

Retooling Literacy Education for the 21st Century:

Key Findings of the Reading for Understanding Initiative and Their Implications

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THE ETS CENTER FOR
RESEARCH ON HUMAN CAPITAL AND EDUCATION



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About This Report

In May 2016, an invitational symposium on the Reading for Understanding (RfU) initiative was held in Alexandria, VA. Co-hosted by ETS and the Council of Chief State School Officers (CCSSO), the symposium brought together some 160 state and local education leaders to examine the results of the Reading for Understanding Initiative. The goal of the U.S. Department of Education-sponsored initiative was to accelerate the research on reading across grades preK-12. In 2010, five grant projects were awarded to focus on learning and instruction, and one project on assessment.

In this policy report, the authors begin by framing the need for a focused, national effort to achieve universal, advanced reading literacy, arguing that it is an issue of equity as well as individual and national prosperity.

The second portion presents a discussion of practical recommendations for lead practitioners, summarizing key insights from the RfU Research Initiative, remaining research challenges, and policy and practice recommendations for enhancing reading achievement across the educational developmental span from pre-K to secondary school graduation.

The presentations of the research teams and videos of concluding panel discussions from the symposium can be found here: https://www.ets.org/research/events/reading_for_understanding_symposium.

Two of the authors of this report (John Sabatini and Tenaha O'Reilly) were members of the RfU assessment project. While insiders in the RfU initiative, they were also outside observers of the other curricula and instruction-focused teams that were designing, implementing, and evaluating instructional programs in schools. This gave them a distinct perspective on how the research teams interacted with schools to develop content, support professional teacher development, and implement curriculum and instructional interventions.

We would like to give special thanks to the CCSSO and the many members of their State Collaboratives on Assessment and Student Standards who participated in the conference and provided valuable insights into the major themes of this report. In addition, the CCSSO advisory group of state leaders who reviewed this paper helped us focus it on issues of high importance to state and district leaders. Their expertise and extensive experience are greatly appreciated.

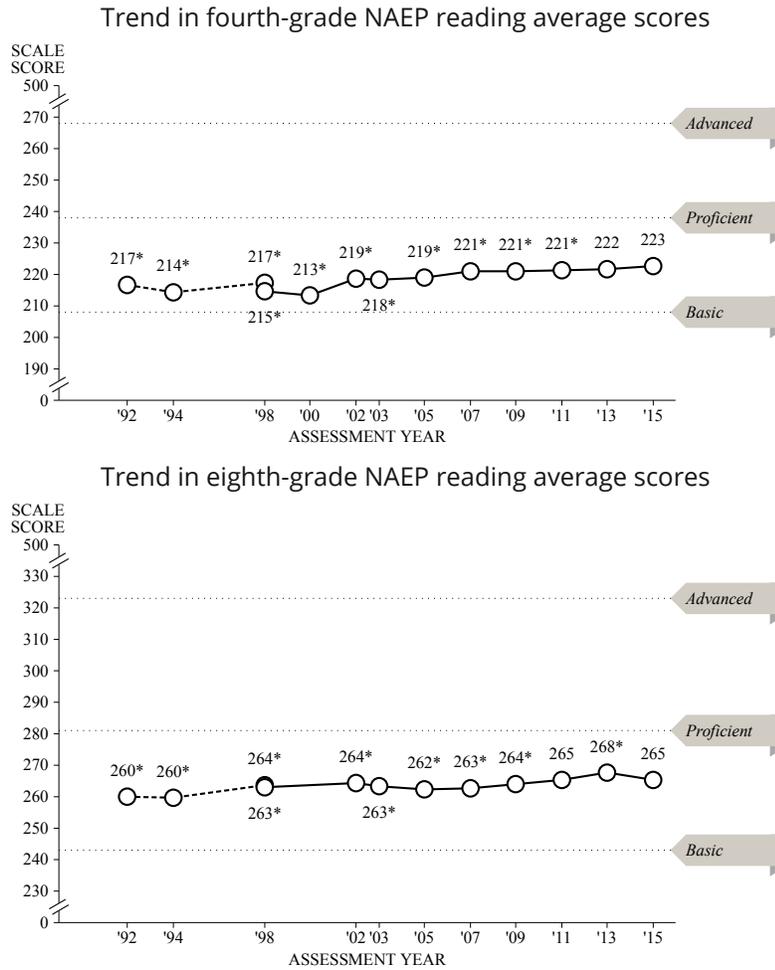
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Introduction

It would truly be difficult to overstate the importance of reading literacy proficiency. That's because it is fundamental to enabling individuals to learn about nearly all other topics—during their school years and throughout life. Without adequate reading and comprehension skills, an individual's ability to pursue his or her field(s) of interest, to become and remain self-sufficient, and to engage productively in society are greatly curtailed. For instance, the ability to read, comprehend, and analyze complex texts is directly connected to life outcomes including educational attainment, dropping out of school, wage earnings, incarceration, and even quality of health.¹

Unfortunately, the United States has been falling short of our national aspiration that all students achieve reading comprehension skills sufficient for today's societal and workplace demands. Over the past seven years, states have taken steps to address this problem by adopting more rigorous reading/literacy standards aligned to college and career readiness² and by investing additional resources in teacher training. Despite these actions and the efforts of many dedicated educators, state, national, and international indicators show very little growth in reading performance, as illustrated by results on the National Assessment of Educational Progress (NAEP®; Figure 1).³

Figure 1: Trends in 4th- and 8th-Grade NAEP Average Reading Scores



Source: NAEP National Results Overview, https://www.nationsreportcard.gov/reading_math_2015/#reading?grade=4
 Note: Dashed line means accommodations were not permitted. A solid line means accommodations were permitted. An asterisk represents the score is significantly different ($p < .05$) from 2015. Score differences are calculated based on differences between unrounded average scores.

The results of the national report card are even more disturbing when one considers how we are doing in educating underserved and vulnerable subpopulations. There remains a significant gap in achievement, with Asian and White students scoring significantly higher than African-Americans, Latino, and Native American students. There are also significant, persistent gaps between native and nonnative speakers. Furthermore, there are significant gaps based on socioeconomic status—differences that may be increasing over time.

Not only are there wide disparities in reading achievement within our country, but we are simultaneously falling behind much of the rest of the developed world due to other nations' faster rates of improvement. The Programme for the International Assessment of Adult Competencies (PIAAC), a large-scale international assessment of adults ages 16-65, developed by the Organisation for Economic Co-operation and Development (OECD), assesses reading literacy, numeracy, and problem-solving in technology-rich environments. For instance, U.S. adults rank 16th in literacy, with

only 7 of the 23 participating countries ranking lower.⁴ Further, secondary analysis shows that our young adults (ages 16-24) are falling even further behind (18th), suggesting that the more recent products of our education system are not keeping pace with international counterparts.⁵ This conclusion is further bolstered by the results of the OECD's Programme for International Student Assessment (PISA). In sum, while much of the developed world is keeping pace with twenty-first-century literacy demands, the United States is lagging in many areas.

Part One: Why It Matters: The Increasing Role of Reading Literacy in the Pursuit of Equity, Opportunity, and Prosperity

Evidence clearly shows that increasing disparities in opportunity and the resulting gaps in human and social capital have significant impacts on both adult outcomes and the transmission of opportunity from one generation to the next. ... We want to see many more children, irrespective of the circumstances in which they are born and grow, develop critical skills and enrich their social capital, enabling them to reach their full potential as workers, parents, community members, and citizens. Ideally, this would require us to address not only the disparities in opportunity for future generations of children, but also the widening gaps in educational, social, and economic outcomes of the current generation of students and adults.

The landscape of opportunity in America today is not simply the result of forces beyond our control. Certainly, globalization and technological innovation will continue to accelerate and both will reshape workplaces and the labor markets attached to them. As a result, both as individuals and as a nation, we will need to continually adapt to rapidly changing economic and social contexts. But the stratified nature of opportunity, with access that varies based on economic status, geographic location, and race and ethnicity, has been strongly impacted by a range of choices made over time by policymakers at all levels of government, as well as by corporations and individuals.

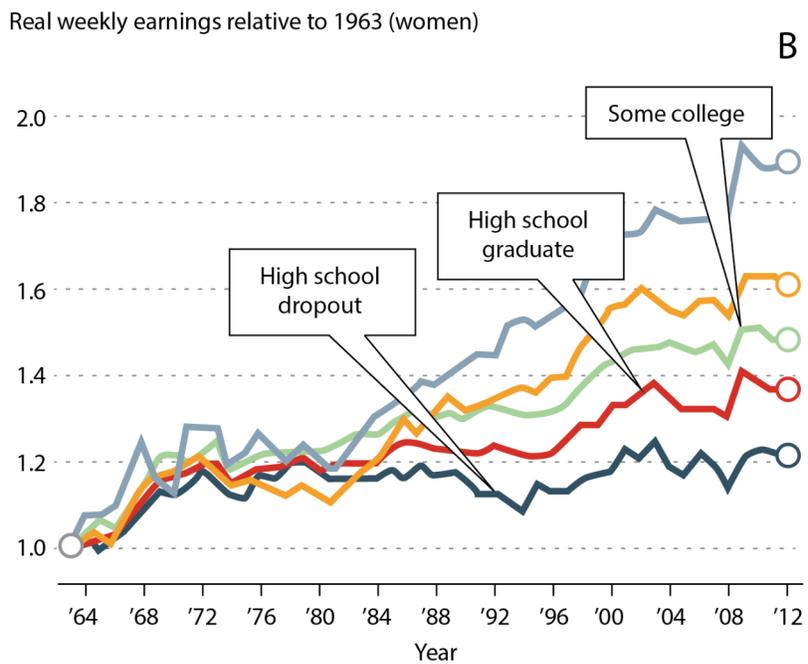
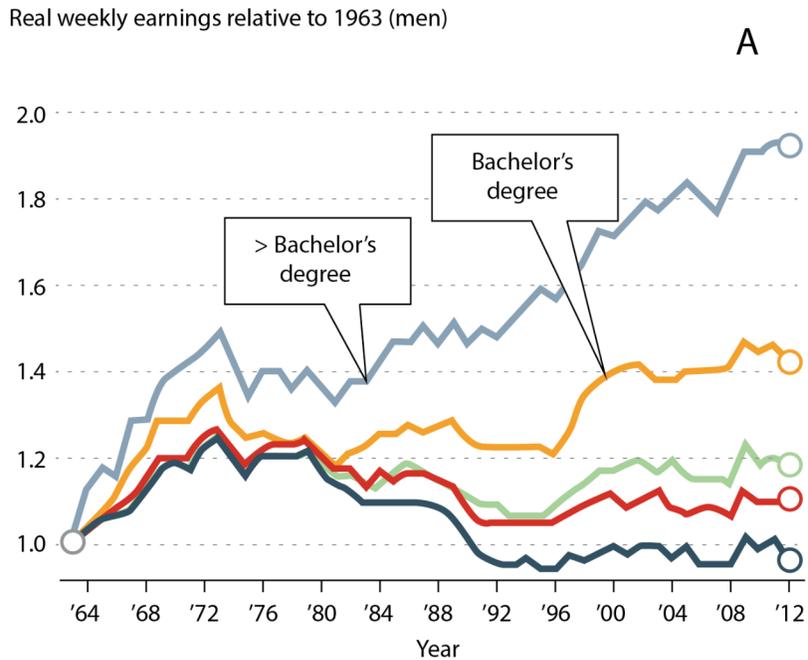
Irwin Kirsch, Henry Braun, Mary Louise Lennon, and Anita Sands

*Choosing Our Future: A Story of Opportunity in America*⁶

The evidence that education and skills are associated with individual prosperity and economic success is accumulating.⁷ Figure 2 shows the increasing gaps in men's and women's wages (as measured by real weekly earnings) since the 1960s based on education level. Not only are the most educated doing better, but the least educated are doing worse. Further, when direct measures of literacy and numeracy skills are considered, there is an additional gap not accounted for by education level alone. That is, it not only matters that one graduates, but that one acquires the skills needed to succeed in the modern workplace.⁸

There has also been a parallel increase in the necessity of enhanced digital skills in everyday life. Transactions with employers, doctors, and government agencies are increasingly conducted online. Many job applications are digital; scheduling appointments or accessing results of tests are frequently conducted online; student records are accessible to parents on the web. Digital navigation, searching, access to digital devices, and the internet are no longer optional lifestyle choices but functional literacy necessities. And this is an area that the United States is not excelling in—over 60 percent of adults are demonstrating only limited skills needed to acquire, evaluate, organize, and utilize information found in digital environments.⁹

Figure 2: Changes in Real Wage Levels of Full-Time U.S. Workers by Gender and Education, 1963 - 2012



Source: David H. Autor, *Science* 344 (2014): 843-851.

The U.S. education system itself has been historically uneven in the allocation of quality educational services. African-Americans have had to use the court system to fight for basic civil rights and equality of education. Language and linguistic immigrant minority groups are the fastest growing

demographic subpopulation in the United States, but schools are largely unprepared for adapting services to their needs. More generally, students concentrated in low-income neighborhoods attending underfunded schools show large achievement gaps that are becoming persistent across generations. The Jeffersonian aspiration was that our education system would aid in creating a more level playing field of achievement and skills so all Americans could enjoy at least a prerequisite level of *human capital*—the knowledge, skills, and experiences needed to seek happiness and prosperity. It was probably not intended to reproduce or reinforce existing differences. However, the U.S. educational system over the past several decades has been stratifying human capital based on social capital; in other words, there has been a vicious cycle where better education is found (and shared) where there is already greater prosperity. By *social capital* we refer to the family structures and social networks into which children are born and raised, the behavioral norms they develop, and the trust that connects members of their communities. We need not deny the existence of individual differences in ability or talent, but we should be able to provide instruction in a set of skills achievable by most. The education system should not simply distribute educational opportunities based on where one is born, the social network of family and friends, or even by cultural and behavioral attitudes and beliefs, yet evidence is accumulating that this is what is occurring.¹⁰ Once identified as a problem, however, this is a trend that we can seek to reverse with systematic, sustained leadership applying research-based evidence to policy and practices.

It is against this backdrop of national economic, social, and literacy concerns that the RfU initiative was launched. Large disparities in both human and social capital that are present early in life tend to magnify over time and stabilize across generations. Concomitantly, the distribution of high-quality educational experiences is increasingly associated with the social capital of the environment in which one is born. While education level is associated with higher economic outcomes, the strength of this relationship is tempered by skills, especially those sophisticated proficiencies required to succeed in a modern economy. Although there are disparities across different groups with respect to their access to technology, lack of resources is an insufficient excuse for not teaching and supporting advanced comprehension skills for application in today's digitally rich literacy environment. As a nation, we must grow together and not leave anyone behind. We need to rally around a common, aspirational goal.

From the Earth to the Moon: Achieving Reading Literacy Proficiency for All Children

In 2010, the federal Institute for Education Sciences (IES) recognized the imperative of increasing reading literacy proficiency and issued a call to action for the development of research-based strategies for accelerating learning, likening it to President Kennedy's goal of landing a person on the moon within 10 years:

President Kennedy's goal to land an American on the moon within 10 years seemed almost unimaginable in 1961. Surely the goal of teaching our children how to read for understanding is as important to each child and to the nation as a whole as being the first country to reach the moon. The Institute believes that a tightly networked and coordinated group of social scientists can work together to accomplish the goal of rapidly increasing the nation's ability to teach children how to read for understanding.

2010 Reading for Understanding request for applications

The metaphor of landing a person on the moon is worth examining here. Let us substitute the goal of landing a person on the moon with the goal that "every *able* child will achieve college and career readiness by the time he or she graduates high school." We can acknowledge that some children with severe cognitive, intellectual, or other disabilities may not achieve this level, though through the good work of the special education community, even a significant proportion of the most challenged students will. We can also acknowledge that not every young adult would want or need to

participate in higher education, though adult wage and earning potential is currently tightly associated with level of education and skills.¹¹ We can even further delimit the goal to reading literacy proficiency, in other words, a high-level ability to understand and learn from postsecondary-level text documents.

The goal of universal, advanced reading literacy seems as unimaginable today as landing a person on the moon did in 1961. Presently, the United States is falling short of our national aspirations that all students achieve reading comprehension skills sufficient for today's societal and workplace demands, as documented in NAEP® results, as well as how our students and adults fare in international comparisons of literacy.¹²

But what would it take to move the literacy needle substantially? We derive three elements from the "race to the moon" metaphor. First, it would require a **shared vision** across all stakeholders that this is a worthy and achievable goal. Second, it would require a sophisticated understanding of the **target, what we will refer to as a twenty-first-century construct of reading literacy proficiency**. Third, it would require **engineering a system** to address the multiple subsystems needed to achieve the goal. Let's examine each of these elements.

Creating a shared vision of reading literacy proficiency. The goal of landing a person on the moon captured the imagination of the nation. It was also fed by Cold War national concerns inflamed by the successful Soviet Sputnik space program. But unlike the goal of raising national literacy levels, it required very little of the average citizen, as most of the scientific and technical work were in the hands of NASA and its contractors.

The goal of raising reading literacy proficiency, however, will place much wider and direct demands on most citizens. Most citizens would probably be willing to give the socially desirable response that raising reading literacy levels is a worthy goal. But there is a history of anti-intellectualism in the United States and some disdain of the overeducated, captured in terms like egghead, nerd, geek, absent-minded professor, and a favorite of one author's mother, "You are book smart but lack common sense" (personal communication heard periodically from age 7 through 45). The image of the street-savvy entrepreneur, self-made businessperson, athlete, entertainer, or celebrity rarely includes the necessity of high-quality preparation for college and careers. In fact, the success of such individuals is often ascribed to some notion of "talent" or "innate ability"¹³ rather than hard work, effort, and continual lifelong learning. Further, a history of racial prejudice toward African-Americans, other ethnic and language minorities, and immigrants further complicates a vision of universal literacy proficiency. These issues are made even more complex by poverty and other associated issues such as family life, childcare, and school experiences.¹⁴

Education administrators, professionals, and teachers themselves are also citizens and therefore not immune to the values and beliefs of the communities in which they live,¹⁵ so one can expect a diversity of views on this vision even within the education community. And if the adults in children's lives do not truly believe they can achieve advanced literacy levels or even truly value the quest, then those children will learn and internalize this belief, making it even harder to help them put in the effort necessary to achieve literacy proficiency.¹⁶ In today's world, achieving a shared vision of reading literacy will involve public communication, discussion, debate,¹⁷ and a willingness to compromise and make difficult changes for the common goal of a stable, democratic society. All of us—educators, business leaders, families, communities, government officials, and community leaders—are responsible for instilling values in our youth about the importance of advanced literacy levels in maintaining such a society.

The relevance of a shared vision to this policy paper stems from the RfU research teams operating on their own shared vision of what a high standard of reading literacy means and consequently

having to convince administrators, teachers, and students within participating schools to also consider that vision worthy and attainable. If teachers or students do not share the vision, think it conflicts or interferes with other achievement goals (such as covering curriculum standards or preparing for a state-mandated test), or do not believe it is attainable, then the intervention or innovation is doomed at the start.

Whether on a community, state, or national level, we think that creating a shared vision is more than simply stating a goal of college and career readiness, or even implementing a common core of curriculum standards. Building a shared vision requires leadership backed up by changes in policy that are understood and supported by parents and communities, not just the education establishment. We believe that a necessary step in building this vision is understanding the goal itself, which we turn to next.

Understanding the target: The construct of reading literacy in the twenty-first century. In order to send an astronaut from the earth to the moon first requires an understanding of where the moon is in space, and the conditions one will find there. (For this metaphor, we can ignore the return journey to earth.) In fact, the moon is a moving target in space, so one must aim for where it will be upon arrival, not where it is when the rocket is launched. Also, the moon has no atmosphere, so an artificial environment must be engineered to keep astronauts alive throughout the journey. Before engineering a solution for transporting a person safely to the moon, precise knowledge of how far away it is, its trajectory, and the conditions relevant to sustaining life all needed to be specified in minute, exhaustive detail.

Reading literacy proficiency is also a moving target, except in time instead of space. The reading literacy proficiency of a high school graduate is twelve years removed from the kindergarten child. Further, given the rate of technological and social change of the digital age, we should anticipate that the nature of reading literacy twelve years from today may be substantially different from now.¹⁸ In fact, part of the urgency to take action stems from the rapid change in the construct of reading literacy in recent decades.¹⁹ We must act now to address current and projected needs while monitoring shifting societal demands and making adjustments over time as needed.

We are well into the twenty-first century. The digital revolution that began in earnest in the 1970s with the widespread production of affordable, personal computers has since transformed the personal, home, social, and commercial activities of societies across the globe. Many think of this revolution as being about technologies used for processing information and mediating communications. A sometimes overlooked side consequence, however, is how the digital revolution has radically and irreversibly altered the nature and processes of reading and literacy²⁰—deconstructing a landscape of printed text forms and genres that had evolved only rather modestly over the past five hundred or so years since the invention of the printing press. Published books, newspapers, magazines, personal letters, technical documents, and forms have been supplemented or largely replaced by search engines, websites, email, and other social media. Traditional sources had a modicum of trustworthiness and credibility one could infer from their authorship and publishing origins. However, digital sources largely must be evaluated critically and cross-checked factually before they are trusted as credible sources.²¹ The problem is magnified as the volume of online printed sources has grown exponentially in the past decade, with no foreseeable change in the rate of growth. For instance, in 1997 there were only about 1.1 million websites, but that number grew to over 121 million by 2007, and as of October 2017, there were over 1.264 billion. These changes require us to rethink what it means to read, comprehend, and be literate in the twenty-first century and how our schools are preparing our children for the future.²²

We refer to the environment of reading literacy and the nature of the skills and processes required to use literacy to learn, make decisions, and solve problems as the *construct of reading literacy*. The

acquisition or development of reading literacy proficiency necessary for college or career readiness is a twelve-year project. It entails developing one's cognitive, language, and social knowledge and skills. One's rate of growth will be mediated by individual differences.

How has reading literacy changed in the twenty-first century? And what skills should be measured in the next generation of assessments? It is beyond the scope of this policy report to describe in detail the rich reading and learning science literature on the topic. But we do summarize some of the key points of the assessment team's framework.

We propose six aspects of the reading construct that might extend beyond what is traditionally measured on a typical summative reading assessment.

First, we argue that people read with specific goals in mind and that these goals affect how they read. Therefore, all reading activities should include an overarching purpose that defines what sources and information are important.²³ For instance, if the goal of reading is to simply find a date, then one only has to scan a text and not read the entire source.

Second, complex reading goals require the use of multiple sources; reading activities should require students to integrate information from multiple sources. Reading comprehension often requires people to read, integrate, and synthesize multiple sources of information.²⁴ Reading goals can be complex, and the answers to one's question might not be found in a single source. For example, if the goal of reading is to decide which is the best green energy source for your home, one might consult a source on wind power, another on solar energy, and others on installations and costs. Modern reading activities should require such integration of information.

Third, in learning and assessment situations, students should be given both reliable and unreliable sources so that students have the opportunity to exercise critical thinking and evaluation skills. Not every source is trustworthy, and today's reader needs to evaluate whether the source is relevant for their goals, whether the author is credible, whether the claims made are supported by evidence, and whether the claims are consistent or disparate across sources. In cases where the claims are different across sources, people need to be able to resolve discrepancies. Thus, modern reading tasks should encourage critical thinking and source evaluation.

Fourth, reading in the twenty-first century necessarily requires an ability to handle technology-rich environments with a variety of source types, so modern assessments of reading should reflect this. People of all ages today need to be able to utilize not only traditional print materials that are written by a single author at a single point in time, but also websites, emails, blogs, chats, video, and audio that may occur in real time (synchronous) or at some point in history (asynchronous). While access to technology is not evenly distributed across many populations, policy changes need to be implemented so that traditionally underserved students have access to technology and can gain the key skills needed to succeed in technology-rich environments.

Fifth, today's instructional and assessment situations should include tasks that determine whether students can recognize mistakes, learn from them, and effectively correct them. Reading is a strategic activity²⁵ that involves monitoring one's understanding and regulating behavior to achieve coherence.²⁶ Rarely do people develop a deep understanding by skimming through a text once. Skilled readers may reread text, ask relevant questions, summarize what they know, or make connections to their background knowledge to draw appropriate inferences. These strategic actions may strengthen a person's understanding and enable deeper comprehension. When individuals do not understand what they have read, they have to recognize there is a problem and then take action to rectify their misunderstanding. In short, we believe there is value in having students recognize and correct errors in their understanding as well as the understandings of others. The "resilience" of learning from mistakes is a key element of twenty-first-century reading and collaborative learning

environments.

Sixth, reading activities should require social interaction to elicit perspective-taking skills and an appreciation for diverse viewpoints. Independent reading involves understanding and navigating people's perspectives.²⁷ The perspectives may include characters in a story or an author. In twenty-first-century reading and work environments, people then discuss and debate ideas and develop shared understandings. In some cases, these shared understandings are mediated through disciplinary expectations such as the value placed on primary sources in history or the amount and type of evidence required in the sciences.²⁸ In short, reading in the twenty-first century is a social activity that may be guided by the communities of practice or disciplinary expectations of the participants involved.

In addition to these six aspects of the reading construct addressed by the Educational Testing Service assessment team, many of the RfU research teams have developed their own definitions, models, and frameworks for changing elements of the reading construct, along with specific recommendations on how instruction may need to change to meet these needs.²⁹ For instance, the Reading, Evidence, and Argumentation in Disciplinary Instruction (READi) team stressed the importance of disciplinary learning with multiple sources,³⁰ while the Catalyzing Comprehension through Discussion and Debate (CCDD) intervention from the Strategic Educational Research Partnership (SERP) organization stressed the importance of complex reasoning, academic vocabulary, and perspective-taking skills as students engaged in active discussions and debates.³¹ We infer some of these recommendations from their research in later sections. But first, we examine how prepared our educational system is for engineering a solution to the challenge of achieving this reading literacy goal.

Engineering a solution. The Apollo rocket that eventually was engineered to take astronauts to the moon in 1969 used different rocket stages to address the different conditions across their trajectory, jettisoning the first two stages after they served their purpose. The first stage was a high-power, high-thrust rocket to achieve liftoff and travel through the greatest gravity and air resistance; the second was for the lower gravity and thinner air of the upper atmosphere; and the final one was a lighter rocket designed for outer-space travel.

In engineering a trajectory toward literacy proficiency, we may have a differential system for launching young elementary children into the world of literacy, advancing their skills through the middle grades, and for adapting to the challenges of secondary school content and learning. Each stage of schooling should be engineered to be conducive to surviving and thriving in the journey toward reading proficiency. We also note that just as the conditions at liftoff for a space launch may be variable (different earth locations, weather conditions, or cargo), so too may early childhood education need to be adaptable to individual differences in children as they start school. The properties of an effective educational system include having reliable, consistent, developmentally tuned systems that produce the desired effects across children and across time.

But are schools adapting their environments to prepare children adequately for twenty-first-century literacy demands? We see evidence everywhere that the construct of reading literacy has changed rapidly in the past decades, transforming how we interact with information, learn, and communicate with each other. When the environment of adult society changes, we rely on our education systems to transmit these changes to our youth. When a society fails to do so, it puts its citizens at risk, a risk compounded when other societies surpass them by doing a better job of rising to the challenge.

Unfortunately, the evidence suggests that the U.S. education system has not been adapting rapidly enough to face the challenges of twenty-first-century literacy. In fact, education may be the slowest sector of the U.S. economy to adopt the transformative digital technologies that are commonplace

throughout other sectors. Those without the skills to use the internet and digital devices to conduct basic self-sufficiency tasks such as applying for a job, buying a car part, looking up a phone number, or learning how to repair a faucet are increasingly disadvantaged. The pace at which the construct of reading literacy has changed over the past several decades has, quite simply, outstripped many schools' capability to adapt curriculum, instruction, resources, and social processes to meet changing needs.

This state of affairs in education is both no one's and everyone's fault. Anticipating change and reforming institutions is a challenging, slow, and uncertain endeavor under the best of conditions. Paraphrasing former Speaker of the House Tip O'Neill, all *education* is local. Local school boards composed of people from the community bring both stability and inertia to school districts. When teachers and administrators live in or near the community where they work and are often raised nearby, it also reflects and stabilizes their community's values and prosperity. Funding of schools through local taxes (supplemented with state and national investments) creates differentiation across the system that reproduces to a great extent the socioeconomic conditions of communities where schools and districts are located.³² Symbiotic relationships between school boards and administrators and suppliers to the education marketplace, especially textbook publishers, further stabilize past practices and processes.³³

In sum, U.S. schooling serves a vital function by linking new generations to their ancestors. This is not necessarily a bad thing, but it is risky when the institution responsible for preparing our children for that changing, uncertain future is too strongly bound to practices of the past. And if schools are not keeping pace as engines of transformation and preparation for a future that may be very different than the past, there are larger consequences, not only for the society at large, but especially for vulnerable, historically underserved populations who rely most on education to create opportunities for social and economic advance—an issue we address in the next section.

Before we leave the moon launch metaphor, we note that the Apollo program launched its first successful manned flight in 1967, six years after initiation of the program. The funding cycle of the RfU initiative is officially over, and its impact is not as clearly visible as the moon landing, but we see multiple steps that policymakers can take toward creating a context and environment conducive to enhancing the impact of research-based innovations in curriculum, instruction, and assessment.

Part Two: The Reading for Understanding Initiative

It is in this context of national challenge that a five-year initiative was launched by the U.S. Department of Education in 2010 to "aggressively attack and derive solutions for enabling students to understand what they read."³⁴ The RfU initiative was the first of its kind to tackle the problem of increasing reading comprehension proficiency over a wide span of student development. Previous research initiatives had led to insights and subsequent instructional programs that proved to be effective in helping young children become adequate decoders of texts—translating text into sounds and words. But that same energy and focus had not yet been applied with rigor to the problem of comprehension—the complex process that allows one to gain meaning and construct new knowledge from texts.

The goals of RfU were to:

- conduct basic research on the development of reading comprehension and learning across the school years from preK-12;
- apply these research results to the development and evaluation of instructional approaches, curricula, technology, teacher professional development programs, and assessments to improve reading comprehension; and
- evaluate those programs in comparison to current practices in schools to determine whether learning had been improved.

A network of over 160 researchers, across six research teams, worked on these issues for over five years. Two teams tackled pre-K and elementary school populations, one addressed the middle grades (4-8), and two teams focused on older adolescents across middle and high schools. A sixth team focused entirely on assessment across the complete developmental span from preK-12.³⁵ The RfU research teams carried out much of their work with and in schools. They developed instructional programs, materials, and classroom-based assessments, and worked with teachers and other education professionals to implement them. Some teams co-developed content and programs with educators; others developed and delivered training and professional development programs. All teams provided guidance regarding adaptation of the instructional programs they designed as well as how assessments could be used to foster learning aims. However, it is not as if pre-existing school curriculum, instruction, and accountability responsibilities simply were suspended. The research teams worked with (and sometimes around) the constraints of the day-to-day practices, policies, and social norms of schooling.

This research initiative, an ambitious and innovative endeavor designed to tackle the subject domain of reading comprehension from preK-12 simultaneously, was the first of its kind funded by the IES. Neither the researchers nor the federal sponsors entered this initiative with naïve expectations that the solutions for raising national reading achievement that have persisted across decades could be solved in five years of focused research. A more tempered measure of success was sought, more specifically, insights into:

- the characteristics of interventions, at each grade band, that accelerate development of reading comprehension skills, particularly for struggling readers;
- the barriers that impede the use of effective approaches and interventions; and
- a more nuanced understanding of the reading comprehension challenges that should be the focus of future research.

In the remainder of this report, we review key findings and draw implications and recommendations for policy and practice aimed at redirecting our nation toward a path to reading proficiency for all students. We apply a lens focused on actionable policy and practice implications that could be enacted in the near term.

It should be noted, however, that there is still much to learn. Scientific evidence should be accumulated cautiously, giving ample time for weighing and synthesizing findings, replicating key results, and critically evaluating them. Each of the six research teams (including our own) is continuing a process of sifting, sorting, analyzing, and publishing in peer review journals and disseminating the core findings of their efforts. This process may well take a decade of scholarly work. We encourage you to visit their websites and read their current and forthcoming research products. However, we see continued urgency and several takeaways that can be initiated in the near term. Before presenting these recommendations, we present a brief overview of the RfU research projects.

Overview of the RfU Research Projects

As noted above, five RfU teams tackled the challenge of building and implementing curriculum and instruction materials from preK-12; the sixth team supported the others by developing and evaluating a new generation of assessments of reading comprehension skills.

The *pre-K* and *elementary* teams focused on building the language resources and related comprehension skills that are prerequisite to and supportive of reading comprehension skill development. By language we mean features such as vocabulary, grammar, and syntax that enable one to communicate in oral and written forms. These teams' main focus was never solely on decoding, though all would note the essentiality of decoding instruction during these early years. Rather, these teams highlighted the importance of language development and sought ways to develop it through forms other than print, such as class discussion and debate.

- **PreK-3.** The Language and Reading Research Consortium (LARRC) studied the role of language skills in listening and reading comprehension in children ages 4 to 8. They focused on grammar, vocabulary, and narration in order to improve listening comprehension and subsequent reading comprehension. Using their findings, they developed a twenty-five-week curriculum supplement, available in Spanish and English. Results from the first cohort of the field-based randomized controlled trial (N = 766 students across grades) indicated large, consistent, and statistically significant effects on targeted skills. (See <https://larrc.ehe.osu.edu/> for details.)
- **PreK-5.** The Florida Center for Reading Research (FCRR) developed integrated multicomponent instructional interventions to support students' oral and text comprehension and reading for understanding. This team found that effective instructional practices on precursor skills increase children's skills and may shift children's growth in reading-related and reading skills, and that interventions need to target multiple components of language in order to have broad impacts on children's skills. (<http://rfu.fcrr.org/>)

The **middle** and **high school** teams each focused extensively on: using text to build knowledge across disciplines—both of content and vocabulary—and using structured discussions to facilitate learning and comprehension. The middle grades teams put additional emphasis on argument and debate, with goals of building perspective taking, reasoning, and academic language skills, which in turn were needed to facilitate deep reading comprehension. The high school teams emphasized reading and learning in the disciplines and student engagement.

- **Grades 4–8.** The Strategic Education Research Project (SERP) studied the roles of perspective taking, complex reasoning, and academic language skills in reading comprehension for upper elementary and middle school students with their CCDD project. They developed two interventions that incorporate discussion and debate in order to catalyze the growth of reading comprehension skills, and included in one of them a focus on basic reading skills for the struggling adolescent reader. The project also included a professional development model for teachers to support reading comprehension and the use of discussion, with an in-depth focus in one content area—science. Results showed the importance of considering "reading" as an area of instruction that continues into middle grade for a significant number of students, and prioritizing academic literacy and practices, such as academic talk, across all disciplines in middle grades. (<http://ccdd.serpmedia.org/>)
- **Grades 6–12.** Project READi (Reading, Evidence, and Argumentation in Disciplinary Instruction) developed instructional interventions that support middle and high school students in developing reading for understanding in three content areas—literary analysis, history, and the sciences. The project focused on the capacity to engage in evidence-based argumentation, drawing on content from multiple texts, in discipline-specific ways. The interventions include professional learning materials and experiences for teachers. A large-scale, randomized control, efficacy study of the READi approach in ninth-grade biological sciences indicated significant effects of the intervention over traditional instruction on the same content. (<http://www.projectreadi.org/>)
- **Grades 7–12.** The PACT (Promoting Adolescents' Comprehension of Text) team studied the cognitive processes associated with reading comprehension to identify malleable processes that may be targets for intervention, as well as the role of engagement and motivation in enhancing reading comprehension outcomes. The team applied its findings to the development of interventions for students with reading comprehension difficulties in grades 7–12. The *What Works Clearinghouse* reported that, in a randomized control trial, eighth-grade students who had one of the interventions performed significantly better than those in control classrooms. (<http://www.meadowscenter.org/projects/detail/promoting-adolescents-comprehension-of-text-pact>)

The ETS team worked with all of the others and developed a new generation of computer-delivered assessments that shared several key traits:

- **Scenario-based:** Students are given a realistic purpose for reading a collection of diverse materials as they make decisions and solve problems.
- **Technology-rich:** The materials range from traditional informational texts, fiction, and biographies to the kinds of materials that students encounter in technology-rich, multimedia environments. Students might be asked to respond to email, evaluate websites, or post to simulated blogs.
- **A focus on collaboration and communication:** These skills are supported and tested through the use of simulated peers in the assessment. For example, test takers "interact" with simulated peers to identify errors, correct misconceptions, and provide feedback on products of learning.
- **Meaningful structures and sequences:** Tasks and activities are structured and sequenced to help scaffold performance for less skilled readers and provide more information on potential student strengths and weaknesses. Performance moderators such as background knowledge and motivation are also measured and can be used to help interpret the reading score.
- **Component measurement:** Associated component reading skill tasks (such as word recognition, decoding, and vocabulary) have also been developed to further understand or qualify the performance of students who may have basic reading skill difficulties that interfere with comprehension performance.

Key Insights and Their Implications for States and Districts

Scenario-based assessments (SBAs) are tests that measure, model, and support reading comprehension in a simulated, project-like environment. Students are provided with a purpose for reading a collection of thematically related materials as they are asked to evaluate and synthesize information for the purposes of making a decision, solving a problem, or applying what they learn to a new situation.

For example, in one SBA that requires about one class period to administer, students are asked to decide whether to put a community garden in an empty lot (the overarching goal). They read about what community gardens are, the pros and cons of their use, and perspectives from others in the community. They then represent this information in a flyer to inform the community about what they learned.

Component assessments are tests that measure a particular foundational subskill, such as decoding or reading fluency, that enables students to "get the words off of the page." Component assessments are useful for instructional decision making, primarily when there is reason to think that students are at risk of failing to achieve at or above grade level.

Insights gleaned from the body of work developed under RfU have important implications for stakeholders in states and districts across the nation. These lessons learned can meaningfully inform literacy efforts designed to ensure that those lacking opportunity can gain the skills needed.

The insights and recommendations that follow are those of the authors, gleaned from the empirical evidence and results accumulated across years of work and scholarship on the RfU initiative, and focus on those outcomes that are most relevant to state and district leaders. We divide the report into sections based on the major strands that were used to organize the National Symposium on Reading for Understanding:

- assessment
- curriculum and instruction
- professional development
- implementation

We start each section with a brief summary of the research undertaken by the RfU teams. We then provide recommendations for state and district leaders based on the key insights gained from the six research projects.

Assessment

Monitoring Progress: A long-term action agenda employing a continuous improvement strategy requires the establishment of a set of milestones representing intermediate goals and the construction of a set of indicators that can be used to monitor progress toward those goals. As Richard Reeves explains, 'Indicators are necessary to guide policy, drive data collection strategies, and measure progress.' Ideally, the indicators will incorporate both quantitative and qualitative evidence.

Kirsch et al., *Choosing Our Future*

We begin with assessment because it represents the starting and culminating point of any learning and instructional cycle and, if properly conceived, can also be used formatively to guide and enhance the instructional program. In other words, we see assessment serving not only as a progress monitoring function but also as a catalyst and contributor to policy and structural change.

The work of the ETS led assessment team focused on two types of assessment: scenario-based assessments (SBA), which require the application of complex reading comprehension skills aligned with our framework for a twenty-first-century reading literacy construct,³⁶ and component assessments, which measure discrete foundational reading skills (see www.ets.org/research/topics/reading_for_understanding/ for more information).³⁷

Each of the other five research teams also developed assessments, primarily classroom-based ones such as quizzes and discussion questions, which targeted skills in which they saw gaps (e.g., academic language, perspective taking, inference making, progress monitoring, and so forth). Contrary to the common complaint that assessment is an add-on that takes time away from instruction, these projects found that a combination of carefully designed and utilized assessments can facilitate, guide, and enable effective instructional approaches and accelerate learning.³⁸

Multiple empirical studies have found evidence to suggest that some percentage of students continue to struggle mastering foundational skills through to secondary school, thwarting learning from text in the content areas.³⁹ Here we refer to foundational skills as the set of subskills that are necessary to "get the words off the page," including decoding, word recognition, and reading fluency. Component assessments that measure foundational skills complement higher level comprehension measures by helping teachers to distinguish weakness in component skills from weaknesses in higher level comprehension processes. This distinction can lead to a better alignment

between students' needs and instruction. Providing both types of assessments gives teachers knowledge of the origin of the difficulties students have so teaching strategies can be directed toward remediating the problem. It should be noted that while both types of assessments will benefit English language learners, new assessments specifically targeted to second-language needs should be developed to focus instruction. Below, we focus on specific recommendations based on the RfU assessment research and development. In particular we focus on issues related to the match between assessments and instruction; the importance of goal-directed activities, assessment frameworks and transparency; the importance of foundational skills; the role of motivation and background knowledge on score interpretation; the inclusion of disciplinary and multiple source reading; and prioritizing web-based assessments.

Recommendations for state and district leaders regarding assessment:

- ***Provide assessment activities that look like quality learning and instruction—in other words, tests worth teaching to.*** Good teaching practices should align with the processes required in assessment tasks.⁴⁰ While preparing students for taking state reading literacy tests is a necessary requirement, the measurement priority during a high-stakes assessment currently is to sample skills broadly, not for students to learn the text content in order to meet a learning goal or reason about an issue. However, in school or classroom assessments, it is a priority that students learn from and reason about what they read, as well as practice the skills and strategies necessary to achieve complex goals. In statewide summative assessments, as well as those used at the district, school, and classroom levels, tasks designed to mimic quality learning activities will provide meaningful guidance for tailoring curriculum and instruction across grades and school subjects.⁴¹ Yet one of the barriers to this potential reform is the possible firewall between summative assessment and instruction. Summative tests are traditionally designed to measure student performance, not support it. It is assumed that any support, learning, or task authenticity might contaminate a student's score. However, if the goal of instruction is to help students grow and meet life's challenges, then why should the tasks used to measure reading be a distal proxy of how a person would read in real life? In a similar vein, skilled readers use reading strategies, so why not include strategies on a reading test to encourage their use and serve as a model for instruction? If properly designed, assessments can model good reading practices while providing solid measurement of a student's reading ability.⁴²

- ***Provide assessment activities that include complex, goal-directed tasks, in which academic learning from text is a primary goal.*** Answering isolated questions about a single passage is not the same as learning and reasoning about content knowledge from text or other information sources such as images, charts, maps, and videos.⁴³ The goal of most reading in school is to learn new subject knowledge. A second common goal, in and out of school, is to learn enough about a topic or issue to make a decision, solve a problem, understand a point of view, or argue a point (e.g., should I apply to this academic program or this job?).⁴⁴ For learning from text to occur, text content must be integrated with one's prior knowledge, creating new knowledge.⁴⁵ Further, providing a complex goal (e.g., see Community Garden example) demands of students that they allocate attention to appropriate skills and strategies necessary to the task⁴⁶ (see Curriculum and Instruction section below for further discussion). Without an overarching goal for reading, students in a testing context may fail to read the entire text and instead adopt test-taking strategies that do not reflect construct-relevant processing.⁴⁷ As such, we argue that reading assessments should provide meaningful goals for reading that help the reader engage in deep processing.⁴⁸
- ***Demand transparency in what the assessment measures and the level of performance expected—not merely reliable and valid score reports.*** This information is essential to ensuring that teaching and testing are aligned. Test scores are part of an assessment's value, but educators also need to understand the construct (what the test was designed to measure) and the test design (how the items and tasks are designed to measure the construct) in order to make effective use of the results to tailor instruction. Moreover, developers of curricula and professional development materials can and should use this information to create well-aligned materials. Thus, we recommend that all assessments of reading should have a framework that describes the construct and how it is measured. This is akin to evidence-centered design,⁴⁹ whereby the test design and construction process is documented for both transparency reasons and for the empirical support for key constructs and design decisions. This way, educators can make more informed decisions as to whether a given assessment meets their needs and how to plan instructional decisions accordingly.
- ***Make the identification of students with foundational skill weaknesses in reading a priority, especially beyond grade 4.*** Component assessments are designed for this purpose. Identifying the proportion of at-risk or struggling readers is a key step needed for district and school level planning for professional development, interventions, and associated policy decisions. Reading assessments should measure foundational reading skills in tandem with higher-level reading comprehension skills through early secondary schooling, or until foundational skills are commensurate with grade level expectations, in order to identify at risk or struggling students. Contrary to some expectations, foundational skills may not be adequately developed after fourth grade, thus continuing to negatively impact higher level comprehension processes.⁵⁰ We therefore recommend that educators continue to monitor the adequacy of foundational skills when problems exist with students' comprehension.

- ***Make users of test scores aware of how motivation and background knowledge mediate assessment performance and score interpretation.*** Users cannot automatically assume that every student score is a true estimate of that student's reading ability. This is because there are a range of other factors that might explain a student's test score that are not directly related to the construct. For instance, low or high knowledge of topics presented on a test can result in misinterpretations of the strengths or weaknesses in comprehension skills underlying that performance.⁵¹ Further, motivation plays a role in testing,⁵² and the instructional approach one recommends may differ significantly based on whether the test taker expends high or low effort when taking the test, or if other emotional states (e.g., anxiety) impact performance. When feasible, we recommend using methods for measuring knowledge or motivation during a test to estimate the impact of these critical comprehension correlates. These actions may improve score interpretation and subsequent decisions for alternative courses of instruction.
- ***Make the inclusion of disciplinary and multiple source reading in assessments a priority.*** There is a significant mismatch in the passages and questions used in current assessments versus the variety of comprehension skills required to learn from text in academic (and nonacademic) environments. Historically, passages on reading comprehension tests tended not to include content-area reading texts so as to reduce overlap with the subject areas and to reduce the impact of background knowledge on comprehension. However, the authors of the Common Core State Standards and others have argued for the importance of content area and disciplinary reading in twenty-first-century reading environments. In short, the cognitive strategies used to understand and learn from a science article differ from those applied to a historical document or a novel.⁵³ For instance, historians may value primary over secondary evidence when developing a causal theory for a set of events, while scientists may weigh the amount and type of empirical evidence when choosing to adopt one theory over another. In short, what it means to read successfully in one domain may differ depending upon the social expectations of the members of the discipline. Assessments should capture this fundamental difference across academic domains. Further, given the proliferation of information on the internet, the ability to evaluate credibility, understand multiple perspectives, and corroborate information across sources is an essential twenty-first-century skill that should be assessed.⁵⁴ It is no longer possible to accept what is written to be true, nor is it often possible to get the information one needs in a single source. Thus, students must now be selective in what they read, be critical about it, and integrate the multiple sources based on the supporting evidence. These skills should be taught in the classroom and measured in the next generation of assessments.

- ***Prioritize computer- or web-based assessments, because most reading and learning in the world and in the future will take place on electronic devices.*** Paper-only reading comprehension is inadequate preparation for the workplace and postsecondary technology-based learning environments in today's society. While people still read print-based materials, the construct has changed and involves the use of digital sources and the associated affordances they provide.⁵⁵ For instance, the internet offers a wide range of sources that have to be searched and sorted for relevance. This requires a knowledge not only of how to effectively use search engines but how to scroll, use hyperlinks, and so forth. Digital literacy also involves an understanding of synchronous (e.g., online chat in real time) and asynchronous forms of communication (a message board updated two years ago). Both forms of digital communication involve keeping track of what was said, what questions were asked, which ones were answered, and those needing a response. Such multitasking could potentially be very demanding on time management and the ability to notice errors. Beyond the changes in construct, computer-assisted assessment affords multiple advantages in administration, construct coverage, cost and time efficiency, and scoring that are impossible to mimic in paper-only assessments. This will also necessitate that states, in partnership with districts, ensure that all students have access to technology within the learning environment in order to develop digital literacy skills. The increased access should not only help with lowering long-term assessment costs but to ensure that students are prepared to read in twenty-first-century technology-rich environments.

Curriculum and Instruction

All too often, interventions are applied at single transition points in an individual's life. Examples include preschool programs to foster cognitive development or career readiness curricula for high school seniors. These efforts may be quite effective according to certain indicators but, too often, their long-term impact is attenuated. The reason is simple: Human and social capital are not built at a single point in time but, rather, are accumulated over many years as the result of a range of experiences and interactions across multiple contexts.

Kirsch et al., *Choosing Our Future*

As noted, five RfU teams tackled the challenge of building curriculum and instruction materials, then implementing them, spanning preK-12. We note that no RfU team started with the premise of teaching to the Common Core State Standards or other new college- and career-readiness standards,⁵⁶ though the instructional programs produced would, in retrospect, be found to be consistent with these standards.

Synthesizing insights for curriculum and instruction across all of the RfU projects in just a few pages clearly requires oversimplification of the richness of their accomplishments. However, we can codify a few key, priority insights. In doing so, we first need to clarify our terminology. In common usage, the terms *reading* and *comprehension* are sometimes used interchangeably and sometimes to distinguish sets of skills. Reading ability often is used to mean what we have called foundational skills, that is, the set of visual processing and basic language skills that get the words off the page into one's head. These skills include decoding and word recognition, as well as ordinary command of spoken language vocabulary and syntax, which together culminate in fluent reading. If there is an assumption of understanding or comprehension, it is usually at a basic or literal comprehension level.

Comprehension can be thought of as something simple, like literal recall or recognition of the gist of what one just read. But this is not what is meant or measured in reading comprehension tests across grades. We would not have nearly 30 percent of students below basic comprehension levels by this simple definition. Rather, comprehension refers to a more complex construct of understanding what one reads, and that is what is measured on assessments. At a minimum, this construct of comprehension requires sophisticated language processing (complex, written forms of vocabulary and grammar), inference, reasoning, perspective taking, and interpretation. It requires regulating a set of skills and strategies toward goals of building new knowledge, making a decision, solving a problem, or applying what one learns. Note that this description of comprehension applies to reading (visual processing of texts), listening, or comprehending any mixture of media (e.g., animation, film, etc.). While the RfU teams differed in the specific definitions of comprehension that they used to guide their research projects, they would all agree that some mixture of these higher order processes are required to read for understanding.

With this in mind, we highlight four common misconceptions that should be addressed by the education community.

- *Reading (i.e., print-based foundational skills) should be the sole or even primary focus of early elementary reading instruction (preK-4).* While foundational skills (e.g., decoding and reading fluency) must continue to be a priority, comprehension development is an equivalent priority and requires a focus on oral language comprehension and development. Individual differences in vocabulary and the sophistication of language skills vary widely among children already at preschool. This gap needs to be addressed as soon as formal schooling begins and continue to be addressed until the gap is narrowed.⁵⁷
- *(Reading) comprehension instruction is complete by grade 4 or 5.* We have long sent a mixed message to students (and teachers) by treating reading comprehension as if it is a skill set that is mastered in elementary school, even as we set content standards and outcome tests of reading literacy through high school. The complex construct of reading comprehension or reading for understanding as measured from preK-12 needs to continue to be explicitly developed through middle and high school, addressing the varying cognitive strategies applied to reading in each discipline.⁵⁸
- *Literacy involves only the ability to gain knowledge or information through text.* The research conducted and reviewed through the RfU projects demonstrates that the application of language, academic vocabulary, reasoning, and the social contexts of literacy are essential elements to developing and applying literacy skills.⁵⁹
- *Reading is an activity involving one reader and one text.* While often thought of in that way, comprehension denotes more than this solitary interaction; it is a social activity that involves listening skills, the sharing and co-constructing of ideas, and perspective taking. Rich literacy environments involve students and teachers interacting to scaffold understanding and provide feedback on each other's ideas. An understanding and appreciation of varying points of view and perspectives are part of the interpretive fabric of reading for understanding.⁶⁰

To address these misconceptions, we structure our recommendations for state and district leaders around three areas: instructional focus on reading comprehension, preK-12; the integration of complex literacy skills; and greater emphasis on reading to learn.

Recommendations for state and district leaders regarding curriculum and instruction:

- ***Ensure that early elementary and preschool curricula focus on language development, comprehension, and knowledge building, as well as foundational reading skills.*** Whereas foundational skills (e.g., decoding and reading fluency) must continue to be a priority, comprehension development is an equivalent priority. This comprehension development is mediated through oral language and visual media. Individual differences across children in vocabulary and the sophistication of language skills are wide, even at the start of schooling.⁶¹ Enhancing language comprehension should include building academic content knowledge in science, social studies, and so forth. If children are more sophisticated users and producers of language, with adequate knowledge of academic domains, this may mediate the so-called fourth-grade slump seen in reading comprehension tests.

- ***Ensure that schools have the resources and policies that enable middle and high schools to address the needs of students who fail to achieve mastery of foundational reading skills.***

Most students who fail to achieve comprehension also show only adequate-to-weak foundational skills.⁶² Many such students may not have sufficiently poor skills to be classified as reading or learning disabled, but they are likely reading well below average for their grade level. Students with these levels of skills often read slowly and are nonfluent when reading grade-level texts. They do not recognize or decode words automatically and are slow to learn new vocabulary from texts on their own. They expend their attention and memory resources on these lower-level processes at the expense of higher level comprehension and reasoning processes. They are reluctant readers; they do not read widely or frequently on their own. State and district assistance is needed when a high prevalence of such students are clustered in middle and high schools, because those schools may not have structures and expertise in place to intervene or remediate foundational skills and comprehension skills and to meet curriculum content standards simultaneously at scale.

- ***Ensure an instructional focus on reading comprehension beyond elementary and through secondary schooling.*** As students progress through middle and high school, instruction should include the specialized ways of reading, thinking, and conveying information needed for each of the content areas. This implies that content area teachers at all grade levels should include these reading comprehension strategies in their instructional practice in their subject area.⁶³ Whenever content is being learned from text (print, digital, or other), instructional support for the necessary reading comprehension skills should be embedded in instruction.

- **Ensure that multiple literacy skills are integrated within curricula and instructional materials, and provide exemplars.** State and district leaders play a critical role in setting expectations and providing exemplars for quality curricula and instructional materials. While at times it may be appropriate to teach reading comprehension in isolation, most often, advanced literacy skills—including listening, language, vocabulary, perspective-taking—should be integrated into content area instruction as the skills and strategies necessary to achieve larger learning goals such as how to build new knowledge with texts, reason and debate an issue, or solve a problem with texts.⁶⁴ It follows, then, that:
 - **The development of content area instructional units should involve both literacy teachers and content area teachers** to ensure that students are supported in the development of reading comprehension skills across the preK-12 continuum.
 - **Academic language development** should be facilitated concurrently with reading comprehension development across the entire span of schooling. This variant of language is the currency of learning environments and should be practiced and developed productively, both in classroom discussions and in written communication. Informal, *conversational language* use should also be encouraged, but helping students to learn and command an academic register of language use will strengthen their confidence and competence in future learning (and workplace) settings.
 - **Realistic texts of varying types and formats** should be incorporated across the curriculum, including fiction and nonfiction, print, digital, and other to reflect the many sources of information, inspiration, and communication students will encounter as adults. Textbooks and trade books written explicitly for educational use serve a didactic purpose. But the world of literacy beyond the school is much richer and more varied than the controlled and closely edited texts prepared by educational publishers and test companies. The internet better represents the richness of literacy the student can expect beyond schools. While access to technology in today's classrooms can be limited by school funding, failure to integrate technology with learning underrepresents the reading comprehension construct and may increase the achievement gap between students from low-income families and their more advantaged peers. In addition, technology affords access to information and an opportunity to exercise critical thinking skills, and can be used to scaffold and enrich literacy environments.
 - Curricula should encourage **language-rich environments** with **discussion and debate** of the ideas and content found in texts as a primary pedagogical vehicle for increasing comprehension. The social context of literacy use and practice should be seamless and synonymous with the practice of learning to comprehend individual text sources. Strong readers often self-explain in their own heads when constructing and reasoning about texts. However, this internal dialogue should be modeled externally for less skilled readers and scaffolded through social interactions.

- As indicated previously, **instruction should directly address the development of thinking and reasoning skills** concurrent with comprehension development across the lifetime. This development should occur even before students can read independently. Instruction in the content areas, including English classes, needs to include the specific thinking and reasoning strategies required in that discipline. The act of reasoning or thinking about text itself is a knowledge-building activity. In this sense, it both supports comprehension and is comprehension.⁶⁵
- The context and setting of literacy practices within instructional units should be **purposeful, goal directed, and engaging**. Students should not read to simply answer basic reading questions, but to solve problems or make decisions as they engage in rich literacy activities. Comprehension is a means to an end, not merely an end in itself.
- **Ensure that all content area instruction includes "reading to learn."** "Reading to learn" requires the student to apply multiple comprehension skills, including:
 - extracting and evaluating information from texts;
 - identifying the big, conceptual ideas across texts and not merely the "main ideas" of individual texts;
 - reasoning about the content of text and how it relates to or contradicts one's prior knowledge;
 - making inferences that connect text ideas coherently, as well as relating them to one's prior knowledge; and
 - generalizing one's knowledge beyond the text and topic in question.

Some of the strategies employed vary across disciplines. Therefore, **a disciplinary approach to reading should be used by districts, particularly at the middle and high school levels**, so that all students learn to "read to learn" in each discipline.

- **Ensure that the texts used within instruction increase in reading level, complexity, and length across the grades.** In order to be prepared for the reading demands of postsecondary education, students should be called upon to develop fluency and stamina with language as represented in print sources through the inclusion of texts of increasing length, complexity, and volume that are commensurate to (and sometimes in advance of) their grade levels. Text complexity metrics are far from an exact science and are mediated by students' prior knowledge and interest in the topics of texts.⁶⁶ Students should never be restricted from attempting to read at any text level because of their current ability. Complex texts can help students to learn how to make inferences, apply strategies, and build stamina in the face of challenges. Simple texts of high interest can help students reinforce fluency, acquire new knowledge, and support engagement and enjoyment in reading.

- **Monitor and develop policies to support dispositions so students see engagement in print reading as natural and necessary to their personal and social development.** This goes beyond appreciation for literature or a joy of reading. Increasingly, easy access to social media, smartphones, and streaming video are competing with extended print reading for students' time and engagement. For many purposes, these alternate media (which often include some limited print reading requirements and navigation skills) are sufficient for learning or solving a problem (e.g., how-to videos). States and districts need to show leadership and devise creative strategies that schools and teachers can use to engage students. Each RfU team addressed motivation and engagement. No simple answer to engaging students emerged, though a strong focus on goal-directed, relevant learning activities, engaging students in big conceptual questions in social learning environments, might be sufficient in the near term for most classrooms.⁶⁷ However, the long-term problem of students disengaging from reading and learning in their school careers is a problem that needs to be addressed.

Professional Development

The implications of the research conducted under the RfU initiative are quite significant for teacher preparation programs and for state and district professional development programs. First and foremost, it is now clear that reading proficiency should be the responsibility of every teacher (not just reading and English/language arts teachers), as well as every educational professional and school administrator. This includes content area teachers, whose aspirations should not only be about building students' content understanding but also to develop the specific skills used within that discipline to learn from and critically evaluate content.

During the RfU project, professional development took on many forms, from assistance with implementing interventions, to co-development of materials and programs, to knowledge transfer on the latest best practices. District leaders may want to require principals to identify faculty and staff with primary responsibility for reading literacy development and organize annual schoolwide reading literacy development plans, with monitoring of progress. A parallel but less intensive plan could be implemented for faculty-wide reading literacy development for all other content area faculty. We recognize that the recommendations here will require substantial planning in order to implement in feasible, resource-reasonable ways. Nonetheless, we see several high priority investments that may be required.

Recommendations for state and district leaders regarding professional development:

- **Require that teacher preparation incorporate research-based, discipline-specific reading comprehension training into the pre-service training of all teachers.** Also, because the field of cognitive science is rapidly developing, states should require teacher preparation programs to update their curriculum to reflect new advances in comprehension instruction as they are developed.

- **Require in-service teachers who are not proficient in the instruction of discipline-specific reading comprehension skills to engage in professional development and then incorporate it into instruction.** Comprehension instruction should reflect the expectations of the discipline. Consequently, content-area teachers will need expert knowledge about how to teach reading for understanding in their discipline. For instance, teachers and students should read history texts in a manner that is consistent with disciplinary expectations (e.g., distinguish primary from secondary sources); this is different from how they should read a science text.

The RfU projects identified several insights into key elements of such professional development offerings.

- **Receptive and productive development of academic language** should be a priority, especially with underserved groups whose language experiences outside of school may diverge from the academic language use expected in school.
- **Knowledge building** across topic and subject areas using rich oral language, vocabulary, as well as visual-graphic materials should continue to be a priority, with attention being given to how this knowledge can be integrated with text reading and comprehension.
- **Social interactions and communication** that foster perspective taking and multiple points of view should also be developed as prerequisites to advanced comprehension skills. Students need to be agents of their own learning, but also collaborators in a socially constructed environment.
- The foundations for **evaluating the credibility and integration of multiple sources** (whether text, oral, or visual) should also be introduced as preparation for more advanced multiple source reading comprehension.
- Teachers should keep up to date on the forms, genres, devices, and uses of **digital technologies** as they represent the reading literacy world that they are preparing students to enter. While the type and prevalence of devices and displays (e.g., laptops, tablets, smartphones, smart boards), communication platforms (e.g., email, blog, Twitter, Snapchat), and resources (e.g., World Wide Web, Wikipedia) continue to change and expand at a dizzying pace, educators must do their best to prepare children from the earliest ages to be flexible in their approach to learning and adapting to dynamic literacy environment of our age. This requires a mindset for integrating both formal reading and writing contexts with more informal and dynamic digital environments.
- Teachers and educators need to enhance their ability to **create language-rich environments and discussions** that foster language development and listening comprehension as well as reading comprehension. In the early grades, language development and listening comprehension instruction should be provided even before students have learned or mastered reading of printed text.

Implementation

In addition to, and because of, the need for a systematic effort to open successive gates to opportunity, it is essential to adopt a systemic approach that encourages, facilitates, and takes advantage of all relevant resources, funders, and providers. Effective solution strategies and implementations cannot simply depend on the efforts of, and utilize resources within, a single organization or system. ... The enormity of the challenges our nation faces demands an 'all hands on deck' philosophy and commitment. ...

In a long-term effort, no single, fixed initiative can carry the burden of change. Rather, in view of the complexity of the challenge and a constantly shifting environment, a strategy of continuous improvement must be implemented. This approach, in which incremental modifications are made over time, involves establishing networks to support collaboration and providing a forum so that providers, system participants, researchers, and funders can learn from each other, as well as from the mistakes and failures that most certainly will occur. Those modifications should be informed both by evidence from a particular site and by evidence from other, similar sites.

Kirsch et al., *Choosing Our Future*

Improving reading literacy involves sustained work at both the classroom level and the larger, community, state, and national level. It also requires research to devise and test new approaches to accelerate learning. If continuous improvement in reading literacy is to ever be achieved, there have to be mechanisms that allow solutions to be tested within classrooms, evaluated, implemented more broadly, and sustained over time. The RfU research teams worked with schools that had a need to enhance reading outcomes for their student populations. On the whole, each of the RfU projects brought technical expertise, ready-to-use professional development, curriculum and instructional content, evaluation tools, and monetary resources to schools. Each team did its best to be accommodating to the curriculum and logistical needs of participating schools and districts. Yet each faced multiple barriers to implementing its instructional programs, making trade-offs that sometimes compromised the evaluation of the efficacy of the programs. As of the writing of this report, teams were less than optimistic that schools would be able to sustain the instructional programs they put in place beyond the duration of the projects.

Imagine that we had solid evidence that the instructional programs implemented by the research teams would be effective. What would it take for them to become instantiated and institutionalized in the schools? It is toward this aim that we offer the following recommendations for district leaders, as well as the state leaders who advise and support them.

Recommendations for state and district leaders regarding implementation:

- ***Ensure that the rules, regulations, and policies that govern school organization and schedules can accommodate implementation and sustainability of new programs designed to enhance student achievement.*** The role of district leadership in transforming the teaching of language and literacy will be essential to implementing and sustaining change. Coverage of the curriculum is important, but content cannot really be learned or mastered absent advanced comprehension skills needed to sustain and enhance disciplinary learning. Time should be set aside for educational staff to explore new approaches to student learning and professional development.

- ***Integrate the expectation of innovation and change into policies and plans.*** While structure and routine schedules are important for the success of any institution, a mindset for innovation and improvement among districts is important for keeping pace with a dynamic learning environment.
- ***Monitor how well change is sustained over the long term.*** Reading is a complex skill that develops over time; changes are gradual, with slow growth over time. Educators should explore the use of new measures that can capture smaller, more realistic changes in student growth and to determine whether, over time, student learning has improved. If so, it is equally important for districts to continue monitoring to ensure that implementation does not decline.
- ***Encourage curriculum design research that collaboratively engages educators with researchers and provides time to explore and implement new approaches for improving reading.*** Implementing and sustaining innovation in research in schools will require a different relationship between educators and research. The approach needs to take into account not only the logistics of implementing a study, but also factors impacting the likelihood of instantiating a sustainable change.

Conclusion

There most certainly is no 'one size fits all' approach to closing the gaps in human and social capital that we see today. Adaptive flexibility will be an essential characteristic of any intervention effort. The specific problems to be tackled, the range of resources available, and the constraints in a particular context will vary across communities and regions. As [William T. Grant Foundation President] Adam Gamoran urged, we need to move beyond 'what works to what works for whom and under what circumstances.' The economic and workforce challenges presented by emerging technologies and globalization vary by industry and may require different approaches in one region or locality than in another. Social challenges also vary by location and across racial and ethnic groups. Effective initiatives must involve the negotiation and integration of the perspectives of stakeholders with different backgrounds, experiences, and expertise, with a focus on bringing them to the point of coherent, collective action.

Kirsch et al., *Choosing Our Future*

The work of the RfU initiative has not yet concluded. While all of the six project teams have finished their grants, the mining and reporting on the data collected will go on for years, as well as the development and dissemination of the instruction and assessment products that were initiated. For example, the National Academy of Education is working on a synthesis of the RfU project, with expected delivery of the report and supplemental monographs on specific issues by 2020.

In this report, the authors attempted to capture and communicate some key insights that can serve as principles for action now. Using the "race to the moon" metaphor, we suggested that change would require a *shared vision* that places value on the importance of improving reading development for all citizens. Second, the destination must be clear: *What it means to be a proficient reader in the twenty-first century has changed*, and assessment and instruction should follow suit. Third, change requires *engineering a system* that impacts policy through assessment, instruction, curriculum, professional development, and implementation of innovation for sustainability and continuous improvement. Adapting to the gradual accumulation of solid, stable empirical findings of research is important, but so too is learning to adapt educational practices to better serve children of today, large percentages of whom continue to fail to achieve reading comprehension levels at the standards we have set for our nation. In the spirit of empirical science, we recommend that innovations in policies and practices should be considered and implemented where needed, but with an eye toward understanding better what works for whom and when. The insights here hopefully can serve as a foundation for such innovation.

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