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Teaching 21st Century Skills

What does it look like in practice?

by Nancy Walser

Call it a quiet revolution. As 2014 approaches—the deadline for all students to be proficient on state tests—academics, educators, business groups, and policymakers are finding common ground in a movement to bring "21st century skills" to the classroom, prompting state agencies and district leaders across the country to rewrite curriculum standards and even to contemplate big changes to existing state testing systems.

What are 21st century skills, who's pushing them, and what does 21st century teaching look like in practice?

Although definitions vary, most lists of 21st century skills include those needed to make the best use of rapidly changing technologies; the so-called "soft skills" that computers can't provide, like creativity; and those considered vital to working and living in an increasingly complex, rapidly changing global society (see *Skills for a New Century*).

"Some of these skills have always been important but are now taking on another meaning—like collaboration. Now you have to be able to collaborate across the globe with someone you might never meet," explains Christopher Dede, a Harvard professor who sits on the Massachusetts 21st Century Skills Task Force. "Some are unique to the 21st century. It's only relatively recently, for example, that you could get two million hits on an [Internet] search and have to filter down to five that you want."

While progressive educators in the past have often been wary of education reforms spearheaded by big business, the outsourcing of menial jobs and the need for workers to compete in a global economy have brought about an unprecedented convergence of interests, argues Tony Wagner, author of ***The Global Achievement Gap*** and codirector of Harvard University's Change Leadership Group. Surveys of business leaders show that when hiring new employees, they are looking for the same higher-order thinking skills as those considered necessary for students to do well in college, he notes.

Wagner and others also point to signs of student disengagement from traditional forms of learning that value memorization and mastery of content over student-designed demonstrations of skills. They cite surveys indicating that U.S. high schoolers drop out more from boredom than failure.

"Making AYP [adequate yearly progress] is absolutely no guarantee that students will be ready for college, citizenship, and employment," says Wagner, noting the high number of students needing remedial coursework in college—including those who graduate from schools boasting high standardized test scores. "Our curriculum is information-based and the emphasis is to acquire information first and foremost, and secondarily acquire skills," he says. "We have it exactly backwards."

Teaching 21st century skills doesn't necessarily mean using a lot of technology, although projects may involve computers, software, and other devices, like a global positioning system (GPS). Sometimes it's simply a matter of approaching an assignment differently to allow

students to demonstrate skills like teamwork, collaboration, and self-directed learning. Equally important is making sure teachers are able to coach students on how to advance to the next level of a particular skill. This is often done with rubrics that explain clearly what poor, average, and effective skills look like in practice.

What follows are some examples of 21st century teaching provided by researchers, curriculum specialists, administrators, and teachers.

Try a Socratic seminar. Instead of relying on the usual lecture-question format, ninth-grade humanities teachers Mark Rubin-Toles and Torie Leinbach, who teach in the Catalina Foothills school district outside Tucson, Ariz., require students to lead their own discussions about a book, documentary, or document they have studied. Students are graded on the quality of their participation. Good marks go to those who build on, clarify, or challenge others' comments while referencing information from the material, their own experience, or other current events, according to a rubric given to them in advance.

"In the beginning, they struggle a lot," says Rubin-Toles, who limits his role to mapping the interactions on paper while the students talk. "There are these long silences and the kids are very uncomfortable." Later in the year, in the best of conversations, the students make connections with material they discussed earlier, he says.

The exercise builds critical thinking, oral communication, flexibility, self-direction, and teamwork. "They have to listen to others to do well," says Rubin-Toles. "Part of teamwork is holding back, especially when you have something to say. It's like a meeting of adults."

Beautify the neighborhood. Sixth-grade science teacher Wayne Naylor has found a way to weave 21st century skills into lessons on longitude and latitude and on scale and proportion—required by Indiana state standards—while also working to get his town certified as a wildlife community by the National Wildlife Federation. In his class at Craig Middle School, students work in groups to identify natural areas in surrounding Lawrence Township that need improvement. One such project was restoring and renovating the city's Fall Creek Park to remove invasive species. Using the Internet, students researched plants native to the area. They conducted surveys to gather ideas from others in the community about their plans. Using a GPS and Google Earth, they marked the locations of their projects and created poster displays and scale models. Some groups went further, producing a videotape to apply for a national Christopher Columbus award, which is given to teams of middle school students who use science and technology to find an innovative solution to a community problem. The students are in the process of implementing the plans they designed.

Naylor's six-week unit has something to engage everyone, he says. One student with attendance problems never missed Naylor's class. Although the student struggled in math class, when it came to translating proportions from a model picnic table to build the real thing (which now sits in the school courtyard), "he did just fine," says Naylor. "He was a leader. Everyone was really impressed."

Build a bridge. Not everyone has access to 40-foot pine trees, but in rural Darlington, Wisc., high school teacher Dick Anderson sized the opportunity to use local rough-sawn timber to impart some 21st century skills and real-world entrepreneurship to his students.

Each year for the past two years, students in Anderson's elective Building Trades class have been involved with nearly every aspect of planning, budgeting, modeling, building, and siting a rustic covered bridge. Students worked 60 hours outside of school to complete the last one. In a real lesson in adaptability, the plan to site it over the nearby Pecatonica River had to be abandoned due to environmental issues. The plans were scaled down so the bridge would fit in a city park near a new motel.

The project went beyond the typical trades class in which students learn technical skills in isolation from the real world, says Anderson. Students gave numerous presentations to school board members, the city council, and business groups, and even gave interviews to reporters from a local TV station. "They had to convince responsible adults to say, 'Yes, we'll take a bridge for the city of Darlington,'" said Anderson. "They learned that if you want to get anything done, that's the way it is."

Make an I-Movie. Catalina Foothills teacher Dana Mulay and her kindergarten class were getting bored with point-and-click software games. So, to keep her five-year-olds excited about learning, she decided to help them use I-Movies software to create videos featuring the solid shapes they were studying in math. She divided them into teams and, armed with digital cameras, they went into the desert nearby hunting for shapes to photograph. "Barrel cactus sort of look like spheres and a seguero [cactus] is a cylinder," she says. She downloaded the photos on to laptops brought into the class on carts, and students worked in pairs to make the movies, using invented spelling for captions. The project helped them learn more not only about computers, but also about teamwork and self-direction, she says. "It was really amazing to see them problem-solve on their own and focus on what they needed to do."

Save a river. A block and a half away from the seventh most endangered river in the United States sits the Hayes Bilingual Elementary School in Milwaukee. It's where library media specialist Tomas Kelnhofer is using 21st century tools to work with fifth-grade teachers and students —the majority of whom come from Spanish-speaking homes—to learn about science, their community, and their planet. The Kinnickinnic River "has been an eyesore—a drainage ditch and dumping ground," says Kelnhofer. Except for occasional debris floating down the wide, concrete-lined channel, the river was invisible to students. Not any more. Partnering with local health and environmental groups, students have canoed down the river to see places where PCB-laden sediment has collected. They have tested water for bacteria, posted reflections in on-line journals using Moodle, and created a DVD and PowerPoint presentations of their plans to enhance the river area. They have also debated moral dilemmas such as whether the city of Milwaukee should continue to use salt on icy roads for safety, given the impact on wildlife in the river. "It's true that our students are going through a continuous revolving door of assessments, including those required by NCLB," says Kelnhofer. "However, in between these assessment cycles there is time to work on research and projects that focus both on content and process skills."

Standards and Assessment

The possibilities for infusing 21st century skills into classrooms are "endless," maintains Ken Kay, president of the Partnership for 21st Century Skills, an advocacy organization that works with states. Yet there is far more agreement on how these skills can be taught than on how to encourage teachers to teach them in the current climate of high-stakes testing (see *Leaders in 21st Century Learning*). Existing curricula are driven largely by the statewide assessments mandated by the No Child Left Behind Act. Simply adding new standards for 21st century skills to existing ones isn't realistic, experts say, since most state standards pack in "27 years' worth of content" for teachers to cover in 12 years, as Dede puts it. Some things will have to go or be "de-emphasized," he says. "There is absolutely no reason to teach state capitals any more, because you can look it up in 15 seconds on a computer and because it's not foundational to learning anything else."

Another knotty issue is assessment. Typical multiple-choice tests can't be used to measure things like teamwork. Newer tests designed to assess critical thinking or problem-solving skills, like the Program for International Student Assessment (PISA), are only recently being piloted in a few U.S. districts. Efforts to implement performance assessments, like those being pursued by a consortium of 28 high schools in New York State as an alternative to high-stakes tests, are also rare.

The Partnership for 21st Century Skills advocates a blend of old and new. "Ultimately, we view this as the future of the No Child Left Behind Act, which measures whether students can perform core skills," says Kay. "The real issue is, do we have the collective will to make 21st century skills a priority?"

Others, like Dede, believe that until states adopt better ways to measure 21st century skills, it will be difficult to bring about a shift in classroom priorities.

"You can't just sprinkle 21st century skills on the 20th century doughnut," he says. "It requires a fundamental reconception of what we're doing."

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For Further Information

Catalina Foothills School District: www.cfsd16.org

Christopher Columbus Awards: www.christophercolumbusawards.com

Darlington, Wisc. High School Timber Framed Covered Bridge Project: www.summerville-novascotia.com/darlingtoncoveredbridge/

C. Dede. Transforming Education for the 21st Century: New Pedagogies That Help All Students Attain Sophisticated Learning Outcomes. Available online at www.gse.harvard.edu/~dedech/Dede_21stC-skills_semi-final.pdf

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The New York Performance Standards Consortium: http://performanceassessment.org

North Carolina Professional Teaching Standards: www.ncptsc.org
Partnership for 21st Century Skills: www.21stcenturyskills.org

T. Wagner. *The Global Achievement Gap*. New York: Basic Books, 2008.

West Virginia Department of Education Teach21: http://wvde.state.wv.us/teach21

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