

# AMERICAN Educator

A QUARTERLY JOURNAL OF EDUCATIONAL RESEARCH AND IDEAS

## In Need of a Renaissance

### NOT ANOTHER HOLLOW REFORM

"The great challenge to our generation is to create a renaissance in education ... that seeks to teach the best that has been thought and known and done in every field of endeavor."

—DIANE RAVITCH

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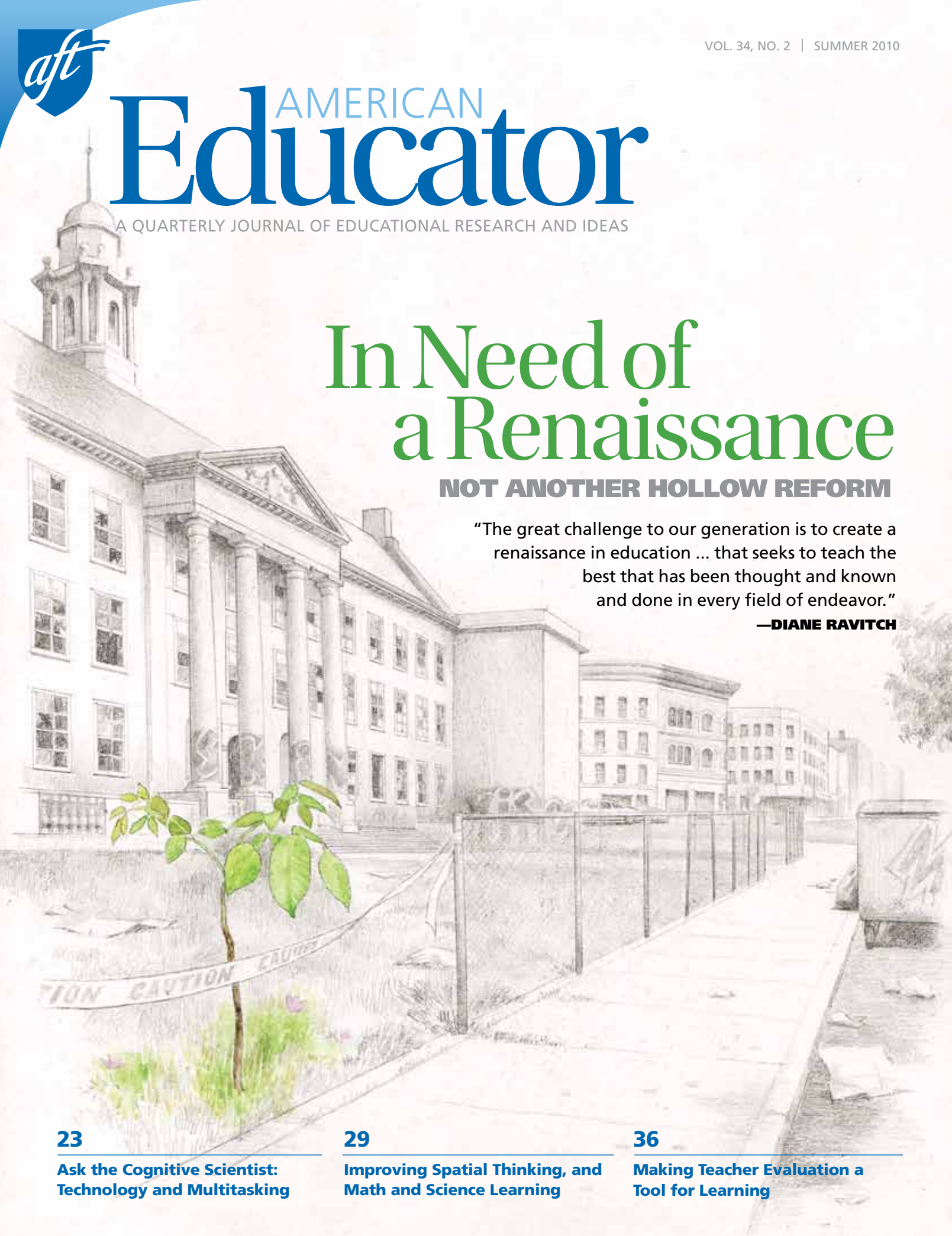
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Hollow reforms, like proposals that emphasize get-tough accountability over support for educators and widespread choice over quality neighborhood schools, enjoy their share of supporters. In this excerpt of her new book, *The Death and Life of the Great American School System*, Diane Ravitch chronicles her realization that high-stakes tests and the proliferation of charter schools are undermining public education. Ravitch calls for a renewed focus on curriculum and instruction “that seeks to teach the best that has been thought and known and done in every field of endeavor.” Our students deserve the best. With the hard work of renaissance, we can give it to them.

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## New Book Explains Research on Teaching English Language Learners

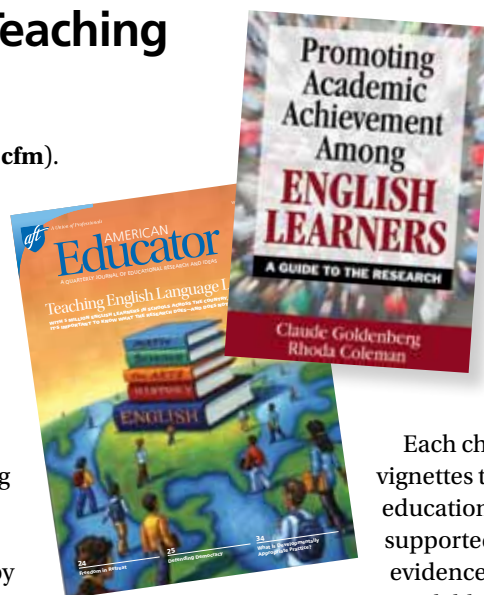
IN OUR SCHOOLS, the number of students whose first language is not English continues to grow rapidly. In 1990, 1 in 20 public school students was an English language learner (ELL); today that ratio is 1 in 9. Teachers and policy-makers need to know the best way to teach such children. To that end, Claude Goldenberg and Rhoda Coleman have written *Promoting Academic Achievement Among English Learners: A Guide to the Research* (Corwin, April 2010).

Goldenberg, a professor of education at Stanford University, and Coleman, a researcher and professional development specialist at California State University, Long Beach, based their book on two government-funded reviews of the research relating to teaching ELLs: *Educating English Language Learners: A Synthesis of Research Evidence* (prepared by researchers associated with the Center for Research on Education, Diversity, and Excellence), and *Developing Literacy in Second-Language Learners: Report of the National Literacy Panel on Language-Minority Children and Youth*. The book also draws on “Teaching English Language Learners: What the Research Does—and Does Not—Say,” an article Goldenberg wrote for the Summer 2008 issue of *American Educator* (which is available at [www.aft.org/newspubs/](http://www.aft.org/newspubs/)

[periodicals/ae/issues.cfm](http://www.aft.org/newspubs/periodicals/ae/issues.cfm)).

Goldenberg and Coleman write that “the need for such a book became manifestly clear when one of us (Coleman) conducted a study of how school districts decided on programs for ELLs. To an alarming degree (although not unique in education), decisions were driven by theoretical orientation or personal preference and philosophy.”

While the authors do address the controversies surrounding bilingual education, their main purpose is to set the record straight on what the research supports. They write that “the consensus—although it is not unanimous—among the experimental studies of primary-language instruction is that teaching ELLs in their home language in fact boosts their achievement in the second language, as compared to teaching them only in their second language.” For this reason, and because instruction in the home language helps promote bilingualism and biliteracy, Goldenberg and Coleman recommend



teaching literacy skills at least, and perhaps subject-matter content as well, in a student’s home language and in English.

Each chapter contains vignettes to illustrate educational practices supported by the best evidence currently available. The scenarios are based on the authors’ observations of actual teachers’ lessons and schoolwide practices during their visits to schools over the last four years. The book concludes with broader suggestions for educators, administrators, and policy-makers on improving the achievement of ELLs. Like students in general, children who come to school speaking little or no English “benefit from well-designed, challenging, and structured lessons and activities ... where teachers provide relevant, timely, and useful feedback that improves learning, understanding, and performance,” Goldenberg and Coleman write. “Don’t undersell ELLs’ academic abilities because they are less than proficient in English.”

## Hotline Helps Families in Need

AS THE SCHOOL YEAR ENDS, teachers are no doubt telling their students to have fun and stay safe this summer. Teachers can also let students know that if they or their families run into trouble—if their parents lose their jobs or their health insurance runs out—they can pick up the phone and dial 2-1-1.

The United Way of America has helped establish this easy-to-remember telephone number to connect people to health and social services in their local communities. The ever-expanding hotline currently serves almost 250 million Americans and is available in 46 states plus Washington, D.C., and Puerto Rico. Specially trained personnel help callers determine what services they need—for example, food banks and shelters, job training, and affordable housing options, among other supports—and provide them with relevant information on where to find those services.

Visit [www.liveunited.org/211](http://www.liveunited.org/211) to learn more.



## Career Day Any Day

SINCE THE SCHOOL YEAR allows little time for visitors to share what it's like to be a surgeon, a carpenter, or a chemical engineer, teachers can turn to CTI Career Search, at [www.citytowninfo.com/employment](http://www.citytowninfo.com/employment), to provide students quick and honest insights into all kinds of careers. This website features roughly 2,000 career stories based on interviews of people working in more than 200 careers. Those interviewed for career stories provide their educational backgrounds, job descriptions, previous experiences, the best and worst parts of their jobs, and tips for pursuing work in their fields. Since career stories are published anonymously, they offer a candid look at each profession. Accom-

panying these stories are hundreds of short videos that show the workplace—be it an office or a national forest—while describing a career.

The site also offers salary information and a college search tool that enables visitors to find institutions offering majors and degrees in a given field. Information about the popularity of a job in a particular industry and in various cities is also available.

The site explores a diverse range of careers and numerous types of jobs within each field. For instance, the career stories for lawyers include 52 jobs, such as appellate attorney for a city, bankruptcy attorney, real estate lawyer, probate lawyer, and Medicare senior

policy analyst, among others. For application software engineers, 34 jobs are listed, including chief software architect, robotics software developer, software engineer and team leader, software engineer for a startup, and technical consultant for a software company, to name a few. More than 200 career stories are posted from educators: a preschool music and drama teacher, a fourth-grade teacher, an elementary school reading teacher, a seventh-grade science teacher, a high school Latin teacher, and a high school math teacher, among them. Of course, students who want to learn more about education careers can consult another useful resource—their very own teachers.

## Writing to Improve Reading

HAVING STUDENTS WRITE about what they read enhances their reading ability and comprehension, according to a new report from the Carnegie Corporation of New York. *Writing to Read: Evidence for How Writing Can Improve Reading* presents the results of a large-scale statistical review that identifies writing practices that improve students' reading ability. These practices include having students write about texts they have read, explicitly teaching spelling and how to write sentences and paragraphs, and increasing how much and how frequently students write. "Our evidence shows that these writing activities improved students' comprehension of text over and above the improvements gained from traditional reading activities such as reading text, reading and rereading text, reading and discussing text, and receiving explicit reading instruction," write the report's authors, Steve Graham, a professor of special education and literacy at Vanderbilt University, and Michael Hebert, a doctoral student in special education at Vanderbilt.

Graham and Hebert explain that responding to a text by writing an analysis, interpretation, personal reflection, or summary, or by creating or answering questions, improves comprehension because the act of writing

requires that students reflect on ideas presented in a text and put those ideas into their own words.

Opportunities for writing do not occur as often as the report's authors would like. Graham and Hebert cite a national survey of high school writing practices that "found that students were rarely asked to complete writing assignments involving analysis and interpretation." Also, assignments asking students to write more than one paragraph were given less than once a month in 50 percent of English (language arts), social studies, and science classes. While researchers have found that, compared with middle and high school teachers,

elementary school teachers "spend more time teaching writing and are better prepared to teach writing practices, most elementary students only spend 20 minutes a day writing," the authors note.

Graham and Hebert emphasize that writing instruction should not replace effective reading instruction, because students need both. Ultimately, they want to make teachers aware of the evidence that "good writing instruction is vital to realizing the goal of literacy for all."

Visit [www.carnegie.org/fileadmin/Media/Publications/WritingToRead\\_01.pdf](http://www.carnegie.org/fileadmin/Media/Publications/WritingToRead_01.pdf) to read the full report.



## Praise for “The Most Daring Education Reform of All”

In the Spring 2010 issue of *American Educator*, it was so good to see that you decided to give the subject of education reform a long spread, rather than the shorter sound-bite stuff we usually get these days.

Obviously I agree with the criticism of 21st-century skills, though I do think it's important to remember—particularly in regard to Diane Ravitch's comments in her essay, “A Century of Skills Movements” (also in the Spring issue)—that one reason we keep getting these skills movements has to do with the failures of too narrow and poorly taught subject matter. The best curriculum and the best teaching, of course, seek a dynamic blend of skills and subject matter. The sad thing is that so often in American education we swing the pendulum in one strong direction or another: whole language versus phonics, math facts versus new math, academic versus vocational, etc. Thanks for this really nicely executed series.

—MIKE ROSE

University of California, Los Angeles



I would just like to praise Diana Senechal for her well-written article. I teach high school social studies, and I cannot tell you how she echoes the frustrations that I have heard from other teachers all year. Over the past 12 years, I have heard one educational reform plan after another (all similar, by the way). Teachers have had to try to adapt to each proposed new program. We have been through so much training and evaluated so much this school year alone, including threats of being fired if we did not conform. From January through March, we were forced to take two days out of the week to prepare our students for the Georgia high

school graduation test, leaving less time to teach the new material in the state standards because we were reviewing old material. It almost brought tears to my eyes to know that someone understands that there is nothing wrong with traditional teaching and that students cannot be expected to teach each other American history, government, etc. It is important for students to learn responsibility. But isn't it the responsibility of the teacher to give the students what they need, to be able to explain ideas and concepts, and to adjust her teaching style as needed? We are being boxed in and forced to conform to business ideas that are not addressing some of the issues that Senechal has mentioned. I would have been happy just to have had enough textbooks this year for students to take home. I was left with a classroom set of 15 textbooks for some classes as large as 30. How about fewer educational trainers and more books?

—ANONYMOUS

After reading “The Most Daring Education Reform of All,” I thought about how long this reform movement has been going on, and how much time and money has been spent in this fruitless pursuit. What I really wonder is, can we actually use tests to measure a good education? The truth is found,

I think, in the resulting adult, not the job he gets. Our aim should be to create lifelong learners and readers who have passion for what they do. I use technology all the time, but it is only a tool for my mind, and I can do without it. Maybe it is time for us to *stop going along* and question what keeps coming down the pike as a fix for what we do.

—SCOTT OUDERKIRK

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I would like to commend *American Educator* for publishing “The Most Daring Education Reform of All” by Diana Senechal. Her article is a provocative and eloquent reflection on the disturbing tendency in education to embrace fad after fad without serious consideration of what it really means to be an educated human being. There are those who, under the guise of accountability or innovation, would transform education from a privilege to a right, the student from a learner to a consumer, and the instructor from a mentor to an entertainer. Senechal reminds us that there are some values and truths that are universal and timeless. Her wise and perceptive observations on the need for retaining the best of traditional content and teaching methodology will resonate with a large number of those involved in the educational process.

—RICHARD KELLOGG

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# Reviving Our Neighborhood Schools



**P**ublic education is in peril. Not because of the actual problems our schools face—like students in poverty, inadequate standards, unwieldy textbooks, weak teacher training, unhelpful assessments, and too many unsupportive administrators—but because of two movements gone awry: accountability and choice. Both movements have the potential to be helpful, but both have been taken to extremes and now defy common sense. Accountability for everyone involved in education, from communities and students to teachers and school boards, makes sense. The popular notion that test scores alone can be used for major decisions (such as whether a student moves to the next grade, whether a teacher is fired, or whether a school closes) does not. Choice for students whose needs or interests are not met by their neighborhood schools makes sense. The idea that the neighborhood school is unnecessary and that market forces will result in all schools being good schools does not.

Today, what we really need is a renaissance, not another hollow reform. Will those of us who value *public* education come together and revive our neighborhood schools?

In this issue of *American Educator*, education historian Diane Ravitch issues a call to action (see page 10). Once an advocate for get-tough accountability and market miracles, Ravitch has watched these movements play out—and she doesn't like what she has seen. Having carefully considered her core principles, how she was led astray, and what our schools really need, she has written an extraordinary book: *The Death and Life of the Great American School System*. Part memoir, part treatise, it has been a best-seller since its release in March. We are pleased to publish an excerpt here, but we implore you to read the whole book. Ravitch, as one teacher put it, is “a real friend to teachers.”

Ravitch arrived at her conclusions by reviewing research and visiting schools—seeing students drilled in test-taking strategies

instead of conducting science experiments or reading great literature, seeing charter and voucher schools pulling in the most motivated students while pushing out those most likely to drag down test scores.

For readers unable to spend significant amounts of time in schools, we open this issue with an excerpt from a neglected book that deserves to be on your summer reading list: *Tested*, by education reporter Linda Perlstein. It chronicles the everyday reality of a high-poverty school that, unfortunately, demonstrates the difference between high scores and a high-quality education.

Though both Ravitch and Perlstein lament the unintended consequences of our current accountability movement, both are strong supporters of standards, testing, and accountability. What they do not support is the belief that tests measure all—or even most—of what makes a good education. They do not support the notion that high scores necessarily indicate that teachers have done a good job or students have acquired important knowledge and skills. And they do not support the fantasy that 100 percent proficiency on a test would actually mean the achievement gap has closed.

Where we stand today is perilous indeed. With copious research and clear logic, Ravitch concludes that the nation's two most popular reform movements—accountability and choice—are undermining public education. They are simply today's versions of the long line of fads and supposed silver bullets that have prevented this country from committing to the incremental improvements and rich curriculum that actually result in great schools. In her words, “Efforts to reform public education are, ironically, diminishing its quality and endangering its very survival. We must turn our attention to improving the schools, infusing them with the substance of genuine learning, and reviving the conditions that make learning possible.” We heartily agree.

—EDITORS

# Unintended Consequences

## High Stakes Can Result in Low Standards



BY LINDA PERLSTEIN

**A** person could live in Annapolis, Maryland, for a lifetime unaware of its poverty.

The city of 40,000 is best known as an exemplar of preppy, nautical affluence; it is home to the buttoned-up U.S. Naval Academy, the pristine, historic State House perched on a hill, and an array of yacht clubs. Those who visit from Washington or Baltimore, 45 minutes away, probably don't know that tucked blocks away are rows of garden apartments that

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*Linda Perlstein is the public editor for the Education Writers Association and writes the Educated Reporter blog; her articles have appeared in numerous publications, including the New York Times, the Nation, and the Columbia Journalism Review. Previously, she covered education for the Washington Post. This article is excerpted from her most recent book, Tested: One American School Struggles to Make the Grade. Copyright (c) 2007 by Linda Perlstein. Reprinted by arrangement with Henry Holt and Company, LLC.*

are modest at best, dilapidated at worst, and two glum housing projects known to few beyond their residents and the police.

When Tina McKnight\* became principal of nearby Tyler Heights Elementary School in 2000, she found the front office crammed with misbehaving children, like emergency-room patients awaiting triage. The test results were so dismal—a school-wide index suggested that only 17 percent of students performed satisfactorily on the state exam her first year—that at county principals' meetings, she wanted to disappear.

Well aware of the stakes, McKnight wasted little time at Tyler Heights before introducing what she called a "laser-sharp focus" on improvement. Her changes, as well as those imposed by the county's new, hard-charging superintendent, looked a lot like those taking place across America. Students at Tyler Heights began receiving at least two and a half hours of reading and

90 minutes of math instruction each day. Floundering children who once might have been allowed to flop undetected from grade to grade were pulled aside daily for special attention. Students were taught strategies for taking tests, including a formula for crafting written responses, and given all manner of rewards for good answers and good behavior. Anything seen as irrelevant to the Maryland School Assessment (MSA)—field trips, talent shows, Career Day—got pushed back until after the March testing dates.

McKnight, a workaholic even before the laser-sharp focus, usually stayed at school until 10:30 p.m. on weeknights, when the custodians went home, and until dark on Saturdays. (She used to stay later, until a bullet zinged through the office window.) Since she arrived at Tyler Heights her social life had disappeared, as did her season tickets to the theater. McKnight, who was 56, never used up her vacation time; it vanished at the end of each calendar year with the Christmas trash.

It was worth it to her when she thought

---

\*While students' names are pseudonyms, the staff members chose to use their real names.

of how much Tyler Heights had accomplished on her watch. The place was no longer as dangerous as during her early years, when the police were a regular presence. Students by now had been taught new rules, a new school culture, a new vocabulary for learning. But in this era of provable results in education, where “increasing achievement,” “improving student learning,” and “demonstrating progress” are just synonyms for upping test scores, McKnight knew that little of that would matter if the numbers didn’t come down in her favor.

On the day they finally did, bouquets of flowers arrived at Tyler Heights. The marquee out front was changed to read: OUR MSA SCORES ARE GREAT.

The scores would secure McKnight a place as one of five finalists for county principal of the year. The school’s improvement merited articles in the *Washington Post*, the *Baltimore Sun*, and both the editorial and news pages of the Annapolis paper. “In some troubled schools,” the *Capital* editorial said, meaning Tyler Heights, “teachers and staff have performed minor miracles—and set an example for others.”

“Miracle” was exactly the word Alia Johnson thought of when she heard how her third-graders had scored on the Maryland School Assessment—90 percent passed the reading test, compared with 35 percent of third-graders just two years before. “An example for others,” though? She wasn’t so sure.

Johnson wanted to make a difference for poor children. But she wasn’t sure how much she was, 90 percent proficiency notwithstanding. The widespread mantra of “no excuses” bothered her: no matter how little help students got from parents, no matter if they came to school hungry or abused, lead-poisoned or learning disabled, they had to pass that test. But did the test really tell anyone all they needed to know about the children? Throughout the year, so much was sacrificed to achieve that score. Was it worth it? This revolution had begun with students like Johnson’s in mind. But teachers like her wondered: were they doing the best by their children?

\* \* \*

In all the elementary schools in the county, benchmark assessments were given six times a year in math and three times in

reading; they were modeled after the questions anticipated on the MSA. Although results were sent to the school board, there were no cosmic consequences for the hourlong tests; they were supposed to be used by teachers to diagnose problems and adjust instruction. But at Tyler Heights, benchmarks were seen as facsimiles of the MSA and treated with commensurate intensity. The first day of school was the last day the third-graders didn’t write a BCR—a “brief constructed response,” a paragraph-sized answer that’s required on the state test.

The benchmarks are no secret, so Johnson looked through the first reading benchmark of the year—4 BCRs and 30 multiple-choice questions—eight school days before her students were supposed to take it.

The benchmark included several topics Johnson hadn’t taught yet: the elements of a poem, words with multiple meanings, text features such as boldface type and numbered lists. Two poems on the test were supposed to be compared with each other, ostensibly because they both used metaphor. But metaphor hadn’t showed up yet in the scheduled lessons, and the classes had only looked at one poem at a time. Teachers always hear that children in poverty come to school knowing thousands fewer words than their better-off peers, and Johnson figured that among those were several on the vocabulary section of the benchmark, such as *construct* and *vanish*.

“I am very scared,” she said.

The next day, Johnson brought her apprehensions to McKnight and asked permission to put aside Open Court, the school’s reading curriculum, and daily interventions for all but the total nonreaders, so the third grade could focus on skills specific to the test. They postponed the benchmark until the last possible day of the county’s window.

A few years ago, Tyler Heights teachers didn’t walk students through problems enough; kids had to fend for themselves. Now the opposite was the norm, part of the school’s laser-sharp focus on improvement. For the BCRs, Tyler Heights had a formula called BATS that was explained in posters hung in every classroom: *borrow* from the question, *answer* the question, *use text* support, and *stretch*. “Stretch” means to give a “so I think” or “so I know”

sentence—“kind of a bonus,” Johnson told her students, that might earn you an advanced score.

Students were taught to fill their paragraphs with what the school calls “hundred-dollar words” and underline them for emphasis. These included transitions, such as “because” or “so I think,” and vocabulary from the state content standards, or MSA words, as they’re called at Tyler Heights: “character trait,” “graphic aids,” “dialogue.” The children were instructed to review these words on flashcards in their spare time—vastly more attention than was given to the real-world vocabulary from their Open Court stories. They would boast about how many hundred-dollar words they managed to include in each BCR. “\$900!!!” a proud child would write at the bottom of his page.

Because the benchmark was going to ask the children to compare two poems, the third-graders of Tyler Heights were guided through practice BCRs comparing sets of poems. Because the benchmark was going to ask how they knew a passage was a poem, they wrote practice BCRs about how they knew passages were poems. (“*I know ‘Smart’ is a poem because it has stanzas and rhyme. I know the text has stanzas and not paragraphs because they didn’t indent....*”) Because the benchmark would ask students to choose which of several meanings of a given word best matched the example sentence, the third-graders were walked through those types of problems, and because the benchmark would ask which of several words had the same sound as that underlined in the example word, they were walked through those questions too.

\* \* \*

Jamila spent a lot of time eyeing the plastic science bins stacked in the back of Johnson’s room. “There’s a lot of things in the boxes,” she said, eyes big, and indeed there were: chalk and clay, calcite and mica, petri dishes, funnels, thermometers, light bulbs. “I’d like to make inventions and experiments,” Roman said. “I want to see stuff—bubbles and all.”

“After the MSA,” Autumn said wistfully, “we can do social studies and science.”

At orientation, third-grade teachers had been told to devote 45 minutes every other day to the science curriculum, which included the very basics of motion and cell structure, nutrition, and plate tectonics.



They were told that science was a stepping stone to all sorts of learning and how much students loved it.

But I saw very little science in the third grade at Tyler Heights. The kits in Johnson's room would be opened to roll marbles one time early in the year, and later to make goo and sculpt a landform and to compare seeds and pebbles in a petri dish. These were only a tiny fraction of the experiments inside, and at any rate, they were presented in class severely abridged—no hypotheses, no data. Mostly students read from the textbook and did worksheets. The only full pass through the scientific method was made after the MSA, in the days spent preparing for the science fair.

"I'm a realist," McKnight had told the teachers. "What gets taught is what gets tested." The rest—even if it is part of the state standards—gets left behind. When it came to the accountability movement, McKnight epitomized the ambivalence of most educators I've met: she was supportive of standards and testing in theory, but painfully aware of the unintended consequences. She was passionate about the

subject she used to teach—social studies, and particularly geography—but when it came down to it, social studies fared no better than science.

Tyler Heights' third-graders got only the most cursory introduction to economics and Native Americans, and much of the curriculum was skipped altogether. The students were geographically ignorant. Approaching the Naval Academy after a three-mile bus ride, several shouted, "Look, it's New York!" The third-graders had heard Africa mentioned a lot but were not sure if it was a city, country, or state. (They never suggested "continent.") At the end of the year, the children in Johnson's class were asked to name all the states they could. Cyrus knew the most: three. He couldn't name any countries, though, and when asked about cities, he thrust his finger in the air triumphantly. "Howard County!"

McKnight had asked teachers to give students passages on social studies and science topics for supplemental reading lessons in preparation for the MSA. But the passages the third-graders read touched

on random knowledge—Billie Holiday's alcoholism, female Arctic explorers—and breezed by quickly. They were hard to understand on the fly when the children had had such little exposure, at school and at home, to history, culture, and the natural world.<sup>†</sup>

\* \* \*

At a conference on assessment, a reading specialist from the Maryland Department of Education told teachers and principals desperate to unlock the secrets of the MSA that BCRs are not tests of writing skills at all, but of reading. "I'm not saying kids shouldn't write well-developed paragraphs," she told the standing-room-only crowd. "But that's not what we're worried about on this test."

"You could bullet it, list key phrases, and you could get the same number of points as someone who wrote a well-crafted answer," McKnight said. The formula is a helpful scaffold, she said, but "if the only

<sup>†</sup>For the relationship between background knowledge and reading skills, see E. D. Hirsch, Jr., *The Knowledge Deficit: Closing the Shocking Education Gap for American Children* (New York: Houghton Mifflin, 2006).

## Tyler Heights Is Not Alone

### *Score Inflation Is Common in Education—and Other Fields*

BY DANIEL KORETZ

Every year, newspaper articles and news releases from education departments around the nation tell us that test scores are up again, often dramatically. Usually, there are some grades or districts that have not made substantial gains, and the gaps in performance between poor and rich, and majority and minority, often fail to budge. Nevertheless, the main story line is usually positive: performance is getting better, and rapidly.

Unfortunately, this good news is often more apparent than real. Scores on the tests used for accountability have become inflated, badly overstating real gains in student performance. Some of the

reported gains are entirely illusory, and others are real but grossly exaggerated. The seriousness of this problem is hard to overstate. When scores are inflated, many of the most important conclusions people base on them will be wrong, and students—and sometimes teachers—will suffer as a result.

This is the dirty secret of high-stakes testing. You may see occasional references to this problem in newspapers, but for the most part, news reports and announcements of scores by states and school districts accept increases in scores at face value.

When I and others who work on this issue point it out, the reactions often range from disbelief to anger. So perhaps it is best to start on less controversial ground. We see something akin to score inflation in many other fields as well. It is so common, in fact, that it has the name Campbell's law in social sciences: "The more any quantitative social indicator is used for social decision making, the more subject it will be to corruption pressures

and the more apt it will be to distort and corrupt the social processes it is intended to monitor."<sup>1</sup> One can find examples of Campbell's law in the media from time to time that provide a hint of how score inflation arises.

The most disturbing example of Campbell's law that I have encountered was reported by the *New York Times* in 2005. The School of Medicine and Dentistry at the University of Rochester had surveyed cardiologists around the state. As the *Times* reported, "An overwhelming majority of cardiologists in New York say that, in certain instances, they do not operate on patients who might benefit from heart surgery, because they are worried about hurting their rankings on physician scorecards issued by the state."<sup>2</sup> Fully 83 percent of respondents said that the reporting of mortality rates had this effect, and 79 percent admitted that "the knowledge that mortality statistics would be made public" had affected their own decisions about whether to perform surgery.\*

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thing you're teaching is BCRs, your kids are not learning to write."

The third-graders at Tyler Heights, then, did not learn to write. They learned, thanks to a timer broadcast on the overhead projector, to fill in the box of eight lines in seven to nine minutes. They learned to "proof and polish" with a special purple pen, and whisper their paragraphs to themselves through C-shaped sections of PVC pipe held to their ears—what they called "whisper phoning," a strategy for detecting if your answer makes sense. They learned to adhere to the BATS formula in BCRs like the one Johnson led her students through one day:

*Damon and Pythias is a play because it has the elements of a play. Some elements of a play are that plays have stage directions. Also, there is a narrator. This play also has a lot of characters. So I know this play has all the features it needs.*

The BCRs tended to repeat themselves, so the children worked on a limited range of questions teachers knew would be on

the county benchmark tests and suspected would be on the MSA. The third-graders answered again and again what traits described the main character of a story. They wrote the "I know this is a play because" BCR about 10 times but never got to act out a play. They wrote "I know this is a fairy tale because" and "I know this is a fable because" but never tried their hand at creating either. About a fake brochure they wrote, "The text features that make this easy for a third-grader to understand are italics, numbering, and underline." But they never made their own brochures with their own text features; the only things they underlined were hundred-dollar words. They wrote "I know this is a poem because it has rhyme, rhythm, and stanzas" about 50 times, Johnson estimated, but they only wrote three poems.

The Tyler Heights teachers knew that the BCR focus was a problem but were either unwilling or unable to veer from the program—they felt they were not allowed. One day in the teachers' lounge, two for-

mer teachers who were now an aide and a mentor reminisced about the days when third-graders read novels and did chemistry experiments and worked in groups to design versions of the 13 colonies and did writing, real writing. A resource teacher who was an active part of the school's laser-sharp focus over the last few years began to question her own role. She listened to the veterans and added her two cents. "While our scores were really good last year, can I tell you our kids are any smarter? I don't know."

\* \* \*

Tyler Heights was not explicitly ordered to de-emphasize topics that are not tested; then again, nobody from the school district, and nobody who lauded the school for its scores, bothered to make sure the whole curriculum was taught. On the last day of MSA testing, McKnight said to me, "MSA, that's just the bottom of what kids should know. It's not like we were calling them brilliant. We're still shooting for the basement. We celebrate the bottom right now. I pray we don't have to keep celebrating the bottom." □



So it should not be surprising that when the heat is turned up, educators—and students—will sometimes behave in ways that inflate test scores. Actually, it would be quite remarkable, given how pervasive the problem is in other fields, if none of them did.

Advocates of current test-based accountability systems often counter by arguing, "So what if the gains are distorted? What matters is that students learn more, and if we get that, we can live with some distortion." Hypothetically, yes, we could live with it if we knew that students were in fact learning more, and if the distortions were small enough that they did not seriously mislead people and cause them to make incorrect decisions. But in fact, we usually cannot distinguish between real and bogus gains. Because so

many people assume that if scores are increasing we can trust that kids are learning more, there is a disturbing lack of good evaluations of these systems, even after more than three decades of high-stakes testing. What we do know is that score inflation can be enormous, more than large enough to seriously mislead people.

As a result, we need to be more realistic about using tests as a part of educational accountability systems. Systems that simply pressure teachers to raise scores on one test (or one set of tests in a few subjects) are not likely to work as advertised, particularly if the increases demanded are large and inexorable. They are likely instead to produce substantial inflation of scores and a variety of undesirable changes in instruction, such as an excessive focus on old tests, an inappropriate narrowing of

instruction, and a reliance on teaching test-taking tricks.

I strongly support the goal of improved accountability in public education. I saw the need for it when I was an elementary school and junior high school teacher many years ago. I certainly saw it as the parent of two children in school. Nothing in more than a quarter century of education research has led me to change my mind on this point. And it seems clear that student achievement must be one of the most important things for which educators and school systems should be accountable. However, we need an effective system of accountability, one that maximizes real gains, and minimizes bogus gains and other negative side effects.

In all, educational testing is much like a powerful medication. If used carefully, it can be immensely informative, and it can be a very powerful tool for changing education for the better. Used indiscriminately, it poses a risk of various and severe side effects. □

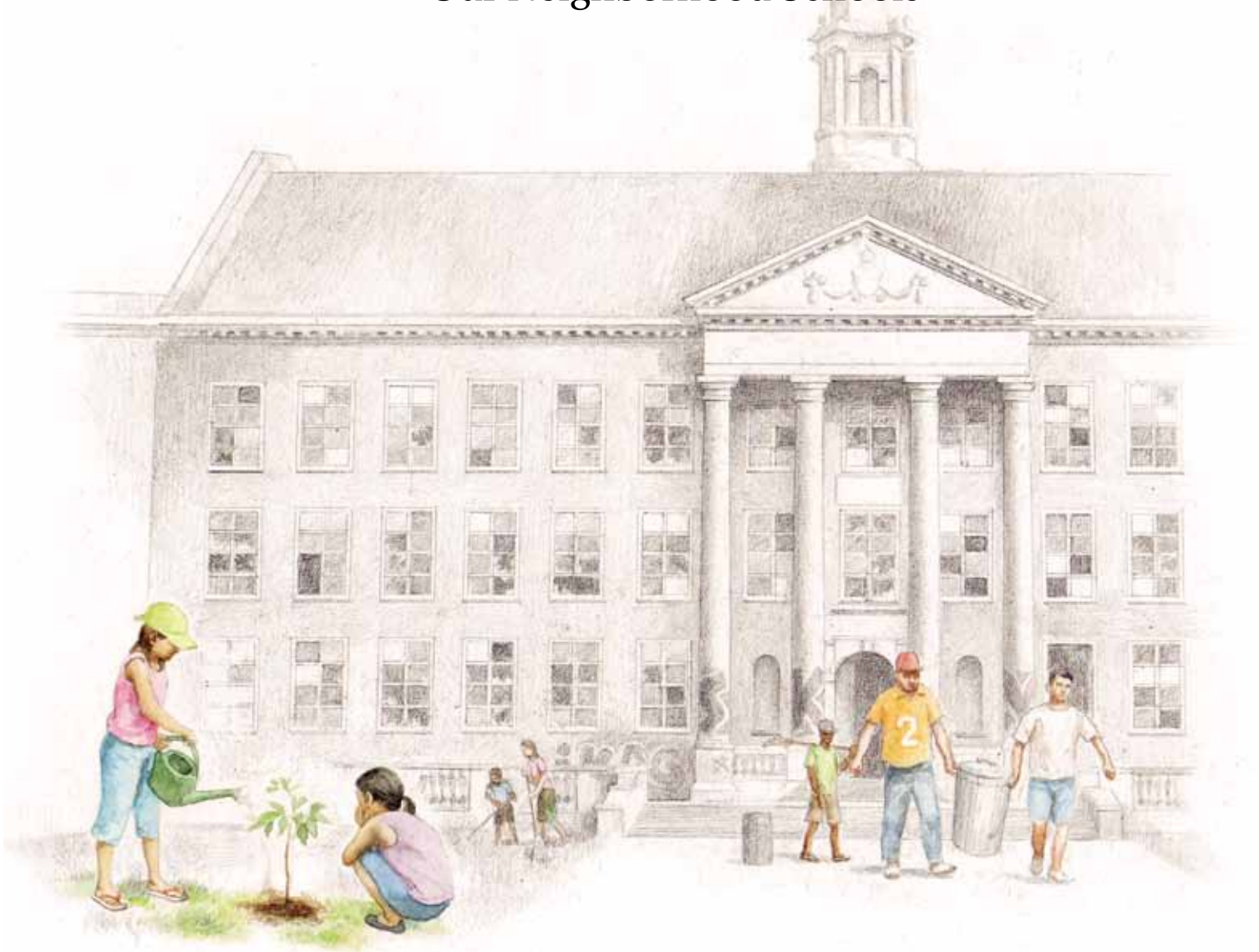
#### Endnotes

1. Donald T. Campbell, "Assessing the Impact of Planned Social Change," in *Social Research and Public Policies: The Dartmouth/OECD Conference*, ed. Gene M. Lyons (Hanover, NH: Public Affairs Center, Dartmouth College, 1975), 35.
2. Marc Santora, "Cardiologists Say Rankings Sway Choices on Surgery," *New York Times*, January 11, 2005.

\*These numbers may be off by a modest amount, but not by enough to make the results less appalling. Only 65 percent of the sampled surgeons responded to the survey, which is a marginally acceptable response rate. The risk is that surgeons who did not respond would have given different answers than those who did. But even if all 35 percent who did not respond would have replied to these questions in the negative—an extremely unlikely case—that would still leave more than half saying that publication of mortality measures led to surgeons' declining to do procedures that could have benefited patients.

# In Need of a Renaissance

## Real Reform Will Renew, Not Abandon, Our Neighborhood Schools



BY DIANE RAVITCH

**I**n the fall of 2007, I reluctantly decided to have my office repainted. It was inconvenient. I work at home, on the top floor of a 19th-century brownstone in Brooklyn. Not only did I have to stop working for three weeks, but I had the addi-

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tional burden of packing up and removing everything in my office. I had to relocate 50 boxes of books and files to other rooms in the house until the painting job was complete.

After the patching, plastering, and painting was done, I began unpacking 20 years of papers and books, discarding those I no longer wanted, and placing articles into scrapbooks. I found that the chore of reorganizing the artifacts of my professional life was pleasantly ruminative. It had a tonic effect, because it allowed me to reflect on the changes in my views over the years.

At the very time that I was packing up my books and belongings, I was going through an intellectual crisis. I was aware that I had undergone a wrenching transformation in my perspective on school reform. Where once I had been hopeful, even enthusiastic, about the potential benefits of testing, accountability, choice, and

markets, I now found myself experiencing profound doubts about these same ideas. I was trying to sort through the evidence about what was working and what was not. I was trying to understand why I was increasingly skeptical about these reforms. Why did I now doubt ideas I once had advocated?

The short answer is that my views changed as I saw how these ideas were working out in reality. When someone chastised John Maynard Keynes for reversing himself about a particular economic policy he had previously endorsed, he replied, “When the facts change, I change my mind. What do you do, sir?”<sup>1</sup> This comment may or may not be apocryphal, but I admire the thought behind it. It is the mark of a sentient human being to learn from experience, to pay close attention to how theories work out when put into practice.

The task of sorting my articles gave me the opportunity to review what I had written at different times, beginning in the mid-1960s. As I read and skimmed and remembered, I began to see two themes at the center of what I have been writing for more than four decades. One constant has been my skepticism about pedagogical fads, enthusiasms, and movements. The other has been a deep belief in the value of a rich, coherent school curriculum, especially in history and literature, both of which are so frequently ignored, trivialized, or politicized.<sup>2</sup>

Over the years, I have consistently warned against the lure of “the royal road to learning,” the notion that some savant or organization has found an easy solution to the problems of American education. As a historian of education, I have often studied the rise and fall of grand ideas that were promoted as the sure cure for whatever ills were afflicting our schools and students. I have tried to show in my work the persistence of our national infatuation with fads, movements, and reforms, which invariably distract us from the steadiness of purpose needed to improve our schools.

In our own day, policymakers and business leaders have eagerly enlisted in a movement launched by free-market advocates, with the support of major foundations. Many educators have their doubts about the slogans and cure-alls of our time, but they are required to follow the mandates of federal law (such as No Child Left Behind) despite their doubts.

As I flipped through the yellowing pages in my scrapbooks, I started to understand my growing doubt regarding popular proposals for choice and accountability. Once again, I realized, I was turning skeptical in response to panaceas and miracle cures. The only difference was that in this case, I too had fallen for the latest panaceas and miracle cures; I too had drunk deeply of the elixir that promised a quick fix to intractable problems. I too had jumped aboard a bandwagon, one festooned with banners celebrating the power of accountability, incentives, and markets. I too was captivated by these ideas. They promised to end bureaucracy, to ensure that poor children were not neglected, to empower poor parents, to enable poor children to escape failing schools, and to close the achievement gap between rich and poor, black and

white. Testing would shine a spotlight on low-performing schools, and choice would create opportunities for poor kids to leave for better schools. All of this seemed to make sense, but there was little empirical evidence, just promise and hope. I wanted to share the promise and the hope. I wanted to believe that choice and accountability would produce great results. But over time, I was persuaded by accumulating evidence that the latest reforms were not likely to live up to their promise. The more I saw, the more I lost the faith.

As I watched the choice and accountability movements gain momentum across the nation, I concluded that curriculum and instruction were far more important than choice and accountability. I feared that choice would let thousands of flowers bloom but would not strengthen American education. It might even harm the public schools by removing the best students from schools in the poorest neighborhoods. I was also concerned that

accountability had become mechanistic and even antithetical to good education. Testing, I realized with dismay, had become a central preoccupation in the schools and was not just a measure but an end in itself. I came to believe that accountability, as written into federal law, was not raising standards but dumbing down the schools as states and districts strived to meet unrealistic targets.

It is time, I think, for those who want to improve our schools to focus on the essentials of education.

We must make sure that our schools have a strong, coherent, explicit curriculum that is grounded in the liberal arts and sciences, with plenty of opportunity for children to engage in activities and projects that make learning lively. We must ensure that students gain the knowledge they need to understand political debates, scientific phenomena, and the world they live in. We must be sure they are prepared for the responsibilities of democratic citizenship in a complex society. We must take care that our teachers are well educated, not just well trained. We must be sure that schools have the authority to maintain both standards of learning and standards of behavior.

We have known for many years that we need to improve our schools. We keep stumbling, however, because there is widespread disagreement about what should be improved, what we mean by improvement, and who should do it. A strong case for improvement was made by *A Nation at Risk*, a major report released in 1983, which warned that our students and our schools were not keeping up with their international peers. Since then, many reports and surveys have demonstrated that large numbers of young people leave school knowing little or nothing about history, literature, foreign languages, the arts, geography, civics, or science. Without knowledge and understanding, one tends to become a passive spectator rather than an active participant in the great decisions of our time.

A democratic society cannot long sustain itself if its citizens are uninformed and indifferent about its history, its government, and the workings of its economy. Nor can it prosper if it neglects to

As I watched the choice and accountability movements gain momentum across the nation, I concluded that **curriculum** and **instruction** were far more important.

educate its children in the principles of science, technology, geography, literature, and the arts. The great challenge to our generation is to create a renaissance in education, one that goes well beyond the basic skills that have recently been the singular focus of federal activity, a renaissance that seeks to teach the best that has been thought and known and done in every field of endeavor.

The policies we are following today are unlikely to improve our schools. Indeed, much of what policymakers now demand will very likely make the schools less effective and may further degrade the intellectual capacity of our citizenry. The schools will surely be failures if students graduate knowing how to choose the right option from four bubbles on a multiple-choice test, but unprepared to lead fulfilling lives, to be responsible citizens, and to make good choices for themselves, their families, and our society.

With the best of intentions, reformers have sought to correct deficiencies by introducing new pedagogical techniques, new ways of organizing classrooms, new technologies, new tests, new incentives, and new ways to govern schools. In every instance, reformers believed that their solution was the very one that would transform the schools, make learning fun, raise test scores, and usher in an age of educational joy or educational efficiency. As

one innovation follows another, teachers may be forgiven if, from time to time, they suffer an acute case of reform fatigue.

This constant reform churn is not the approach typically found in countries with successful schools. In November 2006, I attended a meeting of the International Association for the Evaluation of Educational Achievement, an organization of scholars that has been studying school performance in many nations since the

1960s. Two respected testing experts described the lessons learned from decades of mathematics assessments in dozens of nations. As I listened, I copied this list of the essential ingredients of a successful education system: “a strong curriculum; experienced teachers; effective instruction; willing students; adequate resources; and a community that values education.”<sup>3</sup> The fundamentals of good education are to be found in the classroom, the home, the community, and the culture, but reformers in the United States continue to

Far too many reformers imagine that it is easy to create a successful school, but it is not. School improvements—if they are real—occur **incrementally**, as a result of sustained effort over years.

look for shortcuts and quick answers.

Far too many reformers imagine that it is easy to create a successful school, but it is not. They imagine that the lessons of a successful school are obvious and can be easily transferred to other schools, just as one might take an industrial process or a new piece of machinery and install it in a new plant without error.

## More Choices, Higher Scores, and Worse Education

If there is one thing all educators know and many studies have confirmed for decades, it is that there is no single answer to educational improvement. There are no grounds for the claim made in the past decade that accountability all by itself is a silver bullet, nor for the oft-asserted argument that choice by itself is a panacea.

Nonetheless, in the decade following my brief stint as an assistant secretary in the U.S. Department of Education under President George H. W. Bush, I argued that charters and accountability would help reform our schools. Teachers and schools would be judged by their performance; this was a basic principle in the business world. Schools that failed to perform would be closed, just as a corporation would close a branch office that continually produced poor returns. Having been immersed in a world of true believers at the department, I was influenced by their ideas. I became persuaded that the

business-minded thinkers were onto something important.

Today, having seen these ideas in action, I see the downsides of both the choice movement and the accountability movement. They are not solutions to our educational dilemmas.

### Market Mechanisms: Let 1,000 Flowers Bloom—and 1,000 Wilt?

Charter schools appeal to a broad spectrum of people from the left, the right, and the center, all of whom see charters (as others had previously seen vouchers) as the antidote to bureaucracy and stasis and as the decisive change that could revolutionize American education and dramatically improve educational achievement. Charter schools represent, more than anything else, a concerted effort to deregulate public education, with few restrictions on pedagogy, curriculum, class size, discipline, or other details of their operation.

Have charter schools lived up to the promises of their promoters? Given the wide diversity of charter schools, it's hard to reach a singular judgment about them. In terms of quality, charter schools run the gamut. Some are excellent, some are dreadful, and most are somewhere in between. It is in the nature of markets that some succeed, some are middling, and others fail.

As originally imagined (when Professor Ray Budde<sup>1</sup> and AFT President Albert Shanker<sup>2</sup> each proposed new teacher-developed schools in 1988), charters were intended not to compete with public schools, but to support them. Charters were supposed to be research and development laboratories for discovering better ways of educating hard-to-educate children. They were not intended to siphon away the most motivated students and families in the poorest communities, but to address some of the public schools' most urgent problems.

But a school is successful for many reasons, including the personalities of its leader and teachers; the social interactions among them; the culture of the school; the students and their families; the way the school implements policies and programs dictated by the district, the state, and the federal government; the quality of the school's curriculum and instruction; the resources of the school and the community; and many other factors. When a school is successful, it is hard to know which factor was most important or if it was a combination of factors. Even the principal and teachers may not know for sure. A reporter from the local newspaper may arrive and decide that it must be the principal or a particular program, but the reporter will very likely be wrong. Success, whether defined as high test scores or graduation rates or student satisfaction, cannot be bottled and dispensed at will. This may explain why there are so few examples of low-performing schools that have been "turned around" into high-performing schools. And it may explain why schools are not very good at replicating the success of model schools, whether the models are charters or regular public schools. Certainly,

schools can improve and learn from one another, but school improvements—if they are real—occur incrementally, as a result of sustained effort over years.

### Our Schools Will Not Improve . . .

Our schools will not improve if we continually reorganize their structure and management without regard for their essential purpose. Our educational problems are a function of our lack of educational vision, not a management problem that requires the enlistment of an army of business consultants. The most durable way to improve schools is to improve curriculum and instruction and to improve the conditions in which teachers work and children learn, rather than endlessly squabbling over how school systems should be organized, managed, and controlled. It is not the organization of the schools that is at fault for the ignorance we deplore, but the lack of sound educational values.

Our schools will not improve if elected officials intrude into pedagogical territory and make decisions that properly should be made by professional educators. Congress and state legislatures should not tell teachers how to teach, any more than they should tell surgeons how to perform operations. Nor should the curriculum of the schools be the subject of a political negotiation among people who are neither knowledgeable about teaching nor well educated. Pedagogy—that is, how to teach—is rightly the professional domain of individual teachers. Curriculum—that is, what to teach—should be determined by professional educators and scholars, after due public deliberation, acting with the authority vested in them by schools, districts, or states.

*(Continued on page 16)*



In their current manifestation, charters are supposed to disseminate the free-market model of competition and choice. Now charters compete for the most successful students in the poorest communities, or they accept all applicants and push the low performers back into the public school system. Either approach further disables regular public schools in those communities by leaving the lowest-performing and least-motivated students to the regular public schools. It matters not that the

original proponents of charter schools had different goals. It does matter, though, that charter schools have become, in many communities, a force intended to disrupt the traditional notion of public schooling. The rhetoric of many charter school advocates has come to sound uncannily similar to the rhetoric of voucher proponents and the most rabid haters of public schooling. They often sound as though they want public schools to fail; they want to convert entire districts to charter schools, each with its own curriculum and methods, each with its own private management, all competing for students and public dollars.

If there is one consistent lesson that one gleans by studying school reform over the past century, it is the danger of taking a good idea and expanding it

rapidly, spreading it thin. What is stunningly successful in a small setting, nurtured by its founders and brought to life by a cadre of passionate teachers, seldom survives the transition when it is turned into a large-scale reform. Whether charter schools are a sustainable reform, whether they can proliferate and at the same time produce good results, is a question yet to be resolved. Whether there is the will to close low-performing charters remains to be seen. Whether there is an adequate supply of teachers who are willing to work 50-hour weeks is unknown. The biggest unknown is how the multiplication of charter schools will affect public education.

In barely 20 years, the idea of school choice rapidly advanced in the public arena and captivated elite opinion. Given the accumulating evidence of its uneven results, this is surprising. Even more surprising is how few voices have been raised on behalf of the democratic vision of public education.

Why not insist that future charters fulfill their original mission? Why shouldn't they be the indispensable institutions that

rescue the neediest kids? Why shouldn't they be demonstration centers that show what can be done to help those who can't succeed in a regular school? Why not redesign them to strengthen public education instead of expecting them to compete with and undercut regular public schools?

Do we need neighborhood public schools? I believe we do. The neighborhood school is the place where parents meet to share concerns about their children and the place where they learn the practice of democracy. It creates a sense of community among strangers. As we lose neighborhood public schools, we lose the one local institution where people congregate and mobilize to solve local problems, where individuals learn to speak up and debate and engage in democratic give-and-take with their neighbors. For more than a century, they have been an essential element of our democratic institutions. We abandon them at our peril.

Business leaders like the idea of turning the schools into a marketplace where the consumer is king. But the problem with the marketplace is that it dissolves communities and replaces them with consumers. Going to school is not the same as going shopping. Parents should not be burdened with locating a suitable school for their child. They should be able to take their child to the neighborhood public school as a matter of course and

expect that it has well-educated teachers and a sound educational program.

Our nation's commitment to provide universal, free public education has been a crucial element in the successful assimilation of millions of immigrants and in the ability of generations of Americans to improve their lives. It is unlikely that the United States would have emerged as a world leader had it left the development of education to the whim and will of the free market. The market has been a

obsession with making our schools work like a business may be the worst of them, for it threatens to destroy public education. Who will stand up to the tycoons and politicians and tell them so?

### **Accountability: Narrowing the Curriculum, Sapping Our Strength**

I was initially supportive of No Child Left Behind (NCLB). Who could object to ensuring that children mastered the basic skills of reading and mathematics? Who

As we lose neighborhood public schools, we lose the one **local institution** where people **congregate** to solve local problems. We abandon them at our peril.

wonderful mechanism for the development of small and large business enterprises; it has certainly been far more successful in producing and distributing a wide range of high-quality goods and services than any command-and-control economy. But the market, with its great strengths, is not the appropriate mechanism to supply services that should be distributed equally to people in every neighborhood in every city and town in the nation without regard to their ability to pay or their political power. The market is not the right mechanism to supply police protection or fire protection, nor is it the right mechanism to supply public education. Education is too important to relinquish to the vagaries of the market and the good intentions of amateurs.

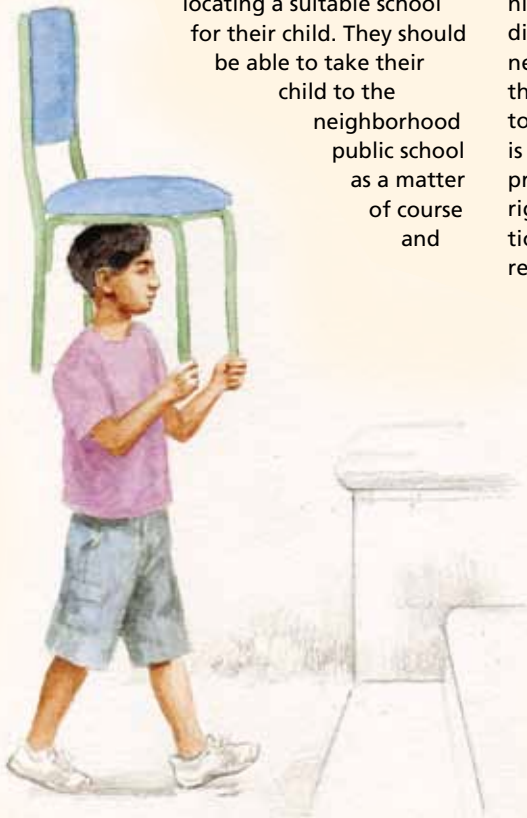
As currently configured, charter schools are havens for the motivated. The question for the future is whether the continued growth of charter schools in urban districts will leave regular public schools with the most difficult students to educate, thus creating a two-tier system of widening inequality. If so, we can safely predict that future studies will "prove" the success of charter schools and the failure of regular schools, because the public schools will have disproportionate numbers of less-motivated parents and needier students.

American education has a long history of infatuation with fads and ill-considered ideas. The current

could object to an annual test of those skills? Certainly not I. Didn't all schools test their students at least once annually?

As NCLB was implemented, I became increasingly disillusioned. I came to realize that the law bypassed curriculum and standards. It demanded that schools generate higher test scores in basic skills, but it required no curriculum at all, nor did it raise standards. It ignored such important studies as history, civics, literature, science, the arts, and geography. Accountability makes no sense when it undermines the larger goals of education. What once was an effort to improve the quality of education turned into an accounting strategy: measure, then punish or reward.

NCLB is a punitive law based on erroneous assumptions about how to improve schools. It assumes that reporting test scores to the public is an effective lever for school reform. It assumes that changes in governance lead to school improvement. It assumes that shaming schools that are unable to lift test scores every year—and the people who work in them—leads to higher scores. It assumes that low scores are caused by lazy teachers and lazy principals, who need to be threatened with the loss of their jobs. Perhaps most naively, it assumes that higher test scores on standardized tests of basic skills are synonymous with good education. Its assumptions are wrong. Testing is not a substitute for curriculum and instruction. Good education cannot be achieved by a strategy of testing children, shaming educators, and closing schools.



Tests should follow the curriculum. They should be based on the curriculum. They should not replace it or precede it. Students need a coherent foundation of knowledge and skills that grows stronger each year. Knowledge and skills are both important, as is learning to think, debate, and question. A well-educated person has a well-furnished mind, shaped by reading and thinking about history, science, literature, the arts, and politics. The well-educated person has learned how to explain ideas and listen respectfully to others.

The problem with using tests to make important decisions about people's lives is that standardized tests are not precise instruments. Unfortunately, most elected officials do not realize this, nor does the general public.

The Committee on Appropriate Test Use of the National Research Council stated in an authoritative report in 1999 that "tests are not perfect" and "a test score is not an exact measure of a student's knowledge or skills." Because test scores are not an infallible measure, the committee warned, "an educational decision that will have a major impact on a test taker should not be made solely or automatically on the basis of a single test score."<sup>3</sup> The committee also held that "all students are entitled to sufficient test preparation" so they are familiar with the format of the test, the subject matter to be tested, and appropriate test-taking strategies. The committee cautioned, however, that the test results might be invalidated "by teaching so narrowly to the objectives of a particular test that scores are raised without actually improving the broader set of academic skills that the test is intended to measure."<sup>4</sup>

Of what value is it to the student to do well on a state reading test if he cannot replicate the same success on a different reading test or transfer these skills to an unfamiliar context? Excessive test preparation distorts the very purpose of tests, which is to assess learning and knowledge, not just to produce higher test scores.

The Committee on Appropriate Test Use could not have dreamed that only two years after its report was published, a law would be passed that established harsh consequences not for test takers, but for educators and schools. Or that only 10 years later, the president of the United States would urge states and school districts to evaluate teachers on the basis of their students' test scores.

A good accountability system must include professional judgment, not simply

a test score, and other measures of students' achievement, such as grades, teachers' evaluations, student work, attendance, and graduation rates. It should also report what the school and the district are providing in terms of resources, class sizes, space, well-educated teachers, and a well-rounded curriculum. Furthermore, a good accountability system might include an external inspection of schools by trained observers to evaluate their quality on a regular schedule, though not necessarily every single year. In a state or a large district, low-performing schools might be reviewed frequently, while schools that consistently get good reports might get a visit every few years. The object of inspection should not be to assay the school as a prelude to closing it or to impose a particular way of teaching, but to help the school improve.\*

When we define what matters in education only by what we can measure, we are in serious trouble. When that happens, we tend to forget that schools are responsible for shaping character, developing sound minds in healthy bodies (*mens sana in corpore sano*), and forming citizens for our democracy, not just for teaching basic skills. We even forget to reflect on what we mean when we speak of a good education. Surely we have more in mind than just bare literacy and numeracy. And when we use the results of tests, with all their limitations, as a routine means to fire educators, hand out bonuses, and close schools, then we distort the purpose of schooling altogether.

**A**ccountability and choice may or may not raise test scores, but neither is a surefire way to improve education. Higher test scores may or may not be a reliable indicator of better education. The overemphasis on test scores

\*For more on this, see "Rethinking Accountability" in the Spring 2009 issue of *American Educator*, available at [www.aft.org/newspubs/periodicals/ae/issues.cfm](http://www.aft.org/newspubs/periodicals/ae/issues.cfm).



to the exclusion of other important goals of education may actually undermine the love of learning and the desire to acquire knowledge, both necessary ingredients of intrinsic motivation. Investing inordinate amounts of time in test-preparation activities may well drive up the scores. Yet at the same time that scores go up, the youngsters may be ignorant of current events, the structure of our government and other governments, the principles of economics, the fundamentals of science, the key works of literature of our culture and others, the practice and appreciation of the arts, or the major events and ideas that have influenced our nation and the world. And so we may find that we have obtained a paradoxical and terrible outcome: higher test scores and worse education.

—D.R.

#### Endnotes

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(Continued from page 13)

Our schools will not improve if we continue to focus only on reading and mathematics while ignoring the other studies that are essential elements of a good education. Schools that expect nothing more of their students than mastery of basic skills will not produce graduates who are ready for college or the modern workplace. Nor will they send forth men and women prepared to design new technologies, achieve scientific breakthroughs, or accomplish feats of engineering skill. Without a comprehensive liberal arts education, our students will not be prepared for the responsibilities of citizenship in a democracy, nor will they be equipped to make decisions based on knowledge, thoughtful debate, and reason.

Our schools will not improve if we value only what tests measure. The tests we have now provide useful information about students' progress in reading and mathematics. But what is tested may ultimately be less important than what is untested, such as a student's ability to seek alternative explanations, to raise questions, to pursue knowledge on his own, and to think differently. If we do not treasure our individualists, we will lose the spirit of innovation, inquiry, imagination, and dissent that has contributed powerfully to the success of our society in many different fields of endeavor.

Our schools will not improve if we rely exclusively on tests as the means of deciding the fate of students, teachers, principals, and schools. When tests are the primary means of evaluation and accountability, everyone feels pressure to raise the scores, by hook or by crook. Some will cheat to get a reward or to avoid humiliation. Schools may manipulate who takes the test and who does not; district and state officials may fiddle with the scoring of the test. Districts and states may require intensive test preparation that mirrors the actual state tests and borders on institutionalized cheating.

Our schools will not improve if we continue to close neighborhood schools in the name of reform. Neighborhood schools are often the anchors of their communities, a steady presence that helps to cement the bonds of community among neighbors. Most are places with a history, laden with traditions and memories that help individuals resist fragmentation in their lives. Their graduates return and want to see their old classrooms; they want to see the trophy cases and the old photographs, to hear the echoes in the gymnasium and walk on the playing fields. To close these schools serves no purpose other than to destroy those memories, to sever the building from the culture of its neighborhood, and to erode a sense of community that was decades in the making. Closing a school should be only a last resort and an admission of failure, not by the school or its staff, but by the educational authorities who failed to provide timely assistance.

Our schools will not improve if we entrust them to the magical powers of the market. Markets have winners and losers. Letting a thousand flowers bloom does not guarantee a garden full of flowers. If the garden is untended, unsupervised, and unregulated, it is likely to become overgrown with weeds. Our goal must be to

The goal of education is not to produce higher scores, but to educate children to become **responsible people** with well-developed minds and good character.



establish school systems that foster academic excellence in every school and every neighborhood.

Our schools cannot improve if charter schools siphon away the most motivated students and their families in the poorest communities from the regular public schools. Continuing on this path will debilitate public education in urban districts and give the illusion of improvement. In exchange for the benefits of deregulation, charter schools should use their autonomy from the usual rules and regulations to show what they can do to educate students who have been unable to learn in a traditional school. In the future, charter schools should be valued partners of traditional public schools. Charter schools should be designed to collaborate with traditional public schools in a common mission: the education of all children. In this mission, they should be allies, not enemies or competitors.

Our schools will not improve if we expect them to act like private, profit-seeking enterprises. Schools are not businesses; they are a public good. The goal of education is not to produce higher scores, but to educate children to become responsible people with well-developed minds and good character. The unrelenting focus on data that has become commonplace in recent years is distorting the nature and quality of education. Competition among schools to get higher scores is sure to cause teachers to spend more time preparing students for state tests, not on thoughtful writing, critical reading, scientific experiments, or historical study. Nor should we expect schools to vie with one another for students, as businesses vie for customers. For schools to learn from one another, they must readily share information about their successes and failures, as medical professionals do, rather than act as rivals in a struggle for survival.

Our schools will not improve if we continue to drive away expe-

rienced principals and replace them with neophytes who have taken a leadership training course but have little or no experience as teachers. The best principals have had a long apprenticeship as educators, first as teachers, then as assistant principals, and finally as principals. If principals have not spent much time as teachers, they are not qualified to judge others' teaching, nor can they assist new teachers.

Our schools cannot be improved by blind worship of data. If the measures are shoddy, then the data will be shoddy. If the data reflect mainly the amount of time invested in test-preparation activities, then the data are worthless. If the data are based on dumbed-down state tests, then the data are meaningless. A good accountability system, whether for schools, teachers, or students, must include a variety of measures, not only test scores.

Our schools cannot be improved by those who say that money doesn't matter. Ample resources do not guarantee success, but it is certainly more difficult for schools to succeed without them. If we are serious about closing the achievement gap, then we will make sure that the schools attended by our neediest students have well-educated teachers, small classes, beautiful facilities, and a curriculum rich in the arts and sciences.

Our schools cannot be improved if we ignore the disadvantages associated with poverty that affect children's ability to learn. Children who have grown up in poverty need extra resources,

including preschool and medical care. They need small classes, where they will get extra teacher time, and they need extra learning time. Their families need additional supports, such as coordinated social services that help them to improve their education, to acquire necessary social skills and job skills, and to obtain jobs and housing. While the school itself cannot do these things, it should be part of a web of public and private agencies that buttress families.

Our schools cannot be improved if we use them as society's all-purpose punching bag, blaming them for the ills of the economy, the burdens imposed on children by poverty, the dysfunction of families, and the erosion of civility. Schools must work with other institutions and cannot replace them.

### What Will Improve Our Schools?

If we want to improve education, we must first of all have a vision of what good education is. We should have goals that are worth striving for. Everyone involved in educating children should ask themselves why we educate. What is a well-educated person? What knowledge is of most worth? What do we hope for when we send our children to school?

What do we want them to learn and accomplish by the time they graduate from high school?

Certainly, we want our children to be able to read and write and be numerate. Those are the basic skills on which all other learning builds. But that is not enough. We want them to be able to think for themselves when they are out in the world on their own. We want them to have good character and to make sound decisions about their life, their work, and their health. We want them to face life's joys and travails with courage and humor. We hope that they will be kind and compassionate in their dealings with others. We want them to have a sense of justice and fairness. We want them to understand our nation and our world and the challenges we face. We want them to be active, responsible citizens, prepared to think issues through carefully, to listen to differing views, and to reach decisions rationally. We want them to learn science and mathematics so they understand the problems of modern life and participate in finding solutions. We want them to enjoy the rich artistic and cultural heritage of our society and other societies.

One could make the list of hoped-for outcomes even longer, but the point should be clear. If these are our goals, the current narrow, utilitarian focus of our national testing regime is not sufficient. Indeed, to the extent that we make the testing regime our master, we may see our true goals recede farther and farther into the distance. By our current methods, we may be training (not educating) a generation of children who are repelled by learning, thinking that it means only drudgery, worksheets, test preparation, and test taking.

If we are serious about closing the achievement gap, we will make sure our **neediest students** have well-educated teachers, small classes, beautiful facilities, and a curriculum rich in the arts and sciences.



So let us begin with a vision of the education we want for our children and our society. To move toward that vision, we should attend to the quality of the curriculum—that is, what is taught. Every school should have a well-conceived coherent, sequential curriculum. A curriculum is not a script but a set of general guidelines. Students should regularly engage in the study and practice of the liberal arts and sciences: history, literature, geography, the sciences, civics, mathematics, the arts, and foreign languages, as well as health and physical education.

Having a curriculum does not solve all our educational problems. But not having a curriculum indicates our unwillingness or inability to define what we are trying to accomplish. To paraphrase the Cheshire cat in *Alice in Wonderland*, if you don't know where you are going, any road will get you there. The curriculum is a starting point for other reforms. It informs teachers, students, parents, teacher educators, assessment developers, textbook publishers, technology providers, and others about the goals of instruction. It provides direction, clarity, and focus around worthy ends, without interfering with teachers' decisions about how to teach.

If we are willing to learn from top-performing nations, such as Japan and Finland,<sup>4</sup> we should establish a substantive national curriculum that declares our intention to educate all children in the full range of liberal arts and sciences, as well as physical education. This curriculum would designate the essential knowledge and skills that students need to learn. In the last two years of high school, there should be career and technical studies for students who plan to enter the workforce after high school graduation. But they too should study the arts and sciences, so that they too may gain a sense of life's possibilities. Because we are all citizens of this democracy, because we will all be voters, we must all be educated for our responsibilities.

Some will object that a country as diverse as ours can't possibly have a national curriculum. The counterargument is that our nation had a de facto curriculum for most of the 19th century, when the textbooks in each subject were interchangeable. For the first half of the 20th century as well, we had an implicit national curriculum that was decisively shaped by the college entrance examinations of the College Board; its highly respected examinations were based on a specific and explicit syllabus, designed by teachers and professors of each subject.

But what about the culture wars that will surely erupt if there is any attempt to decide what will be taught and learned in any subject? We can now see, with the passage of years, that it is possible to forge a

consensus in every contested subject-matter terrain if the various factions accept the necessity of working together and the futility of trying to impose their views on everyone else.

There is reason to hope that the curriculum wars of the 1990s have ended, not in a victory for either side, but in a truce. Where once there were warring partisans of whole language and phonics, now there is a general recognition that children need both. Beginning readers must learn the sounds and symbols of language, and they should learn to love reading by hearing and reading wonderful literature. I would go further, to insist that all children should learn grammar, spelling, and syntax, which will enable them to write well and communicate their ideas clearly.<sup>5</sup>

Furthermore, I suggest a short reading list—not more than 10 titles—of indispensable literary classics for each grade. Back in the days of the culture wars, it was taken as a given that any list would be oppressive, exclusive, and elitist. One hopes we have moved beyond those contentious times and can at last identify essential writings that have stood the test of time and continue to be worthy of our attention.

Without the effort to teach our common cultural heritage, we risk losing it and being left with nothing in common but an evanescent and often degraded popular culture. Let us instead read, reflect on, and debate the ideas of Abraham Lincoln, Martin Luther King Jr., Henry David Thoreau, Elizabeth Cady Stanton, Walt Whitman, Emily Dickinson, Ralph Waldo Emerson,

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One of the few states with an excellent curriculum in every subject is Massachusetts. Perhaps not coincidentally, its students have the **highest academic performance** in the nation.

W. E. B. Du Bois, Herman Melville, Nathaniel Hawthorne, William Shakespeare, John Milton, John Locke, John Stuart Mill, Lewis Carroll, and many others whose writings remain important because of their ideas, their beauty, or their eloquence. Let us be sure that our students read the Declaration of

Independence, the Constitution, and other basic documents of our nation's founding and development. Classic literature coexists happily with contemporary writings, especially when students are encouraged to engage in discussions about timeless issues such as the conflict between freedom and authority, the conflict between the rights of society and the rights of the individual, and the persistent dilemmas of the human condition. I do not suggest that it will be easy to shape lists of essential readings for every grade, only that it is necessary not to shirk this obligation if we wish to have excellent education for all. An English language arts curriculum without literature—real, named books of lasting importance—is no English curriculum at all.

In mathematics, the wars of the 1990s between traditionalists and constructivists have also subsided, although they flare up from time to time when parents discover that their children can't add or subtract. Many districts that mandate constructivist programs now realize that they must also teach basic mathematical computation. A consensus is possible. The results of international assessments, on which American students have faltered over the years, have helped us to understand the importance of avoiding extremes and unnecessary polarization.

In the sciences, the ingredients for a solid, sequential curriculum are at hand, based on work already completed by the American Association for the Advancement of Science's Project 2061 and the National Research Council. Students should study science in every grade, but this is hard to achieve when there are not enough science teachers. The study of science is also hobbled by the theological and political debate about evolution, which shadows every effort to devise science curricula on a statewide basis.

Education authorities must separate teaching about science from teaching about religion. Science classes should teach science, as validated by scholarship, and religion classes should teach religion. This principle cannot be compromised without doing injury to both fields of study.

Even history can be rescued from the culture wars, which now, one hopes, are a distant memory. Massachusetts, California, and a few other states have demonstrated that it is possible to develop a history curriculum that is challenging and lively.

At present, most students plod dutifully and unenthusiastically through obligatory textbooks of 1,000 or more pages stuffed with facts but lacking in narrative or intellectual excitement. The great stories of brave men and women, of heroes and villains, of tragic decisions and extraordinary deeds, are gone.

The textbooks avoid controversy—which would hurt sales—and maintain a studied air of neutrality, thus ensuring the triumph of dullness.

History should be as exciting to young people as anything on television, but their textbooks turn it into a listless parade of names, themes, wars, and nations. Among all the subjects tested by the federal government, U.S. history is the one in which American students register the worst performance, even though almost all students are required to

study it.<sup>6</sup> To restore excitement and vitality to this subject, teachers and curriculum designers must raise questions, provoke debates, explore controversies, and encourage the use of primary documents, narratives written by master historians, biographies, documentaries, and other visual records of important events and personalities. Biographies are a terrific way to introduce elementary-age children to history.

In the arts, we should agree that all children deserve the opportunity to learn to play a musical instrument, sing, engage in dramatic events, dance, paint, sculpt, and study the great works of artistic endeavor from other times and places. Through the arts, children learn discipline, focus, passion, and the sheer joy of creativity. We should make sure that these opportunities and the resources to support them are available to every student in every school.

Many educators and parents worry that a national curriculum might be captured by "the wrong people," that is, someone whose views they do not share. I too worry that a national curriculum might be no better than the vacuum that now exists, might fail to lift our sights, and might fail to release us from the shackles of test-based accountability. Thus, any national curriculum must be both nonfederal and voluntary, winning the support of districts and states because of its excellence.

If it is impossible to reach consensus about a national curriculum, then every state should make sure that every child receives an education that includes history, geography, literature, the arts, the sciences, civics, foreign languages, health, and physical education. These subjects should not be discretionary or left to chance. Every state should have a curriculum that is rich in knowledge,

issues, and ideas, while leaving teachers free to use their own methods, with enough time to introduce topics and activities of their own choosing. That would avoid unnecessary duplication from grade to grade and would guarantee that children in different districts—rural, suburban, and urban—are getting access to the same opportunities to learn.

One of the few states with an excellent curriculum in every subject is Massachusetts. Perhaps not coincidentally, students in Massachusetts have the highest academic performance in the nation on the National Assessment of Educational Progress and rank near the top when compared with their peers in other nations. When Massachusetts participated in the Trends in

International Mathematics and Science Study (TIMSS) in 2007, its fourth-graders placed second in the world in science, surpassed only by Singapore, and its eighth-graders tied for first in the world in science with students in Singapore, Chinese Taipei, Japan, and Korea.<sup>7</sup>

When students in Minnesota took the TIMSS tests, eighth-graders tied with Singapore in earth science; in mathematics, their performance was mediocre, like the nation's. William Schmidt, the U.S. coordinator for TIMSS, said that Minnesota has a strong curriculum in earth science, but not in mathematics. The lesson, he concluded, is that American students "can be the best in the world when we give them a curriculum that is focused and coher-

## A Note on Teacher Unions

Critics of teacher unions seem to be more plentiful now than ever before. Supporters of choice and vouchers see the unions as the major obstacle to their reforms. The *Wall Street Journal* regularly publishes editorials in opposition to teacher unionism, and the business press can be counted on to blame the unions for whatever is wrong with the schools. One would think, by reading the critics, that the nation's schools are overrun by incompetent teachers who hold their jobs only because of union protections, that unions are directly responsible for poor student performance, and that academic achievement would soar if the unions were to disappear.\*

This is unfair. No one, to my knowledge, has demonstrated a clear, indisputable correlation between teacher unionism and academic achievement, either negative or positive. The Southern states, where teacher unions have historically been either weak or nonexistent, have always had the poorest student performance on national examinations. Massachusetts, the state with the highest academic performance, has long had strong teacher unions. The difference in performance is probably due to economics, not unionization. Where there are affluent communities, student performance tends to be higher, whether or not their teachers belong to unions. Some of the top-performing nations in the world are highly unionized; others are not. Finland, whose students score highest on international

assessments of reading, has a teacher workforce that is nearly 100 percent unionized. Most high-performing Asian nations do not have large proportions of unionized teachers (though some do). Unionization per se does not cause high student achievement, nor does it cause low achievement.

While I have never been a member of any union, I was a friend of Albert Shanker, president of the American

political force that has improved the lives of working people in many sectors of American life, including education.

Critics say the union contract makes it impossible for administrators to get rid of bad teachers. The union says it protects teachers against arbitrary dismissals. To be sure, it is not easy to fire a tenured teacher, but it can be done so long as there is due process in hearing the teacher's side of the story.

District officials should **collaborate**, rather than use the union as a scapegoat for low performance.

Federation of Teachers, whom I met after my history of the New York City schools was published. His successor, Sandra Feldman, was also my friend, and I am friends with her successor, Randi Weingarten, who was elected AFT president in 2008. At the behest of the AFT, I traveled to Eastern Europe in 1989 and 1990, as the Cold War ended, to meet with teachers and talk about civic education and democracy in Poland, Hungary, Czechoslovakia, and Romania. I worked with the leaders of Teachers Solidarity in Poland, which opposed the Communist regime and its puppet unions. As a result of these experiences, I came to believe that teachers, like other working people, should have the right to organize and to bargain collectively for their compensation, working conditions, and right to due process. Moreover, as a historian, I recognize the importance of the labor movement as a

But the issue should not take years to resolve. The AFT, which represents most urban school districts, has supported peer review programs, in which teachers evaluate other teachers, offer to help them become better teachers, and, if they do not improve, "counsel them out" of the profession. When it comes to decisions about terminating a teacher, unions want to be part of the decision-making process. It is not in the interest of their members to have incompetent teachers in their midst, passing along poorly educated students to the next teacher. Since unions are not going to disappear, district officials should collaborate with them to develop a fair and expeditious process for removing incompetent teachers, rather than using the union as a scapegoat for low performance or for conditions in the school and society that are beyond the teachers' control.

—D.R.

\*Terry M. Moe, "No Teacher Left Behind," *Wall Street Journal*, January 13, 2005.

ent and that is delivered by teachers well trained in the content being offered at that level.”<sup>8</sup>

If our nation or states have a good curriculum, we must ensure that our assessment systems reflect and reinforce what is taught. There is a maxim among educators that “what gets tested is what gets taught.” The assessments used in our schools should be as good as the curriculum. I do not seek to abolish standardized, multiple-choice tests; they give a useful snapshot of student performance at a specific point in time. But they are not sufficient to measure student learning. To lift the quality of education, we must encourage schools to use measures of educational accomplishment that are appropriate to the subjects studied, such as research papers in history, essays and stories in literature, research projects in science, demonstrations of mathematical competence, videotaped or recorded conversations in a foreign language, performances in the arts, and other exhibitions of learning.

Nor should test scores be the sole measure of the quality of a school. Every state should establish inspection teams to evaluate the physical and educational condition of its schools, to ensure that a full curriculum is taught (not only the tested subjects), and to review

the quality of teaching and learning. Inspectors should judge teaching and learning by observing it, not by using checklists to note whether students have “learning goals,” teachers have “data binders,” schools have “data inquiry teams,” or other nonsensical requirements based on the jargon of the day.

The goal of evaluation should not be to identify schools that must be closed, but to identify schools that need help. The job of educational authorities is to solve problems, not evade them by shuttering schools. When schools are struggling, the authorities should do whatever is necessary to improve them. This may mean professional development for teachers, smaller classes, targeted programs in reading or other subjects, afterschool activities, additional tutoring for students, extra supervisors, a better disciplinary

policy, parent education classes, and other interventions that will strengthen the school’s capacity to educate its students.

With a strong and comprehensive curriculum and a fair assessment and evaluation system in place, the schools must have teachers who are well qualified to teach the curriculum. Teachers must be well educated and know their subjects. To impart a love of learning, they should love learning and love teaching

what they know. They should have professional training to learn how to teach what they know, how to manage a classroom, and how to handle the kinds of issues and problems they are likely to encounter as classroom teachers. As in many other aspects of education, we do not have ways to quantify whether a teacher loves learning, but we have some important signposts, such as their education, their command of the subject, and their skill in the classroom. Prospective teachers should be tested on their knowledge of what they will teach, and new teachers should be regularly evaluated by their supervisors and peers.

To attract and retain the teachers we need, schools must offer compensation that reflects the community’s respect for them as professionals. Many districts are trying various forms of performance pay, and we should watch those experiments closely. Some districts will offer higher salaries to attract teachers in fields where there are chronic shortages, such as science and mathematics. Others may offer bonuses to those who perform extra assignments. Differential pay schemes are in flux and are likely to continue changing for several years, as we learn more from current efforts. But whatever the results may be, no manipulation of salary schedules will suffice to overcome the absence of a sound curriculum, willing students, supportive parents, collegial administrators, and good working conditions.

If our schools had an excellent curriculum, appropriate assessments, and well-educated teachers, we would be way ahead of where we are now in renewing our school system. But even that would not be enough to make our schools all that they should be. Schools do not exist in isolation. They are part of the larger society. Schooling requires the active participation of many, including stu-

The goal of evaluation should be to identify schools that need help. The job of educational authorities is to **solve problems**, not evade them by shuttering schools.



dents, families, public officials, local organizations, and the larger community. As every educator knows, families are children's first teachers. On the very first day of school, there are wide differences in children's readiness to learn. Some children have educated parents; some do not. Some come from homes with books, newspapers, magazines, and other reading materials; some do not. Some parents encourage their children to do their schoolwork and set aside a place and a time for them to study; some do not. Some parents take their children to the library, zoo, museum, and other places of learning; some do not. As a result of different experiences in early childhood, some children begin school with a large vocabulary; some do not.

Researchers Betty Hart and Todd R. Risley studied the language development of young children and found a huge disparity between children from impoverished families and children from professional families.<sup>9</sup> Before the age of 3, children from the advantaged families had vastly more exposure to words and encouragement than children who grew up in poor households.\* Their study implies the need for early intervention, even before the age of 3, as well as intensive adult education for parents.

Families must do their part to get children ready for school. Families implant basic attitudes and values about learning, as well as the self-discipline and good manners necessary for learning in a group. Families must remain involved with their children,

\*To learn more, see "The Early Catastrophe: The 30 Million Word Gap by Age 3," by Betty Hart and Todd R. Risley, in the Spring 2003 issue of *American Educator*, available at [www.aft.org/newspubs/periodicals/ae/issues.cfm](http://www.aft.org/newspubs/periodicals/ae/issues.cfm).

encourage them, monitor their schoolwork, limit the time they spend with electronic devices, meet with their teachers, and see that they have a regular place to study. They must encourage them to take their schooling seriously, respect their teachers, and behave appropriately in school.

Schools must teach and enforce standards of civility, and teach students to respect themselves and others, or they cannot provide a safe, orderly environment, which is necessary for learning. Schools must restore the historic tradition of public schools as places where students learn good behavior, good citizenship, and the habits of mind that promote thoughtfulness and learning.

As a nation, we need a strong and vibrant public education system. As we seek to reform our schools, we must take care to do no harm. In fact, we must take care to make our public schools once again the pride of our nation. Our public education system is a fundamental element of our democratic society. Our public schools have been the pathway to opportunity and a better life for generations of Americans, giving them the tools to fashion their own life

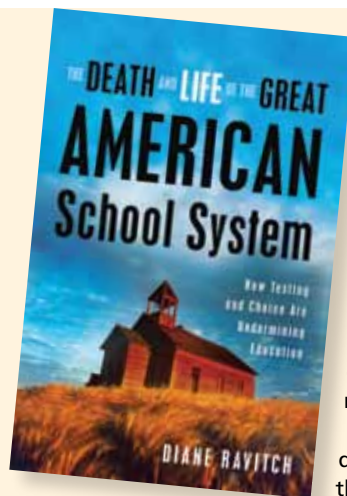
and to improve the commonweal. To the extent that we strengthen them, we strengthen our democracy.

At the present time, public education is in peril. Efforts to reform public education are, ironically, diminishing its quality and endangering its very survival. We must turn our attention to improving the schools, infusing them with the substance of genuine learning and reviving the conditions that make learning possible. □

(Endnotes on page 42)

Efforts to reform public education are, ironically, diminishing its quality. We must **revive** the conditions that make **learning** possible.

This book is my opportunity to explain what I have learned about school reform and to suggest, with (I hope) a certain degree of modesty and full acknowledgment of my own frailties and errors, what is needed to move American education in the right direction. Though at first it may seem dramatic, *The Death and Life of the Great American School System* is the title of my dreams. It is a fitting homage to Jane Jacobs, whose book *The Death and Life of Great American Cities* helped to create a renaissance in the nation's cities. Since I live the life that she wrote about, in a wonderful urban neighborhood



that once seemed promising. I explain why I have concluded that most of the reform strategies that school districts, state officials, the Congress, and federal

officials are pursuing, that mega-rich foundations are supporting, and that editorial boards are applauding are mistaken. I explain how these mistaken policies are corrupting educational values. I describe the policies that I believe are necessary ingredients in a good system of public education. I do not claim that my ideas will solve all our problems all at once and forever. I do claim, however, that we must preserve American public education, because it is so intimately connected to our concepts of citizenship and democracy and to the promise of American life.

—D.R.

saved by historic preservation, I love the idea of associating my book with hers, most especially with the hope that American education in general, and urban education in particular, might also experience a renaissance.

In the book, I describe the evidence that changed my views about reforms

To learn more about Diane Ravitch, or to e-mail her your thoughts on *The Death and Life of the Great American School System*, go to [www.dianeravitch.com](http://www.dianeravitch.com).

# Have Technology and Multitasking Rewired How Students Learn?



*How does the mind work—and especially how does it learn? Teachers' instructional decisions are based on a mix of theories learned in teacher education, trial and error, craft knowledge, and gut instinct. Such knowledge often serves us well, but is there anything sturdier to rely on?*

*Cognitive science is an interdisciplinary field of researchers from psychology, neuroscience, linguistics, philosophy, computer science, and anthropology who seek to understand the mind. In this regular American Educator column, we consider findings from this field that are strong and clear enough to merit classroom application.*

BY DANIEL T. WILLINGHAM

**Question:** It seems like students today have a love affair with technology. They are much more up-to-date on the latest gadgets, and

they seem to have a sixth sense about how to use them. Is it true that growing up with cutting-edge technology has left them thinking differently than students of past generations? And what do the data say about bringing this technology into the classroom? Does it help students learn?

*Daniel T. Willingham is a professor of cognitive psychology at the University of Virginia. His most recent book, *Why Don't Students Like School?*, is designed to help teachers apply research on the mind to the classroom setting. For his articles on education, go to [www.danielwillingham.com](http://www.danielwillingham.com). Readers can pose specific questions to "Ask the Cognitive Scientist," *American Educator*, 555 New Jersey Ave. N.W., Washington, DC 20001, or to [amerred@aft.org](mailto:amerred@aft.org). Future columns will try to address readers' questions.*

**Answer:** Today's students are indeed immersed in technology. According to a recent study, the average American between the ages of 8 and 18 spends more than 7.5 hours per day using a phone, computer, television, or other electronic device.<sup>1</sup> The press weighs in with stories suggesting that changes in technology are so profound that today's teens think of those in their mid-20s as



“old fogies.”<sup>2</sup> Technology has certainly changed how students access and integrate information, so it seems plausible that technology has also changed the way students think. But laboratory research indicates that today’s students don’t think in fundamentally different ways than students did a generation ago.

Should technology change the way you teach? On this point, there is less solid research because new technologies are, well, new. The existing research does tell us something rather obvious: new technologies do not represent a silver bullet. Just using a new gadget does not guarantee student learning. Laboratory research also indicates something more subtle: new technologies may be effective or not depending on the material and on characteristics of the student.

### Has Technology Changed the Way Students Think?

I commonly hear two suggested ways that technology has changed today’s students. The first is that without the rapid changes and the multimedia experiences technology can provide, students will be bored. The second suggested change is that students have developed the ability to multitask—that is, to perform more than one task at the same time. There is a bit of truth to the first of these, but not in the way that most people think. There is no truth to the second.

### Engagement

Don’t students find technology engaging? A complete answer to this question must have two parts. First, we might suggest that the question itself doesn’t make sense. How engaging a technology is for the user depends on how it’s used. It also depends on the content. It doesn’t make any sense to say “Kids are interested in cell phones,” because their engagement will depend on what they do with the cell phone. A teenager who is only allowed to use her phone to call her mother will be dramatically less interested in her cell phone than one who has unlimited text messaging. Is a presentation more interesting if the speaker uses PowerPoint than if the speaker does not? Potentially, but we have all seen a speaker who used PowerPoint only to create bulleted lists, which he or she then read aloud, a practice more or less certain to bore everyone. In contrast, many students are quite engaged by the *Twilight* series of novels despite the lack of technological flair.

Engagement or interest is a mental state, and the environment that will lead to that mental state need not have a technological component. In a previous article,<sup>\*</sup> I suggested that a good bet for engaging students in academic content is to pose solvable mental

problems. I am using the word “problems” in the broadest sense—the problems need not be overtly presented as puzzles to be solved. For example, a story presents a series of mental challenges as the listener pieces together the characters’ motives and perhaps anticipates what might happen next. But the problem does have to be both challenging (i.e., not too easy) and solvable (i.e., not too hard). So while a young child may be entranced by Eric Carle’s *Brown Bear, Brown Bear, What Do You See?* but not the least bit interested in Toni Morrison’s *Beloved*, the opposite would likely be true for a teenager. In order for technology (or any instructional tool) to increase student engagement in academic content, it has

In order for technology to increase student engagement in academic content, it has to aid in presenting problems as both challenging and solvable.



to aid in presenting problems as both challenging and solvable. And many technologies can do just that. For example, students in a physics class may grasp the idea of sensitivity to initial conditions more easily with graphing software that allows them to make small changes in input data and then immediately see large changes in the resulting graph. Technologies like hyperlinks—the clickable words that take us around the Web—help students to explore information sources on their own. But there is nothing inherently interesting about the technology (at least once the newness wears off); students are not interested in all software or all hyperlinks. It’s the content and what the user might do with it that makes it interesting or not.

However, many new technologies *do* have a feature that makes them inherently interesting, irrespective of how they are used or the content they convey. That feature is providing rapid changes in what the user sees or experiences. Every teacher knows that a loud noise outside will make students turn toward the windows. This phenomenon is easily observed in the laboratory as well.<sup>3</sup> But not just any new sight or sound will do—it has to be unknown. We turn our attention to *learn* something. If I know that my dog is in the room, I won’t look up from my book when I hear a jingling sound. But I will look up if I think she’s outside. We turn our attention to new things because we want more information about them. That’s why when your e-mail program pings to alert you to new mail, you feel compelled to investigate, to find out what the e-mail is about. Many new technologies have this property; new sights and sounds come to us in a continual stream, and we are engaged by this flow of new information.

I’ve presented two conflicting ideas: one suggesting that technology is inherently interesting, and the other suggesting that it all depends on how it is used and the content it conveys. Which is correct? These possibilities are not mutually exclusive. There is a “wow” factor that is real—be it a new technology or a new experience provided by an old technology (like a new text message delivered by your old cell phone)—but for the interest to be

<sup>\*</sup>See “Why Don’t Students Like School?” in the Spring 2009 issue of *American Educator*, available at [www.aft.org/newspubs/periodicals/ae/issues.cfm](http://www.aft.org/newspubs/periodicals/ae/issues.cfm).

sustained and to transfer to the subject matter, the technology must be used wisely. This interpretation is supported by data on students' reactions to interactive whiteboards. A number of studies have surveyed students (and teachers), after some weeks or months of using an interactive whiteboard, as to whether they liked it and whether it made them more interested in the subject matter.<sup>4</sup> These surveys indicated that students were very enthusiastic about the new technology. But another study<sup>5</sup> took a different approach. These researchers didn't ask what students thought about the interactive whiteboard per se; they just asked how much they liked their math class. Half of the students had been in a class with an interactive whiteboard, and half had not. The whiteboard had a positive effect on student interest in math class, but not nearly as robust as one would expect based on the other research. In sum, students find the interactive whiteboard really cool, so if you ask them about it, they respond enthusiastically. But that feeling transfers only minimally to the subject matter. That doesn't mean that the interactive whiteboard *couldn't* be used to make math more interesting. It means that the presence of an interactive whiteboard alone doesn't buy the teacher that much. The teacher must know what to do with it.

### Multitasking

What about multitasking? I've just said that many new technologies offer a rapid stream of new information to explore. Perhaps today's students have adapted to these technologies in ways that have changed their brains. Perhaps they find it difficult to focus on one thing for a long period of time, and multitasking engages them because it allows them to do several things at once. Perhaps they are better than previous generations at doing several things at once—for example, completing math problems while listening to music and also carrying on an instant messaging conversation with a friend.

Survey data indicate that younger people do multitask quite often; over half of high school students report that they multitask "most of the time," and about 25 percent report watching television or chatting with friends while they do their homework.<sup>6</sup> Young people report multitasking for more hours per day than older people,<sup>7</sup> and laboratory tests show that younger people are better at multitasking than older people.<sup>8</sup>

In fact, all of us perform tasks best when we do only one at a time. So, when laboratory tests find that younger people are better at multitasking than older people, what that really means is that younger people have less degradation of the speed and accuracy of each task, compared with when each task is done separately.

Young people's advantage in multitasking is not associated with

them practicing it more, or enjoying it more, than older people. It is associated with young people's greater working-memory capacity.<sup>9</sup> Working memory is the mental "space" in which thinking occurs. For example, if you multiply 85 and 33 in your head, you manipulate these numbers in working memory to calculate the answer. If you tried to multiply 83,021 and 39,751 in your head, you would probably get confused. You have a limited amount of "room" in your working memory, and you would run out. It turns out that people with more room in working memory are better at multitasking. For reasons that are not well understood, young people generally have more working-memory capacity than older adults do, and so are better at multitasking.<sup>10</sup>

One of the most stubborn, persistent phenomena of the mind is that when you do two things at once, you don't do either one as well as when you do them one at a time.



I mentioned briefly that young people's practice with multitasking does not account for the advantage they have over older people. The reality is actually somewhat surprising: college students who report being chronic multitaskers tend to be *worse* at standard cognitive control abilities—like rapidly switching attention between two tasks—that are important to successful multitasking.<sup>11</sup> That doesn't necessarily mean that practicing multitasking has made them worse. It may mean that people who are not very good at mental control *choose* to multitask more often. In fact, lack of mental control may mean that they are more distractible, and that's why they choose to multitask frequently. (Research on multitasking is becoming

more common, so we should understand it better in the coming years.)

So, there is *not* evidence that the current generation of students "must" multitask. Is multitasking a good idea? Most of the time, no. One of the most stubborn, persistent phenomena of the mind is that when you do two things at once, you don't do either one as well as when you do them one at a time.<sup>12</sup> Our perception is that we can do two things simultaneously without cost: we may not be able to hold a conversation while we compose a memo, but many students have told me with confidence that they can hold a conversation with me while they text a friend. Actually, even simple tasks show a cost in the speed and accuracy with which we perform them when doubled up with another, equally simple task.<sup>13</sup>

In fact, most of the time when we believe we're multitasking, we're actually switching between two tasks. Switching from one task to another is hard because different tasks follow different rules and call for different types of responses.<sup>14</sup> It takes a moment or two to mentally recalibrate to these different circumstances. For example, suppose a student carries on an instant messaging conversation with a friend while she writes an English paper. The conversation and the paper each have a different history and logi-

cal progression. There are also conventions of writing particular to each: the paper requires complete sentences and that facts be footnoted, whereas instant messaging encourages abbreviations such as “lol.” It’s not that students (or adults) can’t switch between two different tasks, but there is always a cost to speed and accuracy.

This generalization—you can’t do two things as effectively as one—applies to television watching as well, but it may not apply to listening to music. Having the TV playing in the background while doing homework reduces the quality of the homework.<sup>15</sup> For background music, however, the results are more complex. Some studies show that music poses a distraction,<sup>16</sup> and others do not;<sup>17</sup> some indicate that vocal music distracts but nonvocal does not.<sup>18</sup> Still other research indicates that introverted people (those who are less outgoing) are more negatively affected by background music than extroverts (those who are more sociable).<sup>19</sup> This surprising finding might be due to different baseline levels of physiological activity for introverts and extroverts.

What’s the bottom line in this complex literature? Multitasking is never a good idea if you really need to get something done. Listening to music while working may be the exception for some students working on certain types of tasks. Some teachers allow students to listen to their iPods while they work at particular tasks and others don’t. The research literature is not clear enough to recommend to either group that they consider changing that policy.\*

## How Might Technology Influence Classroom Practice?

Just because new technologies are not altering how students think and are not necessary for students to be engaged, that doesn’t mean that technology can’t be useful in the classroom. What do we know about how technology can aid student learning?

Initially, it might seem that the advantages offered by new technologies are obvious. An interactive whiteboard allows a whole class to see a computer screen and the teacher (or a student) to control the computer easily. Student response systems (clickers) allow students to respond to teacher-posed questions and quickly see the tabulated results. The subtle part is figuring out the most effective classroom applications.

Can research provide any guidelines as to which classroom applications are most effective? As you might expect, these technologies are so new that there has been little research on most of them, except for interactive whiteboards and multimedia instruction. The studies on these point to two conclusions. First, the mere presence of technology in the classroom does not necessarily mean that students learn more. Second—and, perhaps, a corol-

lary of the first conclusion—using these technologies effectively is not as obvious as it might seem at first.

Britain has made an enormous investment in interactive whiteboards,<sup>20</sup> and by 2007, 100 percent of primary schools and 98 percent of secondary schools had at least one interactive whiteboard.<sup>21</sup> British researchers have assessed the impact of this initiative, most often in teaching mathematics.

As mentioned in the previous section, early research used survey methodologies to simply ask students and teachers whether they thought interactive whiteboards were useful. The responses from both groups were overwhelmingly positive, and both groups agreed that interactive whiteboards seemed to help students focus

their attention.<sup>22</sup> But other data indicated that the presence of interactive whiteboards did not help students learn mathematics any better.<sup>23</sup> These results have led researchers to a quite logical conclusion: the mere presence of interactive whiteboards in a classroom does not necessarily improve—or even change—teaching all that much.<sup>24</sup> Teachers need time and professional development to create lessons that exploit the potential advantages of the technology,<sup>25</sup> and it must be recognized that crafting such lessons is not necessarily straightforward.<sup>26</sup>

Although researchers are beginning to conclude that the effective use of interactive whiteboards might be more complex than was first guessed, research on multimedia technology is much further along, and it supports the same

general conclusion—using technology effectively may not be as obvious as it first appears. Multimedia instruction simply refers to a lesson that contains words (printed and/or spoken) and pictures (illustrations, photos, animation, and/or video).<sup>27</sup> It might seem obvious that pictures are bound to supplement words and thereby enhance learning. That’s often true, but not always.

Recent reviews<sup>28</sup> emphasize the role of working memory—the mental space in which thinking happens—in how multimedia lessons are interpreted and remembered by students. Multimedia learning means that the student must keep both text and graphics in mind simultaneously, and coordinate the two. One obvious implication is that if the text and graphics conflict, the multimedia lesson will simply confuse students. Further, if the text and graphics that go together are separated in time or in space, there is a greater burden on the student to remember them accurately and mentally put them together, and a greater likelihood that the student will not do so successfully.<sup>29</sup>

Recognizing the importance of working memory leads to more subtle predictions as well, predictions that are rooted in differences among students. Working memory is limited in size—each of us only has so much mental space to work with. But this size limitation varies somewhat from person to person.

Teachers need professional development to create lessons that exploit the potential advantages of technology; crafting such lessons is not straightforward.



So a multimedia lesson that is effective for a student with a large working-memory capacity might be overwhelming for a student with a smaller capacity. That predicted finding has been observed in a study of a multimedia lesson in cell biology, delivered on a computer.<sup>30</sup> In one condition of the experiment, subjects could see cellular structures only in cross-section (that is, a two-dimensional picture of a “slice” of a three-dimensional structure). In the other condition, subjects saw the two-dimensional cross-section and a three-dimensional model of the cell that they could rotate by dragging it with the mouse cursor. The results showed that students with a large working-memory capacity benefited from the chance to see and rotate the three-dimensional model; they scored better on a content test administered immediately after the lesson. But students with a small working-memory capacity not only didn’t benefit from the three-dimensional model, they actually learned *less* than comparable students (i.e., who also had a small working-memory capacity) who saw only the two-dimensional model. These students were apparently overwhelmed by trying to coordinate the three-dimensional images with the principles they were reading about.

Other findings also highlight the importance of working memory for multimedia learning. For example, it’s well known that extensive background knowledge allows one to circumvent the limitation of working memory. To take an obvious example, if I ask you to hold six letters in mind for one minute, it will be much easier to do with B-R-A-K-E-S than with X-P-W-M-Q-R. Although both are a string of six letters, the first forms a word, so you can treat it like a single unit. It’s like holding one thing in working memory, not six. Naturally, this saving of space in working memory only works if you *know* the word “brakes.” The same phenomenon is observed in many other domains. The chess expert looking at a board does not see 16 white pieces—she sees several clusters of pieces, each cluster defined by the relationship of the pieces to one another and to opposing pieces. Whether it’s chess pieces or letters in a word, the compacting of many things into one thing in working memory is based on prior knowledge.<sup>†</sup>

If prior knowledge allows one to circumvent the size limitation of working memory, then we might predict that people who know something about a topic will experience multimedia learning about that topic differently than those who do not. There are data supporting that prediction. For example, reading comprehension

is sometimes compromised<sup>31</sup> in a hypertext environment—that is, text like that found on the Web, where the reader can click on links to see a word definition or a related figure. Deciding whether to click a hypertext link, and then, if clicked, reading the material or studying the figure, disrupts the flow of reading the main text and makes it harder to thread together the ideas. The extent to which hyperlinks disrupt reading comprehension depends on the working memory and prior knowledge of the reader. Those with a large working-memory capacity or with some background knowledge about the subject of the text find hyperlinked text less disruptive.<sup>32</sup>

Two conclusions are salient from this literature. First, the mere presence of technology in a classroom is no guarantee that students will learn more. New technologies are tools like any other, and they can be used in ways that are helpful or not. Second, the ways that new technologies can be usefully applied are not always obvious. Many of the most popular technologies are so new that the research literature on them is thin. There is not a list of best practices for their use.\* Drawing on what we have learned from the multimedia literature, teachers should carefully monitor students to see if a new technology-based component in a lesson is enhancing comprehension or becoming overwhelming.

Teachers should carefully monitor students to see if new technology in a lesson is enhancing comprehension or becoming overwhelming.



### What Does All This Mean for Teaching?

1. *Encourage your students to avoid multitasking when doing an important task.* The literature is clear on this point. Engaging in any mentally challenging task should be done on its own—not while also watching television or carrying on a conversation. Music may be an exception for some tasks and some students.

Students are likely to believe that they are good at multitasking, so they may need some quiet time in class to see just how efficient they can be when multitasking is not permitted. To most students, updating their Facebook page while text messaging and watching TV may be fun and seem efficient, but adding homework into that mix presents serious problems. As I discussed in a previous column,<sup>§</sup> we remember what we think about, so dividing attention between homework and socializing and/or TV is very likely to decrease students’ ability to learn academic content and skills.

2. *If a new piece of technology is placed in your classroom with the expectation that you will use it, take advantage of online*

\*The exception is multimedia lessons; see Roxana Moreno, “Learning in High-Tech and Multimedia Environments,” *Current Directions in Psychological Science* 15, no. 2 (2006): 63–67.

§See “What Will Improve a Student’s Memory?” in the Winter 2008–2009 issue of *American Educator*, available at [www.aft.org/newspubs/periodicals/ae/issues.cfm](http://www.aft.org/newspubs/periodicals/ae/issues.cfm).

<sup>†</sup>For more on this, see “How Knowledge Helps,” which I wrote for the Spring 2006 issue of *American Educator*, available at [www.aft.org/newspubs/periodicals/ae/issues.cfm](http://www.aft.org/newspubs/periodicals/ae/issues.cfm).

*teacher communities*. As noted above, there is not a research-based list of best practices for the use of new technologies. The best ideas for how to teach with interactive whiteboards, clickers, social networking software, and other new technologies will come from teachers. Happily, the teachers who are enthusiastic early adopters of technology are also the ones who are likely to share their ideas with their colleagues via the Internet. There's no need to reinvent the wheel. Get online and find out how others are using technology. Two good places to start are [www.tammyworchester.com](http://www.tammyworchester.com) and [www.freetech4teachers.com](http://www.freetech4teachers.com).

3. *Think about what the technology can and can't do.* If your district plops an interactive whiteboard in your room, you may think "Okay, here it is. How can I use it?" Another (and probably more productive) way to look at technology is to turn this idea on its head. Instead of thinking "How can I use this tool?" think "I want to do X. Is there a tool that will help me do it?" That requires considering what different technologies can do.

Videos are better than photographs for showing processes that evolve in time, but photographs are better than videos for studying the details of a scene. Text messaging offers asynchronous, easily accessed communication between two people. Twitter offers this sort of communication among many people, but users are limited to 140 characters. Clickers allow simultaneous student response that is anonymous to other students, but that the teacher can track over time. When you encounter a new technology, try to think in abstract terms about what the technology permits that was not possible in the past. It's also worth considering what, if anything, the technology prevents or makes inconvenient. For example, compared with a chalkboard, an overhead projector allows a teacher to (1) prepare materials in advance, (2) present a lot of information simultaneously, and (3) present photocopied diagrams or figures. These are clear advantages. However, there are also disadvantages. For instance, James Stigler and James Hiebert noted that American teachers mostly use overhead projectors when teaching mathematics, but Japanese teachers use chalkboards.<sup>33</sup> Why? Because Japanese teachers prefer to maintain a running history of the lesson. They don't erase a problem or an explanation after putting it on the board. It remains, and the teacher will likely refer to it later in the lesson, to refresh students' memories or contrast it with a new concept. That's inconvenient at best with an overhead projector.

4. *There's nothing wrong with engagement.* I noted that students are enthusiastic about interactive whiteboards, but the enthusiasm doesn't seem to transfer to the content of the class. It would be better, of course, for students to become engaged with the content itself, but if the technology gives students a little energy, that's a start. A college professor I know sends assignments to his students via text messages. Another professor sniffed at this idea, noting that he could just as well hand out the assignments on slips of paper. What's important is to be clear-eyed about what's being accomplished. In this instance, the texted assignment may give students a moment of fun.\* □

\*It's also worth noting that this professor had ascertained that his students all had cell phones, and that these text messages would not cost them anything. For many teachers, the best bet may be to focus on using the technology provided by the school.

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(Continued on page 42)

# Picture This

## Increasing Math and Science Learning by Improving Spatial Thinking



BY NORA S. NEWCOMBE

**A**lbert Einstein's scientific accomplishments so impressed the world that his name is shorthand for intelligence, insight, and creativity. To be an Einstein is to be inconceivably brilliant, especially in math and science. Yet Albert Einstein was famously late to talk, and he described his thinking processes as primarily nonverbal. "The words or the language, as they are written or spoken, do not seem to play any role in my mechanism of thought," he once said. "[There are] more or less clear images."<sup>1</sup> Research on his brain, preserved after death, has seemed to support his claim of thinking in spatial images: Sandra Witelson, a neuroscientist in Canada,

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found that his parietal cortex, an area of the brain used for spatial and mathematical thinking, was unusually large and oddly configured,<sup>2</sup> and likely supported him in imagining the universe in innovative ways.

Einstein was unique, but he certainly was not the only scientist to depend on his ability to think spatially. Watson and Crick's discovery of the structure of DNA, for example, was centrally about fitting a three-dimensional spatial model to existing flat images of the molecule. The fact is, many people who work in the sciences rely on their ability to think spatially, even if they do not make grand discoveries. Geoscientists visualize the processes that affect the formation of the earth. Engineers anticipate how various forces may affect the design of a structure. And neurosurgeons draw on MRIs to visualize particular brain areas that may determine the outcome of a surgical procedure.

So, is spatial thinking really a key to science, technology, engineering, and mathematics—the so-called STEM disciplines? Yes. Scores of high-quality studies conducted over the past 50 years indicate that spatial thinking is central to STEM success. One of the most important studies is called Project Talent; it followed

approximately 400,000 people from their high school years in the late 1950s to today.<sup>3</sup> It found that people who had high scores on spatial tests in high school were much more likely to major in STEM disciplines and go into STEM careers than those with lower scores, even after accounting for the fact that they tended to have higher verbal and mathematical scores as well. Similar results have been found in other longitudinal studies: one began in the 1970s and tracked the careers of a sample of gifted students first studied in middle school;<sup>4</sup> another began in the 1980s with observing the block play of preschoolers and followed their mathematics learning through high school.<sup>5</sup>

In short, the relation between spatial thinking and STEM is a robust one, emerging for ordinary students and for gifted students, for men and for women, and for people who grew up during different historical periods. Spatial thinkers are likely to be more

interested in science and math than less spatial thinkers, and are more likely to be good enough at STEM research to get advanced degrees.

So, would early attention to developing children’s spatial thinking increase their achievement in math and science, and even nudge them toward STEM careers? Recent research on teaching spatial thinking suggests the answer may be yes.

### What Do We Mean by Spatial Thinking?

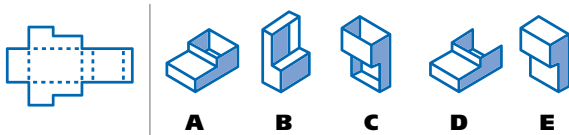
So far, we have been casual in using the term “spatial thinking.” But what do we really mean by it? Spatial thinking concerns the locations of objects, their shapes, their relations to each other, and the paths they take as they move. All of us think spatially in many everyday situations: when we consider rearranging the furniture in a room, when we assemble a bookcase using a diagram, or

## Tests of Spatial Thinking

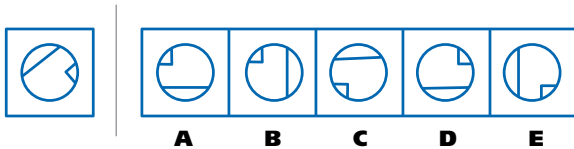
The following four tests were used in the Project Talent study. Here, each is briefly described and a sample item is provided. Answers for the sample items are on page 43 after the endnotes.

—EDITORS

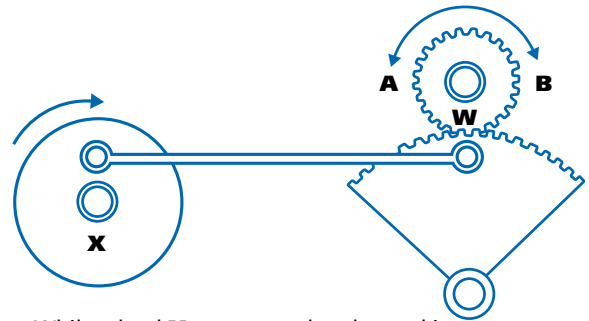
**1. Three-dimensional spatial visualization:** Each problem in this test has a drawing of a flat piece of metal at the left. At the right are shown five objects, only one of which might be made by folding the flat piece of metal along the dotted lines. You are to pick out the one of these five objects which shows just how the piece of flat metal will look when it is folded at the dotted lines. When it is folded, no piece of metal overlaps any other piece or is enclosed inside the object.



**2. Two-dimensional spatial visualization:** In this test each problem has one drawing at the left and five similar drawings to the right of it, but only one of the five drawings on the right exactly matches the drawing at the left if you turn it around. The rest of the drawings are backward even when they are turned around. For each problem in this test, choose the one drawing which, when turned around or rotated, is exactly like the basic drawing at the left.

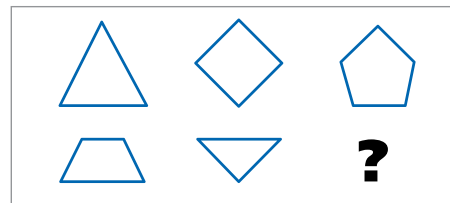


**3. Mechanical reasoning:** This is a test of your ability to understand mechanical ideas. You will have some diagrams or pictures with questions about them. For each problem, read the question, study the picture above it, and mark the letter of the answer on your answer sheet.



While wheel **X** turns round and round in the direction shown, wheel **W** turns  
 A. in direction **A**.  
 B. in direction **B**.  
 C. first in one direction and then in the other.

**4. Abstract reasoning:** Each item in this test consists of a set of figures arranged in a pattern, formed according to certain rules. In each problem you are to decide what figure belongs where the question mark is in the pattern.... The items have different kinds of patterns and different rules by which the drawings change.



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when we relate a map to the road ahead of us. We also use spatial thinking to describe nonspatial situations, such as when we talk about being *close to* a goal or describe someone as an *insider*.

This general description is helpful, but in conducting research, precise definitions are necessary. For the Project Talent study, spatial thinking was defined by the four tests used to assess it; a sample item from each of those four tests is shown in the box on page 30.<sup>6</sup> The first test asks us to imagine folding a two-dimensional shape into a three-dimensional one. The second asks us to mentally rotate a two-dimensional shape. The third asks us to imagine mechanical motion. The fourth asks us to see spatial patterns and progressions.

Tests like these four have been around for a century or so, and they remain useful assessments of spatial ability. But they do not cover the full range of abilities that fall under the term “spatial thinking,” so today’s researchers are working on developing new assessments. For example, one very different kind of spatial thinking involves navigating around the wider world. Many people think that, to get where we are heading, we need to be able to form a mental map of the environment.<sup>7</sup> It appears that some of us are much better than others at forming these integrated representations.<sup>8</sup> Spatial thinking of this kind may also be relevant to STEM success, but this idea has not yet been tested, largely because we lack good tests of navigation ability that can be given to large samples of students. Computer technology may soon allow such assessments.

To really understand what spatial thinking is, we must be clear about what it is not. First, spatial thinking is not a substitute for verbal or mathematical thinking. Those who succeed in STEM careers tend to be very good at all three kinds of thinking. Second, given the popularity of the notion that students have learning styles—i.e., that they are visual, auditory, or kinesthetic learners—it’s important to understand that spatial thinking is not a learning style. The truth is that there is virtually no support for learning styles in the research literature. While students may have preferences, all of us (with very rare exceptions) learn by seeing, hearing, and doing.\* Likewise, all of us (with very rare exceptions) think verbally, mathematically, and spatially. So teachers should be trying to provide students with the content knowledge, experiences, and skills that support development of all three ways of thinking.

### Can Spatial Thinking Actually Be Improved?

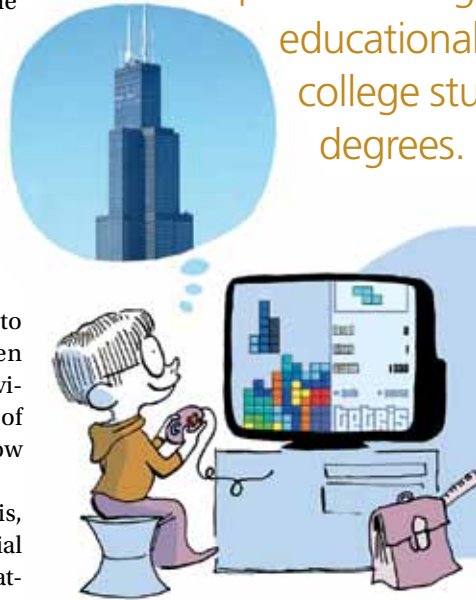
Since spatial thinking is associated with skill and interest in STEM fields (as well as in other areas, such as art, graphic design, and architecture), the immediate question is whether it can be

\*Instead of tailoring lessons to students’ supposed learning styles, teachers should be concerned with tailoring their lessons to the content (e.g., showing pictures when studying art and reading aloud when studying poetry). For a thorough explanation of this, see “Do Visual, Auditory, and Kinesthetic Learners Need Visual, Auditory, and Kinesthetic Instruction?” by Daniel T. Willingham in the Summer 2005 issue of *American Educator*, available at [www.aft.org/newspubs/periodicals/ae/issues.cfm](http://www.aft.org/newspubs/periodicals/ae/issues.cfm).

improved. Can we educate children in a way that would maximize their potential in this domain? Americans often believe that their abilities are fixed, perhaps even at birth;<sup>9</sup> it is not uncommon to hear that a person was born with a gift for mathematics or a difficulty in learning foreign languages. But there is mounting evidence that this is not the case.<sup>10</sup> Abilities grow when students, their parents, and their teachers believe that achievement follows consistent hard work and when anxiety about certain areas, such as math, is kept low.<sup>†</sup>

What about spatial thinking in particular—is it malleable? Definitely. We have known for some time that elementary school

Spatial training has been found to improve educational outcomes, such as helping college students complete engineering degrees.



children’s spatial thinking improves more over the school year than over the summer months.<sup>11</sup> A recent meta-analysis (which integrated the results of all the high-quality studies of spatial malleability conducted over the past few decades) showed substantial improvements in spatial skill from a wide variety of interventions, including academic coursework, task-specific practice, and playing computer games that require spatial thinking, such as Tetris (a game in which play-

ers rotate shapes to fit them together as they drop down the screen).<sup>12</sup> Furthermore, these improvements were durable, and transferred to other tasks and settings. For example, when undergraduates were given extended, semester-long practice on mental rotation, through taking the test repeatedly and also through weekly play of Tetris, training effects were massive in size, lasted several months, and generalized to other spatial tasks such as constructing three-dimensional images from two-dimensional displays.<sup>13</sup> Along similar lines, undergraduates who practiced either mental rotation or paper folding daily, for three weeks, showed transfer of practice gains to novel test items, as well as transfer to the other spatial tasks they had not practiced.<sup>14</sup> Spatial training has also been found to improve educational outcomes, such as helping college students complete engineering degrees.<sup>15</sup>

While many studies have found that spatial thinking can be improved, researchers have found some important differences between high- and low-ability participants. For low-ability participants, there is an initial hump to get over. They improve slowly,

<sup>†</sup>Summing up 30 years of research, Daniel T. Willingham wrote, “Intelligence can be changed through sustained hard work.” For his explanation of the genetic and environmental influences on intelligence, see the sidebar on page 10 of the Spring 2009 issue of *American Educator*, available at [www.aft.org/newspubs/periodicals/ae/issues.cfm](http://www.aft.org/newspubs/periodicals/ae/issues.cfm).



if at all, for the first half-dozen or so sessions.\* But if they persevere, faster improvement comes, so it's important that students (and teachers) not give up.<sup>16</sup> High-ability participants do not have an initial hump, but they still can improve. Even people who are spatially proficient turn out to be not nearly as proficient as they could be, and they can attain even higher levels of excellence through fun activities like playing Tetris.<sup>17</sup> While playing Tetris may not fit into the school day, it might be offered in afterschool settings or be suggested to students as a weekend or summer activity (in moderation, of course). (Other spatial thinking activities that fit better into academic studies, such as why the earth has seasons, are discussed later.)

In addition to practicing spatial thinking tasks like those shown in the box on page 30, well-conceived symbolic representations, analogies, and gestures are also effective in improving one's spatial thinking ability. Let's discuss each of these briefly.

One of the distinctive characteristics of human beings is that they can use symbolic representations, such as language, maps, diagrams, sketches, and graphs. Spatial language is a powerful tool for spatial learning. Babies learn a spatial relation better when it is given a name,<sup>18</sup> preschoolers who understand spatial words like "middle" perform better on spatial tasks than those who do not,<sup>19</sup> and preschool children whose parents use a greater number of spatial words (like *outside*, *inside*, *under*, *over*, *around*, and *corner*) show better growth in spatial thinking than children whose parents do not use such language.<sup>20</sup> Adults' spatial thinking is also enhanced by spatial language (e.g., the word *parallel* helps pick out an important spatial concept), as is their thinking about concepts, such as time, that are often described with spatial metaphors (e.g., *far in the future*).<sup>21</sup> Along similar lines, the ability to use maps can transform our thinking,<sup>22</sup> allowing us to draw conclusions that would be hard to arrive at without maps. A famous example is seeing the relation between drinking polluted water and getting cholera; in the 1800s, a map of water pumps in London superimposed on a map of cholera cases made the case for a relationship. Like maps, diagrams, sketches, and graphs also allow us to make inferences by supporting our spatial thinking.<sup>23</sup> For example, a graph of how boys and girls change in height over childhood and adolescence shows us very clearly that, on average, girls have an earlier growth spurt and finish growing earlier.

In addition to being able to think symbolically, humans have

\*Researchers are not sure why this is. It could be that those who are not good at spatial thinking have not yet developed mental strategies for dealing with spatial problems. So, in the initial stage when it appears that they are not improving, they could be developing and testing strategies. Then, once they have hit on an effective strategy, they start to improve and continue improving as they practice. In contrast, high-ability participants already have effective mental strategies and are simply becoming better through practice.

a distinctive ability to think analogically, that is, to see relational similarities between one situation and another. People can learn through noticing analogies, that is, by comparing two situations and noting their common relational structure (as when we compare the structure of the atom to the structure of the solar system). This process facilitates learning in children,<sup>24</sup> including spatial learning,<sup>25</sup> mathematical insight,<sup>26</sup> and scientific reasoning.<sup>27</sup> Thus, an additional way to get children to develop spatial reasoning abilities is to point out and highlight key comparisons they should be making.

People also gesture as they think, and gesture has turned out

Preschool children whose parents use a greater number of spatial words (like *outside*, *under*, *around*, and *corner*) show better growth in spatial thinking.



to be not only a window onto how thinking occurs,<sup>28</sup> but also a powerful tool for improving various kinds of learning. Gestures provide a window onto learners' minds and offer information about whether a learner is ready to improve on a task.<sup>29</sup> But gesture can also play a more active role in learning, in two ways. First, when *teachers* use gesture in instruction, children often learn better than when taught with speech alone.<sup>30</sup> Second, when *children* gesture as they explain a problem, either prior to<sup>31</sup> or during<sup>32</sup> instruction, they learn better than if they do not gesture. Gesture is a powerful means of reflecting and communicating about spatial knowledge. Gesture has the potential to be a particularly powerful instructional tool in the spatial domain because it is particularly good at capturing spatial relations among objects. For example, when talking about how the earth turns and revolves around the sun, teachers can gesture to capture those relations.

Overall, our bag of tricks for enhancing spatial thinking is quite full. But there is more to learn. We know that practice, symbolic representations, analogies, and gestures all improve spatial thinking, but we don't know which of these approaches is most effective. Teachers will have to use their best judgment and fit spatial thinking into the school day as best they can. To help, I offer some suggestions at the end of this article.

### What about Sex Differences?

Sex differences are often the first thing people want to talk about when they consider spatial thinking. Three big questions usually come to mind: Do sex differences exist? If so, how big are they? What causes them—are they biological or environmental? Research has found sex differences in spatial thinking ability, both among average men and women, and among the very highest achievers. For some spatial tests, these differences are large. However, while these differences do exist, we need to remember that average sex differences do not tell us about individual perfor-

mance—some girls have strong spatial skills, and some boys are lacking these skills. Sex differences in spatial thinking are no barrier to women’s success in the STEM disciplines as long as educators take the steps to ensure that all students, of both sexes, acquire the spatial thinking skills they need.

The question about causes is a tricky one. The assumption behind this question is usually that, if biological, the difference is immutable, whereas if environmental, it could be reduced or even eradicated. There are two problems with the question, however. The first problem is with the assumption behind it: biological causation does *not* imply immutability, and environmental causation does *not* guarantee changeability. The second problem is that we don’t know the answer. A specially assembled team of experts with various takes on the problem recently concluded that there was evidence supporting both kinds of influences, with the additional possibility that the influences interacted (as when experience alters brain structures).<sup>33</sup>

Since spatial thinking can be improved, the important fact is not the causation of sex differences but the fact that girls (and boys) can improve. Some have suggested special training for females to help them catch up to males,<sup>34</sup> but as educators we want all students to do their best. That means we may not close the gap: meta-analyses have found that the sexes generally improve in parallel, and thus the sex difference continues even with training<sup>35</sup> (although some exceptions have been reported in which performance by men and women converged<sup>36</sup>). Nevertheless, even if the gap does not close, many women (and men) can and will come to perform well above threshold levels for success in the STEM disciplines, at which point other factors such as persistence, communication, and creativity may be more important than spatial ability.

## What Does This Mean for Teachers?

Since spatial cognition is malleable, spatial thinking can be fostered with the right kind of instruction and technology. As we have seen, spatial thinking improves during the school year more than over the summer months,<sup>37</sup> showing that teachers are helping students already. But what exactly should we be doing to help them improve even more? Unfortunately, precise answers are not yet possible. The National Academies’ report *Learning to Think Spatially* pointed out that we still lack specific knowledge of what kinds of experiences lead to improvement, how to infuse spatial thinking across the curriculum, or whether (and how best) to use new technologies such as Geographic Information Systems, especially with young children. What kinds of teaching best support spatial learning? Are these kinds of teaching different at different ages, at different socioeconomic status levels, or for girls and boys? Developing and testing curricula in a scientific way can be a slow process, and much remains to be done to be absolutely sure of our ground. However, we are beginning to have some good ideas about where to start, especially with preschool and elementary school students.

1. *Teachers (and parents) need to understand what spatial thinking is, and what kinds of pedagogical activities and materials support its development.* Recall that spatial thinking involves noticing and remembering the locations of objects and their shapes, and being able to mentally manipulate those shapes

and track their paths as they move. Because spatial thinking is not a subject, not something in which children are explicitly tested, it often gets lost among reading, mathematics, and all the other content and skills specified in state standards. Teachers need to be able to recognize where they can infuse it into the school day. For example, teachers could use the cardinal directions (north, south, east, and west) to talk about how to get to the cafeteria or playground, or use words like *parallel* and *perpendicular* when possible.

2. *Teachers at all levels need to avoid infusing students with anxiety about spatial tasks.* In general, anxiety about doing a task can impede performance, at least in part by occupying valuable mental space in working memory.<sup>38</sup> When you spend a lot of time worrying that you won’t do well, you lack the cognitive resources to actually concentrate on the work, a sad example of a self-fulfilling prophecy. Research with first- and second-graders in the Chicago Public Schools has recently shown that this vicious circle is evident for spatial thinking as well as for other areas like math: children who worry about not doing well perform more poorly than children who do not have such anxiety.<sup>39</sup> Thus, as is also true for other areas in teaching, teachers should avoid presenting spatial tasks as difficult challenges on which some people may not do well, or presenting students’ performance on these tasks as indicative of their underlying spatial abilities. Instead, teachers should emphasize that the tasks can be enjoyable and useful, and that they can be mastered with some effort and time.

3. *In the preschool years, teachers (and parents) need to encourage, support, and model engagement in age-appropriate spatial activities of a playful nature.* Preschool children need a good balance of play and formal instruction.<sup>40</sup> Fortunately, there is a wealth of spatial material available for preschool play, much of which can be further leveraged by a teacher with knowledge of the processes of spatial learning. Here are some specific ideas that could fit into most preschool settings:

- Select spatially challenging books for young children. For example, *Zoom* is a book in which attention continually zooms in to finer and finer levels of detail. Verbal and gestural support for children in dealing with the book’s conceptual and graphic challenges is correlated with children’s scores on spatial tests.<sup>41</sup>
- Use odd-looking as well as standard examples when teaching the names of geometric shapes such as circle, square, and triangle (e.g., a tipped, skinny, scalene triangle as well as an equilateral triangle pointing up). Showing these kinds of shapes supports learning that triangles are any closed figure formed by three intersecting straight lines.<sup>42</sup>
- Teach spatial words such as *out, in, outside, inside, middle, between, here, there, front, back, side, top, bottom, up, down, under, over, around, tall, high, short, low, line (it) up, row, next (to), and corner*. Learning spatial words can be enhanced by using gestures that highlight the spatial properties being discussed.<sup>43</sup>
- Encourage young children to gesture. Research has found

that when children are asked whether two shapes can be fit together to make another shape, they do significantly better when encouraged to move their hands to indicate the movements that would be made in pushing the shapes together.<sup>44</sup> Some children do this spontaneously, but children who do not will perform better when asked to gesture.

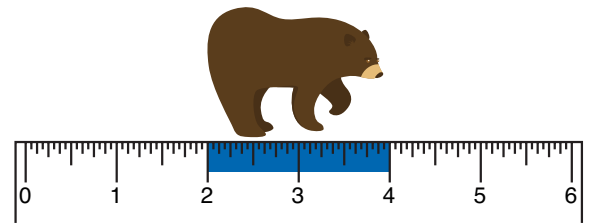
- Ask children to imagine where things will go in simple “experiments.” For example, preschoolers are prone to think that dropped objects will appear directly below where they were released, even when they are dropped into a twisting tube with an exit point far away. But, when asked to *visualize* the path before responding, they do much better. Simply being asked to wait before answering does not help—visualization is key.<sup>45</sup>
- Do jigsaw puzzles with children; they have been found to predict good spatial thinking, especially when coupled with spatial language (e.g., *Can you find all the pieces with a flat edge?*).<sup>46</sup> Similarly, play with blocks is a great activity in itself, and it increases use of spatial language.<sup>47</sup>
- Use maps and models of the world with children as young as 3.<sup>48</sup>
- Develop analogies to help young children learn scientific ideas, such as the principle of how a brace supports a building.<sup>49</sup> Consider the two photos below. In the one on top, comparing the two structures is relatively easy because the only difference is whether the brace is diagonal or horizontal, but on the bottom the comparison is more difficult because the two structures differ in several ways. When children shake these structures to see how much they wiggle, they are much more likely to conclude that a diagonal piece increases stability when interacting with the display on top.



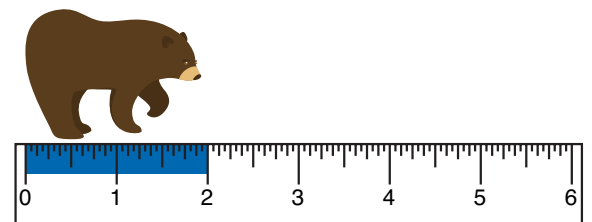
4. *In the elementary school years, teachers need to supplement the kinds of activities appropriate for preschoolers with more focused instruction in spatial thinking.* Playful learning of the sort that occurs in preschool can continue to some extent in

elementary school; activities such as block building, gesturing, reading spatially challenging books, etc., continue to develop spatial skills in older children too.<sup>50</sup> But as children get older, they can also benefit from more focused lessons. Mathematics is a central subject in which spatial thinking is needed, because space provides a concrete grounding for number ideas, as when we use a number line, use base-10 blocks, or represent multiplication as area. Here are some specific ideas for children in kindergarten through fifth grade:

- Highlight spatial elements in mathematics lessons. Measurement, for example, can be difficult for children to master, especially when the object to be measured is not aligned with the end of a ruler. Children often make mistakes such as counting hash marks beginning with 1, thus getting an answer that is one unit too many. When teaching measurement in the early grades, teachers can consider using a technique in which the unit between hash marks on a ruler is highlighted as the unit of measurement.<sup>51</sup> As shown in the illustration below, children can work with small unit markers coordinated with larger pieces to highlight how to determine units.



1. Measure the object so that it is not aligned with the beginning of the ruler. Place opaque unit pieces below the object to measure how long it is.



2. Move the object back to the beginning of the ruler, and use the unit pieces to “check” the answer.

- Add mapping skills, when possible, to geography lessons in the upper elementary grades. Some ideas can be found in Phil Gersmehl’s book, *Teaching Geography*, which is based in part on cognitive science.<sup>52</sup>
- Use well-crafted analogies so that comparisons will highlight essential similarities and differences. For example, students can compare diagrams of animal and plant cells to see similarities and differences.<sup>53</sup>
- Ask children in upper elementary and middle school to make sketches to elaborate on their understanding of top-

ics such as states of matter, or force and motion.<sup>54</sup> For example, they can be asked to draw water molecules in the form of ice, liquid, or vapor.

- Suggest beneficial recreational activities, such as photography lessons (to develop a sense of shifting viewpoints and changes in scale<sup>55</sup>), origami (to deepen their knowledge and skill in combining shapes) and JavaGami<sup>56</sup> (software for creating polyhedra), and video games like Tetris.<sup>57</sup>

**S**patial thinking is important, probably as important as verbal and mathematical thinking, for success in science, technology, engineering, and mathematics. Furthermore, it can be taught, and something we do in schools is already associated with improving it. Yet we can do better. The need to develop students' spatial thinking is currently not widely understood. We already have some excellent techniques for developing it, through practice, language, gesture, maps, diagrams, sketching, and analogy. Systematically building these techniques into the curriculum could yield important dividends for American education. □

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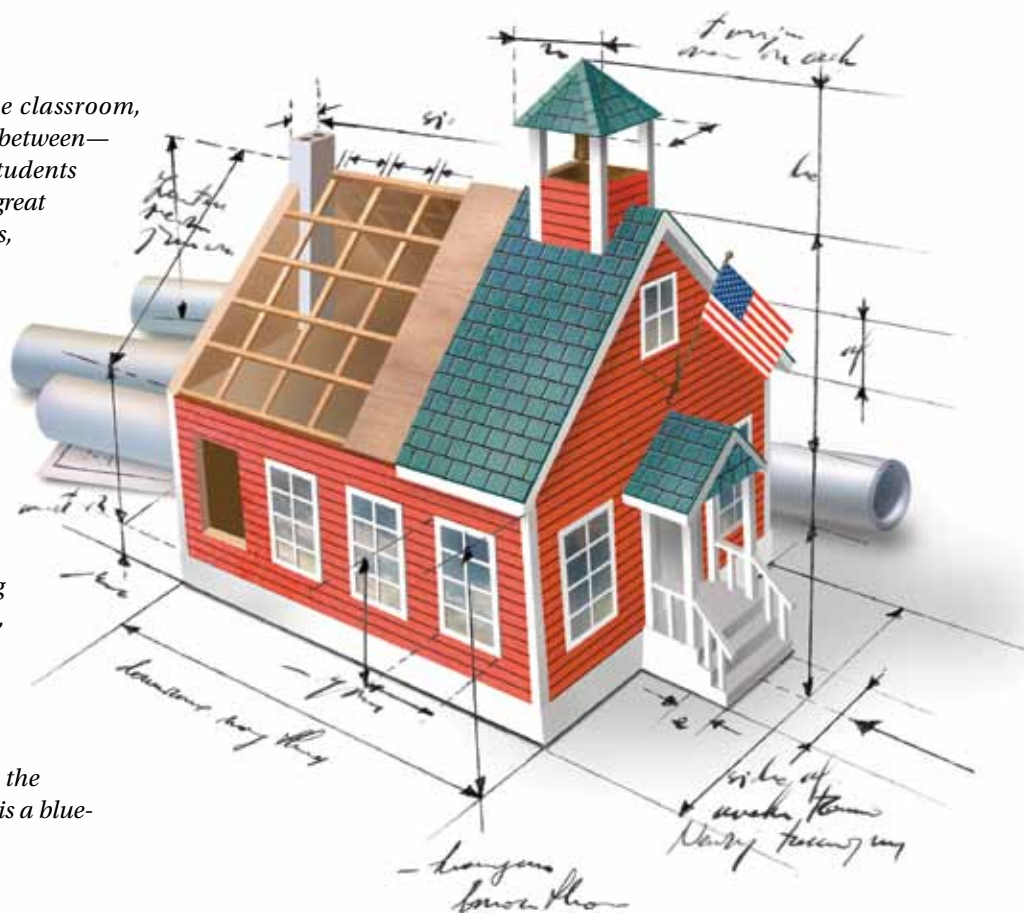
(Continued on page 43)

# Continuous Improvement

Making Evaluation a Tool for Increasing Teacher—and Student—Learning

Professional educators—whether in the classroom, library, counseling center, or anywhere in between—share one overarching goal: seeing all students succeed in school and life. While they take great pride in their students' accomplishments, they also lose sleep over their students' unmet needs. Professional educators routinely meet with students before and after school, examine student work to improve lesson plans, reach out to students' families in the evenings and on the weekends, and strive to increase their knowledge and skills. And yet, their efforts are rarely recognized by the society they serve.

The AFT is committed to supporting these unsung heroes. In this regular feature, we explore the work of professional educators—not just their accomplishments, but also their challenges—so that the lessons they have learned can benefit students across the country. After all, listening to the professionals who do this work every day is a blueprint for success.



Teachers are dedicated to their students. They do their best to ensure that all students learn as much as possible—and they have a strong desire to improve their teaching. No teacher wants a lackluster colleague in the classroom next door. But at the same time, no teacher wants a competent colleague to be punished when a few troubled students turn the school year into a struggle. Listening to the various proposals across the country on how to increase teaching quality, it seems as though few policymakers have grasped these simple truths. Because they know so little about teaching, or about the day-to-day reality of working in a school, these policymakers are unable to offer plans that have much potential to enhance the quality of instruction. Who can create such a plan? Teachers.

Teachers know what they need: a collaborative, trusting school culture that provides a system of supports aimed at continuous improvement. As for that small percentage of teachers

who cannot attain a reasonable level of performance after having been given real opportunities to improve, they need help finding other careers.

The details may vary from school to school, but all effective support systems will share the same basic formula: a seamless combination of professional development, helpful evaluation, and adequate resources such that all teachers have the tools, time, and trust that are necessary to do their jobs well. To better understand how such support systems could be designed, *American Educator* spoke to four AFT leaders: Maria Neira, an AFT vice president and a vice president of the New York State United Teachers; Marcia Reback, an AFT vice president and president of the Rhode Island Federation of Teachers and Health Professionals; Mary Cathryn Ricker, president of the St. Paul Federation of Teachers in Minnesota; and Brenda Smith, president of the Douglas County Federation and of AFT Colorado.

—EDITORS

**Editors: How would you describe the traditional or typical approach to teacher evaluation? Are the results useful?**

**Maria Neira:** Many evaluations can be described as “drive by” and are of little value in helping teachers improve their instructional skills. Typically, teachers are evaluated once or twice a year by the principal or another building administrator. In New York, the tool is usually a checklist that includes 10 or so criteria covering everything from instruction to teacher attitudes. Teachers are rated satisfactory or unsatisfactory, but differences in teaching environment, resources, and learning conditions are not taken into account.

Most administrators are not content specialists in the areas being evaluated, may not be up-to-date with the latest research on pedagogy, and—contrary to New York’s regulations governing evaluations—may have limited training on how to evaluate teachers. As a result, generally, teacher evaluations provide little or no meaningful feedback, so they don’t assist teachers in improving their practice.

**Marcia Reback:** The typical evaluation in Rhode Island is very similar. These checklist evaluations generally don’t lead to professional development. They’re generally not rigorous. Classroom management seems to be the main focus of the evaluation, and it’s typically of little use to a teacher. Such evaluations are so simplistic; they are neither a bother nor a help, just something teachers have to go through.

**Brenda Smith:** I agree with Maria and Marcia on all those points. The evaluator’s lack of content knowledge, especially in high school and middle school, is a major problem. That’s why the focus tends to be classroom management, not improving instruction or reaching all of the kids in the classroom. In Douglas County, we have some walk-throughs, but too often they happen right before Christmas break, or on the last day of school, or at the end of the day when the kids are getting ready to leave. That does not provide a true picture of what happens inside the classroom. Many walk-throughs are poorly timed because each administrator is assigned to roughly 40 people to evaluate throughout the year.

**Mary Cathryn Ricker:** I would say that what is typical is accidental at best and neglectful at worst. What I’ve seen both as a classroom teacher and as a union president is that it’s the rare administrator who takes evaluation seriously. Even more rare is the administrator who actually uses it to improve performance and better support teachers. It’s absurd to have someone in the classroom for 20 years and for his or her last really meaningful evaluation to have been 17 years ago when the probationary period ended. As a teacher, that sounds to me like my administrator doesn’t care about my growth, or how I’m meeting the needs of kids, or what I could bring to other people in my building or my content area.

Typically, the evaluation is a “gotcha” game. The teachers’

union traditionally has had a role in teacher evaluation, only it has come at the due process point, which is way too late for the union to help improve teachers’ practice.

**Editors: How should teacher evaluation be done? What role should the teachers’ union play?**

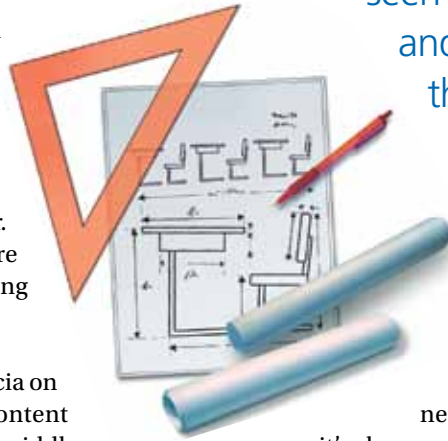
**Marcia Reback:** I don’t think that there’s any union president who has an interest in having less-than-effective teachers in the classroom.

**Mary Cathryn Ricker:** Hear, hear!

**Marcia Reback:** The unions usually get scapegoated for the people who should not be in the profession. I think one of the

“Typical [teacher evaluation] is accidental at best and neglectful at worst. What I’ve seen both as a classroom teacher and as a union president is that it’s the rare administrator who takes evaluation seriously.”

—MARY CATHRYN RICKER



roles of the union is to negotiate good, solid, rigorous evaluation systems for teachers that lead to support and improvement. If there is no improvement, then it’s necessary to have some exit strategy. Of course, it’s also necessary to represent a teacher who believes that he or she has been treated unfairly.

An evaluation system that doesn’t lead to a support system isn’t worth anything. The purpose of the evaluation has got to be to reinforce good practice and to improve practice. Evaluation should not be a show or event that happens once a year or once every three years; it must be something continuous and meaningful for teachers.

More AFT locals are adopting peer assistance and review. It is the union’s way of guaranteeing due process for teachers. It is the union’s way of making sure that people who need support get support. It is the union’s way of actually being the gatekeeper into the profession. It is a way of professionalizing teaching and making it much more akin to other professions like medicine and law. (See page 39 for a brief explanation of peer assistance and review.)

**Mary Cathryn Ricker:** In St. Paul, we are currently developing a peer assistance and review system for evaluation. As we negotiate, we are insisting on a full-spectrum program, meaning it helps all of our teachers improve. We want the program to be open to new teachers, to experienced teachers who others believe are struggling, and to experienced teachers who identify themselves as needing some help, even if they are already terrific teachers. For example, let’s say you’ve taught seventh-grade English for 13 years, but now you are moving to a high school English position.

You may want to ask for a consulting teacher. Our program does not just intervene with teachers who are struggling; it's truly a system of support that everyone can access to get stronger. We're also incorporating our supports for teachers who want to earn national board certification into the peer assistance and review program.

One thing I really like about the program is that it offers leadership opportunities that allow exemplary teachers to stay in the classroom.

**Maria Neira:** Teacher evaluation itself is just one component of a larger process related to entering and developing in the profession. But, as Mary Cathryn has described, it can be a powerful tool

teachers must be involved in defining the standards of excellence, both for students and for their own profession.

**Brenda Smith:** Building on Maria's comments, I see the teachers' union role as providing ongoing professional development. We, as an organization, need to be proactive, especially in cases when we know of struggling teachers. Along with other locals across Colorado, in Douglas County we are building professional development courses on classroom management, reading, and mathematics that can be used across the state.

**Editors: In most schools, teacher professional development and evaluation are separate. Why do you think they should be connected? How would a seamless development and evaluation system benefit teachers and students?**

**Maria Neira:** Traditionally, professional development activities have been the result of initiatives imposed by district-level decision makers. When these development opportunities happen to address a problem that a teacher has encountered, they are very useful. But when they don't, they can seem like a waste of time. Teachers are proud of their profession and realize that, as in any complex endeavor, there is always room to improve. But professional development activities need to be highly relevant to their immediate conditions; teachers do not have time to waste.

Good professional development is long-term and embedded in the teaching context. With a direct connection between evaluation and professional development, the evaluation becomes one of the tools for planning and decision making around one's own professional growth. This direct connection always makes sense, but becomes absolutely necessary at a time of limited resources.

A model of continuous professional development based on the growth of individual teachers is the basis of a comprehensive teacher evaluation system. This process can guide individualized and highly focused professional development plans. These plans address research-based approaches for continuous improvement in *all* aspects of the profession (e.g., planning, teaching, and collaborating with colleagues and families).

This model also provides a much fairer way of determining if a person is not well-suited for the challenges of the profession. A comprehensive development and evaluation system will ensure that everyone is provided with the supports necessary for success, and guide evidence-based decisions related to continued retention in the profession.

**Marcia Reback:** I'd agree, and add that when evaluation is taken very seriously and is continual in the course of a teacher's career, then it helps to build a professional culture in the school.

Many of us are veterans who've been doing the job for 12 years or 21 years; we know what our curriculum is and we know what our content is, and we become less thoughtful about what we're doing because we have done it over and over again. But in a continual evaluation and support process, we are forced to think

"An evaluation system that doesn't lead to a support system isn't worth anything. The purpose of the evaluation has got to be to reinforce good practice and to improve practice."

—MARCIA REBACK

when carefully designed. A well-designed evaluation system is focused on improving teaching and increasing student achievement.

My union, New York State United Teachers, is engaged in a pilot project to design an evaluation system that would be comprehensive, accurate, and fair. With a grant from the AFT's Innovation Fund,\* we've put together a team of union leaders, district teachers, and administrators from five school districts in New York: Albany, Hempstead, Marlboro, Plattsburgh, and North Syracuse. We're working with national experts to create and link three critical elements: teaching standards, a meaningful and comprehensive teacher evaluation system, and differentiated professional development that includes a peer assistance and review process. This system will establish a clear definition of teacher effectiveness and be based on multiple sources of evidence to measure teacher effectiveness—including evidence of student learning. A critical element of this will be trained evaluators who focus on reliability.

A range of measures of teacher effectiveness are being explored, since different measures are needed to capture different aspects of the profession. Some examples we are considering include evidence binders, student work, evaluations by administrators, peer review, and classroom observations. Of course, our ultimate goal is improving student learning.

Unions have a responsibility to students, the profession of teaching, and the community. Often, that means we have to take risks as we explore new forms of collaboration. As AFT President Randi Weingarten has pointed out many times, there is far too much focus right now on standardized tests. To find a better path,



about what it is we're doing. Then we look at our current pupils and make decisions based on what they're doing—not on what we've always done—and that yields a different *modus operandi* in the schools. You find teachers talking to one another more about what they're doing, the students they have in common, and their lessons. With the right system, teachers relish the opportunity to get feedback.

The national focus on teacher quality is bringing around a lot more formalized opportunities for professional practice, such as schools with built-in planning time for teams or grade-level groups, and the core of this is evaluation, particularly self-reflection. It's a regulation in Rhode Island that in the secondary schools teachers have common planning time. I also think there's growth in lesson study going on in the schools, taking a page from what Japanese teachers do.

**Brenda Smith:** A big piece of this is creating a safe environment. Teachers know where their strengths and weaknesses are. If we truly want the profession to grow and get better, we have to be able to have conversations about our weaknesses and who could help us improve. And the type of environment we have with our traditional evaluation system doesn't foster openly examining one's weaknesses. We're still afraid to admit what our weaknesses are because we're afraid that we will not get the support we need to improve, but that the weakness will be noted on an evaluation checklist and used to decide if we can continue as teachers. So support and evaluation have to come together in a fluid process that builds trust and encourages people to talk about where they believe they need to improve.

**Mary Cathryn Ricker:** When evaluation becomes the tool that is used to continuously support and improve your work, you feel as though you are in a whole new profession, completely different from the one we inherited. The closer the decision-making point is to students, the more likely it is that students will be affected in a positive way.

### **Editors: How could such a system affect teachers' careers?**

**Mary Cathryn Ricker:** One thing that is so powerful, yet tends to be overlooked, is that this type of continuous improvement system creates pathways to leadership that involve tried-in-your-classroom practice—not the stereotypical ladder to leadership that is administration. Professional development delivered to teachers by teachers provides powerful leadership positions. There's a lot of cachet that a teacher leading a professional development session brings when he or she says, "Stop by my classroom on Monday to see this practice in action." When teachers support each other like this, they gain power over their profession.

**Marcia Reback:** We want our best teachers in the classroom with our kids. One great feature of peer assistance and review is that it offers an opportunity to do something different for three to five years and then return to the classroom. It is not a road to another career. But teachers who have served as consulting teachers often say that it's the best professional development they have ever had.

### **Editors: With the national focus on quality instruction,**

## What is peer assistance and review?

**Marcia Reback:** Peer assistance and review is a system in which exemplary teachers, carefully selected by both union and management, take on the responsibility of working with teachers who are newly hired into the school district and, in some instances, working with veteran teachers who are referred for assistance. After receiving training, these exemplary teachers, called consulting teachers or peer coaches, give assistance by spending many, many, many hours in their assigned teachers' classrooms, helping them improve their practice, conferring with them, and providing written feedback. Ultimately, consulting teachers make recommendations to a board—made up of a large number of union and management representatives—with respect to whether each teacher they've worked with should continue in the profession or be let go.

The consulting teachers usually work with about 8 to 12 new teachers. If they have a veteran teacher who needs

assistance—someone who has been referred by the principal, the teachers in the school, or a combination—then the consulting teacher typically works with fewer teachers so that plenty of time can be spent in the veteran teacher's classroom and every opportunity for improvement can be pursued. To the extent possible, consulting teachers and teachers in the program are matched by subject and/or grade.

Normally, the consulting position is available to teachers for no more than a three- to five-year period, and then they cycle back into the classroom. Peer assistance and review is not meant to be a pipeline to becoming a school administrator—it's really a peer program. In most



contracts, consulting teachers make a commitment to return to the classroom for at least two years before seeking an administrative post.

Peer assistance and review began in Toledo, Ohio, almost 30 years ago. Today, there are a lot of districts with peer assistance and review programs; each has its own culture. They've all been modified and customized to meet the needs of their locals.

To learn more, see "Taking the Lead: With Peer Assistance and Review, the Teaching Profession Can Be in Teachers' Hands" and "Peer Assistance and Review: A View from the Inside," both of which are in the Fall 2008 issue of American Educator, available at [www.aft.org/newspubs/periodicals/ae/issues.cfm](http://www.aft.org/newspubs/periodicals/ae/issues.cfm).



**there have been a variety of proposals to base teacher compensation on the results of student achievement tests. What are the merits and drawbacks of such proposals?**

**Mary Cathryn Ricker:** A lot of the compensation proposals out there right now are fairly ill-informed and rudimentary. Achievement test-based measures tend to create demoralizing and divisive incentives. In contrast, teachers tend to create evaluation systems that are rigorous and value support, peer feedback, and collaborative learning.

Outside education, evaluation systems tend to be more complex—whether it is a mechanic evaluating why your car isn't running or a doctor evaluating why your cough hasn't gone away,

working closely with our district. We've all agreed that there are multiple ways to identify the success of a classroom and we are developing our own measures. Once good measures are in place, we will explore using this system to make decisions about teacher tenure.

As one of our measures of student success, we are examining how to use the results of our Colorado state tests of reading and mathematics to recognize whole schools' accomplishments. But since the state achievement tests were not designed to evaluate teachers or schools—and only about 30 percent of our teachers have students who are tested—I think we should give the test results very, very little weight in the comprehensive evaluation system. We're considering making the state test less than 5 percent of the school evaluation.

We have found that it doesn't matter whether the performance pay is \$400 or \$1,200; teachers participate because they want to improve their schools—not for the money. The group incentive is simply a tool that allows the necessary collaboration to happen. What really matters is for teachers to drive the system. The teachers must take the lead on how to move a school forward and what goals they are working together to accomplish.

**Marcia Reback:** In the national debate, ideas about how to improve teaching seem to be on independent tracks. While there's no question that we need to get away from the checklist-style evaluation, the drive to create robust development and evaluation systems is on one track, and the drive to incentivize teachers to increase students' test scores is on a completely separate track. To me, the first track is substantive and the second is ideological.

I don't think there is any evidence that students get a better education because their teachers have a chance of making more money if test scores go up. But I do think there are often unintended consequences, such as teachers feeling pressure to narrow the curriculum and being afraid of having English language learners in their classrooms. In order to truly become professionals, we need rigorous evaluation systems, we need self-reflection, and we need opportunities during the day to work with colleagues and to focus on the students.

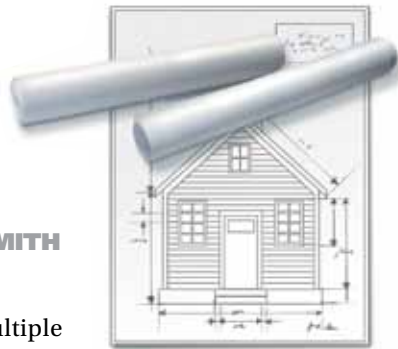
Schoolwide bonuses may be helpful in getting all of the teachers rowing in the same direction and fostering a collaborative, professional culture. However, drilling down to individual teachers' impact on students' test scores is ripe for error. Evaluating teachers with students' test scores is a politically driven idea, not a research-based idea.

**Editors: All of you have been working on these issues for several years. How has your thinking changed over time? And what concerns do you have going forward?**

**Marcia Reback:** When I was a young union president 40 years ago, I thought the "drive-by" evaluation was a really good thing. I thought a simple checklist that made it very difficult for an administrator to rate teachers "unsatisfactory" was really good for our members; it would be easy for us to defend them and ensure they kept their jobs. Over time, as I became influenced by AFT Presidents Al Shanker, Sandy Feldman, Ed McElroy, and Randi Wein-

“Incentives focused on the individual make teachers compete with each other. Teachers need to work collaboratively. Group incentives in which teachers select their group goals foster that collaboration.”

—BRENDA SMITH



evaluation systems tend to rely on multiple sources of information to diagnose problems and make decisions.

**Brenda Smith:** In Douglas County, we adopted an optional performance-pay program in 1994. Having done this for so long, we've learned a lot along the way. For example, since the beginning, we've had both individual incentives and group incentives in which teachers can identify a goal, such as increasing reading scores by a certain amount by the end of the school year. This has shown us that group incentives work better than individual incentives, and that it's important that the teachers decide what their goal should be. The teachers have to drive the system.

There are two major problems with individual incentives. One is that, at the individual teacher level, the models for using students' test scores to evaluate teachers are far too error-prone. The other is that incentives focused on the individual make teachers compete with each other. Teachers need to work collaboratively. Group incentives in which teachers select their group goals foster that collaboration.

Over the years we've made various changes to the system. In the last couple years we've finally realized that we've had the cart before the horse: we are just now seriously questioning how we identify our outstanding teachers. Of course, being able to clearly state what knowledge, skills, and practices make for an exemplary teacher should be the foundation, the starting place.

Now, we're trying to build an effective evaluation system that has multiple measures of student success as well as useful feedback for teachers. Our school board is very supportive and we are

garten, I've done a 180-degree turn.

I am now convinced that it is part of the union's work to make sure the teachers are in the best position possible to do their jobs well, and that it is our responsibility to ensure they are in fact doing their jobs well. We have a stake in making sure only competent teachers are in our classrooms, and we should be helping those competent teachers become exemplary teachers.

I think it is great that there is so much focus on teacher quality now because it has caused everyone in the schoolhouse to start thinking about it. Unfortunately, the national narrative seems to be all about "gotcha." The support system we've been discussing is what is really important; the fact that there will be some weeding out of a very small percentage of teachers should not be the focus.

The one thing I regret about all this is the focus on student test scores. My experience indicates that our fixation on scores has narrowed the curriculum. I know of gifted programs, art programs, and athletic programs that have been eliminated. In addition, I've seen an increase in the number of coaches who are in classrooms, and the number of remedial classes that have come into existence. As a result, electives are disappearing. Some of the things that make school an enjoyable and pleasant place for kids are disappearing to get the reading and mathematics scores up. Higher scores are not always synonymous with a better education.

**Brenda Smith:** My biggest concern is that the district as a whole does not understand how the overhaul of the development and evaluation system we are working on is going to affect everything. Many of the major departments will have to be revamped, including curriculum, instruction, and assessment. My fear is that we won't have the funding or the will to revamp the bureaucracy. In order for this to work, everything must be based on what we want kids to learn and be able to do.

But those concerns won't make me any less excited about this work. I think unions have to be proactive in crafting the right system to support teachers and increase student learning. If we don't, changes in teacher evaluation are going to be imposed on us. I've seen it in the districts surrounding Douglas County. The union knows how to do this the right way, so we have to be the ones developing the system.

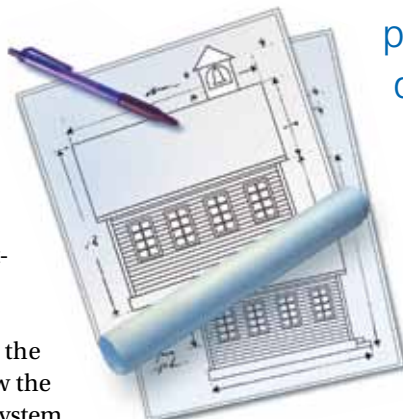
**Maria Neira:** Traditionally, the principal has had the role of evaluator. We must realize that embracing a broader view of evaluation, with teachers assuming new responsibilities in that process, will be a challenging shift for some. Yet, this shift is occurring. As with any significant change, time is needed for this practice to be fully embraced—for all parties to see the value in these types of processes.

Carefully developed teacher evaluation systems—based clearly on standards and performance indicators—enhance all teachers' careers. When professional development is individualized and focused on helping teachers meet their students' needs, teachers are able to accomplish their student learning goals and

experience much greater career satisfaction.

And, since this continuous improvement model relies on teams of trained evaluators and professional development providers, highly effective teachers have increased opportunities to take on leadership roles related to peer review, coaching and mentoring colleagues, and designing curriculum and professional development.

One concern I have is that there is sometimes a risk, especially in difficult economic times, to oversimplify the challenge of measuring teacher effectiveness. Teaching is an extremely complex endeavor, and systems of evaluation will need to mirror that complexity. It may be tempting for those not familiar with the demands of the profession to use measures that are too narrow, or that may be easy to implement, but that in the end are



“There is far too much focus right now on standardized tests. To find a better path, teachers must be involved in defining the standards of excellence, both for students and for their own profession.”

—MARIA NEIRA

not adequate to address overall teacher quality or improve student learning. As a profession, we must rise to the challenge of defining these measures for ourselves. The devil is in the details, but taking the less-traveled road is a must for our profession.

**Mary Cathryn Ricker:** My main concern is that our efforts will be misunderstood and misinterpreted. This is not something that can be boiled down to a sound bite for the media or explained to policymakers in just a few bullet points. This is about creating comprehensive, constructive systems for continuous improvement. I feel great urgency in taking our profession back from people who want to return to 19th-century working conditions for teachers while expecting 21st-century results.

Fortunately, we've been able to work well with our superintendent and school board. We began by showing them that the current system was broken and that it was in their best interests to move away from it. Our members and our district's leadership have gotten very excited about this notion that peer assistance and review can serve all teachers—those who are new to the district, those who are struggling, and those who are strong and want to grow even stronger by working with their colleagues on a specific goal.

As we get ready to implement this in the fall, my nightmare scenario is that we don't have enough money to do this well, and so we go back to doing what we've always done just because it is inexpensive. That would not be good for our students or our profession. At the end of the day, this is all about meeting the needs of our students. □

## Renaissance

(Continued from page 22)

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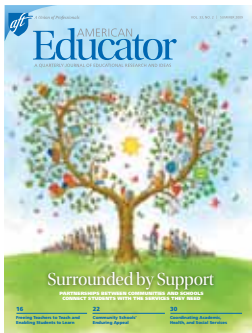
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**Answers to the sample test items on page 30: 1. A, 2. A, 3. C, 4. D.**



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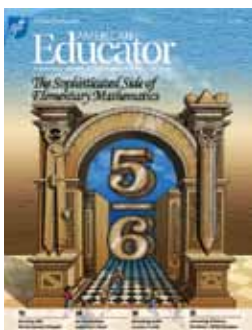
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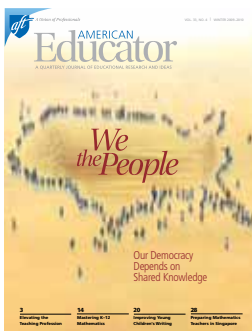
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