Executive Summary: Defining a 21st Century Education

The last few years have brought much talk of “21st century skills” but little certainty about why and how skill demands are actually changing. Will students really need better or different skills to succeed in life and work in the 21st century? If so what trends are behind such changes? And what specific kinds of knowledge and skills will be most important?

Broadly speaking, five major lessons emerge from the expert research and opinion on what kinds of knowledge and skills will most benefit students in the future:

1. Students who obtain more education will be at a great advantage; increasingly, some postsecondary education or technical training is essential for an opportunity to support a family or secure a middle-class lifestyle.
2. The need for traditional knowledge and skills in school subjects like math, language arts, and science is not being “displaced” by a new set of skills; in fact, students who take more advanced math courses and master higher math skills, for example, will have a distinct advantage over their peers.
3. At the same time, for success both on the job and in their personal lives, students must also better learn how to apply what they learn in those subjects to deal with real world challenges, rather than simply “reproduce” the information on tests.
4. Students who develop an even broader set of in-demand competencies—the ability to think critically about information, solve novel problems, communicate and collaborate, create new products and processes, and adapt to change—will be at an even greater advantage in work and life.
5. Applied skills and competencies can best be taught in the context of the academic curriculum, not as a replacement for it or “add on” to it; in fact, cognitive research suggests that some competencies like critical thinking and problem solving are highly dependent on deep content knowledge and cannot be taught in isolation.

A number of major forces are reshaping skill demands. Those forces include:

**Automation.** Because computers are good at following rules and recognizing simple patterns, they are increasingly being used to substitute for human labor in “routine” jobs. Therefore, any job that mostly entails following directions is vulnerable to automation, including so-called “white collar” jobs like accounting. As a result, there are fewer jobs that call for routine thinking work and routine manual work; between 1969 and 1999, the share of Americans in blue collar and administrative support jobs plummeted from 56 to 39 percent. At the same time, there is increasing demand for skills that computers cannot mimic, such as the ability to solve unpredictable problems and the ability to engage in “complex communications” with other humans, along with foundational skills in math, reading, and writing.

**Globalization.** Advances in digital technology and telecommunications now enable companies to carve up work and send tasks to be done wherever they can be completed best and cheapest. At the same time, political and economic changes in places like Russia, Eastern Europe, China, and India have freed up many more workers who can potentially perform such jobs. As a result, many more Americans are competing for jobs with a huge number of foreigners in an increasingly global labor market and—just as significantly—collaborating with workers in other countries when they do land a job. So far the impact of globalization has resembled that of automation, reducing demand for less-skilled labor. However, some economists predict that
highly skilled workers in other countries will increasingly compete for more intellectually demanding and higher paying jobs, which will force Americans to offer not only strong traditional skills but also high levels of creativity and innovation in order to stay competitive.

In a global knowledge economy, economic growth depends on human capital. One team of economists recently predicted that if the United States improved its students’ performance on international tests to the level of top performing nations, its gross domestic product would be an additional five percent in higher 32 years from now—enough to entirely pay for K-12 education—and an astonishing 36 percent higher in 75 years. Unfortunately, high school students in the United States perform worse on a number of international assessments than many of our economic competitors, and our historic advantage in attainment of secondary and postsecondary degrees is rapidly eroding as other countries improve and expand educational opportunities.

Corporate change. Because of technology, globalization, and other competitive forces, companies have radically restructured how work gets done. Many companies are now “flatter” organizations with less hierarchy and much lighter supervision where workers experience greater autonomy and personal responsibility for the work they do. Work also has become much more collaborative, with self-managing work teams increasingly responsible for tackling major projects. Increasingly, such work teams are global in nature, much of the interaction taking place electronically. Jobs have become less predictable and stable. From project to project and from year to year, employees must adapt to new challenges and demands.

Demographics. The U.S. population is rapidly becoming both older and more diverse. The 65 and older population is expected to more than double between 2008 and 2050 (while the 85 and older population is expected to more than triple), and so-called “minorities” will constitute the majority of schoolchildren by 2023, of working-age Americans by 2039, and of all Americans by 2042. That creates a two-fold challenge for schools: First, they will need to be able to teach a more diverse group of students. Second, they will need to prepare those students to collaborate in diverse job settings and function in a diverse society.

Risk and responsibility. Individuals increasingly shoulder a greater burden of risk and responsibility for their personal well-being. Three intersecting spheres that illustrate the trend are job security, health care, and financial planning:

- Job security. Several decades ago, most companies still valued and rewarded loyalty, but with increasing reliance on human capital that has changed. The vast majority of major companies now make continued employment contingent on performance, while only a small minority reward seniority or loyalty.
- Companies used to provide pensions that guaranteed retirees a defined level of income based on longevity and salary, but those plans have largely been replaced by “defined contribution” plans where employees are at least partly responsible for making decisions about how to invest money for retirement. The success of those investments determines whether and how comfortably they can retire.
- Individuals are being asked to understand complex health-related information to make more decisions about their own medical care; at the same time, they are shouldering a greater share of medical costs.

Students will need to be able to use what they learn in school to understand critical information—including numerical health and financial information—in order to make sound decisions that ensure their well-being.

As a result of these forces, three kinds of learning are becoming increasingly important if not essential for students to succeed in work and life:
1) **Traditional academic knowledge and skills.** The belief that students will no longer need to learn the academic content traditionally taught in the school curriculum is false. Students will need strong math and English skills to succeed in work and life, for example. A strong academic foundation also is essential for success in postsecondary education and training, which itself is increasingly necessary for anyone who wants to earn a middle class wage.

2) **Real world application, or “applied literacies.”** Students will need not just knowledge but also “literacy”—the ability to apply their learning to meet real-world challenges. That applies to all subjects, including English, math, science, and social studies.

3) **Broader competencies.** Students who develop an even broader set of competencies will be at an increasing advantage in work and life. Based on employer surveys and other evidence, the most important seem to be:

   a. The ability solve new problems and think critically;
   b. Strong interpersonal skills necessary for communication and collaboration;
   c. Creativity and intellectual flexibility; and
   d. Self sufficiency, including the ability to learn new things when necessary.

**How should school districts prepare students to meet these challenges?**

Obviously, applied literacies are best taught in the context of the academic curriculum. However, districts also should consider broader competencies like critical thinking an enhancement to the core curriculum rather than as a substitute for it or an “add on” to it. After decades of research, cognitive scientists have concluded that “how to think” competencies like problem-solving and critical thinking are not generic skills that can be taught directly and then applied to any situation later in life. Rather, they depend on deep knowledge of the subject area in question—facts as well as an understanding of how those facts fit together, which provides a sense of how and why “things work” in a particular field, whether it be history, science, medicine, or auto mechanics.

Employers consistently rank collaboration very high on their list of “must have” competencies, which is not surprising given changes in the workplace. This broad competency is best understood as a cluster of related “interpersonal skills” that give one the power to interact effectively with others, including the ability to communicate effectively both orally and in writing, to relate well to others and cooperate with them, to negotiate and manage conflicts, and to lead through persuasion. When asked about these separate interpersonal skills, employers rate graduates worst in oral and written communications. But classroom teachers should bear the only responsibility: Research shows that athletics and other student activities (yearbook, student government, etc.) can help students develop skills related to leadership and teamwork and have a positive impact on later earnings.

Experts predict that creativity and innovation will become more important given economic trends, both for individual corporations and for the U.S. as a whole. While there is a large body of research and advice about encouraging creativity in students, school districts should first carefully consider how they are defining this competency since it can mean many different things to different people. For example, a recent study found significant differences in how district superintendents define creativity compared with what employers need. While superintendents ranked the ability to solve problems as the most important indicator of a creative person, employers said it is most important to be able to identify problems. Employers also thought it much more important that students be comfortable facing a problem with “no right answer,” which suggests that schools must find more ways to give students more complex and unstructured problems and fewer multiple choice questions.
What are the implications for planning?

First, it is clear that districts should aim to prepare all students for postsecondary education or advanced training. Beyond that, districts must do a better job attending the application of knowledge and skills, going beyond simply teaching students to “reproduce” what they are taught within familiar contexts, as well as encouraging students to develop broader competencies related to critical thinking, collaboration, and creativity.

It is important to avoid simplistic “either or” thinking about 21st century skills. Factual knowledge, the ability to follow directions, knowing how to find a right answer when there is one—all of these things will still be important in the 21st century. The key is to develop a curriculum that teaches students those things as well as how to apply what they learn to solve real world problems and helps them to develop the broader competencies increasingly important for success in an ever more complex and demanding world.

To that end, applied literacies and broader competencies are best taught within traditional disciplines instead of as separate subjects. Even so, some might ask how it will be possible to do so while still covering all of the content in the official curriculum. For ideas on how to make room in the curriculum, districts can take a cue from countries that perform well on international assessments: focus the curriculum by emphasizing a slimmer set of knowledge and concepts that can then be taught in much greater depth.

Craig D. Jerald is President of Break the Curve Consulting, specializing in education policy, communications, research, and practice. Previously, Craig was a Principal Partner at the Education Trust where he worked on issues related to teacher quality, accountability, federal education policy, and the practices of high-performing schools and districts. Craig was also a Senior Editor at Education Week where he founded and managed the organization’s research division and helped create Ed Week’s special annual reports series, Quality Counts and Technology Counts.