

A SUMMARY OF ACT RESEARCH REPORT SERIES 2015 (4)

ACT Complete: A Holistic Framework for Education and Workplace Success



EDITED BY

Wayne Camara, PhD

Ryan O'Connor, PhD

Krista Mattern, PhD

Mary Ann Hanson, PhD

ACT[®]

Becky L. Bobek, PhD, is a principal research scientist conducting research on career development and investigating topics such as individual differences in interests and values, education/career exploration, decision making, and action plans for education and work transitions.

Jeremy Burrus, PhD, is a principal research scientist in the Career Transitions Research department working on the assessment of noncognitive skills.

Wayne Camara, PhD, is senior vice president of Research at ACT. His research background spans the ACT continuum of solutions. Before he came to ACT, he held positions at the American Psychological Association and College Board, where he served as vice president of research and development.

Alex Casillas, PhD, is senior research psychologist in Career Transitions Research. He leads the development and validation of ACT behavior assessments and conducts research on predictors of performance and persistence in education and work settings.

James Gambrell, PhD, is a research scientist in Assessment Design studying cognitive models of item performance and assessment of learning progressions.

Mary Ann Hanson, PhD, is former director of Career Transitions Research. She is involved in research and development for a wide variety of career- and behavior-related solutions across education and work.

Krista Mattern, PhD, is director in Statistical and Applied Research, working on the validity and fairness of assessment scores as well as more general higher education issues such as enrollment, persistence, and graduation.

Ryan O'Connor, PhD, is director of Assessment Design, providing leadership and strategic vision for the evaluation of student learning on multiple dimensions.

Robert Pulvermacher, ABD, is a senior assessment designer in Assessment Design. He researches predictors of achievement in the workforce and how these predictors can be implemented into assessments.

Jason Way, PhD, is a research psychologist in Career Transitions Research. He researches behavioral and psychosocial skills, including their relevance to important academic and work outcomes.

Ran Zhao, PhD, is a research psychologist in Career Transitions Research studying the influence of individual differences such as interests, values, and abilities on career decision making and the role of gender, cultural identity, and socioeconomic status on the career development process.

Contents

The Purpose	1
The Problem	1
Developing a Solution	2
Holistic Framework of Education and Workplace Readiness	2
Core Academic Skills	3
Cross-cutting Capabilities	4
Behavioral Skills	4
Education and Career Navigation Skills	5
Summary	6

*ACT Complete: A Holistic Framework for Education and Workplace Success*¹

The Purpose

Building on research conducted at ACT over the last fifty years, this report describes the development of a holistic framework that can provide a more complete description of the knowledge and skills individuals need to know and be able to do to succeed at school and at work. This framework, called ACT Complete, is organized into four broad domains:

- **Core Academic Skills:** knowledge and skills necessary to perform essential tasks in the core academic content areas of English language arts, mathematics, and science.
- **Cross-cutting Capabilities:** general knowledge and skills necessary to perform essential tasks across academic content areas. This includes 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 adaptation to and successful performance in education 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 Problem

Today, most policymakers and accountability systems focus solely on academic measures when discussing college and career readiness. Specifically, performance on reading, math, and, to a lesser extent, science assessments have come to define college and career readiness in the K–12 sector because of their convenience and the focus of accountability efforts. This has occurred while higher education and the workforce have focused increasingly on other competencies and skills that appear to be equally important for success in college and careers.

In particular, colleges have long recognized the importance of considering several aspects of student performance and abilities when selecting students for admission. Admissions officers assess multiple indicators of diverse student qualities, including: high school grades as indicators of persistence and achievement; student statements and letters of recommendation as indicators of character, behavior, and adaptability; the difficulty of courses completed in high school as evidence of effort, motivation, and challenge; and activities and extracurricular involvement as indicators of leadership, teamwork, and collaboration. Their attention to these diverse indicators is supported by research that shows that many students who drop out of college do so not because of a lack of academic preparedness but rather due to a range of other factors, such as choosing a major that is a poor fit, having poor study/time-management skills, lacking clear academic goals, or having low academic self-efficacy. Similarly, employers use a wide range of practices to make inferences about individuals' likely adaptation, persistence, and contribution to the job and organization as a whole.

¹ To read more, see Camara, W., O'Connor, R., Mattern, K., & Hanson, M. A. (2015). *Beyond Academics: A Holistic Framework for Enhancing Education and Workplace Success*. Iowa City, IA: ACT. Retrieved from http://www.act.org/research/researchers/reports/pdf/ACT_RR2015-4.pdf.

Developing a Solution

ACT has long been a leading source of research and development of these additional dimensions that are essential for education and workplace success, such as interests (Discover® and the ACT®), behaviors (ACT Engage® and ACT WorkKeys® Personal Skills Assessments), and generalized cognitive skills (ACT WorkKeys), as well as a source of information on how core academic skill requirements (such as math and reading) can be assessed across different contexts, including work, career training, liberal arts, or the sciences.

This report represents another step in an ongoing effort to build an expanded framework of readiness for success. Based on a comprehensive review of relevant theory, education and work standards, empirical research, input from experts in the field, and a variety of other sources, ACT has developed ACT Complete, a comprehensive framework that states what people need to know and be able to do to be successful throughout the course of their education and careers. The developmental nature of the framework is important since the precursors of success emerge very early in life and development continues well beyond the confines of traditional secondary and postsecondary education. ACT Complete articulates the most general domains along with the very specific knowledge, skills, and behaviors within those domains that are essential for education and work success. The focus is ultimately on knowledge, behaviors, and skills—aspects that can be trained and improved. Thus, the ACT Complete framework is well positioned to inform education and other interventions aimed at helping people achieve education and workplace success.

Holistic Framework of Education and Workplace Readiness

To provide a more holistic and integrated picture of education and work readiness from kindergarten to career, ACT has created a framework of readiness that includes knowledge and skills organized into four broad domains:

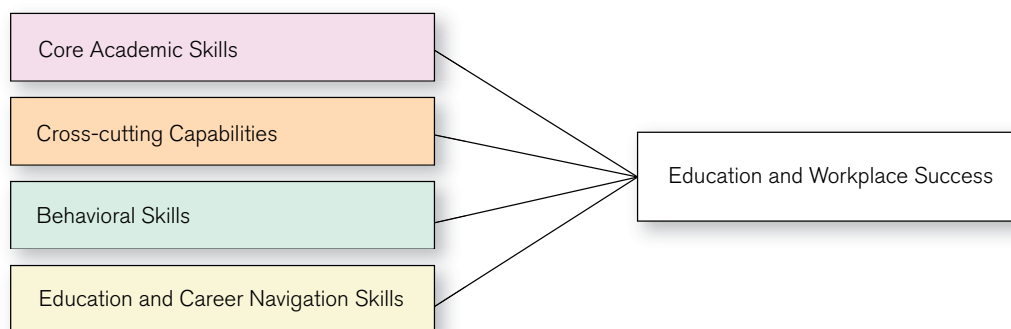


Figure 1. Holistic model of education and workplace success

Core Academic Skills

The purpose of the Core Academic Skills framework is to identify, describe, and organize cognitive knowledge and skills in key foundational areas. The development of Core Academic Skills is the traditional focus of primary, secondary, and postsecondary general education curricula and coursework. These courses are limited to a small number of academic disciplines that provide a necessary foundation for future learning. Specifically, students need some level of proficiency in reading, writing, and mathematics in earlier stages of learning to be prepared for more advanced learning in subsequent grades or for specialization in postsecondary education and employment. ACT has long employed an expanded model of college and career readiness that incorporates scientific skills and knowledge in addition to English language arts (ELA) and mathematics. This focus on scientific reasoning and practices is significant because these skills are central to many fields of study and are commonly used on the job. The Core Academic Skills framework also expands on the current ACT College Readiness Standards in ELA by adding speaking and listening skills to the English language arts domain. In the United States, oral communication has not traditionally received as much attention in the curriculum as written communication skills, yet it is universally acknowledged as critical for success in both education and work.

The highest level of the [Core Academic Skills framework](#) includes the three academic subjects: (1) ELA, (2) mathematics, and (3) science, each of which is organized into a set of areas specific to each subject. Each of these areas (e.g., statistics and probability) is further broken down into components (e.g., data representation) and more focused subcomponents (e.g., distributions). Each subcomponent focuses on a specific learning progression or sequence of skills (e.g., determine the mean of a set of numbers), and these skill descriptions are supplemented by a comprehensive list of related knowledge, misconceptions, common errors, and strategies in order to provide a richer picture of student learning.

The Core Academic Skills framework:

- Identifies and organizes key cognitive knowledge and skills in the academic areas that are most necessary for preparation for more advanced learning
- Focuses on skills that are known barriers to college and career success
- Provides a detailed description of knowledge and skill development from kindergarten through career
- Emphasizes the connected, progressive nature of learning
- Provides rich context by integrating research on learning progressions, misconceptions, and strategies
- Expands the current ACT College and Career Readiness Standards by putting more emphasis on STEM and oral communication
- Continues to constitute the core of the ACT holistic model of education and workplace success
- Together with the Cross-cutting Capabilities framework, identifies the cognitive learning outcomes necessary for success in the 21st century

Cross-cutting Capabilities

Data from employer surveys document the demand for a broader range of cognitive skills to adequately prepare students and adults for the most in-demand and rewarding jobs. For example, a survey of 431 US employers reported that teamwork and critical thinking skills were rated “very important” more often than traditional academic areas such as writing, mathematics, and science. This finding, which has been replicated across many studies, indicates that measurement of Core Academic Skills alone is insufficient for assessment of education and workplace readiness.

The [Cross-cutting Capabilities framework](#) addresses this gap with the inclusion of four areas that cut across most academic fields and career paths: (1) technology and information literacy, (2) collaborative problem solving, (3) thinking and metacognition, and (4) studying and learning. Mirroring Core Academic Skills, the Cross-cutting Capabilities framework breaks each area down into more specific components, subcomponents, and skills.

The Cross-cutting Capabilities framework:

- Focuses on skills that are consistently identified as critical for success by educators and employers
- Complements the Core Academic Skills framework by highlighting high-value skills that facilitate learning and real-world problem solving, but are not the focus of traditional academic instruction
- Enhances transfer by drawing attention to knowledge and skills that appear in more than one academic subject, such as information literacy and critical thinking
- Expands and improves current ACT standards by acknowledging the importance of technology, problem solving, and other applied skills
- Together with the Core Academic Skills framework, identifies the cognitive learning outcomes necessary for success in the 21st century

Behavioral Skills

Much of early childhood education focuses on shaping students' behavior by modeling appropriate Behavioral Skills, such as waiting one's turn, communicating one's needs, and sharing toys. However, as students progress developmentally, teaching academic content (e.g., mathematics) is generally viewed as the primary responsibility of the educational system, and the role of teachers and schools in guiding behavior is not as clear. Attendance, punctuality, conduct, effort, and responsibility are acknowledged as important factors in many grading systems, and negative behaviors often result in disciplinary actions that impact educational and learning outcomes. However, Behavioral Skills are not organized systematically the way academic skills are. The Behavioral Skills framework addresses this gap.

The [Behavioral Skills framework](#) includes six broad areas of behavior at the highest level and drills down into more detailed (and age-appropriate) components, subcomponents, and behavioral skill dimensions. The six areas include: (1) acting honestly, (2) maintaining composure, (3) socializing with others, (4) getting along with others, (5) sustaining effort, and (6) keeping an open mind.

The Behavioral Skills framework:

- Incorporates research across multiple areas of psychology (including developmental, personality, and industrial organizational)
- Includes general behavior areas as organizers and more specific behavioral skill components as descriptors of behavior
- Applies to a broad range of ages, settings, and outcomes throughout the span of one's education and career
- States what individuals need to know and be able—and willing—to do in order to develop and thrive in education and workplace settings

Education and Career Navigation Skills

The journey through one's education and career is often filled with challenges and obstacles. Progress is difficult and compromise frequent. Students and workers, faced with myriad choices and courses of action, can struggle to decide on a direction and navigate their chosen path successfully. The Education and Career Navigation Skills framework is designed to facilitate identification and organization of the knowledge, skills, and other factors needed to help individuals make informed, personally relevant decisions and build actionable, achievable plans. By acquiring relevant knowledge and skills, individuals gain adaptive advantages in the present, and better education and career outcomes in the future.

This [Education and Career Navigation Skills framework](#) is organized into areas, components, subcomponents, and finally, at the most specific level, navigation knowledge and skills. The four areas at the highest level of the navigation taxonomy include: (1) self-knowledge, (2) environmental factors, (3) integration, and (4) managing career and education actions.

The Education and Career Navigation Skills framework:

- Is essential to providing a more holistic view of individuals, focusing on acquiring, combining, and using knowledge about the self and environmental factors to purposefully and actively achieve goals
- Is grounded in extensive theoretical, empirical, and intervention research support, as well as information from standards, assessments, and experts
- Includes components and subcomponents that are important throughout the span of one's education and career, although their relative importance can vary depending on individual circumstances
- Contributes to a wide range of education and work outcomes and helps individuals progress throughout their education and career journey

Toward an Integrated Framework of Education and Work Readiness

It is important not only to identify factors within each broad domain that are important for success, but also understand how these factors work together across domains to jointly influence education and work readiness and success. Research and theory have identified points at which the constructs included in the Core Academic Skills, Cross-cutting Capabilities, Behavioral Skills, and Education and Career Navigation Skills areas are related to each other, as well as points at which they have potential to be complementary.

Specifically, research suggests that factors within these four broad domains function differently but collectively facilitate the navigation of education and career decisions. Cognitive ability is a major determinant of what one knows and is able to do. Academic skills can be considered a subset of cognitive ability. Personality, at least its behavioral components, is what one actually does. In a broad sense, it also partially serves to motivate general behavior. For example, a conscientious person will be motivated to work hard *in general*, and a person who is high in openness will be motivated to learn facts *in general*. Interests serve to determine specific activities surrounding what one is willing and/or prefers to do. They direct attention to particular activities and partially determine the intensity with which one engages in those activities. Whereas conscientious people may be motivated to work hard in general, a person with interest in math will be motivated to work hard in tasks related to math. ACT research supports the complementary nature of these broad domains in that academic discipline and the extent to which one's major matches his/her interests predicts timely degree attainment in college above and beyond test scores and college GPA.

The research underscores the fact that many characteristics contribute to one's success, both at school and the workplace. Of course, some factors are more highly related to success than others, and some may be relatively more important for particular outcomes or at certain points in time. One challenge that remains is determining how to pare down the number of factors to a manageable few for a particular purpose by focusing on those that are most important while at the same time being inclusive enough to provide meaningful, personalized feedback to the individual as it relates to his or her level of readiness. To address this challenge, ACT has begun to develop specific models of education and work success by identifying the most important factors at critical education and work transitions for particular outcomes. For example, we have begun to examine the similarities and differences in models of success when the outcome is college grade point average versus college graduation or job performance. Across the three models, there was some overlap in which factors were most important; however, there were also differences. These findings highlight the importance of considering both the transition and outcome of interest when developing models of success.

Summary

We hope the reader will take away a few central findings and ideas from this report and other research conducted by ACT on college and career readiness. Preparation for college, career, or life requires skills and competencies from multiple domains. Core Academic Skills, whether focusing solely on math and reading, or more broadly to include science, are clearly essential to most definitions of postsecondary success, but are not sufficient to ensure success. The specific skills needed in an area like math may differ somewhat across majors or occupations, and assessments and the feedback provided to individuals must be sensitive to these complexities even when a one-size-fits-all approach is more convenient for accountability. We invite the reader to examine the complexities associated with Behavioral Skills, how they may look different over time, and how important they are for success in both education and work. Finally, we hope the reader recognizes the role that Cross-cutting Capabilities play in learning, self-direction, and a positive predisposition to lifelong learning, as well the importance of Education and Career Navigation Skills for progressing from school to college to career. It is our belief that a holistic examination of college and career readiness such as ACT Complete can improve outcomes that lead to education and workplace success. ■



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.

For more information, visit www.act.org.