

# TECH & LEARNING



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## 21st Century Skills: Will Our Students Be Prepared?

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*Learning for the 21st Century*, a report from a new public-private coalition known as the Partnership for 21st Century Skills ([www.21stcenturyskills.org](http://www.21stcenturyskills.org)), articulates a vision of how schools can best prepare students to succeed in the first decades of the 21st century. Central to the report's recommendations is a call for schools to focus on six key elements of 21st century learning:

1. **Core Subjects:** The authors reaffirm the importance of the core subjects identified by No Child Left Behind but challenge schools and policymakers to expand their focus beyond "basic competency" to understanding the core academic content at much higher levels.
2. **Learning Skills:** "To cope with the demands of the 21st century," the report states, "students need to know more than core subjects. They need to know how to use their knowledge and skills-by thinking critically, applying knowledge to new situations, analyzing information, comprehending new ideas, communicating, collaborating, solving problems, and making decisions."
3. **21st Century Tools:** Recognizing that "technology is, and will continue to be, a driving force in workplaces, communities, and personal lives in the 21st century," *Learning for the 21st Century* emphasizes the importance of incorporating information and communication technologies into education from the elementary grades up.
4. **21st Century Context:** Experiences that are relevant to students' lives, connected with the world beyond the classroom, and based on authentic projects are central to the sort of education the Partnership for 21st Century Skills defines as the appropriate context for learning in the information age.
5. **21st Century Content:** The report's authors believe that certain content essential for preparing students to live and work in a 21st century world is missing from many state and local standards. (See [list](#).)
6. **New Assessments that Measure 21st Century Skills:** "As pervasive as assessment seems to be today," the report says, "it remains an emerging and challenging field that demands further study and innovation." Recommendations include moving beyond standardized testing as the sole measure of student learning; balancing traditional tests with classroom assessments to measure the full range of students' skills; and using technology-based assessments to deliver immediate feedback.

Just as the CEO Forum on Education and Technology included a StaR (School Technology and Readiness) Chart in its 2001 report to aid schools in identifying their level of technology readiness and preparation, *Learning for the 21st Century* features a fold-out MILE (Milestones for Improving Learning and Education) Guide to help measure progress at preparing students to meet the challenges of the new millennium.

### What's New Here?

Many of the themes explored in *Learning for the 21st Century* will be familiar to educators who have read the 1991 SCANS Report (Secretary's Commission on Achieving Necessary Skills) or subsequent reports issued by the CEO Forum. Both groups outlined a variety of skills-including higher-order thinking, personal abilities, and technology literacy-essential for preparing students for a knowledge-based economy.

So what is new about the recommendations being made by the Partnership for 21st Century Skills? "To some degree, the recommendations are not all that new," says Chris Dede, professor of learning technologies at the Harvard Graduate School of Education and an education advisor to the partnership, "and that, in itself, is newsworthy. The fact that educators and business leaders keep returning to many of the same findings means we have a lot of confidence in them-that they're not part of a temporary fad."

Another partnership advisor, Paul Resta, director of the Learning Technology Center at the University of Texas at Austin, agrees that the consensus arrived at by the partnership is noteworthy-especially because of the large number of stakeholders from business, K-12 schools, higher education, and government who participated in its creation. In addition, he

points out that it delves deeper into the how of delivering 21st century skills than its predecessors.

John Wilson, vice chair for the 21st Century Skills partnership and executive director of the National Education Association adds that, "While previous works have focused on technology, this goes beyond that to what we need to do to prepare students for a world that is vastly transformed by technology, making it necessary to constantly learn and adapt."

### **NCLB and 21st Century Skills: Contradictory or Complementary?**

For some who attended the *Learning for the 21st Century* press conference, there was something incongruous about listening to John Bailey, director of the U.S. Department of Education's Office of Educational Technology, endorse the report—including its suggestion that "standardized tests can measure only a few of the critical skills that we hope our students will learn." After all, for many educators today the government's No Child Left Behind program is synonymous with high-stakes testing and a narrowing vision of what constitutes achievement.

For example, social studies teacher and media coach Marco Torres laments the fact that his students, who create outstanding multimedia projects that demonstrate both knowledge and creativity, are forced to attend four-hour Saturday "drill-and-kill" sessions if they fail to pass a weekly test. "Many of my colleagues feel too overwhelmed to focus on teaching or learning. Louder, slower, and more repetitive seems to be the pedagogy of choice of low-income schools like mine," he says.

ISTE president Jan Van Dam concurs with the feeling that, "Many districts are so overwhelmed and concerned about the NCLB requirements and potential financial repercussions of not complying, that for lots of them the safest route is the 'back-to-basics' approach—focusing entirely on 20th century skills at the expense of 21st century ones."

But both Van Dam and Bailey believe that it does not have to be this way. "It's not an either/or choice," says Bailey. "We can teach higher-order thinking skills and have students using 21st century tools at the same time that they master core content areas." He points out that NCLB does not mandate that measures of average yearly performance be based solely on tests of lower-order thinking skills and that many of the 21st century skills outlined in the partnership's report are already part of state standards.

"I wholeheartedly agree that there is no need for an either/or approach," adds Van Dam. "There needs to be less fear and more creativity applied to the methods used to meet the needs of NCLB."

### **Basic Skills Revisited**

One of the key points of *Learning for the 21st Century*, according to John Wilson, is that we are defining essential skills too narrowly. "As our nation focuses on the basics, it is noteworthy that government, educators, and private industry are unified in underlining that 21st century skills must be part of today's basics," he says.

The report states, "Literacy in the 21st century means more than basic reading, writing, and computing skills. As writer Alvin Toffler points out, 'The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.'"

*Learning for the 21st Century* reminds readers that NCLB defines core subjects to include the arts, civics, and a number of other subjects often overlooked in back-to-basics curricula and that many states and districts already incorporate a wide range of learning skills into their standards. Now, the report says, it is time to "emphasize them strategically and comprehensively" — and to add some more key skills to the list.

### **Technology's Role Today**

Although the authors are careful to point out that there are plenty of learning skills that have nothing to do with technology, they describe 21st century tools — including computers, telecommunications, and audio- or video-based media — as critical enablers of learning in a number of realms. And the fact that the information age that has resulted from the widespread adoption of such tools places us "in a world of almost unlimited streams of trivial and profound information, of enormous opportunity and difficult choices," necessitates an emphasis on information and communication technology literacy skills that will allow students to make sense of it all.

While many education, business, and government leaders concur with the importance of technology as a tool for 21st

#### **Poll**

In the report, the Partnership for 21st Century Skills invited educators to join the debate about teaching either basic skills or 21st century skills.

[Weigh in.](#)

century teaching and learning, this realization contrasts sharply with what is happening in a number of states and districts as they scramble to respond to budget cuts and accountability pressures. "Unfortunately," says Margaret Honey, vice president and director of EDC's Center for Children and Technology, "in the schools that have the most pressure on them to improve test scores, technology often takes a back seat, along with the arts or anything that is seen as peripheral."

"I think everyone recognizes the importance of technology," agrees Ginger Jewell, coordinator of educational technology for the Clarke County School District in Georgia, "but it sometimes comes down to Solomon-like decisions. We've lost the technology money that was generated by the lottery and that is a tremendous blow. We also had to scale back the regular budget to accommodate unfunded NCLB mandates." Nevertheless, she says, her district continues to support its technology program with help from a local sales tax. "I actually think we're experiencing better use as teachers see the technology as a tool to accomplish academic goals rather than an add-on to an already busy day."

### **Having Faith in 21st Century Teaching**

The authors of *Learning for the 21st Century* are clear that an emphasis on learning skills, 21st century tools, global awareness, and other elements of 21st century curriculum can — and should — coexist with core content. "Both [basic and 21st century skills] are essential," they write, "and, when taught concurrently, one reinforces the other."

According to Chris Dede, "In their focus on achievement lots of people are going back to behaviorist ideas from the first half of the 20th century, which said that basics must come first, and only when you know all the basic concepts and skills can you move on to learn about more complex interrelationships. Unfortunately, many kids get bored or burned out long before they get there. The drill kills their natural curiosity and they stop even trying."

"There is plenty of evidence," he continues, "that it is possible to learn the simple things in the process of addressing a complicated problem. Given interesting but complex challenges and projects, students are often motivated to learn the basic computation skills or simple facts that they need to master the problem."

The value of rich, multidisciplinary, technology-infused learning seems so obvious to educators who have seen its impact on young people that it is often frustrating to be asked to prove it using tests. Eeva Reeder, educational consultant and project-based learning specialist, speaks for many of her colleagues when she says, "A massive amount of research has made it clear how people learn and don't learn. The fact that it is still being debated is baffling. We need to use our common sense and pay attention. All human beings learn by doing, analyzing, talking, processing, and problem-solving. Talking at kids never has been and never will be an effective way to help them learn."

At the same time, there is good news for those who are resigned to the idea that test scores will continue to take center stage, at least for the near future. According to a number of researchers, rich 21st century learning experiences commonly do translate into higher test scores. Paul Resta describes two projects he worked on with secondary schools in Texas. Both focused on cooperative learning and knowledge construction in the context of English and social science instruction. "The teachers and administrators were very nervous about the nontraditional nature of the activities and how they would affect test scores. In the end, the students involved in these two projects all scored as well as their peers on some of the tests and significantly better on others."

It is interesting to note that these sorts of gains are true in spite of the fact that allowing students to solve real-world problems, collaborate with others, and create presentations to demonstrate their learning takes more time — time that might otherwise be used to speed through additional content material. Both Dede and fellow advisor Margaret Honey point to the importance of deep learning. "A broad overview is important," says Honey, "but stopping frequently to involve students in projects that allow them to go deep is equally important. We need a balanced approach."

Ironically, educators' worries about test scores might eventually be what it takes to make them broaden their teaching methods. "Let's be honest," says Michael Simkins, creative director for the California-based Technology Information Center for Administrative Leadership, "we can get some initial gains on tests by teaching to the test and practicing test taking skills. Ultimately, though, we're going to hit an achievement wall. The irony here is that teachers are most likely to drill basic skills even harder in their effort to keep getting new achievement gains when, in fact, it may only be through engaging kids in higher-order thinking activities that they have any chance of breaking through those subsequent achievement barriers."

### **New Assessments and Measures of Progress**

Regardless of the impact of 21st century learning on test scores, there is clearly a need for assessment tools that measure those essential skills that will never be captured by traditional tests. Even before *Learning for the 21st Century* challenged states and districts to add new skills to their lists of essentials, many of the standards on the list were being played down

or ignored simply because they weren't easy to measure. Or, as the report reminds us, "What gets measured gets taught... We must measure what we value — or it won't be taught."

While the urgency is evident, the mandate for what must follow is a little fuzzier. Twenty-first century project and portfolio assessments are great classroom-level tools for monitoring the progress of individual students but, as the report mentions, "These assessments typically are not valid or reliable for broad comparisons across classrooms or schools." Other new approaches, such as computer-delivered tests, are helping with scoring and rapid feedback to schools — an essential element if we are to use the results to help students — but do not dramatically broaden the sorts of things that are being tested.

Whether second-generation assessment tools can bridge the gap — allowing the entire nation to focus on what's important, not just what can be tested easily — is a big question. John Wilson, for one, is optimistic that "technology will help us find ways to more effectively utilize assessment both for identifying overall achievement patterns as well as for helping individual students learn. Devising these much-needed quality assessments must be a priority of our policymakers."

In the meantime, the report places surprisingly little emphasis on other measures of progress that so many educators point to as compelling evidence that their 21st century teaching is paying off. While NCLB legislation permits states to use a variety of measures for measuring annual yearly progress, factors such as student attendance, college acceptances, or student and parent satisfaction, are receiving far less publicity than test scores.

And yet those are the factors that administrators at New York's widely respected Urban Academy tout when they talk about the measures of success that matter to them and their school community. "Why is Urban Academy so successful?" they ask at their Web site — and then go on to explain that 97 percent of their graduates enter four-year universities, they have virtually no violence, theft, or teacher turnover, and their attendance and dropout rates are far better than those seen in most other New York City schools.

And those are the factors Marco Torres takes pride in as he surveys his classroom. "My students just had a film festival last week that over 500 community folks attended. Within three days, the Web site had 22,000 hits," he says. "Here, in one of the poorest areas of Los Angeles County, I have kids who have self-esteem, who are going to college, who are being recruited to help make companies and institutions more effective, who are being treated like queens and kings by our elected officials and being recognized in front of L.A. City Council for their commitment to giving our community a voice. Come to my class when the bell rings and see how many kids get up to go home. They want to be there, they want to finish their projects, they want to learn more." If that's not achievement, what is?

NEXT: [21st Century Learning Skills and ICT Literacy](#)

[21st Century Content](#)

[9 Steps to Build Momentum](#)

[How Do We Know It's Working?](#)



Take a closer look at school districts and programs that are focusing on 21st century learning with help from 21st century technology, while also winning at the accountability game at: "[How Do We Know It's Working?](#)".

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## **21st Century Learning Skills and ICT Literacy**

Information and communication technology literacy

- Thinking and problem-solving skills
- Critical thinking and systems thinking
- Problem identification, formulation, and solution
- Creativity and intellectual curiosity

Using problem-solving tools (such as spreadsheets, decision support, and design tools) to manage complexity, solve problems, and think critically, creatively, and systematically.

#### Information and communication skills

- Information and media literacy skills
- Communication skills

Using communication, information processing, and research tools (such as word processing, e-mail, groupware, presentation software, and the Internet) to access, manage, integrate, evaluate, create, and communicate information.

#### Interpersonal and self-direction skills

- Interpersonal and collaborative skills
- Self-direction
- Accountability and adaptability
- Social responsibility

Using personal development and productivity tools (such as e-learning, time managers, and collaboration tools) to enhance productivity and personal development.

*Excerpted and adapted from Learning for the 21st Century*

Go to next page: [21st Century Content](#) > > >

< < < [intro](#)

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## 21st Century Content

### Global awareness

- Using 21st century skills to understand and address global issues
- Learning from and working collaboratively with individuals representing diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue in personal, work, and community contexts
- Promoting the study of languages other than English as a tool for understanding other nations and cultures

### Financial, economic, and business literacy

- Knowing how to make appropriate personal economic choices
- Understanding the role of the economy and the role of business in the economy
- Applying appropriate 21st century skills to function as a productive contributor within an organizational setting
- Integrating oneself within and adapting continually to our nation's evolving economic and business environment

### Civic literacy

- Being an informed citizen to participate effectively in government
- Exercising the rights and obligations of citizenship at local, state, national, and global levels
- Understanding the local and global implications of civic decisions
- Applying 21st century skills to make intelligent choices as a citizen

SOURCE: *Learning for the 21st Century*

Go to next page: [9 Steps to Build Momentum](#) > > >

< < < [21st Century Learning Skills and ICT Literacy](#)

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## 9 Steps to Build Momentum

1. Embrace a powerful vision of public education that includes 21st century skills.
2. Align leadership, management, and resources with educational goals.
3. Use [the MILE Guide] to assess where schools are now.
4. Develop priorities for 21st century skills.
5. Develop a professional development plan for 21st century skills.
6. Make sure students have equitable access to a 21st century education.
7. Begin developing assessments to measure student progress in 21st century skills.
8. Collaborate with outside partners.
9. Plan collectively and strategically for the future.

Go to next page: [How Do We Know It's Working?](#) > > >

< < < [21st Century Content](#)

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### **How Do We Know It's Working?**

Looking for schools, districts, and programs that are focusing on 21st century learning while demonstrating academic progress (through rising test scores or other quantitative measures such as graduation or attendance rates)? Here are a few examples that have been sent our way by readers and interviewees.

If you have a 21st Century Success Story to add, [email us with information and a URL where we can learn more.](#)

### **Individual Schools/Districts**

#### [Union City, NJ](#)

Margaret Honey and others at the Center for Children and Technology have done [extensive research](#) long-term reform efforts geared at raising achievement in this low-income, inner-city community. Authentic learning and the widespread use of technology to support the development of thinking, reasoning, and collaboration skills are central to the Union City approach, which has resulted in consistent 10-year gains in test scores. These results are also discussed at the [NCREL Web site](#).

#### [Mott Hall, New York City](#)

Since students at this grade 4-8 science, technology, and math magnet school have all been accepted, in part, because they show academic excellence, it's not possible to attribute their high test scores solely to the school's approach. However, principal Marian Acosta-Sing and teacher Marc Brill both report that Mott Hall's laptop computer program and its emphasis on "academically rigorous curricula" and "analytical and critical thinking skills necessary to succeed and make significant contributions to the world that awaits them" have all helped the low-income, largely bilingual student population soar even higher than they might have otherwise. Brill points, in particular, to writing skills, which have improved through the use of technology and collaborative editing. "We are finding that students revise their work more often and can better organize their work and assignments."

#### [Applied Learning Academy, Fort Worth, TX](#)

A year-round campus and a school of choice, Applied Learning Academy gives students an opportunity to learn through real-world experience in an environment that "fosters critical thinking, creativity, and collaboration with Fort Worth's arts, business, and scientific communities." Students create portfolios, design high tech projects, collaborate with a local theater company, and produce and field test documents for the school district. The school Web site reports TAAS (Texas state test) scores that are considerably above average — as well as positive attendance rates.

#### [Clarke County School District, GA](#)

Dr. Ginger Jewell, Coordinator of Educational Technology, describes great progress at one of the district's schools, [Hilsman Middle](#), that has a 1:1 computing program and a newly designed 21st century building. As one of eight schools chosen statewide because of poor test scores and high poverty, Hilsman's wireless laptop program is part of a state pilot focusing on increased student achievement through the use of technology-integrated rich curriculum. "Our scores there," says Jewell, "have gone up dramatically, at a much higher rate than the schools without the benefit of 1:1 technology."

#### [Sherman Oaks Elementary, San Jose, CA](#)

A K-6 charter school, Sherman Oaks features a dual immersion English/Spanish language program and project-based learning culminating in widely attended student exhibitions. According to the school Web site, the Sherman Oaks program focuses on "strong academics built around real-life learning" and has "significantly raised student achievement levels." More

detail is offered at the school site and at the [George Lucas Education Foundation site](#).

## Compilations and Reports

### [The George Lucas Educational Foundation](#)

This Web site features profiles of a wide variety of technology-enhanced programs focusing on project-based learning, equity issues, and a variety of the 21st century learning challenges. Examples include Marco Torres' multimedia work in one of the poorest areas in Los Angeles County and three alternative high schools (New York's Urban Academy, the Indianapolis-based Key Learning Community, and Mountlake Terrace High School near Seattle), all of which feature authentic learning and can point to significant student achievement as measured by performance assessment.

### [School Redesign Network](#)

Focusing on small school reform, with a goal of teaching "all children to high levels," the Stanford University-based School Redesign Network serves as a resource to district and school leaders. Schools in the network are committed to 10 elements of effective school design — including the use of standards and performance assessment, authentic curriculum, collaboration, and community connections. Individual schools profiled at the School Redesign Network include: Sir Francis Drake High School in San Anselmo, Calif.; Urban Academy and Landmark High School in New York City; Sherman Oaks Elementary charter school in San Jose, Calif.; and The Met in Rhode Island. In addition, you can read a [research report](#) showing that test scores in schools affiliated with the network compare favorably to equivalent schools taking a different approach.

### [New York Performance Standards Consortium](#)

This coalition of 28 successful small high schools across New York State all feature "active student learning, exemplary professional development, and innovative curriculum and teaching strategies for 21st century students." You can jump to individual school sites or learn more about the performance assessment tools and philosophy of the consortium, which has been very active in opposing the use of high-stakes standardized tests to measure student progress. Instead, they point to other evidence of success, including low dropout rates and high college acceptance rates.

### [NCREL's EnGauge Program](#)

The North Central Regional Educational Laboratory (NCREL) has developed this site to focus on high-performance learning of academic content using 21st century skills and tools. The enGauge framework identifies six essential factors critical to effective uses of technology for student learning as well as four key categories of 21st century content. [Sixteen schools are profiled](#) as examples of successful implementation of the enGauge principles.

### [Schools As Knowledge-Building Communities](#)

This research report, co-authored by Dr. Paul Resta, quoted in the article you have just read, elaborates on an older Texas-based middle school project that featured computer-based, collaborative learning. Resta described to us the concerns on the part of teachers who worried that the work would not translate into test score progress and their relief to discover that students did as well or better than peers on standardized tests after completing the projects.

[< < < 9 Steps to Build Momentum](#)

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