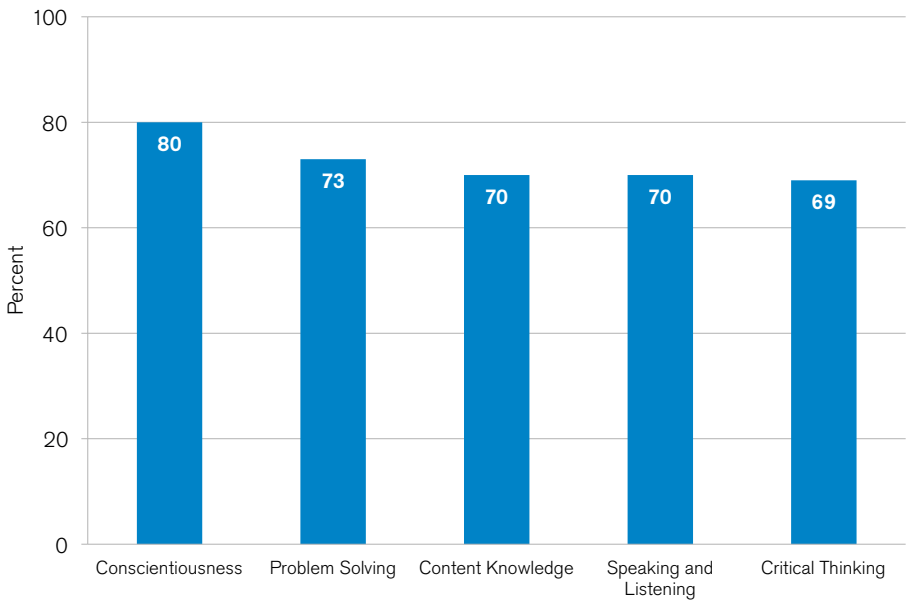


Figure 5.2. Mean percentages of workforce respondents reporting that weakness in selected areas is "moderately likely" or "very likely" to contribute to a poor outcome for an employee[11]

Conscientiousness (e.g., attention to detail, completing work), a behavioral skill, was rated the most likely skill area to contribute to a poor outcome, followed by problem solving (i.e., finding solutions to difficult or complex issues), a cross-cutting capability. A second cross-cutting capability, critical thinking (e.g., interpretation, analysis, inference, evaluation, explanation), was rated fifth. These results are consistent with ACT research on the importance of nonacademic skills to success in the workplace.

Finding 2: In the context of workplace technology, supervisors and employees agree about the importance of understanding the ethical use of information.

As part of the ACT National Curriculum Survey 2016, we asked supervisors and employees to rate the importance on the job of various kinds of technology and/or computer skills (13 in all). At least 50% of supervisors rated the following five skills in the top half of the importance scale:

1. Understanding and using basic computer terminology (64% of respondents)
2. Understanding information security (63%)
3. Using email (60%)
4. Understanding the ethical use of information (i.e., copyright, attribution, piracy) (54%)
5. Understanding operating systems (navigating between applications, locating settings/preferences, managing information/files/programs, etc.) (50%)

[11] Respondents were asked to use a four-point scale: Not At All Likely; Somewhat Likely; Moderately Likely; Very Likely. Percentages have been rounded to the nearest whole number; skill areas with identical percentages were arranged according to their non-rounded values. In descending order, the remaining five skill areas were: technology (e.g., effective use of computer hardware and software, internet navigation), 61%; collaboration with peers, 61%; writing, 34%; study skills, 31%; and educational plan, 25%.

At least 50% of employees rated the following six skills in the top half of the importance scale:

1. Using database software (68%)
2. Using presentation software (66%)
3. Using email (59%)
4. Understanding word processing software (54%)
5. Understanding the ethical use of information (i.e., copyright, attribution, piracy) (52%)
6. Understanding and using basic computer terminology (52%)[12]

The employees' list is, perhaps understandably, more focused on the ability to use various specific kinds of technology, suggesting that employees may of necessity be more involved with the details of precisely how they must use technology to produce results on the job, while supervisors, equally out of necessity, may take more of a "big picture" or utilitarian approach to the role of technology in the workplace. Both views are essential for an organization to succeed.

Despite their different priorities with respect to technology, it is interesting to note that both lists include a somewhat unusual skill: understanding the ethical use of information (54% of supervisors and 52% of employees).

Issues such as computer crime, intellectual property violations, and software piracy are becoming more urgent for today's workforce. In an international survey, 57% of computer users reported using pirated software, including 19% of US users (Business Software Alliance, 2012). The estimated commercial value of the pirated software used in the US alone was almost $9.8 million. In such a context, it is encouraging that supervisors and employees share a concern with ethical use of information with respect to technology.

Finding 3: Workforce respondents report that workplace communication relies more heavily on face-to-face communication than on written communication.

Both supervisors and employees indicated that, of six forms of communication in the workplace, the three they use most often are face-to-face communication (e.g., meetings, presentations), email, and telephone (Figure 5.3).

[12] Percentages have been rounded to the nearest whole number; the non-rounded value for this skill was slightly lower than that of the skill immediately preceding it.

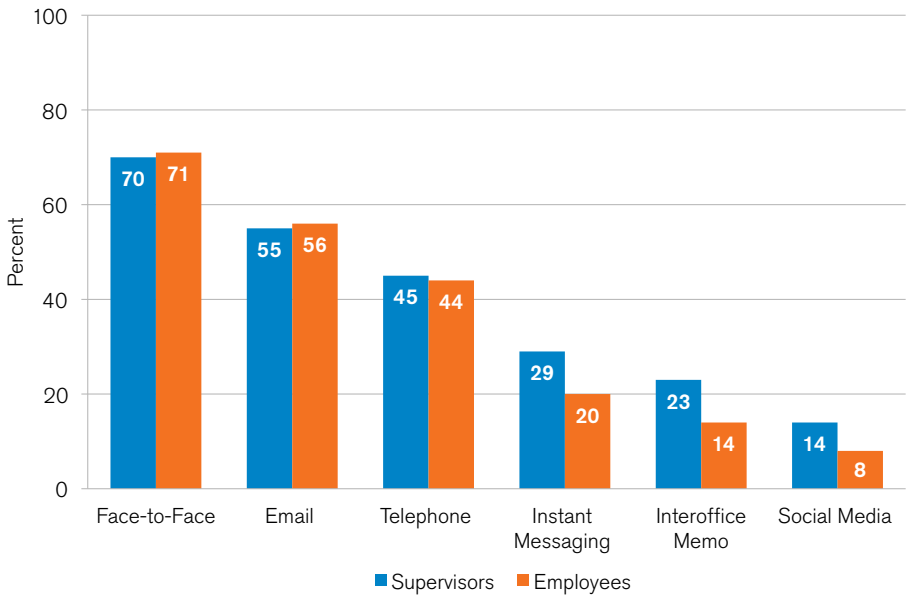


Figure 5.3. Percentages of workforce respondents rating the frequency of their use of various forms of workplace communication as "often" or "every work day"[13]

Face-to-face communication requires strong speaking and listening skills. The high percentages of workforce respondents indicating very frequent use of face-to-face communication are consistent with the percentage of these respondents rating the likelihood of weakness in speaking and listening as an obstacle to a positive outcome for an employee. As shown in Figure 5.2, workforce respondents ranked speaking and listening fourth of ten skill areas, both academic and nonacademic, in terms of the likelihood that weakness in the area would contribute to a poor outcome for an employee.

In addition to how often they use various forms of communication, workforce respondents were also asked to consider the importance to entry-level success of a set of twelve workplace communication skills. At least 70% of either supervisors, employees, or both groups rated the following skills in the top half of the importance scale:

- Conveying a knowledgeable demeanor when presenting information
- Presenting information in a logical and organized manner
- Summarizing information for efficient communication
- Conveying a confident demeanor while presenting information
- Tailoring communications to enhance understanding
- Reconciling gaps in understanding

[13] Respondents were asked to use a five-point scale: Never; Occasionally (in about 25% of work days); Sometimes (in about 50% of work days); Often (in about 75% of work days); Every Work Day. Percentages have been rounded to the nearest whole number.

Two of these skills address the employee's demeanor: the way that the employee will seem to others based on attitude and behaviors. Demeanor is most relevant in the real-time contexts of face-to-face and telephone communication. Three other skills—summarizing information for efficient communication, tailoring communications to enhance understanding, and reconciling gaps in understanding—are also relevant in these contexts but also relate to communication in writing. The sixth skill—presenting information in a logical and organized manner—is likely most crucial in written contexts, although it is of course relevant to many forms of communication.

The importance of some workplace communication skills was viewed differently by supervisors and employees. Identifying evidence a speaker uses to support particular points was rated in the top half of the importance scale by 54% of supervisors but only 37% of employees, and representing information visually using tables, charts, graphs, and multimedia was rated in the top half of the scale by 43% of supervisors but only 31% of employees.[14]

One potential explanation for supervisors seeing somewhat more value in certain speaking and listening skills than employees is that supervisors, especially middle managers, must often act as a conduit between employees and upper management, and may thus see more frequent evidence of how necessary such skills are to an organization's successful functioning.

[14] The four remaining communication skills were: using appropriate terminology such as acronyms, titles and technical terms; explaining how central ideas are supported by key details; paraphrasing accurately; and providing nonverbal feedback as appropriate. These skills were rated in the top half of the importance scale by roughly 60% of supervisors and between 50 and 60% of employees.

Chapter 6: Conclusions

1. There are discrepancies between some state standards and what some educators believe is important for college readiness.

Although standards are developed to help ensure that all students graduate from high school ready for college and career in English language arts and mathematics, some results of the ACT National Curriculum Survey suggest that some state standards may not reflect college readiness in some aspects.

In English Language Arts finding 2, high school teachers and perhaps some middle school teachers may be emphasizing certain approaches to writing over others due to a concern for source-based writing in response to the Common Core State Standards. But if so, college instructors appear to value some key features of source-based writing (the ability to analyze source texts and summarize other authors' ideas) much less than the ability to generate sound ideas—a skill applicable across much broader contexts.

In Mathematics finding 1, some early elementary school teachers report that they are still teaching some of the topics omitted from the Common Core State Standards at certain early grade levels, perhaps in part because the teachers perceive that students are entering their classrooms unprepared for the demands that later mathematics courses will make of them.

Also in finding 1, less than half of middle school and high school teachers believe that the Common Core State Standards for Mathematics are aligned "a great deal" or "completely" with college instructors' expectations for college readiness.

2. Calculator use is quite prevalent in the K–12 mathematics classroom.

According to Mathematics finding 2, most K–12 teachers teach students how to use calculators to perform computations and graph equations, and teachers in later grades commonly allow students to use calculators on classroom exams. This is true even as these teachers also continue to value and teach the skill of executing mathematics processes without the aid of technology.

3. There may be disagreement across K–12, college, and workforce about which mathematics topics are important to success in postsecondary STEM coursework and STEM careers. In K–12, there may also be disagreement about when these topics should be introduced in the mathematics curriculum.

Mathematics finding 4 indicates that although middle school and high school teachers generally agree about what mathematics skills are important to success in STEM courses and careers, college instructors or workforce respondents ascribed much less importance to those skills. In addition, many mathematics teachers in grades 4–7 report including certain topics relevant in

STEM coursework in their curricula at grades earlier than they appear in the Common Core and the Next Generation Science Standards. Perhaps these teachers fear that delaying these topics will prevent their students from success in later STEM coursework, or perhaps there is a lack of cross-content coordination with science to streamline what knowledge and skills are required of students at each grade.

4. Science educators believe that science achievement is best assessed using science assessments.

In Science finding 5, science educators in middle school, high school, and college overwhelmingly prefer a dedicated, standalone test that asks students to engage with authentic scientific scenarios (such as the ACT science test) as the best method of assessing student achievement in science.

5. Overall, workforce respondents appear to value a unique set of knowledge and skills as important to success in the workplace.

Results from both the Workforce portion of the ACT National Curriculum Survey 2016 and the education portions suggest that some of what workforce supervisors and employees value or do not value as important to entry-level success is not easily categorized, and sometimes perhaps unexpected. For example:

- In Workforce finding 1, three of the skill areas most often rated as likely to contribute to a poor outcome for an employee were nonacademic: conscientiousness, problem solving, and critical thinking.
- Workforce finding 2 shows that majorities of both supervisors and employees place high value on the somewhat unusual skill of understanding the ethical use of information.
- According to Workforce finding 3, supervisors and employees report that workplace communication relies more heavily on face-to-face communication than on written communication. And, perhaps in keeping with this finding, workforce respondents also place high value on speaking and listening as contributors to positive outcomes for employees on the job. In addition, two of the six most highly-rated workplace communication skills relate to the demeanor with which the employee presents information.
- As discussed in English Language Arts finding 1, supervisors indicated that employees in entry-level positions should be able to write narrative texts as well as informational and persuasive texts. Supervisors also value an employee's ability to tailor communications to enhance understanding and to reconcile gaps in understanding.
- Mathematics finding 2 shows that workforce respondents value facility with certain kinds of technology (e.g., calculators, graphing calculators, equation editors) much less than educators do.

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Appendix A: Kindergarten–College Statistical Details for Topics and Skills

Table A.1

How Important Content Topics Are in Class

ENGLISH LANGUAGE ARTS

EE		LE		Topics and Skills
Mean	+/-	Mean	+/-	
				READING GENRES AND TEXT TYPES How important it is for students in your class to be familiar with the following genres and text types
3.08	0.13	3.39	0.09	Short stories
2.66	0.14	3.39	0.08	Personal narratives/memoirs
2.50	0.14	3.01	0.10	Myths, tales, fables
2.28	0.14	2.91	0.10	Poetry
1.87	0.14	2.73	0.11	Dramas/plays
1.96	0.17	3.56	0.08	Chapter books
2.30	0.15	3.27	0.09	Natural science texts
2.26	0.15	3.29	0.09	Social science texts
1.96	0.16	3.32	0.09	Historical passages, biographies
1.97	0.16	3.16	0.10	Opinion/persuasive texts
1.34	0.15	2.43	0.13	Speeches
1.89	0.17	2.98	0.12	Informational websites
.	.	2.89	0.13	Expository/arguments (includes thesis/support or claim/evidence structures)
				WRITING PURPOSES, GENRES, AND TEXT TYPES
2.98	0.15	3.50	0.09	Writing to express an opinion
3.12	0.15	3.69	0.07	Writing to explain information and ideas
3.27	0.13	3.58	0.07	Writing to recount experiences or events
2.81	0.16	3.29	0.11	Writing to explore ideas and concepts
2.32	0.18	2.96	0.12	Letters, emails, or other correspondence
2.29	0.17	2.92	0.12	Procedures or instructions
2.50	0.17	3.43	0.10	Informational pieces, reports
2.51	0.18	3.30	0.11	Opinion/persuasive texts
2.95	0.15	3.44	0.09	Personal narratives
2.48	0.17	2.96	0.12	Short stories
2.04	0.16	2.72	0.12	Poems
.	.	3.07	0.13	Expository/arguments (includes thesis/support or claim/evidence structures)
				READING COMPREHENSION
3.17	0.14	3.69	0.06	Locating important details in static text (i.e., printed reading materials)
1.89	0.18	2.69	0.12	Locating important details in dynamic text (i.e., websites and other hypertexts with interactive features that make possible and even require navigation and nonsequential reading)
3.16	0.13	3.72	0.06	Drawing logical inferences and conclusions about a text
3.21	0.14	3.67	0.06	Determining the central idea(s)/theme(s) of a short text (i.e., less than one paragraph)
2.68	0.17	3.65	0.06	Determining the central idea(s)/theme(s) of a longer text (i.e., multiple paragraphs)
3.05	0.14	3.65	0.06	Summarizing a text accurately
3.38	0.12	3.43	0.08	Ordering sequences of events in a text
3.35	0.12	3.61	0.07	Describing characters, settings, or events in stories, drama, or poetry
3.17	0.13	3.63	0.07	Interpreting the meaning of words and phrases (including figurative meanings) as they are used in a text
3.14	0.13	3.51	0.08	Describing the plot of a story
2.53	0.17	3.37	0.09	Identifying different points of view (e.g., author, narrator, speaker, character) in a story or informational text
2.43	0.17	3.18	0.10	Distinguishing one's own point of view or perspective from that of an author, narrator, speaker, or character
2.86	0.16	3.37	0.09	Distinguishing between fact and opinion in a text
2.73	0.16	3.32	0.09	Comparing two or more texts on a similar theme or topic
.	.	3.07	0.10	Distinguishing between literal and nonliteral language
.	.	3.29	0.09	Describing the overall structure of a text or part of an informational text or section of text (e.g., chronology, comparison, cause-effect, problem-solution)
.	.	3.00	0.11	Identifying false statements
.	.	2.96	0.11	Identifying persuasive techniques
.	.	3.27	0.09	Interpreting the relationship between text and associated images (e.g., pictures, maps, graphs)

Table A.1 (continued)

How Important Content Topics Are in Class

ENGLISH LANGUAGE ARTS

EE		LE		Topics and Skills
Mean	+/-	Mean	+/-	
				WRITING KNOWLEDGE AND SKILLS
3.02	0.16	3.57	0.08	Pre-writing (e.g., brainstorming, clustering/concept mapping, listing, outlining)
2.35	0.18	3.42	0.10	Writing multiple drafts and making revisions
2.56	0.17	3.50	0.10	Producing and publishing a polished final draft
2.67	0.17	.	.	Using knowledge of English grammar and conventions to revise individual phrases and sentences
2.29	0.19	.	.	Using knowledge of English grammar and conventions to revise short paragraphs on an engaging topic
1.78	0.18	.	.	Using knowledge of English grammar and conventions to revise longer, multi-paragraph texts
1.97	0.18	2.81	0.12	Recognizing and correcting expressions that deviate from standard English
2.28	0.18	3.30	0.10	Using the proper form for possessive pronouns (e.g., its, not it's)
3.35	0.12	.	.	Spelling grade-appropriate words correctly
3.42	0.13	3.80	0.06	Writing complete sentences with end punctuation
2.38	0.18	3.66	0.08	Grouping sentences into paragraphs
2.69	0.17	3.62	0.09	Supporting ideas or story elements with specific reasons, details, and examples
2.97	0.16	3.70	0.07	Using a clear beginning, middle, and end
1.72	0.17	3.19	0.11	Using a dictionary or thesaurus to make vocabulary decisions
1.98	0.18	3.35	0.10	Gathering relevant information about a topic from different sources
0.97	0.15	2.44	0.14	Producing a bibliography or list of sources
1.59	0.18	.	.	Integrating information from other sources into writing
.	.	3.64	0.08	Offering a logical progression of ideas on the same topic
.	.	3.69	0.07	Identifying the topic of a paragraph
.	.	3.67	0.07	Writing introductions and conclusions
.	.	3.61	0.08	Choosing appropriate vocabulary
.	.	2.92	0.13	Integrating researched information (information from other sources) into writing
				CONVENTIONS OF ENGLISH
.	.	3.49	0.09	Using knowledge of English language grammar and conventions to revise individual phrases and sentences
.	.	3.45	0.09	Using knowledge of English language grammar and conventions to revise short paragraphs
.	.	3.20	0.11	Using knowledge of English language grammar and conventions to revise longer, multi-paragraph texts
.	.	1.99	0.15	Recognizing and correcting faulty subordination, coordination, and parallelism
.	.	3.14	0.12	Recognize and correcting rhetorically inappropriate sentence fragments and fused sentences (e.g., comma splices, run-on sentences)
.	.	3.13	0.11	Recognizing and correcting inappropriate shifts in verb tense and aspect
.	.	3.09	0.11	Recognizing and correcting inappropriate shifts in pronoun number and person
.	.	2.75	0.13	Determine whether an adjective form or an adverb form is called for in a given situation
.	.	2.47	0.14	Using idiomatically appropriate prepositions
.	.	3.20	0.10	Using the appropriate word in pairs or sets of frequently confused words (e.g., past and passed)
.	.	3.11	0.11	Using commas to avoid ambiguity and maintain sentence flow
.	.	3.65	0.08	Using end of sentence punctuation (e.g., periods, question marks, exclamation points) appropriately
.	.	3.28	0.10	Punctuating dialogue in a conventional way
				SPEAKING, LISTENING, VIEWING
3.45	0.11	3.35	0.10	Reading aloud from texts in the classroom
2.87	0.15	3.12	0.11	Using information presented in diverse media and formats for speaking and listening activities
3.20	0.13	3.40	0.10	Participating in collaborative conversations with peers and adults
2.10	0.17	2.94	0.12	Giving group presentations to the class
2.47	0.16	3.19	0.10	Giving individual presentations to the class
.	.	3.48	0.09	Listening in order to draw conclusions based on facts, gist, and inferred meaning
.	.	2.88	0.13	Demonstrating awareness of the specific purpose for collaboration by adapting behaviors to suit it
.	.	2.84	0.13	Managing one's own nonverbal cues in collaborative communication
.	.	2.59	0.14	Adapting style of speech to a variety of contexts and communicative tasks, including formal speeches and presentations.

Note:

Mean = The value given under Mean is the average of participant responses on a five-point scale, where 0 = Not important, 1 = Low, and 4 = High.

+/- = The value given under +/- represents the confidence interval (CI) for the population mean, at a confidence level of 95%. For example, for a mean of 3.27 with a +/- of 0.09, we are 95% confident that the actual mean for the population is within the range 3.27 plus or minus 0.09.

EE = Early elementary (K–2) school teachers

LE = Late elementary (3–6) school teachers

. = This item was not asked at this grade level.

Table A.2

How Important Content Topics Are in a Course

READING

MS		HS		College		Topics and Skills
Mean	+/-	Mean	+/-	Mean	+/-	
						READING SKILLS
3.30	0.12	3.31	0.07	3.67	0.07	Reading words and sentences (e.g., applying word knowledge efficiently, interpreting complex syntax, reading academic language fluently)
3.83	0.05	3.76	0.04	3.76	0.06	Understanding texts (e.g., identifying central ideas and purposes, inferring relationships between events and/or characters, summarizing the most important information)
3.46	0.11	3.58	0.06	3.38	0.09	Evaluating texts (e.g., analyzing authors' techniques and evaluating effectiveness, evaluating evidence and/or support for claims or positions, determining the usefulness of texts for particular purposes)
3.61	0.09	3.67	0.05	3.71	0.07	Determining central ideas
3.26	0.11	3.41	0.07	3.15	0.11	Determining the purpose for which a text was written
3.29	0.11	3.39	0.07	3.24	0.10	Determining an author's points of view
3.72	0.08	3.68	0.05	3.64	0.07	Drawing conclusions and making inferences
3.45	0.10	3.43	0.06	3.41	0.09	Analyzing cause-and-effect relationships
3.26	0.12	3.34	0.07	3.28	0.10	Analyzing comparative relationships
3.23	0.13	3.42	0.07	3.28	0.11	Analyzing multiple levels of meaning
3.33	0.12	3.32	0.07	2.77	0.12	Using knowledge of academic language to interpret a text
3.17	0.14	3.30	0.08	3.32	0.10	Identifying specific claims
3.50	0.10	3.56	0.06	3.52	0.09	Evaluating evidence and/or support for claims
3.40	0.11	3.34	0.07	3.55	0.09	Distinguishing among fact, opinion, and reasoned judgment
3.64	0.08	3.58	0.06	3.54	0.08	Identifying important details
3.18	0.14	3.23	0.09	2.23	0.16	Identifying literary devices and interpreting their effect
3.00	0.13	3.19	0.08	2.74	0.12	Identifying persuasive techniques
3.37	0.11	3.39	0.07	3.28	0.11	Connecting and summarizing information from multiple sources
3.50	0.11	3.40	0.07	3.15	0.12	Using reading strategies to manage comprehension of challenging texts
2.49	0.17	2.52	0.11	1.99	0.16	Navigating digital texts effectively
3.03	0.13	2.82	0.10	.	.	Interpreting the relationship between a text and associated images (e.g., pictures, maps, graphs)
.	.	.	.	3.28	0.11	Evaluating the reasoning used in an argument
						ARGUMENT ANALYSIS
.	.	.	.	3.32	0.10	Identifying specific claims
.	.	.	.	3.28	0.11	Evaluating the reasoning used in an argument
.	.	.	.	3.55	0.09	Distinguishing among fact, opinion, and reasoned judgment
.	.	.	.	2.74	0.12	Identifying persuasive techniques
						TEXT TYPES How important it is for students in your course to be familiar with the following text types
3.13	0.13	2.92	0.09	2.87	0.16	Textbooks
3.41	0.12	3.19	0.09	2.28	0.18	Fictional texts (e.g., novels or short stories)
3.23	0.11	3.02	0.08	2.14	0.16	Articles from popular periodicals (including Internet sites)
2.60	0.14	2.81	0.09	2.37	0.16	Articles from scholarly periodicals
2.81	0.15	2.54	0.10	1.31	0.15	Functional texts (e.g., instruction manuals, memos)
3.03	0.12	3.08	0.08	2.85	0.14	Historical documents (e.g., Declaration of Independence)
3.26	0.12	3.13	0.07	.	.	Informational websites
						TEXT GENRES
2.49	0.17	2.70	0.12	1.58	0.18	Drama
2.94	0.15	2.74	0.11	1.65	0.18	Poetry
3.40	0.14	3.18	0.10	.	.	Fiction
3.56	0.10	3.32	0.08	2.44	0.15	Literary nonfiction (e.g., memoirs, personal essays)
2.48	0.17	2.71	0.10	2.62	0.14	Humanities (e.g., art, film, language, music)
2.43	0.18	2.61	0.11	2.98	0.14	Social sciences (e.g., anthropology, history, psychology, sociology)
2.00	0.19	1.56	0.12	1.36	0.15	Natural sciences (e.g., biology, chemistry, geology, physics)

Note:

Mean = The value given under Mean is the average of participant responses on a five-point scale, where 0 = Not important, 1 = Low, and 4 = High.

+/- = The value given under +/- represents the confidence interval (CI) for the population mean, at a confidence level of 95%. For example, for a mean of 3.27 with a +/- of 0.09, we are 95% confident that the actual mean for the population is within the range 3.27 plus or minus 0.09.

MS = Middle school/junior high school teachers

HS = High school teachers

College = College instructors

. = This item was not asked at this grade level.

Table A.3

How Important Content Topics Are in a Course

WRITING

MS		HS		College		Topics and Skills
Mean	+/-	Mean	+/-	Mean	+/-	
						WRITING GENRES AND TEXT TYPES
1.96	0.18	1.57	0.13	.	.	Letters, emails, or other correspondence
2.62	0.19	2.13	0.13	.	.	Procedures or instructions
3.34	0.12	3.02	0.10	.	.	Informational pieces, reports
3.64	0.11	3.71	0.07	.	.	Expository/arguments (includes thesis/support or claim/evidence structures)
3.48	0.12	3.52	0.08	.	.	Opinion/persuasive texts
2.96	0.14	2.65	0.12	.	.	Personal narratives
2.49	0.17	2.24	0.14	.	.	Short stories
2.38	0.17	2.15	0.14	.	.	Poems
						APPROACHES TO WRITING
.	.	.	.	3.31	0.08	Generate sound ideas for writing
.	.	.	.	3.07	0.09	Use language conventions proficiently
.	.	.	.	3.09	0.10	Critically analyze source texts
.	.	.	.	2.84	0.10	Clearly rehearse/summarize other authors' ideas in writing
						CONVENTIONS OF ENGLISH
3.47	0.11	3.35	0.09	.	.	Using knowledge of English grammar and conventions to revise individual phrases and sentences
3.51	0.11	3.27	0.09	.	.	Using knowledge of English grammar and conventions to revise short paragraphs on an engaging topic
3.44	0.12	3.36	0.10	.	.	Using knowledge of English grammar and conventions to revise longer, multi-paragraph texts
2.64	0.19	2.96	0.11	.	.	Recognizing and correcting faulty subordination, coordination, and parallelism
3.30	0.14	3.30	0.09	.	.	Recognizing and correcting rhetorically inappropriate sentence fragments and fused sentences (e.g., comma splices, run-on sentences)
3.22	0.13	3.15	0.10	.	.	Recognizing and correcting inappropriate shifts in verb tense and aspect
3.15	0.14	3.11	0.10	.	.	Recognizing and correcting inappropriate shifts in pronoun number and person
2.73	0.17	2.66	0.11	.	.	Determining whether an adjective form or an adverb form is called for in a given situation
3.18	0.15	3.05	0.11	.	.	Using the proper form for possessive pronouns (e.g., its, not it's)
2.82	0.17	2.85	0.12	.	.	Recognizing and correcting expressions that deviate from standard English
2.56	0.18	2.57	0.12	.	.	Using idiomatically appropriate prepositions
3.11	0.15	2.89	0.12	.	.	Using the appropriate word in pairs or sets of frequently confused words (e.g., past and passed)
3.18	0.13	3.17	0.10	.	.	Using commas to avoid ambiguity and maintain sentence flow
2.84	0.17	2.91	0.11	.	.	Using punctuation to set off parenthetical elements
2.89	0.17	2.92	0.11	.	.	Using punctuation to set off nonessential/nonrestrictive appositives and clauses
3.02	0.16	2.84	0.12	.	.	Punctuating dialogue in a conventional way
2.79	0.17	2.99	0.10	.	.	Using a semicolon to link closely related independent clauses or when items in a series have internal punctuation (e.g., when items have their own commas)
2.65	0.17	2.86	0.11	.	.	Using a colon to introduce an example, an elaboration, or a series of phrases
.	.	.	.	1.94	0.13	Identifying and describing parts of speech and linguistic structures in writing
.	.	.	.	3.18	0.10	Knowing rules of standard English and correcting usage errors
.	.	.	.	2.80	0.10	Understanding the function of linguistic structures and the rhetorical and stylistic effects that they produce.
						WRITING PROCESS AND EVIDENCE
3.58	0.10	3.19	0.10	.	.	Using pre-writing techniques (e.g., brainstorming, clustering/concept mapping, listing, outlining)
3.65	0.09	3.47	0.08	.	.	Writing multiple drafts and making revisions
3.63	0.10	3.56	0.08	.	.	Producing and publishing a polished final draft
3.82	0.07	3.78	0.06	.	.	Establishing a position and supporting it with reasons and evidence
3.70	0.09	3.62	0.08	.	.	Using different types of evidence to support writing (e.g., facts and data, evidence drawn from personal experience) depending on task, purpose, and audience
3.35	0.14	3.42	0.10	.	.	Integrating different writing modes and strategies (e.g., logical argumentation, emotional appeals, exposition, and narration) in a writing task for a given purpose and audience

Table A.3 (continued)

How Important Content Topics Are in a Course

WRITING

MS		HS		College		Topics and Skills
Mean	+/-	Mean	+/-	Mean	+/-	
						SPEAKING, LISTENING, VIEWING
3.09	0.16	2.83	0.12	.	.	Using information presented in diverse media and formats for speaking and listening activities
3.28	0.14	3.04	0.11	2.58	0.14	Listening in order to draw informed conclusions based on facts, gist, and inferred meaning
3.32	0.15	3.29	0.11	.	.	Participating in collaborative conversations with peers and adults
2.94	0.17	2.74	0.13	2.32	0.13	Demonstrating awareness of the specific purpose for collaboration by adapting behaviors to suit it
2.60	0.19	2.38	0.13	1.95	0.13	Managing one's own nonverbal cues in collaborative communication
2.96	0.18	2.64	0.13	.	.	Giving group presentations to the class
3.14	0.15	2.80	0.13	.	.	Giving individual presentations to the class
3.11	0.17	2.69	0.14	.	.	Adapting style of speech to a variety of contexts and communicative tasks, including formal speeches and presentations
.	.	2.82	0.13	2.32	0.14	Evaluating speaker's motives and strategic choices regarding presentation and content
.	.	.	.	1.58	0.13	Demonstrate mastery of formal speaking skills in a speech or presentation
.	.	.	.	2.70	0.13	Listen to multiple perspectives in order to respond to and collaborate with others
						ENGAGING WITH MULTIPLE PERSPECTIVES
3.21	0.16	3.37	0.11	.	.	Engaging with multiple perspectives on a topic
2.68	0.21	3.11	0.12	.	.	Identifying and analyzing rhetorical strategies
3.46	0.13	3.24	0.11	.	.	Writing for specific audiences other that the instructor (i.e., the specified audience could be real or imagined)
3.48	0.12	3.55	0.08	.	.	Recognizing other views
3.34	0.15	3.47	0.10	.	.	Recognizing other counterarguments
3.16	0.17	3.31	0.11	.	.	Rebutting counterarguments
3.39	0.15	3.37	0.11	.	.	Integrating own ideas with the ideas of others in writing
						GENERAL WRITING KNOWLEDGE AND SKILLS
.	.	3.47	0.08	3.16	0.10	Sentence structure and formation (making sure that sentences are grammatically sound)
.	.	3.33	0.09	3.09	0.10	Usage conventions (writing conforms to standard English usage)
.	.	3.27	0.09	2.93	0.10	Punctuation conventions (following rules of standard English punctuation)
.	.	3.65	0.07	3.38	0.08	Topic development in terms of purpose and focus
.	.	3.76	0.05	3.39	0.09	Organization, unity, and cohesion (strategies to ensure that text is logically organized, flows smoothly, and has an effective introduction and conclusion)
.	.	3.52	0.07	2.96	0.09	Knowledge of language (ensuring precision and concision in word choice, maintaining consistency in style and tone)

Note:

Mean = The value given under Mean is the average of participant responses on a five-point scale, where 0 = Not important, 1 = Low, and 4 = High.

+/- = The value given under +/- represents the confidence interval (CI) for the population mean, at a confidence level of 95%. For example, for a mean of 3.27 with a +/- of 0.09, we are 95% confident that the actual mean for the population is within the range 3.27 plus or minus 0.09.

MS = Middle school/junior high school teachers

HS = High school teachers

College = College instructors

. = This item was not asked at this grade level.

Table A.4

How Important Content Topics Are in Class

MATHEMATICS

MS		HS		Topics and Skills
Mean	+/-	Mean	+/-	
				APPLIED MATHEMATICAL KNOWLEDGE AND SKILLS
1.78	0.16	2.33	0.15	Identifying trends in data
3.18	0.14	3.55	0.09	Explaining mathematical concepts precisely and fluently
2.73	0.17	3.09	0.14	Choosing appropriate degree of precision for modeling real-world situations
2.79	0.16	3.20	0.12	Recognizing when essential information is missing
2.94	0.15	3.03	0.12	Creating visual representations of data such as tables, line graphs, and bar graphs
3.01	0.15	3.24	0.11	Interpreting visual representations of data such as tables, line graphs, and bar graphs
3.33	0.13	3.58	0.09	Executing mathematical processes without technology (i.e., using only mental or paper-and-pencil calculations)
.	.	3.01	0.12	Using basic geometry skills (e.g., estimating and computing area and volume, converting units of measurement, measuring angles)
.	.	3.20	0.11	Analyzing and interpreting data from tables, graphs, and diagrams
				JUSTIFICATION AND EXPLANATION
2.28	0.17	.	.	Explaining another student's mathematical justification
2.57	0.17	3.20	0.12	Finding and explaining an error in a mathematical justification
2.74	0.17	3.17	0.13	Using examples to support or challenge a mathematical justification
2.36	0.18	2.94	0.14	Organizing mathematical statements to make a valid argument
2.55	0.17	3.05	0.13	Explicitly stating the given information whenever justifying
2.43	0.17	3.07	0.13	Explicitly stating a conclusion whenever justifying
2.44	0.17	3.17	0.11	Using general statements when justifying (e.g., all even numbers are divisible by 2)
2.62	0.18	3.32	0.12	Knowing that mathematical justification means providing reasons
.	.	3.31	0.12	Reading and explaining a mathematical justification
				MATHEMATICS TOPICS
3.51	0.11	.	.	Recognizing 1–5 objects without actually counting (i.e., subitize quantities)
3.70	0.09	.	.	Counting to 10
3.55	0.11	.	.	Recognizing a bundle of 10 "ones" as 1 "ten"
3.65	0.10	.	.	Using counting-on as a strategy for addition
3.35	0.11	.	.	Using ordinal numbers (e.g., first, second, third)
3.28	0.13	.	.	Locating whole numbers on the number line
2.70	0.16	3.33	0.11	Understanding why estimation is useful
2.73	0.17	3.35	0.11	Understanding what makes a good estimate
3.38	0.11	3.25	0.11	Identifying and extending patterns
2.83	0.16	3.09	0.14	Looking for and being guided by mathematical structure
1.96	0.18	2.47	0.17	Identifying angle situations in everyday objects (e.g., turning of a doorknob, path of windshield wipers, corner of a room, road intersections)
2.25	0.18	2.62	0.17	Measuring an object's length when neither end of the object is aligned with the zero point on a ruler
2.38	0.18	2.95	0.14	Predicting outcomes based on data
2.14	0.18	2.62	0.16	Measuring area by tiling two-dimensional units (e.g., laying index cards side by side with no overlaps to measure the area of a desktop)
2.03	0.19	.	.	Applying order of operations to mathematical expressions such as 12 - 5 - 2
1.74	0.18	2.28	0.18	Using a calculator or computer for computation
.	.	2.91	0.16	Locating positive decimals on the number line
.	.	3.25	0.13	Locating positive fractions on the number line
.	.	2.99	0.17	Comparing a decimal and a fraction
.	.	3.38	0.11	Using rounding strategies for computational estimation
.	.	3.06	0.14	Evaluating algebraic expressions
.	.	2.54	0.18	Understanding that angles are measured in the number of parts out of 360 that it takes to make a full rotation
.	.	2.29	0.18	Using a protractor to measure angles
.	.	2.56	0.17	Determining the probability of a simple event
.	.	1.95	0.19	Determining the probability of a compound event
.	.	2.19	0.19	Using median as a measure of center
.	.	2.19	0.19	Using mean as a measure of center
.	.	1.69	0.19	Using interquartile range as a measure of spread
.	.	1.71	0.20	Using mean absolute deviation as a measure of spread

Table A.4 (continued)

How Important Content Topics Are in Class

MATHEMATICS

MS		HS		Topics and Skills
Mean	+/-	Mean	+/-	
.	.	2.12	0.19	Creating a circle graph
.	.	2.46	0.18	Interpreting a circle graph
.	.	3.30	0.14	Dividing using the standard algorithm
.	.	3.14	0.15	Applying order of operations to mathematical expressions such as 12 – 3 x 4
.	.	3.12	0.16	Applying order of operations to mathematical expressions with grouping symbols, such as 12 – (5 – 2)
.	.	1.60	0.19	Using a calculator or computer for graphing equations
.	.	1.55	0.19	Using an equation editor to enter expressions or equations
.	.			**FOUNDATION SKILLS**
3.56	0.11	.	.	Knowing basic mathematical vocabulary (e.g., sum, rectangle)
3.55	0.12	.	.	Knowing basic mathematical concepts (e.g., place value, subtraction)
3.30	0.14	.	.	Recalling mathematical and numerical facts (e.g., addition facts for single digits)
2.75	0.19	.	.	Performing basic mathematical procedures (e.g., adding two-digit numbers, subtracting with borrowing)
2.35	0.19	3.21	0.14	Solving novel problems (i.e., solution method is not obvious or predictable)
3.06	0.15	3.62	0.09	Solving straightforward problems (i.e., solution method is predictable)
.	.	3.71	0.08	Knowing basic mathematical vocabulary (e.g., denominator, quadrilateral)
.	.	3.73	0.08	Knowing basic mathematical concepts (e.g., place value, connections between multiplication and area)
.	.	3.74	0.07	Recalling mathematical and numerical facts (e.g., addition facts for single digits, multiplication table through 10 x 10)
.	.	3.70	0.08	Performing basic mathematical procedures (e.g., add multidigit numbers, multiply decimals)
				MATHEMATICS PRACTICES How important the practice is in your class
3.03	0.15	3.35	0.13	Conscientiousness in doing mathematics work
2.32	0.17	2.78	0.15	Choosing challenging problems over easy ones when the opportunity arises
3.22	0.14	3.49	0.11	Demonstrating persistence when solving problems
2.99	0.15	3.35	0.12	Drawing upon previous experiences to inform current work
2.64	0.17	3.11	0.13	Proficiency reading and navigating mathematics texts
3.13	0.14	3.27	0.12	Participating in small- and large-group discussion
2.67	0.16	3.00	0.13	Facilitating group work
3.15	0.14	3.30	0.13	Showing evidence of a growth mindset

Note:

Mean = The value given under Mean is the average of participant responses on a five-point scale, where 0 = Not important, 1 = Low, and 4 = High.

+/- = The value given under +/- represents the confidence interval (CI) for the population mean, at a confidence level of 95%. For example, for a mean of 3.27 with a +/- of 0.09, we are 95% confident that the actual mean for the population is within the range 3.27 plus or minus 0.09.

EE = Early elementary (K–2) school teachers

LE = Late elementary (3–6) school teachers

. = This item was not asked at this grade level.

Table A.5

How Important Content Topics Are in a Course

MATHEMATICS

MS		HS		College		Topics and Skills
Mean	+/-	Mean	+/-	Mean	+/-	
						APPLIED MATHEMATICAL KNOWLEDGE AND SKILLS
2.80	0.12	2.73	0.10	2.43	0.11	Using geometry skills (e.g., estimating and computing area and volume, converting units of measurement, measuring angles)
2.70	0.13	2.41	0.10	2.02	0.11	Identifying trends in data
3.19	0.10	2.93	0.09	2.42	0.11	Analyzing and interpreting data from tables, graphs, and diagrams
2.43	0.14	2.13	0.10	.	.	Determining likelihood and probability
3.46	0.09	3.53	0.06	.	.	Explaining mathematical concepts precisely and fluently
2.87	0.14	2.95	0.09	2.04	0.10	Choosing appropriate degree of precision for modeling real-world situations
3.02	0.11	3.13	0.08	2.89	0.09	Recognizing when essential information is missing
3.00	0.12	2.67	0.10	.	.	Creating visual representations of data such as tables, line graphs, and bar graphs
3.14	0.11	2.88	0.09	.	.	Interpreting visual representations of data such as tables, line graphs, and bar graphs
3.21	0.12	3.05	0.09	.	.	Executing mathematical processes without technology (i.e., using only mental or paper-and-pencil calculations)
.	.	2.35	0.09	.	.	Applying estimation skills (e.g., judging rough quantities or cost)
.	.	3.48	0.07	.	.	Applying algebra/pre-algebra skills (e.g., solving multiple-step problems involving fractions, decimals, or percentages)
.	.	.	.	2.49	0.10	Choose appropriate units for modeling real-world situations
.	.	.	.	2.43	0.10	Use estimation to approximate calculations and quantities
.	.	.	.	3.16	0.09	Solve multiple-step problems involving rational numbers that require the use of algebra
.	.	.	.	2.63	0.09	Solve challenging mathematics problems
.	.	.	.	3.13	0.08	Routinely check reasonableness of solutions
.	.	.	.	2.65	0.10	Use alternate methods to verify solutions (e.g., graphing calculators, draw a picture)
.	.	.	.	2.78	0.09	Recognize when extraneous information is included
.	.	.	.	2.05	0.11	Predict outcomes based on data
.	.	.	.	2.69	0.10	Follow a mathematical derivation
						JUSTIFICATION AND EXPLANATION
3.31	0.10	3.26	0.08	2.67	0.10	Reading and explaining a mathematical justification
3.20	0.11	3.15	0.08	.	.	Finding and explaining an error in a mathematical justification
3.13	0.12	.	.	.	.	Using examples to support or challenge a mathematical statement
2.95	0.14	3.07	0.09	2.42	0.11	Organizing mathematical statements to make a valid argument
2.92	0.13	.	.	.	.	Explicitly stating the given information whenever justifying
2.99	0.13	.	.	.	.	Explicitly stating a conclusion whenever justifying
2.98	0.12	.	.	.	.	Using general statements when justifying (e.g., all even numbers are divisible by 2)
3.15	0.12	.	.	.	.	Knowing that mathematical justification means providing reasons
.	.	2.87	0.09	2.47	0.10	Producing examples to test the validity of a mathematical claim
.	.	2.90	0.10	2.40	0.11	Routinely stating the given information explicitly when justifying
.	.	3.01	0.09	2.53	0.11	Routinely stating a conclusion explicitly when justifying
.	.	2.86	0.09	2.45	0.10	Providing and using general statements when justifying (e.g., all even numbers are divisible by 2)
.	.	3.19	0.09	2.70	0.11	Providing reasoning for mathematical statements when justifying
.	.	.	.	2.45	0.10	Indicate an error in a justification
.	.	.	.	2.36	0.11	Explain why an error in a justification is erroneous
.	.	.	.	2.45	0.11	Provide and use specific statements when justifying (e.g., 6 is an even number)
.	.	.	.	2.71	0.10	Use number sense when justifying
.	.	.	.	2.85	0.09	Use computations when justifying
.	.	.	.	2.39	0.11	Use counterexamples when justifying
.	.	.	.	2.00	0.11	Use the names of definitions, theorems, axioms, or properties when justifying
.	.	.	.	2.35	0.11	Use definitions, theorems, axioms, or properties when justifying
.	.	.	.	2.33	0.11	Use patterns when justifying
.	.	.	.	2.53	0.10	Use visual representations/graphics/pictures when justifying
.	.	.	.	1.98	0.11	Use cases when justifying
.	.	.	.	1.52	0.11	Use indirect proof

Table A.5 (continued)

How Important Content Topics Are in a Course

MATHEMATICS

MS		HS		College		Topics and Skills
Mean	+/-	Mean	+/-	Mean	+/-	
						MATHEMATICS TOPICS
2.81	0.13	2.07	0.12	.	.	Locating positive decimals on the number line
2.81	0.14	2.08	0.12	.	.	Locating positive fractions on the number line
3.05	0.13	.	.	.	.	Comparing a decimal and a fraction
3.18	0.12	2.69	0.10	.	.	Performing operations with positive fractions
3.15	0.12	2.49	0.11	.	.	Understanding percentage as a rate out of 100
2.93	0.12	.	.	.	.	Understanding why estimation is useful
2.96	0.13	.	.	.	.	Understanding what makes a reasonable estimate
2.78	0.13	.	.	.	.	Using rounding strategies for computational estimation
3.02	0.13	2.98	0.09	.	.	Identifying and extending patterns
3.06	0.13	3.14	0.09	.	.	Looking for and being guided by mathematical structure
3.58	0.09	3.43	0.08	.	.	Evaluating algebraic expressions
2.94	0.17	3.09	0.10	.	.	Solving a multivariable equation for one of the variables
2.53	0.20	2.72	0.12	.	.	Solving systems of two linear inequalities
2.05	0.20	3.03	0.11	.	.	Solving quadratic equations by factoring
2.73	0.18	3.11	0.10	.	.	Understanding that equations can have one, many, or no solutions
2.87	0.17	3.05	0.11	.	.	Understanding the concept of a function
1.61	0.18	1.93	0.13	.	.	Understanding informal limit arguments (e.g., the circumference of a circle can be found by using inscribed regular polygons that have more and more sides)
2.40	0.17	2.41	0.13	.	.	Understanding that angles are measured in the number of parts out of 360 that it takes to make a full rotation
2.26	0.17	2.19	0.13	.	.	Identifying angle situations in everyday objects (e.g., turning of a doorknob, path of windshield wipers, corner of a room, road intersections)
2.73	0.16	2.32	0.13	.	.	Using properties of angles (e.g., complementary, supplementary, adjacent, vertical) to find the measures of angles
2.58	0.17	2.35	0.13	.	.	Using properties of parallel and perpendicular lines to find the measures of angles
2.31	0.18	2.35	0.13	.	.	Applying transformations (e.g., rotations, reflections, translations) to figures
1.96	0.17	1.93	0.13	.	.	Measuring an object's length when neither end of the object is aligned with the zero point on a ruler
2.17	0.16	1.76	0.13	.	.	Using a protractor to measure angles
2.59	0.17	2.33	0.12	.	.	Knowing that relationships between variables can have positive or negative associations and different strengths
1.77	0.18	1.81	0.13	.	.	Differentiating causation from correlation
2.05	0.17	1.68	0.13	.	.	Understanding the role of randomization in surveys, experiments, and observational studies
2.52	0.17	2.20	0.13	.	.	Representing data with a scatterplot and estimating a line of best fit
2.85	0.15	2.48	0.13	.	.	Predicting outcomes based on data
2.41	0.17	1.97	0.13	.	.	Using data from a representative sample to generalize to a population
2.47	0.17	2.02	0.13	.	.	Determining the probability of a simple event
2.34	0.17	1.88	0.13	.	.	Determining the probability of a compound event
2.69	0.16	2.01	0.13	.	.	Using median as a measure of center
2.73	0.15	2.02	0.13	.	.	Using mean as a measure of center
2.27	0.17	1.67	0.13	.	.	Using interquartile range as a measure of spread
1.90	0.18	1.47	0.13	.	.	Using mean absolute deviation as a measure of spread
2.02	0.17	.	.	.	.	Creating a circle graph
2.27	0.17	.	.	.	.	Interpreting a circle graph
2.51	0.17	.	.	.	.	Dividing using the standard algorithm
3.51	0.10	.	.	.	.	Applying order of operations to mathematical expressions, such as 12 – 3 x 4
3.55	0.10	.	.	.	.	Applying order of operations to mathematical expressions with grouping symbols, such as 12 – (5 – 2)
3.00	0.14	3.21	0.09	.	.	Using a calculator or computer for computation
2.16	0.19	2.80	0.12	.	.	Using a calculator or computer for graphing equations
1.63	0.18	1.82	0.13	.	.	Using an equation editor to enter expressions or equations
.	.	1.71	0.13	.	.	Find magnitude, direction, and components of vectors
.	.	2.63	0.12	.	.	Modeling with higher order polynomials
.	.	2.39	0.13	.	.	Dividing polynomials
.	.	2.67	0.13	.	.	Graph and recognize characteristics (e.g., zeros, end behavior) of polynomial functions
.	.	2.46	0.14	.	.	Graph and recognize characteristics (e.g., zeros, asymptotes, end behavior) of rational functions

Table A.5 (continued)

How Important Content Topics Are in a Course

MATHEMATICS

MS		HS		College		Topics and Skills
Mean	+/-	Mean	+/-	Mean	+/-	
						USE OF TECHNOLOGY ON ASSESSMENTS
.	.	.	.	2.92	0.12	Perform operations without the assistance of a calculator or other device
.	.	.	.	1.07	0.13	Use the statistical capabilities of a calculator or a statistical software package
.	.	.	.	1.90	0.13	Use the graphical capabilities of a calculator
.	.	.	.	0.89	0.10	Use the symbolic algebra manipulation capabilities of a calculator (i.e., computer algebra system)
.	.	.	.	0.55	0.08	Use dynamic geometry software
.	.	.	.	0.98	0.12	Use productivity software (e.g., word processing, spreadsheet)
.	.	.	.	0.65	0.09	Use presentation software
.	.	.	.	1.17	0.13	Use communication software (e.g., email, instant messaging, social media)
.	.	.	.	1.00	0.12	Use search engines
.	.	.	.	2.12	0.15	Use information ethically (i.e., adhering to proper rules regarding copyright, attribution, plagiarism, or piracy)
						FOUNDATION SKILLS
3.67	0.07	3.51	0.07	3.03	0.09	Knowing basic mathematical vocabulary (e.g., mode, diameter, integer)
3.43	0.12	3.42	0.08	3.39	0.08	Knowing basic mathematical concepts (e.g., measures of central tendency, parallel lines have the same slope)
3.49	0.10	3.11	0.10	3.03	0.10	Recalling mathematical and numerical facts (e.g., multiplication table through 10 x 10, squares of whole numbers through 15, geometry formulas)
3.54	0.09	3.35	0.08	3.42	0.08	Performing basic mathematical procedures (e.g., divide multidigit numbers, find the area of a triangle, solve a linear equation)
3.04	0.14	3.18	0.09	2.48	0.09	Solving novel problems (i.e., solution method is not obvious or predictable)
3.57	0.08	3.50	0.07	3.36	0.07	Solve straightforward problems that involve several steps (solution method is predictable)
.	.	.	.	3.20	0.08	Understand problems in a real-world context and translate to mathematical relationships (e.g., numerical relationships, geometric relationships, algebraic relationships)
.	.	.	.	3.09	0.08	Interpret the mathematical solution to a real-world problem in terms of the context
						MATHEMATICS PRACTICES
3.35	0.12	3.37	0.08	.	.	Conscientiousness in doing mathematics work
2.78	0.14	2.79	0.10	.	.	Choosing challenging problems over easy ones when the opportunity arises
3.52	0.09	3.59	0.06	.	.	Demonstrating persistence when solving problems
3.32	0.11	3.51	0.07	.	.	Drawing upon previous experiences to inform current work
3.06	0.13	2.93	0.10	.	.	Proficiency reading and navigating mathematics texts
3.13	0.12	2.99	0.10	.	.	Participating in small- and large-group discussion
2.91	0.14	2.71	0.10	.	.	Facilitating group work
3.15	0.13	3.24	0.08	.	.	Showing evidence of a growth mindset

Note:

Mean = The value given under Mean is the average of participant responses on a five-point scale, where 0 = Not important, 1 = Low, and 4 = High.

+/- = The value given under +/- represents the confidence interval (CI) for the population mean, at a confidence level of 95%. For example, for a mean of 3.27 with a +/- of 0.09, we are 95% confident that the actual mean for the population is within the range 3.27 plus or minus 0.09.

MS = Middle school/junior high school teachers

HS = High school teachers

College = College instructors

. = This item was not asked at this grade level.

Table A.6

How Important Content Topics Are in Class

SCIENCE

EE		LE		Topics and Skills
Mean	+/-	Mean	+/-	
				IMPORTANCE OF SCIENCE SKILLS
2.76	0.23	3.26	0.13	Interpret graphs and tables
2.58	0.24	3.19	0.13	Construct graphs and tables of data
3.32	0.16	3.47	0.11	Perform a simple scientific investigation
2.98	0.18	3.34	0.13	Identify and use scientific tools needed for a simple scientific investigation
3.10	0.19	3.47	0.12	Understand the basic processes and steps in a simple scientific investigation
2.64	0.23	3.24	0.14	Identify factors that might affect the results of a scientific investigation
3.12	0.18	3.27	0.15	Determine the purpose of an experiment
3.20	0.19	3.57	0.11	Develop a conclusion from collected data
.	.	3.07	0.16	Develop a testable question
.	.	3.39	0.14	Understand basic scientific terminology used in investigations (e.g., control, variable, data, predict, hypothesis)
.	.	2.99	0.16	Identify similarities and differences in experiments
.	.	2.80	0.17	Compare two or more different conclusions that are based on the same experimental results
.	.	3.10	0.16	Determine which conclusions are supported by the results of an investigation
.	.	3.18	0.14	Identify data that supports, or does not support, a simple prediction
.	.	2.43	0.20	Propose and test a design plan for solving an engineering problem
				ELEMENTARY SCIENCE CONCEPTS
3.46	0.15	.	.	Describe observable properties of objects (e.g., size, mass, shape, color, temperature)
2.81	0.23	.	.	Understand that magnets attract and repel each other as well as attract and repel other materials
2.93	0.23	.	.	Understand that the position and motion of an object can be changed by pushing or pulling
2.45	0.24	.	.	Describe ways that heat can be produced (e.g., burning or rubbing)
3.03	0.21	.	.	Understand that objects sink or float in a liquid
3.51	0.15	.	.	Know that living things go through different stages of life
2.61	0.23	.	.	Know that some kinds of organisms that once lived on Earth have become extinct
3.56	0.15	.	.	Identify the specific things organisms need in order for them to stay alive (e.g., plants need light and water; animals need food, air, water, and shelter)
3.10	0.19	.	.	Understand that some animals eat only plants, only animals, both plants and animals, either dead plant or animal material
3.30	0.18	.	.	Describe weather in terms of different characteristics (e.g., temperature, rainfall, cloudiness, wind speed)
3.31	0.18	.	.	Understand that the sun provides light and heat for Earth
3.42	0.16	.	.	Recognize that seasons change in a predictable order and can influence weather
2.33	0.24	2.85	0.23	Know that fossils provide evidence about things that lived long ago and the nature of the environment at that time
2.54	0.25	.	.	Recognize that different parts of Earth have different landforms and different soil types
.	.	2.80	0.22	Recognize that heat can move from one object to another by conduction
.	.	2.83	0.21	Know that density affects whether an object sinks or floats in a liquid
.	.	2.68	0.25	Understand that electrical circuits require a complete loop through which an electrical current can pass
.	.	2.70	0.23	Describe how one substance can dissolve in another substance to form a solution
.	.	2.63	0.24	Know that mixtures can often be separated into the original substances using one or more of its characteristic properties
.	.	3.13	0.20	Recognize how matter can be changed from one state to another by heating or cooling
.	.	2.85	0.24	Describe the motion of an object by its position, direction of motion, and speed
.	.	2.71	0.23	Understand that light can be reflected, refracted, or absorbed by an object
.	.	2.60	0.23	Recognize that sound can be produced by objects vibrating
.	.	2.48	0.24	Understand that the pitch of sound can be varied by changing the frequency of vibration
.	.	3.39	0.18	Know that living things in an environment are interdependent
.	.	3.34	0.18	Understand that some animals eat only plants, only animals, plants and animals, dead plant or animal material
.	.	3.34	0.17	Recognize that the world has many different environments, and distinct environments support different types of organisms
.	.	3.25	0.19	Identify resources as the things (living or nonliving) from the environment that meet the needs of a population
.	.	3.11	0.19	Understand that a population can increase or decrease depending on factors such as disease, famine, predation, and environmental changes
.	.	3.06	0.20	Explain how plants convert energy through photosynthesis
.	.	3.24	0.18	Understand that all living things must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment

Table A.6 (continued)

How Important Content Topics Are in Class

SCIENCE

EE		LE		Topics and Skills
Mean	+/-	Mean	+/-	
.	.	2.91	0.22	Know that all living things are composed of cells
.	.	2.66	0.25	Understand that humans have systems for digestion, respiration, reproduction, circulation, excretion, movement, control and coordination, and protection from disease
.	.	2.94	0.22	Describe how natural selection has led to living things adapting to their environment
.	.	2.85	0.24	Recognize how some traits are inherited and others result from interactions with the environment
.	.	3.11	0.20	Understand that most of Earth is covered with water, mainly in oceans, and that oceans support life
.	.	3.11	0.21	Describe how weather can be measured by quantities, such as temperature, wind direction, wind speed, and precipitation
.	.	2.89	0.22	Understand that landforms are the result of a combination of constructive forces (e.g., crustal deformation, volcanic eruptions, sediment deposition) and destructive forces (e.g., erosion, weathering)
.	.	2.94	0.22	Describe how the surface of Earth can change over time due to slow processes (e.g., erosion, weathering) and due to rapid processes (e.g., volcanic eruptions, earthquakes)
.	.	2.97	0.22	Describe how decomposers play a key role in the development of soil
.	.	2.74	0.23	Recognize the properties of soils such as color, texture, capacity to retain water, and the ability to support the growth of plants, including those used for food
.	.	2.79	0.25	Understand that the patterns of motion of objects in the night sky (e.g., stars, constellations, planets, and the moon) can be predicted based on prior observations
.	.	2.63	0.24	Describe the layers of the Earth
.	.	2.56	0.24	Compare and contrast the formation of sedimentary, igneous, and metamorphic rocks, and identify examples of each
.	.	3.09	0.21	Understand that gravity is the force that keeps planets in orbit around the sun and governs the motion of other objects (e.g., moons, asteroids, comets) in the solar system
.	.	3.08	0.22	Understand important matter cycles such as the water cycle, the carbon cycle, etc.

Note:

Mean = The value given under Mean is the average of participant responses on a five-point scale, where 0 = Not important, 1 = Low, and 4 = High.

+/- = The value given under +/- represents the confidence interval (CI) for the population mean, at a confidence level of 95%. For example, for a mean of 3.27 with a +/- of 0.09, we are 95% confident that the actual mean for the population is within the range 3.27 plus or minus 0.09.

EE = Early elementary (K–2) school teachers

LE = Late elementary (3–6) school teachers

. = This item was not asked at this grade level.

Table A.7

How Important Content Topics Are in a Course

SCIENCE

MS		HS		College		Topics and Skills
Mean	+/-	Mean	+/-	Mean	+/-	
						IMPORTANCE OF SCIENCE AND ENGINEERING PRACTICES
3.59	0.08	3.54	0.06	2.81	0.07	Understand and use fundamental scientific terminology
3.28	0.10	3.39	0.07	3.40	0.06	Apply fundamental mathematics skills to analyze scientific data and phenomena
3.54	0.09	3.58	0.06	3.24	0.05	Analyze and interpret data from tables, graphs, and diagrams
3.06	0.12	3.34	0.07	2.94	0.06	Identify trends in data
3.29	0.11	3.37	0.07	2.83	0.06	Predict outcomes based on data
2.65	0.13	2.73	0.09	2.59	0.07	Use estimation to approximate calculations and quantities
3.53	0.09	3.25	0.08	2.63	0.07	Understand the purpose of each part of a scientific investigation (e.g., control, variable, hypothesis)
3.61	0.08	3.52	0.06	2.39	0.07	Perform a scientific investigation
3.24	0.12	3.34	0.07	2.74	0.07	Evaluate scientific concepts and assumptions underlying scientific explanations
3.26	0.11	3.15	0.08	2.58	0.07	Evaluate the consistency of a hypothesis, prediction, or conclusion with accompanying data presentation or scientific explanation
2.97	0.13	2.85	0.09	2.30	0.07	Evaluate the impact of new findings on the validity of a scientific explanation or model
3.04	0.13	2.93	0.09	2.53	0.07	Argue for or against a scientific claim using evidence and reasoning
2.48	0.16	1.79	0.12	1.19	0.08	Propose and execute a design solution for an engineering problem
2.23	0.16	1.59	0.11	1.04	0.07	Evaluate the effectiveness of prototypes in designing a solution for an engineering problem

Note:

Mean = The value given under Mean is the average of participant responses on a five-point scale, where 0 = Not important, 1 = Low, and 4 = High.

+/- = The value given under +/- represents the confidence interval (CI) for the population mean, at a confidence level of 95%. For example, for a mean of 3.27 with a +/- of 0.09, we are 95% confident that the actual mean for the population is within the range 3.27 plus or minus 0.09.

MS = Middle school/junior high school teachers

HS = High school teachers

College = College instructors

. = This item was not asked at this grade level.

Appendix B: Kindergarten–College Content Topics "Taught" Percentages

Table B.1

How Course Content Topics Are Taught

ENGLISH LANGUAGE ARTS

EE (%)			LE (%)			Topics and Skills
1	2	3	1	2	3	
						WRITING PURPOSES, GENRES, AND TEXT TYPES
18	7	75	6	9	85	Writing to express an opinion
14	7	78	3	7	90	Writing to explain information and ideas
9	8	83	3	15	82	Writing to recount experiences or events
22	12	66	12	14	75	Writing to explore ideas and concepts
33	20	47	14	30	55	Letters, emails, or other correspondence
33	22	45	16	25	60	Procedures or instructions
28	13	59	7	7	86	Informational pieces, reports
31	12	56	10	9	81	Opinion/persuasive texts
17	11	72	4	16	80	Personal narratives
27	19	54	16	21	63	Short stories
37	24	38	12	24	64	Poems
.	.	.	20	10	70	Expository/arguments (includes thesis/support or claim/evidence structures)
						READING COMPREHENSION
13	8	79	2	9	88	Locating important details in static text (i.e., printed reading materials)
58	15	27	27	19	53	Locating important details in dynamic text (i.e., websites and other hypertexts with interactive features that make possible and even require navigation and nonsequential reading)
10	8	82	2	5	93	Drawing logical inferences and conclusions about a text
9	8	83	1	11	89	Determining the central idea(s)/theme(s) of a short text (i.e., less than one paragraph)
27	8	66	2	8	91	Determining the central idea(s)/theme(s) of a longer text (i.e., multiple paragraphs)
13	13	74	1	12	87	Summarizing a text accurately
4	11	84	2	26	72	Ordering sequences of events in a text
8	8	84	1	15	84	Describing characters, settings, or events in stories, drama, or poetry
10	10	80	2	8	90	Interpreting the meaning of words and phrases (including figurative meanings) as they are used in a text
9	13	78	2	17	81	Describing the plot of a story
27	17	57	4	12	85	Identifying different points of view (e.g., author, narrator, speaker, character) in a story or informational text
35	16	49	8	14	78	Distinguishing one's own point of view or perspective from that of an author, narrator, speaker, or character
21	13	66	3	27	70	Distinguishing between fact and opinion in a text
25	13	62	5	12	83	Comparing two or more texts on a similar theme or topic
.	.	.	10	21	69	Distinguishing between literal and nonliteral language
.	.	.	5	11	84	Describing the overall structure of a text or part of an informational text or section of text (e.g., chronology, comparison, cause-effect, problem-solution)
.	.	.	14	30	56	Identifying false statements
.	.	.	14	18	68	Identifying persuasive techniques
.	.	.	4	20	75	Interpreting the relationship between text and associated images (e.g., pictures, maps, graphs)
						WRITING KNOWLEDGE AND SKILLS
15	9	75	3	17	80	Pre-writing (e.g., brainstorming, clustering/concept mapping, listing, outlining)
36	14	51	5	16	78	Writing multiple drafts and making revisions
32	11	58	6	13	80	Producing and publishing a polished final draft
26	11	64	.	.	.	Using knowledge of English grammar and conventions to revise individual phrases and sentences
38	11	50	.	.	.	Using knowledge of English grammar and conventions to revise short paragraphs on an engaging topic
59	12	30	.	.	.	Using knowledge of English grammar and conventions to revise longer, multi-paragraph texts
50	13	36	19	23	58	Recognizing and correcting expressions that deviate from standard English
37	14	49	8	18	75	Using the proper form for possessive pronouns (e.g., its, not it's)
7	8	85	.	.	.	Spelling grade-appropriate words correctly
7	6	87	2	18	80	Writing complete sentences with end punctuation
37	13	50	3	17	80	Grouping sentences into paragraphs
26	12	62	4	8	88	Supporting ideas or story elements with specific reasons, details, and examples

Table B.1 (continued)

How Course Content Topics Are Taught

ENGLISH LANGUAGE ARTS

EE (%)			LE (%)			Topics and Skills
1	2	3	1	2	3	
21	8	71	2	13	85	Using a clear beginning, middle, and end
55	15	30	7	27	66	Using a dictionary or thesaurus to make vocabulary decisions
43	17	40	7	12	80	Gathering relevant information about a topic from different sources
80	10	10	35	18	47	Producing a bibliography or list of sources
58	13	29	.	.	.	Integrating information from other sources into writing
.	.	.	3	13	84	Offering a logical progression of ideas on the same topic
.	.	.	3	13	84	Identifying the topic of a paragraph
.	.	.	3	9	88	Writing introductions and conclusions
.	.	.	3	14	83	Choosing appropriate vocabulary
.	.	.	18	17	65	Integrating researched information (information from other sources) into writing
						CONVENTIONS OF ENGLISH
.	.	.	4	16	80	Using knowledge of English language grammar and conventions to revise individual phrases and sentences
.	.	.	6	13	81	Using knowledge of English language grammar and conventions to revise short paragraphs
.	.	.	13	12	75	Using knowledge of English language grammar and conventions to revise longer, multi-paragraph texts
.	.	.	54	13	33	Recognizing and correcting faulty subordination, coordination, and parallelism
.	.	.	15	18	67	Recognize and correcting rhetorically inappropriate sentence fragments and fused sentences (e.g., comma splices, run-on sentences)
.	.	.	12	17	71	Recognizing and correcting inappropriate shifts in verb tense and aspect
.	.	.	12	19	69	Recognizing and correcting inappropriate shifts in pronoun number and person
.	.	.	24	20	56	Determine whether an adjective form or an adverb form is called for in a given situation
.	.	.	31	19	50	Using idiomatically appropriate prepositions
.	.	.	9	23	68	Using the appropriate word in pairs or sets of frequently confused words (e.g., past and passed)
.	.	.	14	17	68	Using commas to avoid ambiguity and maintain sentence flow
.	.	.	4	26	71	Using end of sentence punctuation (e.g., periods, question marks, exclamation points) appropriately
.	.	.	7	15	78	Punctuating dialogue in a conventional way
						SPEAKING, LISTENING, VIEWING
4	7	89	4	24	71	Reading aloud from texts in the classroom
21	13	66	12	19	69	Using information presented in diverse media and formats for speaking and listening activities
11	9	80	6	14	80	Participating in collaborative conversations with peers and adults
42	19	40	11	20	68	Giving group presentations to the class
27	19	54	6	20	74	Giving individual presentations to the class
.	.	.	4	12	83	Listening in order to draw conclusions based on facts, gist, and inferred meaning
.	.	.	23	18	59	Demonstrating awareness of the specific purpose for collaboration by adapting behaviors to suit it
.	.	.	24	22	54	Managing one's own nonverbal cues in collaborative communication
.	.	.	28	17	54	Adapting style of speech to a variety of contexts and communicative tasks, including formal speeches and presentations

Note:
1 = Not taught in the course
2 = Taught in the course but mainly as review
3 = Taught in the course as part of the standard course content
EE = Early elementary (K–2) school teachers
LE = Late elementary (3–6) school teachers
. = This item was not asked at this grade level.

Table B.2
How Course Content Topics Are Taught
READING

MS (%)			HS (%)			Topics and Skills
1	2	3	1	2	3	
						READING SKILLS
8	30	62	8	37	56	Reading words and sentences (e.g., applying word knowledge efficiently, interpreting complex syntax, reading academic language fluently)
0	7	93	1	13	86	Understanding texts (e.g., identifying central ideas and purposes, inferring relationships between events and/or characters, summarizing the most important information)
4	12	84	4	9	87	Evaluating texts (e.g., analyzing authors' techniques and evaluating effectiveness, evaluating evidence and/or support for claims or positions, determining the usefulness of texts for particular purposes)
0	22	78	1	22	77	Determining central ideas
1	26	73	3	21	76	Determining the purpose for which a text was written
2	24	74	4	19	77	Determining an author's points of view
1	9	90	1	14	84	Drawing conclusions and making inferences
2	22	76	3	25	72	Analyzing cause-and-effect relationships
4	19	77	6	22	72	Analyzing comparative relationships
7	15	78	6	15	79	Analyzing multiple levels of meaning
5	16	79	5	22	73	Using knowledge of academic language to interpret a text
9	15	76	6	21	73	Identifying specific claims
4	11	85	3	14	83	Evaluating evidence and/or support for claims
2	29	69	5	29	66	Distinguishing among fact, opinion, and reasoned judgment
0	19	80	2	24	74	Identifying important details
8	21	71	11	23	67	Identifying literary devices and interpreting their effect
10	28	62	8	26	66	Identifying persuasive techniques
6	18	76	4	19	77	Connecting and summarizing information from multiple sources
2	21	76	6	29	66	Using reading strategies to manage comprehension of challenging texts
34	28	38	32	29	40	Navigating digital texts effectively
7	29	64	16	31	53	Interpreting the relationship between a text and associated images (e.g., pictures, maps, graphs)
						TEXT GENRES
28	24	48	28	13	59	Drama
13	22	66	20	18	62	Poetry
9	14	77	13	12	74	Fiction
4	14	82	7	14	79	Literary nonfiction (e.g., memoirs, personal essays)
33	31	36	21	33	45	Humanities (e.g., art, film, language, music)
42	24	34	31	28	41	Social sciences (e.g., anthropology, history, psychology, sociology)
62	20	18	68	19	13	Natural sciences (e.g., biology, chemistry, geology, physics)

Note:
1 = Not taught in the course
2 = Taught in the course but mainly as review
3 = Taught in the course as part of the standard course content
MS = Middle school/junior high school teachers
HS = High school teachers
These items were not asked of college instructors.

Table B.3

How Course Content Topics Are Taught

WRITING

MS (%)			HS (%)			Topics and Skills
1	2	3	1	2	3	
						WRITING GENRES AND TEXT TYPES
33	44	24	52	29	19	Letters, emails, or other correspondence
21	33	46	32	39	29	Procedures or instructions
4	11	85	10	20	70	Informational pieces, reports
2	5	93	4	6	90	Expository/arguments (includes thesis/support or claim/evidence structures)
2	9	89	3	13	83	Opinion/persuasive texts
4	30	67	12	29	59	Personal narratives
20	28	52	33	18	49	Short stories
15	25	60	32	19	50	Poems
						APPROACHES TO WRITING
3	23	74	3	19	78	Generating sound ideas for writing
1	21	78	3	22	75	Using language conventions proficiently
5	10	85	3	10	87	Critically analyzing source texts
2	14	84	4	18	78	Clearly summarizing other authors' ideas in writing
						CONVENTIONS OF ENGLISH
3	28	69	3	41	57	Using knowledge of English grammar and conventions to revise individual phrases and sentences
2	25	73	4	41	55	Using knowledge of English grammar and conventions to revise short paragraphs on an engaging topic
4	24	72	5	31	64	Using knowledge of English grammar and conventions to revise longer, multi-paragraph texts
28	22	50	10	34	55	Recognizing and correcting faulty subordination, coordination, and parallelism
5	32	63	4	39	57	Recognizing and correcting rhetorically inappropriate sentence fragments and fused sentences (e.g., comma splices, run-on sentences)
7	34	60	6	47	47	Recognizing and correcting inappropriate shifts in verb tense and aspect
6	32	62	6	46	48	Recognizing and correcting inappropriate shifts in pronoun number and person
19	33	49	16	50	34	Determining whether an adjective form or an adverb form is called for in a given situation
7	39	55	9	54	37	Using the proper form for possessive pronouns (e.g., its, not it's)
12	37	51	12	49	39	Recognizing and correcting expressions that deviate from standard English
20	34	47	19	50	30	Using idiomatically appropriate prepositions
5	41	54	14	53	34	Using the appropriate word in pairs or sets of frequently confused words (e.g., past and passed)
3	34	64	7	42	51	Using commas to avoid ambiguity and maintain sentence flow
12	34	54	11	42	47	Using punctuation to set off parenthetical elements
9	35	56	10	43	47	Using punctuation to set off nonessential/nonrestrictive appositives and clauses
7	36	57	12	45	44	Punctuating dialogue in a conventional way
13	28	58	8	39	53	Using a semicolon to link closely related independent clauses or when items in a series have internal punctuation (e.g., when items have their own commas)
16	30	54	9	43	48	Using a colon to introduce an example, an elaboration, or a series of phrases
						WRITING PROCESS AND EVIDENCE
1	25	74	7	38	56	Using pre-writing techniques (e.g., brainstorming, clustering/concept mapping, listing, outlining)
1	19	80	2	28	70	Writing multiple drafts and making revisions
1	15	84	3	18	79	Producing and publishing a polished final draft
1	6	93	3	9	88	Establishing a position and supporting it with reasons and evidence
1	8	91	3	12	85	Using different types of evidence to support writing (e.g., facts and data, evidence drawn from personal experience) depending on task, purpose, and audience
10	12	78	6	15	78	Integrating different writing modes and strategies (e.g., logical argumentation, emotional appeals, exposition, narration) in a writing task for a given purpose and audience
						SPEAKING, LISTENING, VIEWING
11	22	67	16	28	56	Using information presented in diverse media and formats for speaking and listening activities
9	24	67	14	31	55	Listening in order to draw informed conclusions based on facts, gist, and inferred meaning
6	22	72	8	22	70	Participating in collaborative conversations with peers and adults
16	32	52	20	32	48	Demonstrating awareness of the specific purpose for collaboration by adapting behaviors to suit it
30	28	41	34	34	33	Managing one's own nonverbal cues in collaborative communication

Table B.3 (continued)
How Course Content Topics Are Taught
WRITING

MS (%)			HS (%)			Topics and Skills
1	2	3	1	2	3	
13	21	66	21	29	51	Giving group presentations to the class
7	22	70	18	26	56	Giving individual presentations to the class
14	26	61	23	26	50	Adapting style of speech to a variety of contexts and communicative tasks, including formal speeches and presentations
.	.	.	21	22	58	Evaluating speaker's motives and strategic choices regarding presentation and content
						ENGAGING WITH MULTIPLE PERSPECTIVES
9	19	72	9	16	75	Engaging with multiple perspectives on a topic
31	19	50	13	17	70	Identifying and analyzing rhetorical strategies
6	21	72	10	15	75	Writing for specific audiences other that the instructor (i.e., the specified audience could be real or imagined)
4	17	79	3	17	80	Recognizing other views
12	13	74	7	12	81	Recognizing other counterarguments
17	15	68	10	15	74	Rebutting counterarguments
10	13	76	10	14	76	Integrating own ideas with the ideas of others in writing
						GENERAL WRITING KNOWLEDGE AND SKILLS
.	.	.	1	16	83	Topic development in terms of purpose and focus
.	.	.	0	11	89	Organization, unity, and cohesion (strategies to ensure that text is logically organized, flows smoothly, and has an effective introduction and conclusion)
.	.	.	2	22	76	Knowledge of language (e.g., ensuring precision and concision in word choice, maintaining consistency in style and tone)
.	.	.	2	41	57	Sentence structure and formation (e.g., making sure that sentences are grammatically sound)
.	.	.	4	46	50	Usage conventions (e.g., writing conforms to standard English usage)
.	.	.	3	48	49	Punctuation conventions (e.g., following rules of standard English punctuation)

Note:
1 = Not taught in the course
2 = Taught in the course but mainly as review
3 = Taught in the course as part of the standard course content
MS = Middle school/junior high school teachers
HS = High school teachers
These items were not asked of college instructors.

Table B.4

How Course Content Topics Are Taught

MATHEMATICS

EE (%)				LE (%)				Topics and Skills
1	2	3	4	1	2	3	4	
								APPLIED MATHEMATICAL KNOWLEDGE AND SKILLS
6	55	11	28	7	38	17	38	Identifying trends in data
2	16	7	75	1	4	13	82	Explaining mathematical concepts precisely and fluently
3	30	9	59	3	17	10	70	Choosing appropriate degree of precision for modeling real-world situations
2	29	10	58	3	10	20	67	Recognizing when essential information is missing
3	17	9	71	7	8	18	67	Creating visual representations of data such as tables, line graphs, and bar graphs
2	17	7	74	4	6	20	70	Interpreting visual representations of data such as tables, line graphs, and bar graphs
3	10	10	78	2	5	11	82	Executing mathematical processes without technology (i.e., using only mental or paper-and-pencil calculations)
.	.	.	.	3	15	11	71	Using basic geometry skills (e.g., estimating and computing area and volume, converting units of measurement, measuring angles)
.	.	.	.	4	7	21	68	Analyzing and interpreting data from tables, graphs, and diagrams
								JUSTIFICATION AND EXPLANATION
2	48	10	40	.	.	.	.	Explaining another student's mathematical justification
2	38	11	48	2	14	13	72	Finding and explaining an error in a mathematical justification
2	30	7	61	2	16	11	71	Using examples to support or challenge a mathematical justification
2	47	9	42	3	25	13	59	Organizing mathematical statements to make a valid argument
2	37	11	50	3	20	14	64	Explicitly stating the given information whenever justifying
2	42	9	48	2	20	13	64	Explicitly stating a conclusion whenever justifying
2	39	10	48	3	13	18	66	Using general statements when justifying (e.g., all even numbers are divisible by 2)
2	37	9	51	2	15	11	72	Knowing that mathematical justification means providing reasons
.	.	.	.	2	14	8	76	Reading and explaining a mathematical justification
								MATHEMATICS TOPICS
10	3	20	67	.	.	.	.	Recognizing 1–5 objects without actually counting (i.e., subitize quantities)
19	1	21	59	.	.	.	.	Counting to 10
4	7	12	76	.	.	.	.	Recognizing a bundle of 10 "ones" as 1 "ten"
3	3	12	82	.	.	.	.	Using counting-on as a strategy for addition
6	8	20	67	.	.	.	.	Using ordinal numbers (e.g., first, second, third)
5	17	13	65	.	.	.	.	Locating whole numbers on the number line
3	33	9	55	5	6	22	67	Understanding why estimation is useful
3	33	9	55	3	5	22	69	Understanding what makes a good estimate
7	7	11	75	7	3	29	61	Identifying and extending patterns
3	29	8	60	3	16	19	62	Looking for and being guided by mathematical structure
6	63	5	26	11	31	13	45	Identifying angle situations in everyday objects (e.g., turning of a doorknob, path of windshield wipers, corner of a room, road intersections)
3	52	6	38	11	22	20	46	Measuring an object's length when neither end of the object is aligned with the zero point on a ruler
3	46	6	46	3	19	14	63	Predicting outcomes based on data
3	56	7	34	12	24	13	51	Measuring area by tiling two-dimensional units (e.g., laying index cards side by side with no overlaps to measure the area of a desktop)
5	64	5	26	.	.	.	.	Applying order of operations to mathematical expressions such as 12 – 5 – 2
4	67	8	20	9	31	21	39	Using a calculator or computer for computation
.	.	.	.	5	25	12	59	Locating positive decimals on the number line
.	.	.	.	4	13	9	74	Locating positive fractions on the number line
.	.	.	.	3	26	7	64	Comparing a decimal and a fraction
.	.	.	.	4	5	18	72	Using rounding strategies for computational estimation
.	.	.	.	1	23	6	71	Evaluating algebraic expressions
.	.	.	.	8	36	10	46	Understanding that angles are measured in the number of parts out of 360 that it takes to make a full rotation
.	.	.	.	12	37	8	43	Using a protractor to measure angles
.	.	.	.	5	33	15	47	Determining the probability of a simple event
.	.	.	.	5	55	12	28	Determining the probability of a compound event
.	.	.	.	9	42	12	38	Using median as a measure of center
.	.	.	.	8	41	14	38	Using mean as a measure of center

Table B.4 (continued)
How Course Content Topics Are Taught
MATHEMATICS

EE (%)				LE (%)				Topics and Skills
1	2	3	4	1	2	3	4	
.	.	.	.	8	62	8	23	Using interquartile range as a measure of spread
.	.	.	.	8	65	8	19	Using mean absolute deviation as a measure of spread
.	.	.	.	10	43	12	35	Creating a circle graph
.	.	.	.	10	33	13	44	Interpreting a circle graph
.	.	.	.	3	16	12	69	Dividing using the standard algorithm
.	.	.	.	3	20	8	69	Applying order of operations to mathematical expressions such as 12 – 3 x 4
.	.	.	.	3	19	8	71	Applying order of operations to mathematical expressions with grouping symbols, such as 12 – (5 – 2)
.	.	.	.	8	68	6	18	Using a calculator or computer for graphing equations
.	.	.	.	10	65	4	21	Using an equation editor to enter expressions or equations
								FOUNDATION SKILLS
1	6	8	86	.	.	.	.	Knowing basic mathematical vocabulary (e.g., sum, rectangle)
1	12	5	82	.	.	.	.	Knowing basic mathematical concepts (e.g., place value, subtraction)
2	16	8	74	.	.	.	.	Recalling mathematical and numerical facts (e.g., addition facts for single digits)
1	42	3	54	.	.	.	.	Performing basic mathematical procedures (e.g., adding two-digit numbers, subtracting with borrowing)
3	53	7	37	3	13	14	70	Solving novel problems (i.e., solution method is not obvious or predictable)
2	21	7	70	2	2	13	82	Solving straightforward problems (i.e., solution method is predictable)
.	.	.	.	2	3	12	83	Knowing basic mathematical vocabulary (e.g., denominator, quadrilateral)
.	.	.	.	3	2	14	80	Knowing basic mathematical concepts (e.g., place value, connections between multiplication and area)
.	.	.	.	8	2	24	66	Recalling mathematical and numerical facts (e.g., addition facts for single digits, times table through 10 x 10)
.	.	.	.	3	4	16	78	Performing basic mathematical procedures (e.g., add multidigit numbers, multiply decimals)

Note:
1 = Not taught (Covered in a previous grade)
2 = Not taught (Covered in a future grade)
3 = Taught (Mostly as review)
4 = Taught (Regular course content)
EE = Early elementary (K–2) school teachers
LE = Late elementary (3–6) school teachers
. = This item was not asked at this grade level.

Table B.5

How Course Content Topics Are Taught

MATHEMATICS

MS (%)				HS (%)				Topics and Skills
1	2	3	4	1	2	3	4	
								APPLIED MATHEMATICAL KNOWLEDGE AND SKILLS
10	10	20	59	28	13	26	33	Using geometry skills (e.g., estimating and computing area and volume, converting units of measurement, measuring angles)
5	16	21	59	19	18	21	42	Identifying trends in data
5	4	23	68	15	7	25	53	Analyzing and interpreting data from tables, graphs, and diagrams
17	14	21	49	22	22	19	37	Determining likelihood and probability
2	5	17	76	2	2	13	82	Explaining mathematical concepts precisely and fluently
4	19	15	62	9	10	23	58	Choosing appropriate degree of precision for modeling real-world situations
7	8	33	52	11	4	29	56	Recognizing when essential information is missing
11	3	27	58	26	7	24	43	Creating visual representations of data such as tables, line graphs, and bar graphs
7	4	27	62	21	6	26	47	Interpreting visual representations of data such as tables, line graphs, and bar graphs
10	2	27	61	17	2	26	55	Executing mathematical processes without technology (i.e., using only mental or paper-and-pencil calculations)
.	.	.	.	48	3	37	12	Applying estimation skills (e.g., judging rough quantities or cost)
.	.	.	.	22	1	44	33	Applying algebra/pre-algebra skills (e.g., solving multiple-step problems involving fractions, decimals, or percentages)
								JUSTIFICATION AND EXPLANATION
1	9	16	74	5	7	16	72	Reading and explaining a mathematical justification
2	9	21	67	6	5	20	69	Finding and explaining an error in a mathematical justification
1	14	19	66	.	.	.	.	Using examples to support or challenge a mathematical statement
1	25	15	59	9	15	14	62	Organizing mathematical statements to make a valid argument
2	19	19	59	.	.	.	.	Explicitly stating the given information whenever justifying
2	21	17	59	.	.	.	.	Explicitly stating a conclusion whenever justifying
6	13	30	51	.	.	.	.	Using general statements when justifying (e.g., all even numbers are divisible by 2)
3	16	18	63	.	.	.	.	Knowing that mathematical justification means providing reasons
.	.	.	.	6	17	19	58	Producing examples to test the validity of a mathematical claim
.	.	.	.	10	12	18	60	Routinely stating the given information explicitly when justifying
.	.	.	.	8	11	18	63	Routinely stating a conclusion explicitly when justifying
.	.	.	.	14	9	25	52	Providing and using general statements when justifying (e.g., all even numbers are divisible by 2)
.	.	.	.	6	9	16	69	Providing reasoning for mathematical statements when justifying
								MATHEMATICS TOPICS
29	2	30	39	69	2	20	9	Locating positive decimals on the number line
28	3	31	38	68	2	21	9	Locating positive fractions on the number line
21	2	31	45	.	.	.	.	Comparing a decimal and a fraction
18	2	34	46	47	1	41	12	Performing operations with positive fractions
22	1	28	49	54	1	31	14	Understanding percentage as a rate out of 100
22	1	38	39	.	.	.	.	Understanding why estimation is useful
21	2	37	40	.	.	.	.	Understanding what makes a reasonable estimate
27	1	40	32	.	.	.	.	Using rounding strategies for computational estimation
16	3	32	49	16	5	29	51	Identifying and extending patterns
7	9	26	59	8	7	24	61	Looking for and being guided by mathematical structure
4	4	12	80	14	2	33	52	Evaluating algebraic expressions
1	26	7	66	11	9	25	55	Solving a multivariable equation for one of the variables
1	39	7	53	21	12	20	47	Solving systems of two linear inequalities
2	55	7	37	15	11	26	48	Solving quadratic equations by factoring
2	30	7	61	17	8	22	53	Understanding that equations can have one, many, or no solutions
3	26	9	62	18	9	22	52	Understanding the concept of a function
3	69	6	22	17	46	6	30	Understanding informal limit arguments (e.g., the circumference of a circle can be found by using inscribed regular polygons that have more and more sides)
9	29	17	45	25	23	14	38	Understanding that angles are measured in the number of parts out of 360 that it takes to make a full rotation
13	31	20	37	29	25	11	34	Identifying angle situations in everyday objects (e.g., turning of a doorknob, path of windshield wipers, corner of a room, road intersections)
8	20	13	59	33	19	14	33	Using properties of angles (e.g., complementary, supplementary, adjacent, vertical) to find the measures of angles

Table B.5 (continued)
How Course Content Topics Are Taught
MATHEMATICS

MS (%)				HS (%)				Topics and Skills
1	2	3	4	1	2	3	4	
7	29	13	51	35	20	12	33	Using properties of parallel and perpendicular lines to find the measures of angles
12	29	12	48	27	21	13	38	Applying transformations (e.g., rotations, reflections, translations) to figures
30	27	20	23	49	15	12	24	Measuring an object's length when neither end of the object is aligned with the zero point on a ruler
28	20	22	30	49	18	10	23	Using a protractor to measure angles
4	32	11	53	21	22	19	38	Knowing that relationships between variables can have positive or negative associations and different strengths
3	63	8	26	18	44	11	27	Differentiating causation from correlation
10	42	11	37	18	49	11	22	Understanding the role of randomization in surveys, experiments, and observational studies
5	29	11	55	25	20	13	41	Representing data with a scatterplot and estimating a line of best fit
6	16	15	64	17	21	15	47	Predicting outcomes based on data
10	25	14	50	19	37	12	32	Using data from a representative sample to generalize to a population
18	15	18	48	29	23	16	33	Determining the probability of a simple event
15	26	16	44	26	34	9	31	Determining the probability of a compound event
19	7	26	48	38	15	20	26	Using median as a measure of center
19	7	27	47	37	15	22	25	Using mean as a measure of center
14	27	13	46	31	30	14	25	Using interquartile range as a measure of spread
11	45	10	34	24	47	9	20	Using mean absolute deviation as a measure of spread
32	22	17	28	.	.	.	.	Creating a circle graph
26	18	24	31	.	.	.	.	Interpreting a circle graph
29	19	23	29	.	.	.	.	Dividing using the standard algorithm
13	2	35	50	.	.	.	.	Applying order of operations to mathematical expressions, such as 12 – 3 x 4
11	2	33	54	.	.	.	.	Applying order of operations to mathematical expressions with grouping symbols, such as 12 – (5 – 2)
10	8	26	56	13	4	23	60	Using a calculator or computer for computation
4	51	10	35	12	17	17	54	Using a calculator or computer for graphing equations
5	61	11	24	16	39	12	33	Using an equation editor to enter expressions or equations
.	.	.	.	11	57	6	26	Find magnitude, direction, and components of vectors
.	.	.	.	10	26	11	53	Modeling with higher order polynomials
.	.	.	.	13	28	13	46	Dividing polynomials
.	.	.	.	10	27	11	52	Graph and recognize characteristics (e.g., zeros, end behavior) of polynomial functions
.	.	.	.	9	37	8	46	Graph and recognize characteristics (e.g., zeros, asymptotes, end behavior) of rational functions
								FOUNDATION SKILLS
5	1	24	70	14	1	28	58	Knowing basic mathematical vocabulary (e.g., mode, diameter, integer)
2	10	20	68	12	3	27	57	Knowing basic mathematical concepts (e.g., measures of central tendency, parallel lines have the same slope)
23	2	44	31	39	1	35	25	Recalling mathematical and numerical facts (e.g., multiplication table through 10 x 10, squares of whole numbers through 15, geometry formulas)
11	4	33	52	26	1	35	39	Performing basic mathematical procedures (e.g., divide multidigit numbers, find the area of a triangle, solve a linear equation)
2	19	17	62	5	9	18	67	Solving novel problems (i.e., solution method is not obvious or predictable)
3	2	21	74	5	1	21	73	Solving straightforward problems (i.e., solution method is predictable)

Note:
1 = Not taught (Covered in a previous grade)
2 = Not taught (Covered in a future grade)
3 = Taught (Mostly as review)
4 = Taught (Regular course content)
MS = Middle school/junior high school teachers
HS = High school teachers
These items were not asked of college instructors.

Table B.6

How Course Content Topics Are Taught

SCIENCE

EE (%)			LE (%)			Topics and Skills
1	2	3	1	2	3	
						IMPORTANCE OF SCIENCE SKILLS
26	11	64	5	27	68	Interpret graphs and tables
28	13	58	6	24	70	Construct graphs and tables of data
7	9	84	2	10	88	Perform a simple scientific investigation
13	11	76	5	18	77	Identify and use scientific tools needed for a simple scientific investigation
14	9	77	3	12	85	Understand the basic processes and steps in a simple scientific investigation
27	15	58	6	14	80	Identify factors that might affect the results of a scientific investigation
13	15	73	6	15	78	Determine the purpose of an experiment
9	11	80	3	10	87	Develop a conclusion from collected data
.	.	.	11	21	68	Develop a testable question
.	.	.	6	11	83	Understand basic scientific terminology used in investigations (e.g., control, variable, data, predict, hypothesis)
.	.	.	11	23	66	Identify similarities and differences in experiments
.	.	.	18	23	59	Compare two or more different conclusions that are based on the same experimental results
.	.	.	14	15	71	Determine which conclusions are supported by the results of an investigation
.	.	.	10	18	72	Identify data that supports, or does not support, a simple prediction
.	.	.	37	21	42	Propose and test a design plan for solving an engineering problem
						ELEMENTARY SCIENCE CONCEPTS
5	6	89	.	.	.	Describe observable properties of objects (e.g., size, mass, shape, color, temperature)
26	9	65	.	.	.	Understand that magnets attract and repel each other as well as attract and repel other materials
23	11	67	.	.	.	Understand that the position and motion of an object can be changed by pushing or pulling
38	14	48	.	.	.	Describe ways that heat can be produced (e.g., burning or rubbing)
16	11	73	.	.	.	Understand that objects sink or float in a liquid
5	7	87	.	.	.	Know that living things go through different stages of life
27	21	52	.	.	.	Know that some kinds of organisms that once lived on Earth have become extinct
7	4	89	.	.	.	Identify the specific things organisms need in order for them to stay alive (e.g., plants need light and water; animals need food, air, water, and shelter)
16	10	74	.	.	.	Understand that some animals eat only plants, only animals, both plants and animals, either dead plant or animal material
10	11	79	.	.	.	Describe weather in terms of different characteristics (e.g., temperature, rainfall, cloudiness, wind speed)
13	12	75	.	.	.	Understand that the sun provides light and heat for Earth
7	13	80	.	.	.	Recognize that seasons change in a predictable order and can influence weather
36	15	49	22	18	61	Know that fossils provide evidence about things that lived long ago and the nature of the environment at that time
29	11	60	.	.	.	Recognize that different parts of Earth have different landforms and different soil types
.	.	.	25	10	65	Recognize that heat can move from one object to another by conduction
.	.	.	21	15	64	Know that density affects whether an object sinks or floats in a liquid
.	.	.	33	10	57	Understand that electrical circuits require a complete loop through which an electrical current can pass
.	.	.	26	14	60	Describe how one substance can dissolve in another substance to form a solution
.	.	.	30	14	56	Know that mixtures can often be separated into the original substances using one or more of its characteristic properties
.	.	.	12	16	73	Recognize how matter can be changed from one state to another by heating or cooling
.	.	.	25	13	62	Describe the motion of an object by its position, direction of motion, and speed
.	.	.	25	15	60	Understand that light can be reflected, refracted, or absorbed by an object
.	.	.	32	12	57	Recognize that sound can be produced by objects vibrating
.	.	.	34	15	50	Understand that the pitch of sound can be varied by changing the frequency of vibration
.	.	.	8	10	82	Know that living things in an environment are interdependent
.	.	.	7	12	81	Understand that some animals eat only plants, only animals, plants and animals, dead plant or animal material
.	.	.	7	15	78	Recognize that the world has many different environments, and distinct environments support different types of organisms
.	.	.	8	14	78	Identify resources as the things (living or nonliving) from the environment that meet the needs of a population
.	.	.	15	17	68	Understand that a population can increase or decrease depending on factors such as disease, famine, predation, and environmental changes

Table B.6 (continued)
How Course Content Topics Are Taught
SCIENCE

EE (%)			LE (%)			Topics and Skills
1	2	3	1	2	3	
.	.	.	15	18	66	Explain how plants convert energy through photosynthesis
.	.	.	10	13	76	Understand that all living things must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment
.	.	.	23	18	59	Know that all living things are composed of cells
.	.	.	34	15	51	Understand that humans have systems for digestion, respiration, reproduction, circulation, excretion, movement, control and coordination, and protection from disease
.	.	.	25	20	55	Describe how natural selection has led to living things adapting to their environment
.	.	.	25	16	59	Recognize how some traits are inherited and others result from interactions with the environment
.	.	.	13	20	67	Understand that most of Earth is covered with water, mainly in oceans, and that oceans support life
.	.	.	16	18	67	Describe how weather can be measured by quantities, such as temperature, wind direction, wind speed, and precipitation
.	.	.	19	21	59	Understand that landforms are the result of a combination of constructive forces (e.g., crustal deformation, volcanic eruptions, sediment deposition) and destructive forces (e.g., erosion, weathering)
.	.	.	18	18	64	Describe how the surface of Earth can change over time due to slow processes (e.g., erosion, weathering) and due to rapid processes (e.g., volcanic eruptions, earthquakes)
.	.	.	19	14	66	Describe how decomposers play a key role in the development of soil
.	.	.	25	24	51	Recognize the properties of soils such as color, texture, capacity to retain water, and the ability to support the growth of plants, including those used for food
.	.	.	25	15	60	Understand that the patterns of motion of objects in the night sky (e.g., stars, constellations, planets, and the moon) can be predicted based on prior observations
.	.	.	29	18	52	Describe the layers of the Earth
.	.	.	32	17	51	Compare and contrast the formation of sedimentary, igneous, and metamorphic rocks, and identify examples of each
.	.	.	19	16	65	Understand that gravity is the force that keeps planets in orbit around the sun and governs the motion of other objects (e.g., moons, asteroids, comets) in the solar system
.	.	.	18	12	70	Understand important matter cycles such as the water cycle, the carbon cycle, etc.

Note:
1 = Not taught in the course
2 = Taught in the course but mainly as review
3 = Taught in the course as part of the standard course content
EE = Early elementary (K–2) school teachers
LE = Late elementary (3–6) school teachers
. = This item was not asked at this grade level.

Table B.7

How Course Content Topics Are Taught

SCIENCE

MS (%)			HS (%)			Topics and Skills
1	2	3	1	2	3	
						IMPORTANCE OF SCIENCE AND ENGINEERING PRACTICES
1	12	87	1	16	83	Understand and use fundamental scientific terminology
5	32	63	5	27	68	Apply fundamental mathematics skills to analyze scientific data and phenomena
2	18	80	1	22	77	Analyze and interpret data from tables, graphs, and diagrams
9	26	64	3	25	72	Identify trends in data
6	20	74	3	20	77	Predict outcomes based on data
18	40	42	14	42	44	Use estimation to approximate calculations and quantities
3	19	78	5	35	60	Understand the purpose of each part of a scientific investigation (e.g., control, variable, hypothesis)
2	11	87	2	15	83	Perform a scientific investigation
7	16	78	4	19	77	Evaluate scientific concepts and assumptions underlying scientific explanations
6	21	72	6	24	70	Evaluate the consistency of a hypothesis, prediction, or conclusion with accompanying data presentation or scientific explanation
19	21	59	14	25	61	Evaluate the impact of new findings on the validity of a scientific explanation or model
15	22	63	15	23	62	Argue for or against a scientific claim using evidence and reasoning
38	19	43	57	15	28	Propose and execute a design solution for an engineering problem
45	22	33	62	16	23	Evaluate the effectiveness of prototypes in designing a solution for an engineering problem

Note:
1 = Not taught in the course
2 = Taught in the course but mainly as review
3 = Taught in the course as part of the standard course content
MS = Middle school/junior high school teachers
HS = High school teachers
These items were not asked of college instructors.

Appendix C: Other Topics

Table C.1

How Proficient Students Are Regarding Specific Reading Genres and Text Types

ENGLISH LANGUAGE ARTS

EE (%)				LE (%)				Reading Genres and Text Types
Not Proficient			Very Proficient	Not Proficient			Very Proficient	
1	2	3	4	1	2	3	4	
16	20	36	28	7	13	44	36	Short stories
24	31	31	14	6	15	49	30	Personal narratives/memoirs
24	33	32	11	11	27	45	17	Myths, tales, fables
33	36	24	7	14	36	34	16	Poetry
39	33	24	5	15	33	38	14	Dramas/plays
44	28	21	8	6	15	33	46	Chapter books
34	32	25	8	11	33	37	20	Natural science texts
36	33	23	7	11	31	39	19	Social science texts
44	34	18	4	11	31	36	22	Historical passages, biographies
40	33	24	4	9	30	44	16	Opinion/persuasive texts
61	29	7	3	31	41	20	8	Speeches
47	30	17	7	15	29	38	19	Informational websites
.	.	.	.	20	34	32	14	Expository/arguments (includes thesis/support or claim/evidence structures)

Note:
EE = Early elementary (K–2) school teachers
LE = Late elementary (3–6) school teachers
. = This item was not asked at this grade level.

Table C.2

How Proficient Students Are with Using Specific Text Types

READING

MS (%)				HS (%)				Text Types
Not Proficient			Very Proficient	Not Proficient			Very Proficient	
1	2	3	4	1	2	3	4	
6	27	42	25	4	21	47	27	Textbooks
3	21	40	36	3	18	44	34	Fictional texts (e.g., novels or short stories)
10	32	44	14	6	29	45	20	Articles from popular periodicals (including Internet sites)
37	40	18	5	32	40	21	6	Articles from scholarly periodicals
15	43	36	6	14	37	38	12	Functional texts (e.g., instruction manuals, memos)
22	41	24	13	15	38	35	12	Historical documents (e.g., Declaration of Independence)
7	28	45	20	4	25	48	23	Informational websites

Note:
MS = Middle school/junior high school teachers
HS = High school teachers
These items were not asked of college instructors..

Table C.3

How Prepared Students Are on Content Skills When Entering a Course

READING

College (%)				Topics and Skills
Not Prepared 1	2	3	Very Prepared 4	
				READING SKILLS
9	43	39	8	Reading words and sentences (e.g., applying word knowledge efficiently, interpreting complex syntax, reading academic language fluently)
12	55	30	2	Understanding texts (e.g., identifying central ideas and purposes, inferring relationships between events and/or characters, summarizing the most important information)
35	49	15	1	Evaluating texts (e.g., analyzing authors' techniques and evaluating effectiveness, evaluating evidence and/or support for claims or positions, determining the usefulness of texts for particular purposes)
6	42	46	5	Determining the central ideas
18	55	26	1	Determining the purpose for which a text was written
18	52	27	2	Determining an author's points of view
20	53	25	2	Drawing conclusions and making inferences
18	49	30	3	Analyzing cause-and-effect relationships
20	50	29	1	Analyzing comparative relationships
35	51	14	1	Analyzing multiple levels of meaning
42	46	10	2	Using knowledge of academic language to interpret text
25	52	21	2	Evaluating evidence and/or support for an author's claims
11	44	41	4	Identifying important details
34	52	12	3	Identifying the use and effect of literary devices
26	57	15	1	Connecting and summarizing information from multiple sources
30	52	17	2	Using reading strategies to manage comprehension of challenging texts
14	40	39	7	Navigating digital texts effectively
				ARGUMENT ANALYSIS
13	45	37	4	Identifying specific claims
25	59	16	1	Evaluating the reasoning used in an argument
29	53	16	2	Distinguishing among fact, opinion, and reasoned judgment
32	54	14	1	Identifying persuasive techniques
				TEXT TYPES How prepared students entering your course are with regard to these types of texts
8	32	46	14	Textbooks
17	47	31	4	Fiction (e.g., novels or short stories)
16	39	35	10	Articles from popular periodicals (including Internet sites)
67	28	3	1	Articles from scholarly periodicals
23	48	27	2	Functional texts (e.g., instruction manuals, memos)
28	54	17	0	Historical documents (e.g., Declaration of Independence)
				TEXT GENRES How prepared students entering your course are with regard to familiarity with these text genres
33	47	19	2	Drama
46	44	9	1	Poetry
21	55	23	1	Literary nonfiction (e.g., memoirs, personal essays)
21	50	28	2	Humanities (e.g., art, film, language, music)
24	53	21	1	Social sciences (e.g., anthropology, history, psychology, sociology)
36	49	14	2	Natural sciences (e.g., biology, chemistry, geology, physics)

Note:

College = College instructors

These items were not asked of middle school/junior high teachers or high school teachers.

Table C.4

How Prepared Students Are on Content Skills When Entering a Course

WRITING

College (%)				Topics and Skills
Not Prepared 1	2	3	Very Prepared 4	
				SPEAKING, LISTENING, VIEWING
25	53	20	1	Listen to evaluate speaker's motives and strategic choices regarding presentation and content
23	57	19	1	Listen in order to draw informed conclusions based on facts, gist, and inferred meaning
31	46	21	2	Demonstrate mastery of formal speaking skills in a speech or presentation
22	53	23	2	Listen to multiple perspectives in order to respond to and collaborate with others
22	54	22	2	Demonstrate awareness of the specific purpose for collaboration by adapting behaviors to suit it
22	49	25	3	Manage one's own nonverbal cues in collaborative communication
				GENERAL WRITING KNOWLEDGE AND SKILLS
12	51	35	2	Sentence structure and formation (making sure that sentences are grammatically sound)
12	48	38	2	Usage conventions (writing conforms to standard English usage)
18	50	30	2	Punctuation conventions (following rules of standard English punctuation)
19	51	27	2	Topic development in terms of purpose and focus
19	56	22	2	Organization, unity, and cohesion (strategies to ensure that text is logically organized, flows smoothly, and has an effective introduction and conclusion)
28	56	15	1	Knowledge of language (ensuring precision and concision in word choice, maintaining consistency in style and tone)

Note:
College = College instructors
These items were not asked of middle school/junior high teachers or high school teachers.

Table C.5

Rank Items According to How Important Each Is as a Prerequisite for Success in a Course

WRITING

MS (%)				HS (%)				College (%)				Statements
1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	
												APPROACHES TO WRITING
29	20	15	36	35	24	18	24	47	23	15	16	Generating sound ideas for writing
29	22	25	24	25	24	27	24	23	24	20	32	Using language conventions proficiently
30	20	22	27	43	19	15	23	21	31	26	23	Critically analyzing source texts
17	28	32	22	16	22	30	32	10	21	39	30	Clearly summarizing other authors' ideas in writing
												ENGAGING WITH MULTIPLE PERSPECTIVES
.	.	.	.	.	.	.	.	45	45	5	5	Recognizing other views
.	.	.	.	.	.	.	.	2	19	72	6	Recognizing other counterarguments
.	.	.	.	.	.	.	.	2	6	14	78	Rebutting counterarguments
.	.	.	.	.	.	.	.	51	30	9	10	Integrating own ideas with the ideas of others in writing

Note:
1st to 4th = Ranking of importance, where 1st = most important and 4th = least important
MS = Middle school/junior high school teachers
HS = High school teachers
College = College instructors
. = This item was not asked at this grade level.

Table C.6

Perspectives on Content-Related Statements

WRITING

College (%)				Statements
Strongly Disagree	Disgree	Agree	Strongly Agree	
				WRITING PROCESS AND EVIDENCE Degree to which teachers agree or disagree with:
1	6	39	55	Pre-writing techniques such as questioning, brainstorming, and concept mapping are an important part of the writing process
1	7	42	50	Pre-writing activities are useful and important for producing high-quality written pieces
2	13	52	33	Students' pre-writing offers additional insights that can help you better understand their writing capabilities
17	44	26	13	Students' pre-writing should be evaluated along with their final product
2	24	56	18	Students entering your course should already be familiar with the conventions of argumentative writing, including how to establish a position and support it with reasons and evidence
1	4	50	45	Evidence that supports claims or ideas in proficient college-level writing can include logical reasoning and personal experiences, in addition to facts and data
0	1	37	62	It is important for students to know how to use different kinds of evidence to meet different writing purposes
1	3	32	64	Students should learn how to make strategic use of argumentative, expository, and narrative writing techniques to achieve their writing purpose
				ENGAGING WITH MULTIPLE PERSPECTIVES Entering students must be able to:
1	10	56	33	Engage with multiple perspectives on a topic
4	24	54	19	Identify and analyze rhetorical strategies
2	13	52	34	Write for specific audiences other than the the instructor (i.e., the specified audience could be real or imagined)

Note:
College = College instructors
These items were not asked of middle school/junior high teachers or high school teachers.

Table C.7

How Often Teachers Allow Students to Use Technology

MATHEMATICS

EE (%)				LE (%)				Use of Technology
Never	Rarely	Often	Always	Never	Rarely	Often	Always	
								ON EXAMS
80	13	5	1	48	32	14	5	A handheld calculator
84	11	4	1	66	24	8	2	A calculator application on a touchscreen device
81	11	6	2	55	28	13	4	A calculator built into a computer program or test platform
.	.	.	.	77	15	5	3	An equation editor on a computer for entering equations or expressions
								ON OTHER WORK
64	27	8	1	33	42	21	4	A handheld calculator
71	22	6	1	55	30	13	2	A calculator application on a touchscreen device
71	20	7	3	51	30	16	3	A calculator built into a computer program or test platform
.	.	.	.	71	19	8	2	An equation editor on a computer for entering equations or expressions

Note:
EE = Early elementary (K–2) school teachers
LE = Late elementary (3–6) school teachers
. = This item was not asked at this grade level.

Table C.8

How Often Teachers Allow Students to Use Technology

MATHEMATICS

MS (%)				HS (%)				Use of Technology
Never	Rarely	Often	Always	Never	Rarely	Often	Always	
								ON EXAMS
13	21	42	25	4	8	31	57	A handheld calculator
47	32	15	6	60	19	11	10	A calculator application on a touchscreen device
40	30	24	6	57	22	11	10	A calculator built into a computer program or test platform
50	17	19	14	11	12	31	45	A handheld graphing calculator
68	23	7	3	66	19	7	8	A graphing application on a touchscreen device
63	26	7	4	64	19	9	8	A graphing application built into a computer program or test platform
70	20	7	3	71	18	5	6	An equation editor on a computer for entering equations or expressions
								ON OTHER WORK
6	24	44	26	2	8	29	61	A handheld calculator
35	29	23	12	37	22	19	21	A calculator application on a touchscreen device
33	30	27	11	43	27	13	18	A calculator built into a computer program or test platform
44	19	19	17	9	12	28	51	A handheld graphing calculator
60	21	13	6	45	24	13	18	A graphing application on a touchscreen device
56	26	10	8	49	26	10	15	A graphing application built into a computer program or test platform
65	16	12	6	57	22	8	13	An equation editor on a computer for entering equations or expressions

Note:
MS = Middle school/junior high school teachers
HS = High school teachers
These items were not asked of college instructors.

Table C.9

Whether or Not Teachers Assign Points for Specific Practices

MATHEMATICS

EE (%)		LE (%)		Mathematics Practices
NO	YES	NO	YES	
54	46	38	62	Conscientiousness in doing mathematics work
69	31	58	42	Choosing challenging problems over easy ones when the opportunity arises
45	55	36	64	Demonstrating persistence when solving problems
51	49	42	58	Drawing upon previous experiences to inform current work
59	41	48	52	Proficiency reading and navigating mathematics texts
41	59	36	64	Participating in small- and large-group discussion
57	43	46	54	Facilitating group work
43	57	40	60	Showing evidence of a growth mindset

Note:
EE = Early elementary (K–2) school teachers
LE = Late elementary (3–6) school teachers

Table C.10

Whether or Not Teachers Assign Points for Specific Practices

MATHEMATICS

MS (%)		HS (%)		Mathematics Practices
NO	YES	NO	YES	
34	66	30	70	Conscientiousness in doing mathematics work
50	50	55	45	Choosing challenging problems over easy ones when the opportunity arises
30	70	27	73	Demonstrating persistence when solving problems
38	62	33	67	Drawing upon previous experiences to inform current work
53	47	57	43	Proficiency reading and navigating mathematics texts
32	68	41	59	Participating in small- and large-group discussion
39	61	49	51	Facilitating group work
41	59	43	57	Showing evidence of a growth mindset

Note:
MS = Middle school/junior high school teachers
HS = High school teachers
These items were not asked of college instructors.

Table C.11

Perspectives on Next Generation Science Standards (NGSS)

SCIENCE

EE (%)				LE (%)				Statements
Strongly Disagree	Disgree	Agree	Strongly Agree	Strongly Disagree	Disgree	Agree	Strongly Agree	
								KNOWLEDGE OF NGSS
25	42	28	4	15	35	36	13	I am familiar with the NGSS
0	10	82	8	0	5	71	24	The NGSS align well with my expectations regarding the knowledge required for success in future science classes
2	20	51	27	3	18	51	28	The NGSS will impact the content of my class/classes this year
2	2	61	35	2	3	59	36	I anticipate the NGSS will impact the content of my class/classes over the next few years
10	27	49	14	6	36	39	19	My current curriculum is based on the NGSS and my instruction includes all the NGSS Disciplinary Core Ideas for the grade level of my course
10	31	47	12	8	36	41	14	My current curriculum is based on the NGSS and my instruction includes all the NGSS Science and Engineering Practices for the grade level of my course
10	32	44	14	8	40	38	13	My current curriculum is based on the NGSS and my instruction includes all the NGSS Cross-Cutting Concepts for the grade level of my course

Note:
EE = Early elementary (K–2) school teachers
LE = Late elementary (3–6) school teachers

Table C.12a

Perspectives on NGSS

SCIENCE

MS (%)				HS (%)				Statements
Strongly Disagree	Disgree	Agree	Strongly Agree	Strongly Disagree	Disgree	Agree	Strongly Agree	
								KNOWLEDGE OF NGSS
11	27	42	20	11	30	40	19	I am familiar with the NGSS
2	10	65	23	3	18	68	12	The NGSS align well with my expectations regarding the knowledge required for success in future science classes
4	27	46	23	4	29	49	17	The NGSS will impact the content of my class/classes this year
3	8	52	36	1	15	57	26	I anticipate the NGSS will impact the content of my class/classes over the next few years
9	34	45	13	7	41	42	10	My current curriculum is based on the NGSS and my instruction includes all the NGSS Disciplinary Core Ideas for the grade level of my course
10	41	37	12	12	53	29	7	My current curriculum is based on the NGSS and my instruction includes all the NGSS Science and Engineering Practices for the grade level of my course
10	41	40	9	10	52	31	8	My current curriculum is based on the NGSS and my instruction includes all the NGSS Cross-Cutting Concepts for the grade level of my course
.	.	.	.	.	.	.	.	The NGSS align well with my expectations regarding college and career readiness for science

Note:
MS = Middle school/junior high school teachers
HS = High school teachers
. = This item was not asked at this grade level.

Table C.12b

Perspectives on NGSS

SCIENCE

College (%)				Statements
Strongly Disagree	Disgree	Agree	Strongly Agree	
				KNOWLEDGE OF NGSS
39	22	33	7	I am familiar with the NGSS
.	.	.	.	The NGSS align well with my expectations regarding the knowledge required for success in future science classes
27	57	14	2	The NGSS will impact the content of my class/classes this year
20	31	44	5	I anticipate the NGSS will impact the content of my class/classes over the next few years
.	.	.	.	My current curriculum is based on the NGSS and my instruction includes all the NGSS Disciplinary Core Ideas for the grade level of my course
.	.	.	.	My current curriculum is based on the NGSS and my instruction includes all the NGSS Science and Engineering Practices for the grade level of my course
.	.	.	.	My current curriculum is based on the NGSS and my instruction includes all the NGSS Cross-Cutting Concepts for the grade level of my course
19	30	46	6	The NGSS align well with my expectations regarding college and career readiness for science

Note:
College = College instructors
. = This item was not asked at this grade level.

Table C.13a

Perspectives on Science Education

SCIENCE

MS (%)				HS (%)				Statements
Strongly Disagree	Disgree	Agree	Strongly Agree	Strongly Disagree	Disgree	Agree	Strongly Agree	
								OPINIONS ON SCIENCE EDUCATION
2	12	58	29	2	9	63	27	Science achievement is best assessed by questions on a science assessment involving authentic scientific scenarios
12	43	40	5	9	48	38	6	Science achievement is best assessed by science-oriented questions on a mathematics assessment
15	41	39	5	13	53	30	4	Science achievement is best assessed by questions on an English or reading assessment involving science-oriented topics
9	37	45	8	12	39	46	4	Students enter my classroom well prepared to succeed in my course
14	50	30	6	14	59	26	1	Students enter my classroom able to apply scientific understanding to unfamiliar situations (i.e., they can "think on their feet")
0	8	70	22	1	9	76	15	Students leave my classroom able to apply scientific understanding to unfamiliar situations (i.e., they can "think on their feet")
.	.	.	.	31	53	12	4	High school science courses currently focus too heavily on science process skills (e.g., data interpretation, experimental design, evaluating conclusions)
.	.	.	.	17	55	22	6	High school science courses currently focus too heavily on discipline-specific content knowledge (e.g., kinematics, gas laws, cellular respiration)
.	.	.	.	11	42	41	6	High school science courses should spend more time on engineering practices (e.g., making a design plan, testing prototypes)
.	.	.	.	7	35	53	5	The priorities of high school science educators align with the priorities of postsecondary science educators
.	.	.	.	.	.	.	.	High school science courses should focus on a smaller set of fundamental content topics
.	.	.	.	.	.	.	.	High school science courses try to cover too much subject matter

Note:
MS = Middle school/junior high school teachers
HS = High school teachers
. = This item was not asked at this grade level.

Table C.13b

Perspectives on Science Education

SCIENCE

College (%)				Statements
Strongly Disagree	Disgree	Agree	Strongly Agree	
				OPINIONS ON SCIENCE EDUCATION
1	12	61	26	Science achievement is best assessed by questions on a science assessment involving authentic scientific scenarios
6	38	44	11	Science achievement is best assessed by science-oriented questions on a mathematics assessment
12	45	37	6	Science achievement is best assessed by questions on an English or reading assessment involving science-oriented topics
28	56	15	1	Students enter my classroom well prepared to succeed in my course
45	48	7	1	Students enter my classroom able to apply scientific understanding to unfamiliar situations (i.e., they can "think on their feet")
.	.	.	.	Students leave my classroom able to apply scientific understanding to unfamiliar situations (i.e., they can "think on their feet")
29	56	12	3	High school science courses currently focus too heavily on science process skills (e.g., data interpretation, experimental design, evaluating conclusions)
16	54	25	6	High school science courses currently focus too heavily on discipline-specific content knowledge (e.g., kinematics, gas laws, cellular respiration)
24	47	26	3	High school science courses should spend more time on engineering practices (e.g., making a design plan, testing prototypes)
22	49	27	3	The priorities of high school science educators align with the priorities of postsecondary science educators
5	31	45	19	High school science courses should focus on a smaller set of fundamental content topics
8	43	34	15	High school science courses try to cover too much subject matter

Note:
College = College instructors
. = This item was not asked at this grade level.

Appendix D: Workforce Statistical Details for Content-Related Skills

Table D.1

Participants' Perspectives on Importance of Content-Related Skills for Employees' Workplace Success

SCIENCE

Employee		Supervisor		Skills
Mean	+/-	Mean	+/-	
				WORKPLACE COMMUNICATION
2.92	0.13	2.98	0.10	Conveying a confident demeanor while presenting information
3.18	0.12	3.16	0.10	Conveying a knowledgeable demeanor while presenting information
3.16	0.11	3.18	0.10	Presenting information in a logical and organized manner
2.28	0.14	2.55	0.11	Providing nonverbal feedback as appropriate
2.88	0.12	2.94	0.10	Reconciling gaps in understanding
2.94	0.12	2.95	0.10	Tailoring communications to enhance understanding
2.56	0.14	2.65	0.12	Using appropriate terminology such as acronyms, titles, and technical terms
2.00	0.15	2.44	0.12	Identifying evidence a speaker uses to support particular points
1.64	0.16	2.04	0.14	Representing information visually using tables, charts, graphs, and multimedia
2.32	0.15	2.64	0.11	Paraphrasing accurately
2.86	0.13	3.05	0.10	Summarizing information for efficient communication
2.38	0.14	2.67	0.12	Explaining how central ideas are supported by key details
				READING
2.09	0.18	2.21	0.15	Extracting information from specialized or technical text
1.68	0.17	1.87	0.14	Extracting information from an unclear or poorly structured text
0.86	0.14	1.26	0.14	Extracting writer's position from persuasive text
2.22	0.17	2.71	0.13	Identifying the order of steps to be taken from instructional or procedural text (i.e., recipe/manual)
0.98	0.15	1.40	0.15	Identifying strengths and weaknesses of an argument in a persuasive text
0.94	0.15	1.34	0.14	Identifying author's purpose in a persuasive text
1.79	0.18	2.01	0.15	Evaluating the credibility of a source of information
1.87	0.18	2.22	0.15	Evaluating the relevance of a source of information
				WRITING
2.05	0.17	2.30	0.14	Adjusting content to fit level of technical understanding of the audience
1.84	0.17	2.05	0.14	Editing for grammar, usage, and mechanics
2.21	0.17	2.41	0.14	Using credible and relevant sources of information
2.09	0.17	2.30	0.14	Summarizing information from professional sources
2.07	0.18	2.23	0.14	Writing concise texts to communicate effectively (i.e., specific words, phrases, and bulleted lists)
1.97	0.18	2.26	0.14	Organizing writing to facilitate understanding
1.29	0.16	1.67	0.15	Writing to persuade or influence
2.18	0.18	2.44	0.14	Writing to explain or inform
1.74	0.17	2.15	0.14	Writing to instruct
1.62	0.17	2.01	0.13	Writing to describe events or relate experience
2.36	0.17	2.68	0.14	Writing one- to two-sentence emails or instant messages
2.09	0.17	2.22	0.15	Writing one- to two-paragraph emails
1.56	0.17	1.77	0.14	Writing multiple-paragraph emails
1.72	0.18	2.12	0.15	Writing reports that are a single page or less
1.24	0.17	1.65	0.15	Writing multiple-page reports
				MATHEMATICS
2.33	0.16	2.55	0.13	Using estimation skills (i.e., judging rough quantities or cost)
1.66	0.18	1.80	0.14	Using algebra/pre-algebra skills such as solving multiple-step problems involving fractions, decimals, or percentages
1.09	0.16	1.38	0.14	Using geometry skills such as estimating and computing area and volume, converting units of measurement, and measuring angles
1.69	0.18	1.80	0.15	Identifying trends in data
1.70	0.18	1.93	0.15	Analyzing and interpreting data from tables, graphs, and diagrams
1.56	0.17	1.80	0.14	Determining likelihood and probability
1.10	0.16	1.24	0.14	Explaining mathematical concepts precisely and fluently
1.24	0.17	1.49	0.15	Choosing appropriate degree of precision for modeling real-world situations
2.35	0.18	2.47	0.15	Recognizing when essential information is missing
1.30	0.17	1.49	0.15	Creating visual representations of data such as tables, line graphs, and bar graphs
1.60	0.18	1.77	0.15	Interpreting visual representations of data such as tables, line graphs, and bar graphs

Table D.1 (continued)

Participants' Perspectives on Importance of Content-Related Skills for Employees' Workplace Success

SCIENCE

Employee		Supervisor		Skills
Mean	+/-	Mean	+/-	
1.68	0.17	1.82	0.15	Executing mathematical processes without technology (i.e., using only mental or paper-and-pencil calculations)
1.98	0.18	2.02	0.16	Executing mathematical processes with technology (e.g. spreadsheets, database software, calculators)
				REASONING AND INQUIRY
1.98	0.14	2.30	0.12	Identifying areas of potential improvement within the organization
1.47	0.15	1.97	0.13	Evaluating and selecting relevant academic, professional, and practical resources for information about areas of potential improvement
1.10	0.14	1.69	0.14	Developing a testable question focused on potential improvements
1.24	0.15	1.74	0.13	Creating a systematic initiative to improve the organization
1.29	0.15	1.89	0.14	Describing the features of an initiative
1.56	0.16	2.01	0.13	Describing the central ideas or conclusions of a project
1.45	0.17	1.84	0.14	Using relevant research and data to effectively communicate a project proposal
1.12	0.15	1.56	0.14	Generating a hypothesis for a project
1.06	0.15	1.65	0.14	Proposing alternate methods for testing a hypothesis
1.26	0.15	1.76	0.14	Identifying and explaining potential beneficial outcomes of an initiative (e.g., ROI, increased employee satisfaction)
1.40	0.15	1.99	0.13	Identifying potential weaknesses in protocols and design of an initiative
1.46	0.15	2.03	0.14	Suggesting factors that might affect the result of an initiative
1.18	0.15	1.65	0.15	Prioritizing, evaluating, and resolving conflicting goals and opinions among stakeholders
1.21	0.15	1.75	0.14	Leveraging existing procedures and processes to perform an investigation in an expedient, valid manner
1.27	0.16	1.64	0.14	Determining organizational impact through analysis of investigation data
1.65	0.16	2.15	0.14	Considering possible other explanations for results
1.32	0.15	1.81	0.13	Proposing new projects to enhance or expand results of an initiative

Note:

Employee = Values under Employee represent employee-rated importance of content-related skills for employees' workplace success.

Supervisor = Values under Supervisor represent supervisor-rated importance of content-related skills for employees' workplace success.

Mean = The value given under Mean is the average of participant responses on a five-point scale, where 0 = Not important, 1 = Low, and 4 = High.

+/- = The value given under +/- represents the confidence interval (CI) for the population mean, at a confidence level of 95%. For example, for a mean of 3.27 with a +/- of 0.09, we are 95% confident that the actual mean for the population is within the range 3.27 plus or minus 0.09.

Appendix E: Workforce "Content-Related" Frequency Percentages

Table E.1

Participants' Perspectives on How Often Employees Engage in Content-Related Activities

Employee (%)					Supervisor (%)					Activities
1	2	3	4	5	1	2	3	4	5	
										WORKPLACE COMMUNICATION
15	29	12	10	34	8	28	19	18	28	Telephone
5	11	13	16	55	2	11	17	23	46	Face-to-face-communication (e.g., meetings, presentations)
19	17	8	14	43	13	17	14	20	35	Email
53	16	12	10	10	34	21	16	12	17	Instant messaging
40	29	18	9	4	28	27	22	17	6	Interoffice memo
70	18	5	6	2	57	17	12	9	5	Social media
										READING
30	22	13	18	16	20	26	21	22	11	Extracting information from specialized or technical text
37	28	18	9	8	26	30	20	16	8	Extracting information from an unclear or poorly structured text
62	16	15	4	3	47	21	17	10	5	Extracting writer's position from persuasive text
21	21	23	20	15	12	16	22	27	22	Identifying the order of steps to be taken from instructional or procedural text (i.e., recipe/manual)
60	14	13	8	5	43	20	17	14	6	Identifying strengths and weaknesses of an argument in a persuasive text
60	15	12	10	3	44	22	17	12	5	Identifying author's purpose in a persuasive text
36	18	20	14	13	25	21	22	19	12	Evaluating the credibility of a source of information
33	19	19	15	14	22	20	20	21	17	Evaluating the relevance of a source of information
										WRITING
20	15	14	23	28	12	16	18	21	33	Writing one- to two-sentence emails or instant messages
24	24	17	22	13	22	20	21	20	17	Writing one- to two-paragraph emails
39	27	19	12	3	29	28	20	15	8	Writing multiple-paragraph emails
38	26	17	11	7	22	28	19	18	12	Writing reports that are a single page or less
54	26	11	7	2	39	29	15	11	7	Writing multiple-page reports
										MATHEMATICS
18	25	22	18	18	11	22	22	26	19	Using estimation skills (i.e., judging rough quantities or cost)
36	28	12	10	14	27	26	20	15	11	Using algebra/pre-algebra skills such as solving multiple-step problems involving fractions, decimals, or percentages
58	20	10	5	7	41	21	18	14	7	Using geometry skills such as estimating and computing area and volume, converting units of measurement, and measuring angles
38	19	17	15	11	27	23	17	21	12	Identifying trends in data
39	20	17	13	11	26	24	20	16	15	Analyzing and interpreting data from tables, graphs, and diagrams
40	22	19	10	9	27	23	22	16	12	Determining likelihood and probability
55	21	11	7	6	47	20	13	14	5	Explaining mathematical concepts precisely and fluently
53	20	13	7	8	38	19	20	14	9	Choosing appropriate degree of precision for modeling real-world situations
22	21	20	20	17	15	16	22	23	24	Recognizing when essential information is missing
51	19	14	10	7	37	25	19	13	7	Creating visual representations of data such as tables, line graphs, and bar graphs
42	20	17	13	9	28	22	21	19	9	Interpreting visual representations of data such as tables, line graphs, and bar graphs
32	31	13	9	15	27	26	19	16	13	Executing mathematical processes without technology (i.e., using only mental or paper-and-pencil calculations)
31	21	15	14	19	23	24	18	19	16	Executing mathematical processes with technology (e.g. spreadsheets, database software, calculators)

Note:

Employee = Values under Employee represent how often an employee participant engages in certain workplace activities.

Supervisor = Values under Supervisor represent how often employees under a supervisor particiapnt engage in certain workplace activities.

1 = Never

2 = Occasionally (in about 25% of work days)

3 = Sometimes (in about 50% of work days)

4 = Often (in about 75% of work days)

5 = Every work day

Appendix F: General Impressions

General Information

Table F.1

How many students entering your course have an appropriate level of skills?

	EE (%)					LE (%)					MS (%)					HS (%)					College (%)				
	None or Very Few	Less Than Half	About Half	More Than Half	All or Nearly All	None or Very Few	Less Than Half	About Half	More Than Half	All or Nearly All	None or Very Few	Less Than Half	About Half	More Than Half	All or Nearly All	None or Very Few	Less Than Half	About Half	More Than Half	All or Nearly All	None or Very Few	Less Than Half	About Half	More Than Half	All or Nearly All
ELA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Reading	.	.	.	.	.	.	.	.	.	.	12	18	29	27	14	9	16	29	29	17	3	26	30	28	12
Writing	.	.	.	.	.	.	.	.	.	.	11	33	29	22	5	6	23	32	28	12	7	31	38	19	4
Math	11	20	32	27	11	8	25	30	27	11	8	25	30	27	11	5	22	29	28	16	5	28	30	31	6
Science	.	.	.	.	.	.	.	.	.	.	9	27	31	22	10	3	17	31	32	17	8	38	33	16	5

Note:

EE = Early elementary (K–2) school teachers

LE = Late elementary (3–6) school teachers

MS = Middle school/junior high school teachers

HS = High school teachers

College = College instructors

. = This item was not asked at this grade level.

Table F.2

How important each characteristic is for attaining successful educational outcomes (e.g., earning a good GPA, graduating on time, staying out of trouble) for students in your school

EE				LE				MS				HS				College				WF Employees				WF Supervisors				Characteristics
Mean	Median	SD	+/–	Mean	Median	SD	+/–	Mean	Median	SD	+/–	Mean	Median	SD	+/–	Mean	Median	SD	+/–	Mean	Median	SD	+/–	Mean	Median	SD	+/–	
3.77	4	0.54	0.04	3.73	4	0.58	0.04	3.60	4	0.66	0.04	3.55	4	0.73	0.03	3.69	4	0.61	0.03	3.55	4	0.69	0.08	3.55	4	0.73	0.07	Acting honestly
3.74	4	0.54	0.04	3.68	4	0.59	0.04	3.52	4	0.67	0.04	3.36	4	0.76	0.03	3.23	3	0.79	0.04	3.52	4	0.74	0.08	3.49	4	0.81	0.08	Getting along with others
3.52	4	0.67	0.04	3.54	4	0.68	0.05	3.49	4	0.68	0.04	3.44	4	0.73	0.03	3.59	4	0.65	0.03	3.12	3	0.97	0.11	3.16	3	0.96	0.10	Keeping an open mind
3.54	4	0.66	0.04	3.53	4	0.65	0.04	3.42	4	0.69	0.04	3.33	3	0.73	0.03	3.21	3	0.77	0.04	3.49	4	0.77	0.09	3.47	4	0.83	0.08	Maintaining composure
3.43	4	0.76	0.05	3.35	3	0.76	0.05	3.13	3	0.84	0.05	3.01	3	0.87	0.04	2.76	3	0.91	0.04	2.89	3	1.05	0.12	2.82	3	1.09	0.11	Socializing with others
3.79	4	0.49	0.03	3.82	4	0.51	0.03	3.78	4	0.48	0.03	3.77	4	0.52	0.02	3.77	4	0.50	0.02	3.52	4	0.78	0.09	3.50	4	0.75	0.08	Sustaining effort
.	.	.	.	3.65	4	0.65	0.04	3.65	4	0.59	0.04	3.56	4	0.67	0.03	2.99	3	0.94	0.04	3.10	3	1.01	0.11	3.25	3	0.87	0.09	Awareness of the connection between academic learning and future work
.	.	.	.	3.62	4	0.63	0.04	3.62	4	0.61	0.04	3.59	4	0.63	0.03	3.18	3	0.83	0.04	3.19	3	0.89	0.10	3.14	3	0.94	0.10	Awareness of one's own academic strengths and weaknesses
.	.	.	.	3.37	4	0.82	0.06	3.25	3	0.79	0.05	3.17	3	0.84	0.04	1.98	2	1.07	0.05	2.72	3	1.18	0.13	2.72	3	1.09	0.11	Having an education plan tailored to one's knowledge and skill needs
.	.	.	.	3.50	4	0.78	0.05	3.50	4	0.67	0.04	3.47	4	0.70	0.03	2.92	3	0.88	0.04	2.77	3	1.15	0.13	2.79	3	1.09	0.11	Understanding that there are a variety of educational paths one can take
.	.	.	.	3.55	4	0.74	0.05	3.44	4	0.77	0.05	3.34	4	0.83	0.04	2.77	3	0.97	0.05	2.64	3	1.18	0.13	2.65	3	1.15	0.12	Recognizing that doing better early in one's schooling is related to doing better in later grades
.	.	.	.	3.50	4	0.73	0.05	3.46	4	0.70	0.04	3.39	4	0.74	0.03	2.99	3	0.92	0.04	2.64	3	1.15	0.13	2.61	3	1.13	0.11	Openness to exploring new and different activities in and out of school

Note:

Data in this table are aggregated across all content areas within one grade level

Mean = The value given under Mean is the average of participant responses on a five-point scale, where 0 = Not important, 1 = Low, and 4 = High.

+/- = The value given under +/- represents the confidence interval (CI) for the population mean, at a confidence level of 95%. For example, for a mean of 3.27 with a +/- of 0.09, we are 95% confident that the actual mean for the population is within the range 3.27 plus or minus 0.09.

EE = Early elementary (K–2) school teachers

LE = Late elementary (3–6) school teachers

MS = Middle school/junior high school teachers

HS = High school teachers

College = College instructors

WF Employees = Workforce employees

WF Supervisors = Workforce supervisors

. = This item was not asked at this grade level.

College Entrance Tests

Table F.3a

Please rate the degree to which you value each of the following attributes of college entrance tests.

MS (%)					HS (%)					College (%)					Attributes
Not Important 0	Low 1	2	3	High 4	Not Important 0	Low 1	2	3	High 4	Not Important 0	Low 1	2	3	High 4	
11	14	22	30	23	15	18	27	28	12	.	.	.	.	.	Alignment with the Common Core State Standards
2	2	9	34	54	1	2	8	32	57	2	2	7	33	55	Alignment with expectations for college readiness
2	2	14	35	47	3	5	16	38	38	13	25	31	23	9	Alignment with expectations for career readiness

Note:
Data in this table are aggregated across all content areas within one grade level.
MS = Middle school/junior high school teachers
HS = High school teachers
College = College instructors
These items were not asked of elementary school teachers.
. = This item was not asked at this grade level.

Table F.3b

Please rate the degree to which you value each of the following attributes of college entrance tests.

WF Employees (%)				WF Supervisors (%)				Attributes
Very Little	Somewhat	Often	To a Great Extent	Very Little	Somewhat	Often	To a Great Extent	
12	25	40	23	12	30	40	18	Alignment with expectations for college readiness
15	31	34	20	14	30	36	21	Alignment with expectations for career readiness

Note:
WF Employees = Workforce employees
WF Supervisors = Workforce supervisors

Table F.4

Please rate the areas below with regard to how important each is for improving outcomes for traditionally underserved learners.

EE				LE				MS				HS				College				Areas
Mean	Median	SD	+/–	Mean	Median	SD	+/–	Mean	Median	SD	+/–	Mean	Median	SD	+/–	Mean	Median	SD	+/–	
2.61	3	1.28	0.08	2.71	3	1.23	0.08	2.44	3	1.26	0.08	2.18	2	1.22	0.05	2.09	2	1.29	0.06	Course and exam content that is better aligned with the Common Core State Standards
3.06	3	0.98	0.06	3.14	3	0.92	0.06	3.17	3	0.80	0.05	3.12	3	0.86	0.04	3.02	3	0.97	0.05	Assistance navigating educational pathways
3.63	4	0.73	0.05	3.70	4	0.60	0.04	3.56	4	0.68	0.04	3.50	4	0.74	0.03	3.36	4	0.83	0.04	Early and sustained interventions, both academic and nonacademic (e.g., help developing behavioral and cognitive skills related to success in education and the workforce)
3.39	4	0.87	0.06	3.46	4	0.78	0.05	3.32	3	0.80	0.05	3.26	3	0.81	0.04	2.93	3	0.96	0.05	More personalized and developmentally appropriate reporting and feedback
2.66	3	1.28	0.08	3.15	3	0.97	0.07	3.21	3	0.87	0.06	3.16	3	0.89	0.04	2.54	3	1.15	0.05	Expanded definition of college and career readiness and success (e.g., inclusion of technology and nonacademic dimensions)
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.92	3	1.00	0.05	Increased exam preparation opportunities (e.g., preparation materials, financial assistance)
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.74	3	1.08	0.05	Improved access to exams (e.g., location, dates, financial assistance)

Note:

Data in this table are aggregated across all content areas within one grade level.

Mean = The value given under Mean is the average of participant responses on a five-point scale, where 0 = Not important, 1 = Low, and 4 = High.

+/- = The value given under +/- represents the confidence interval (CI) for the population mean, at a confidence level of 95%. For example, for a mean of 3.27 with a +/- of 0.09, we are 95% confident that the actual mean for the population is within the range 3.27 plus or minus 0.09.

EE = Early elementary (K–2) school teachers

LE = Late elementary (3–6) school teachers

MS = Middle school/junior high school teachers

HS = High school teachers

College = College instructors

. = This item was not asked at this grade level.

Table F.5a

Has your state adopted the Common Core State Standards?

	EE (%)		LE (%)		MS (%)		HS (%)	
	Yes	No	Yes	No	Yes	No	Yes	No
ELA	84	16	77	23	.	.	.	.
Reading	.	.	.	.	78	22	77	23
Writing	.	.	.	.	76	24	80	20
Math	79	21	77	23	74	26	79	21
Science	78	22	72	28	80	20	71	29

Note:
EE = Early elementary (K–2) school teachers
LE = Late elementary (3–6) school teachers
MS = Middle school/junior high school teachers
HS = High school teachers
College = College instructors
. = This item was not asked at this grade level.

Table F.5b

To what extent are you familiar with the Common Core State Standards?

	EE (%)				LE (%)				MS (%)				HS (%)				College (%)			
	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely
ELA	1	21	56	22	1	12	61	26	.	.	.	.	.	.	.	.	.	.	.	.
Reading	.	.	.	.	.	.	.	.	1	16	63	21	3	17	54	26	6	42	42	9
Writing	.	.	.	.	.	.	.	.	1	12	64	24	5	18	55	22	9	40	42	9
Math	3	26	52	19	2	12	60	25	2	15	64	18	3	18	60	18	8	44	36	13
Science	6	28	50	16	4	27	48	20	5	29	50	16	8	37	46	9	22	50	24	4

Note:
EE = Early elementary (K–2) school teachers
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HS = High school teachers
College = College instructors
. = This item was not asked at this grade level.

Table F.5c

To what extent do you feel that the Common Core State Standards have been implemented in your curriculum?

	EE (%)				LE (%)				MS (%)				HS (%)			
	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely
ELA	3	13	57	28	2	12	54	33	.	.	.	.	.	.	.	.
Reading	.	.	.	.	.	.	.	.	3	10	64	23	4	20	54	21
Writing	.	.	.	.	.	.	.	.	3	13	60	25	6	22	52	20
Math	3	15	55	27	2	13	50	35	3	16	55	26	4	21	56	20
Science	1	17	53	28	9	19	47	25	7	28	53	13	7	43	43	7

Table F.5d

To what extent do you feel that your instruction has changed to accommodate the Common Core State Standards?

	EE (%)				LE (%)				MS (%)				HS (%)			
	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely
ELA	5	25	51	19	3	21	55	21	.	.	.	.	.	.	.	.
Reading	.	.	.	.	.	.	.	.	5	32	43	20	11	42	37	9
Writing	.	.	.	.	.	.	.	.	7	48	34	12	13	45	31	10
Math	5	29	48	17	3	19	52	26	5	34	48	13	10	42	38	10
Science	6	27	47	20	7	21	48	24	11	48	35	7	20	56	23	2

Table F.5e

To what extent do you feel that the Common Core State Standards are aligned with college instructors' expectations regarding college readiness?

	EE (%)				LE (%)				MS (%)				HS (%)				College (%)			
	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely	Not At All	Slightly	A Great Deal	Completely
ELA	8	33	47	12	5	31	50	14	.	.	.	.	.	.	.	.	.	.	.	.
Reading	.	.	.	.	.	.	.	.	10	31	47	12	11	41	40	8	16	53	29	2
Writing	.	.	.	.	.	.	.	.	12	40	45	3	14	38	41	7	14	49	34	2
Math	9	31	49	11	4	34	48	13	11	42	42	5	14	38	41	7	12	39	42	7
Science	7	36	46	11	12	37	37	14	13	44	38	5	19	50	29	2	13	49	35	3

Note:
EE = Early elementary (K–2) school teachers
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MS = Middle school/junior high school teachers
HS = High school teachers
College = College instructors
. = This item was not asked at this grade level.

Table F.6a

Likelihood of contributing to a poor outcome

Weakness in which of the following areas is most likely to contribute to a poor outcome for a student in your class (e.g., failure to progress along an educational path)?

EE				LE				MS				HS				College				WF Employees				WF Supervisors				Characteristics
Mean	Median	SD	+/–	Mean	Median	SD	+/–	Mean	Median	SD	+/–	Mean	Median	SD	+/–	Mean	Median	SD	+/–	Mean	Median	SD	+/–	Mean	Median	SD	+/–	
3.14	3	0.98	0.07	3.30	4	0.90	0.06	3.34	4	0.83	0.05	3.36	4	0.83	0.04	3.16	3	0.88	0.04	2.94	3	1.02	0.12	3.08	3	0.95	0.10	Content knowledge
2.56	3	0.93	0.06	2.56	3	0.93	0.07	2.42	2	0.91	0.06	2.32	2	0.88	0.04	1.98	2	0.81	0.04	1.82	2	0.87	0.10	2.07	2	0.97	0.10	Educational plan
2.49	2	0.94	0.06	2.52	3	0.89	0.06	2.50	2	0.84	0.05	2.35	2	0.82	0.04	2.25	2	0.80	0.04	2.66	3	0.99	0.11	2.91	3	0.93	0.10	Collaboration with peers
3.22	3	0.93	0.06	3.40	4	0.83	0.06	3.51	4	0.71	0.05	3.57	4	0.68	0.03	3.76	4	0.50	0.02	1.90	2	0.90	0.10	2.18	2	0.96	0.10	Study skills
3.09	3	0.93	0.06	3.25	3	0.85	0.06	3.20	3	0.84	0.05	3.20	3	0.89	0.04	3.05	3	0.91	0.04	2.11	2	0.98	0.11	2.27	2	0.93	0.10	Writing
3.24	3	0.91	0.06	3.18	3	0.88	0.06	3.15	3	0.80	0.05	3.14	3	0.79	0.04	2.95	3	0.80	0.04	2.93	3	1.01	0.12	3.07	3	0.94	0.10	Speaking and listening
3.28	4	0.87	0.06	3.41	4	0.82	0.06	3.47	4	0.70	0.05	3.50	4	0.69	0.03	3.66	4	0.57	0.03	3.26	4	0.94	0.11	3.21	3	0.94	0.10	Conscientiousness
3.34	4	0.90	0.06	3.50	4	0.81	0.06	3.56	4	0.67	0.04	3.64	4	0.64	0.03	3.65	4	0.57	0.03	2.99	3	1.02	0.12	3.03	3	0.98	0.10	Critical thinking
3.35	4	0.90	0.06	3.51	4	0.81	0.06	3.48	4	0.71	0.05	3.51	4	0.71	0.03	3.53	4	0.68	0.03	3.03	3	1.03	0.12	3.12	3	0.95	0.10	Problem solving
2.56	3	0.98	0.07	2.65	3	0.93	0.07	2.58	3	0.94	0.06	2.54	3	0.90	0.04	2.46	2	0.87	0.04	2.76	3	1.07	0.12	2.81	3	1.04	0.11	Technology

Note:

Data in this table are aggregated across all content areas within one grade level.

Mean = The value given under Mean is the average of participant responses on a four-point scale, where 1 = Not At All Likely, 2 = Somewhat Likely, 3 = Moderately Likely, and 4 = Very Likely.

+/- = The value given under +/- represents the confidence interval (CI) for the population mean, at a confidence level of 95%. For example, for a mean of 3.27 with a +/- of 0.09, we are 95% confident that the actual mean for the population is within the range 3.27 plus or minus 0.09.

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College = College instructors

WF Employees = Workforce employees

WF Supervisors = Workforce supervisors

Table F.6b

Rank the following areas from 1 to 10, with 1 being the biggest obstacle to success

EE			LE			MS			HS			College			WF Employees			WF Supervisors			Characteristics
Mean	Median	Total % of top 1	Mean	Median	Total % of top 1	Mean	Median	Total % of top 1	Mean	Median	Total % of top 1	Mean	Median	Total % of top 1	Mean	Median	Total % of top 1	Mean	Median	Total % of top 1	
4.45	4	26.39	4.46	4	27.96	4.31	4	27.29	4.46	4	20.80	4.80	5	17.40	4.23	4	20.54	4.21	4	21.89	Content knowledge
6.54	7	7.52	7.03	8	5.89	7.27	8	5.23	7.66	9	3.56	8.41	9	1.88	7.40	8	6.08	6.99	8	7.34	Educational plan
6.75	8	2.95	6.99	8	2.87	7.08	8	1.86	7.33	8	1.70	7.52	8	0.84	5.45	5	6.06	5.09	5	9.51	Collaboration with peers
4.87	5	10.26	4.7	4	12.98	4.30	4	14.94	4.23	4	15.36	3.23	3	26.23	7.51	8	1.01	7.25	8	2.72	Study skills
5.56	6	4.58	5.39	5	6.00	5.43	5	6.55	5.16	5	9.13	5.39	6	9.63	7.04	8	3.04	6.79	7	3.54	Writing
4.89	5	11.47	5.62	6	5.71	5.74	6	3.97	5.81	6	3.57	6.09	6	1.68	4.91	5	13.47	4.98	5	9.76	Speaking and listening
4.78	5	10.51	4.58	4	14.29	4.47	4	14.85	4.39	4	15.02	3.62	3	19.59	4.07	4	18.18	4.65	4	13.01	Conscientiousness
4.25	4	20.06	3.95	3	21.71	3.96	3	21.12	3.71	3	23.49	3.46	3	19.54	4.40	4	10.47	4.83	4	8.13	Critical thinking
4.66	4	8.69	4.23	3	12.84	4.74	4	7.34	4.63	4	7.10	4.38	4	8.27	4.61	4	5.05	4.66	4	11.96	Problem solving
7.77	9	3.98	7.49	9	4.89	7.59	9	4.33	7.74	9	3.01	7.61	8	1.36	5.46	6	15.88	5.96	6	9.02	Technology

Note:

Data in this table are aggregated across all content areas within one grade level.

Mean = The value given under Mean is the average of participant responses on a 10-point scale from 1st to 10th.

EE = Early elementary (K–2) school teachers

LE = Late elementary (3–6) school teachers

MS = Middle school/junior high school teachers

HS = High school teachers

College = College instructors

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