Introduction

Educating the workforce of tomorrow

Providing a high-quality education to America's youth is essential to our nation's economic competitiveness. In a global market predicated on knowledge and innovation, a poor education is a ticket to the economic margins of society.

To sustain its competitive position among world economies, America will need to radically improve its educational prowess. American high school seniors today rank near the bottom in the Western world in math and science scores.[37] Moreover, U.S. college students today constitute only 14 percent of the total world population of college students, as compared with 30 percent three decades ago.

One consequence of this decline is the growing chasm between the business demand for high-skilled labor and the supply coming out of our colleges and universities. The shortage of students pursuing math and science careers, as well as outdated teaching methods, threaten America's competitive advantage. With India and China enrolling almost one and a half times the number of students in tertiary education,

the United States needs to graduate more students to retain its position in the global marketplace.[38]

Few experts doubt that this will require wholesale changes in our education system.

In particular, the United States needs to drive much greater innovation and competition into education. Simply giving students more of the same — more hours per day and more weeks per year following status quo educational strategies — won't produce the necessary change. If the United States is to rekindle its competitive edge, its schools will have to discover some entirely fresh approaches (see figure 3-1).

The number of students pursuing careers in math and science must increase in order to accommodate the needs of industries that hinge on these skills. The jobs with the fastest growth rates are in the science and technology fields.[39] The United States ranks 16th out of 17 nations in the proportion of 24-year-olds earning degrees in natural science or engineering.

The United States ranks 16th out of 17 nations in the proportion of 24-year-olds earning degrees in natural science or engineering.

To satisfy this demand, America will need to increase student interest in math and science. It can do this by improving teacher recruitment and training, engaging students earlier and educating the public about the importance of nurturing more science and engineering professionals.

Implementing reform programs for schools can be expensive, and states and school districts are feeling increasing pressure to reduce education costs. Thirty-four states have cut services for FY2011 in K–12 and early education, and all but eight have done the same for higher education.[40] New Jersey's state budget, for example, slashed $1 billion in state aid to local districts.

In such tight fiscal times, states and school districts need to explore every avenue for squeezing efficiencies out of the current system. The State of California has explored digital textbooks as a way to cut costs while simultaneously encouraging the use of technology. Indiana, Pennsylvania, New Jersey and other states have created incentives for schools to reduce costs through sharing services. While economics weighs heavily on school reform, the consequences of not implementing effective reforms will be far more perilous.

Transforming education
Mounting momentum for radical change

Education reform has been a national priority for four decades. During the Reagan administration, Bill Bennett's Department of Education released "A Nation At Risk" and even equated the crisis in our educational system to a hostile takeover by an enemy. What have decades of urgent pleas for education reform produced? Unfortunately, most key education indicators have worsened.

More than 30 percent of American students never graduate from high school.[41] SAT scores have fallen every year since 2004.[42] Of those who make it to college, 60 percent of incoming community college students and 30 percent of freshmen at four-year colleges need remedial reading and math courses, indicating that many high schools fail to prepare students for college.[43] Only half of those students who enroll in college end up with a bachelor's degree.[44]

Rising against this backdrop of despair is an education reform movement that is more determined, more bipartisan and more powerful than anything seen in this country in decades. It can be seen in Washington D.C., where test scores rose after a series of reforms were enacted.

In New Orleans, after Katrina struck in August 2005, the state legislature swept 107 of the city's 128 public schools (most of them already closed because of the hurricane) into the Recovery School District. At these 107 schools, the move instantly wiped away all existing school leadership, teachers, contracts, processes, procedures, forms, rules and

policies, along with oversight from the Orleans Parish School Board. The schools were given a clean slate.

Education reform is also alive in New York City, where former schools chancellor Joel Klein raised $75 million in private funds to create the largest training program for principals in the country and where the city's School of One uses personalization to improve learning.[45] Teachers collect data based on the results of classroom and virtual instruction as well as one-on-one tutoring to develop individual plans tailored to each pupil.

Likewise in high schools across the country, the Bill and Melinda Gates Foundation has invested more than $250 million in grants to divide large, underperforming high schools into smaller schools through its "schools-within-a-school model."[46]

Supporting most of these efforts, either financially or rhetorically, is a reform-minded president and education secretary in our nation's capital. President Obama's Race to the Top initiative is committed to reforming schools by investing

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in education innovation. The Department of Education has also placed leadership in its top priorities, choosing schools to receive Race to the Top funds partly based on the effectiveness of their principals and insisting on better communication among state and federal education leaders.[47]

ACTION PLAN FOR REFORMING EDUCATION

Preparing young people to meet the demands of economic competition in the 21st century will require a broad range of new solutions. These five strategies should top the list for school reformers:

Enhance the effectiveness of teachers

Teacher quality is almost universally considered the most important variable determining how well students do in school. A study of more than 7,000 eighth graders and their science and math teachers, conducted by Harold Wenglinsky of the Educational Testing Service, agreed with this claim. Students outperformed their peers by a significant

margin if their teachers majored in the subjects they taught or conducted hands-on learning activities, if their science teachers received professional development in laboratory skills or if their math teachers emphasized higher-order thinking skills.[48]

Unfortunately, teacher quality today is uneven. Improving teacher effectiveness starts with measuring current outcomes to establish benchmarks. Some 46 states have outlined plans or passed legislation to enact fundamental changes, such as reforming tenure, boosting pay for the best teachers, implementing pay-for-performance, weeding out ineffective teachers and offering just-in-time professional development. Florida's winning Race to the Top application focused on the need for highly effective teachers, which it will get by changing the culture of the teaching profession; reforming the way teachers are paid, evaluated and promoted; and using student achievement on tests as a factor in measuring teacher performance.[49]

Use metrics to drive high school reform

High school is where American students experience the largest drop in competitiveness compared

3-1. Ten shifts that change everything about learning

Factor	From	To	To
Responsibility	Parents	State	Individuals/parents
Expectations	Social reproduction	Success for all	Individual choice
Aspirations	Practical skills	Disciplinary knowledge	Learning how to learn
Content	Books	Textbook	Learning objects
Pedagogy	Observation	Testing	Embedded assessment
Assessment	Apprenticeship	Didacticism	Interaction
Grouping	Mixed-age	Age cohorts	Individual progress
Location	Home	School	Anywhere
Culture	Adult culture	Peer culture	Mixed-age culture
Relationship	Personal bonds	Authority figures	Social networks

Source: Tom Vander Ark, edReformer (Adapted from *Rethinking Education in the Age of Technology*, Collins and Halverson)

The "bridge year" — the first year of schooling after high school — is the make-or-break year for many students' college careers. About 30 percent of students who start college do not return for a second year.[50]

to their peers in other Western, industrialized countries. A student drops out of a high school in America every 26 seconds.[51] The two factors most at fault for the falling rate of graduation from U.S. colleges are the high school dropout rate and the inability of many high schools to adequately prepare students for higher education.

To get high schools to focus more on college readiness, states could begin comparing, school by school, the percentage of students who go to college to those who drop out. The Center for American Progress suggests that measuring the rate of "college proficiency" — how quickly a high school's students finish one year of college-level work and how well those students perform later on in their college careers — gives educators key data they can use when deciding how to improve high schools.[52] Successfully tracking the college proficiency of high schools can better prepare students for college and increase the number of graduates.

Improve the lowest performing schools

Some states are implementing aggressive reforms aimed at the lowest-performing 5 percent of schools in the country. The U.S. Department of Education is spending billions of dollars to refocus resources and attention on the worst-performing schools. Many low-performing schools are being closed or turned into charters. Others are experiencing a much-needed uptick. The Green Dot program, for example, is transforming low-performing schools in Los Angeles and the Bronx.[53]

Possibly the most powerful example of turning around low-performing schools is in New Orleans. Roughly two-thirds of the schools are run by independent charter operators, up from less than 2 percent prior to Hurricane Katrina. The improvements in student performance have been encouraging. Sixty-four percent of the city's schools were considered academically unacceptable before Katrina; by 2009, that number had fallen to 42 percent. Also, the number of seniors who graduated from the Recovery School District increased from 50 percent in 2007 to 90 percent in 2010. The number of New Orleans students who scored at or above the basic level in English increased from 37 percent in 2007 to 52 percent in 2010.[54]

Encourage education innovation

Paul Vallas, the individual recruited to lead the Recovery School District in New Orelans, is a veteran education reformer, having been superintendent in Chicago and Philadelphia. In both Chicago and Philadelphia, Vallas had to take over an existing system and try to reform it. In New Orleans, he has been able to start virtually from scratch, freed of the pretzel logic that dominates so many urban school bureaucracies. The ability to start anew is part of what attracted Vallas to New Orleans. "Without question, this is the easier job," says Vallas. "You can come and, with no restraint on who you hire and no institutional obstacles blocking you, change the whole curriculum, the length of the school day, length of the school year."[55] Vallas did all that and more in his first two years.

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Over the last 40 years, public education reforms have historically focused on trying to make the system work, rather than reexamining the system itself. Many reformers remain anchored to the existing structures and desperately yearn for a way to get different results from the same system. Results have been meager. No doubt, transforma-

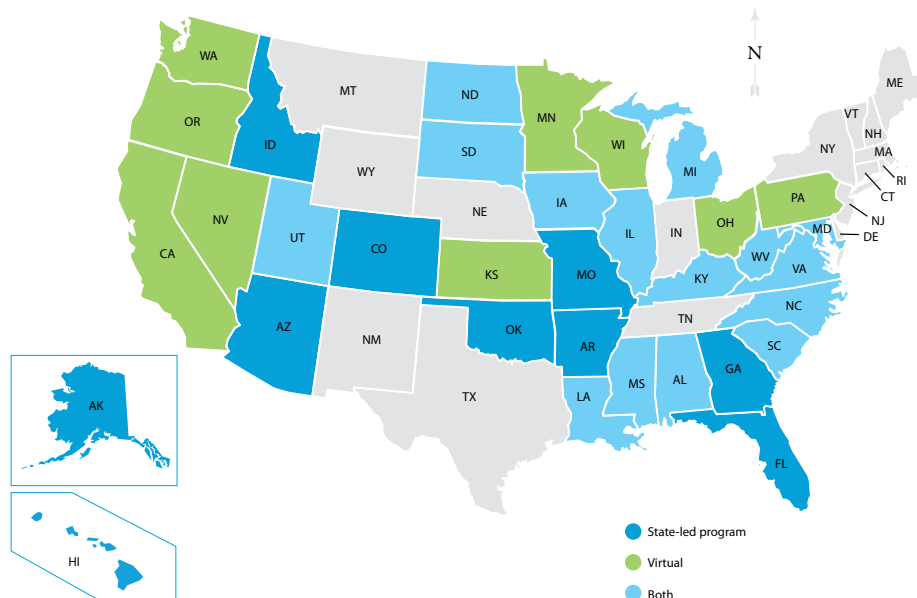## There are more than 173 virtual charter schools in 18 states serving 92,235 students.

tive change — a clean slate approach like New Orleans — is painful, but isn't it more painful to watch generation after generation of children robbed of an education? Disruptive changes like virtual charter schools, competition, choice, blended learning and for-profit schools can all play a role in bringing about new approaches to education.

Promote online and personalized learning

Online learning is growing 30 percent annually in K–12 education and currently shows no signs of slowing.[56] The advent of low-cost computing technologies, such as netbooks and broadband, presents opportunities for states to save money. Textbooks cost the State of California $350 million annually.[57] By transitioning to online textbooks, the state hopes to encourage students' participation in virtual learning while reducing textbook costs.

Schools are beginning to break free from traditional assembly-line education models, integrating personalized learning into students' curricula. New York City's School of One uses special algorithms to recommend activities and lessons that maximize student engagement and improve learning. Its technologies offer virtual tutoring and one-on-one teacher/student modalities, simultaneously requiring teachers to track metrics of student performance to ensure continued progress.

3-2. States that have established state-led and virtual charter programs

- State-led program
- Virtual
- Both

Source: Technology Counts 2008 STEM, *Education Week* and Editorial Projects in Education Research Center, Watson, J., & Ryan, J. (2007). *Keeping Pace with K-12 Online Learning: A Review of State-Level Policy and Practice.*
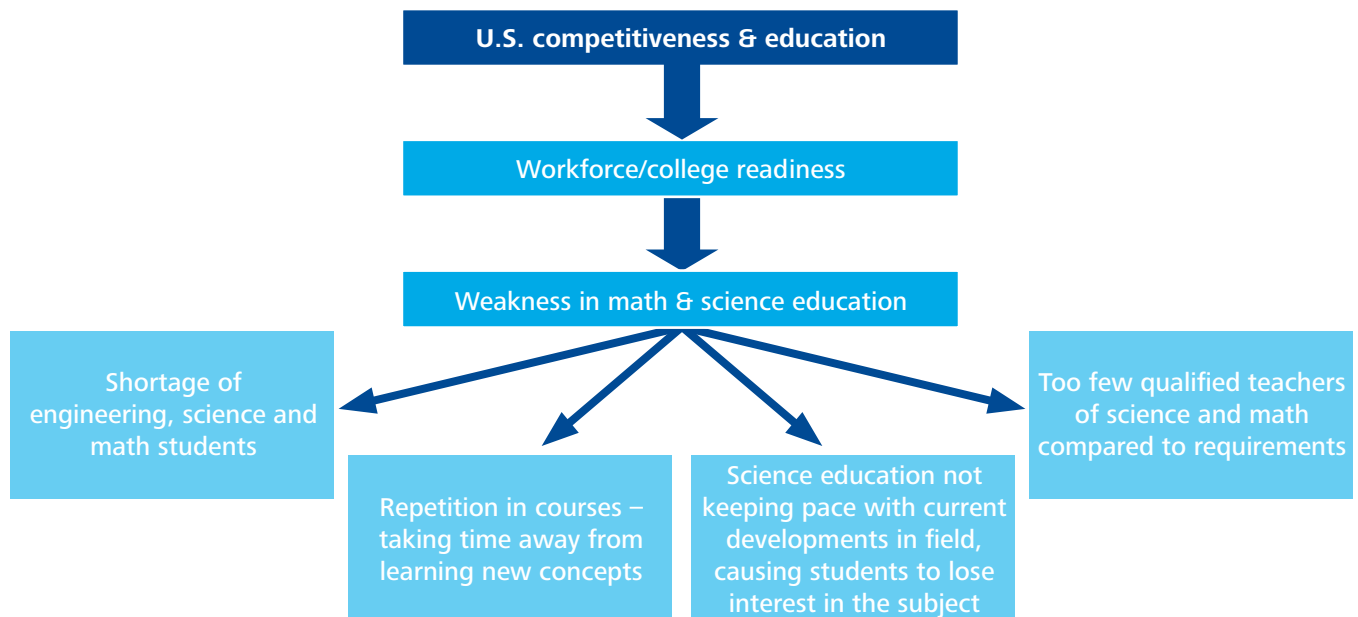
21st century education

Expanding focus on science, technology, engineering and mathematics

Promoting STEM is key to our nation's competitiveness

Economists don't agree on much. One area of little debate, however, is that future American competitiveness will depend on producing a skilled workforce with significant abilities in math and science. American colleges and universities are not graduating enough scientists and engineers to meet the expected needs of our future economic growth.

Reports such as the National Academies' *Rising Above the Gathering Storm* argue that unless America vastly improves K–12 mathematics and science education, it will not be able to compete in the future in scientific and technological areas. Compared with the growth in industries related to math and science, the number of students

3-3. U.S. competitiveness and education


```
U.S. competitiveness & education
        │
        ▼
Workforce/college readiness
        │
        ▼
Weakness in math & science education
```

- Shortage of engineering, science and math students
- Repetition in courses – taking time away from learning new concepts
- Science education not keeping pace with current developments in field, causing students to lose interest in the subject
- Too few qualified teachers of science and math compared to requirements

Source: Deloitte Research

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pursuing careers in those areas is small, leaving a growing gap in the workforce. Making matters worse, school curricula haven't been updated to reflect the needs of the 21st century, and repetitive courses take up time that students might otherwise spend learning new concepts.
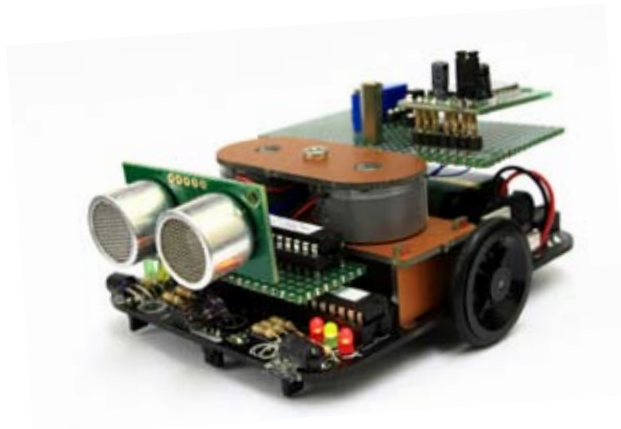
To date, most efforts to address the shortage of math and science students have focused on the supply side of the issue. For example, they have focused on enhancing rigor in the math and science curricula and required coursework. Other strategies have included better and earlier assessment tools to measure student progress and improved teacher recruitment and training.

But what of the demand side? Governments need to adopt new approaches to increase student

What works: FIRST, building competitive spirit

For Inspiration and Recognition of Science and Technology (FIRST) designs accessible, innovative programs for elementary and high school students. The goals are to build an interest in science and technology and to help students develop self-confidence, leadership and life skills. FIRST signature programs include a robotics competition, the tech challenge and the LEGO league; all of these give students a chance to compete against teams from across the U.S. and around the world. Now in its 18th year, the program has over 130,000 participating students with 60,000 volunteers. FIRST has shown that students who participate in its challenges are more than twice as likely as other students to pursue a career in science and technology. FIRST's many corporate supporters include Delphi, General Motors, Motorola, Xerox, Abbott and FedEx.

engagement in math and science. The Science, Technology, Engineering and Mathematics (STEM) Education Coalition has developed a learner-centered philosophy. It emphasizes a 24x7 learning culture that encourages questions, creativity and possibilities through concepts such as "after school must become school." Another essential element of this kind of new approach is to engage businesses and the community in providing each young person with the best education possible.

ACTION PLAN FOR INCREASING STEM GRADUATION RATES

Getting all the key education, government and business stakeholders to focus on improving the demand side of STEM won't be easy. These five strategies can form the foundation for such a change:

Forge public-private partnerships

The National Science Foundation's Math and Science Partnership program awards competitive, merit-based grants to teams comprised of institutions of higher education, local K–12 school systems and their supporting partners. Partnerships develop and implement new ways to advance math and science education by bringing innovation, inspiration, support and resources to educators and students in local schools, colleges and universities. Such programs can help schools to provide challenging curricula for all students and encourage more students to succeed in advanced courses in math and the sciences.

Intel works with governments and educators to improve teaching and learning in more than 50 countries, offering programs in formal and informal K–12 education. Also, to expand elementary and secondary students' knowledge of and enthusiasm for science, mathematics and engineering, Intel sponsors a number of competitions, including the Intel International Science and Engineering Fair and the Intel Science Talent Search. The

What works: College Summit

Not-for-profit College Summit aims to create lasting change by helping high schools and their surrounding communities develop college-going cultures in underrepresented areas. The program worked so well in Brooklyn that it has been replicated at hundreds of high schools across the country. College Summit combines teacher training, community outreach, coaching and counseling, and robust data tracking that facilitates accountability in high schools. Workshops serve 12,000 students, 79 percent of whom end up enrolling in college.[58]

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Almost 30 percent of high school mathematics students and who either did not major in the subject in college or are not

aim of these competitions is to recognize the accomplishments of students and to recognize their schools for promoting math and science.

Introduce mentors and role models

Local school districts can partner with businesses to establish programs that provide scientists and engineers as role models and resources for schools. These forums should facilitate direct contact between teachers and scientists and engineers and, as appropriate, direct contact between scientists and students. Such an initiative would also engage the popular media in teaching children about famous and semi-famous people who use (or have used) math and science extensively to achieve their success.

The Futures Channel uses new media technologies to promote a bond between today's scientists, engineers, explorers and visionaries and the next generation. The Futures Channel creates movies in which science and technology professionals talk about their work. Educators can obtain these movies, plus related classroom activities, through the organization's Web site, or by purchasing DVDs.

Target underrepresented students

Some of America's brightest students are not receiving an adequate education.[59] Low-income students who score in the top 25 percent on tests apply to college about as frequently as upper-income students in the bottom 25 percent of test-takers.[60] This problem is frequently caused by socioeconomic issues, lack of guidance in schools and lack of information about college. Improving access to education, particularly to programs that teach high-demand skills, may help close gaps in the labor market.[61]

Programs that have proven effective in promoting high achievement among traditionally underrepresented groups of students in K–12 STEM courses should be replicated. Governments must redouble their efforts to support traditionally underrepresented undergraduate students in the STEM pipeline.

Tie math and science to the real world

States can engage businesses to provide financial and logistical support to extracurricular math and science activities, as well as the time and talents of their employees, to enrich students' learning

60 percent of those enrolled in physical science have teachers certified to teach it.

experiences. Educators could organize student groups to participate in such activities, if they do not already exist, and work to integrate business support into these programs. Such community-based learning initiatives could also include a significant technology component, using a blend of low-cost, Web-enabled applications to engage students and mobilize community-based projects.

One promising model is the partnership between The Manufacturing Institute and Discovery Communications to help nurture a new generation of manufacturing engineers and technologists through experience-based learning. The initiative will use multiple platforms in programs designed to excite students and build competency through project-based learning. Components of the program include: "How To Week," a series on Discovery's Science Channel that spotlights the latest in science and engineering in manufacturing; "Inventor's Workshop," a national program to celebrate young inventors; "Head Rush," a STEM curriculum that integrates on-air, online and in-class learning; and "Dream It! Do It!," a video competition in which students solve real-world STEM puzzles.

Engage students through new learning technologies such as gaming

Gaming technologies can be used to develop higher-order thinking skills such as strategic thinking, interpretative analysis, problem solving, plan formulation and execution, and adaptation to rapid change. Gaming can enhance personalized learning and help bridge the growing attention gap that seems to be contributing to the dropout rate. A University of Wisconsin study shows that gaming, in some cases, increases cognitive learning and literacy.[62] Downtown High School in Columbus, Ohio has improved student test scores through collaborative e-Learning software.[63]

One of the most successful education game initiatives underway today is Carnegie Mellon University's Alice program, currently in use at a couple hundred colleges and some high schools. Alice focuses tightly on sparking greater interest among young women in computer science. Because Carnegie Mellon has formed a strong partner-ship with a leading game company — Electronic Arts — to enhance the game's evolution and development, Alice could serve as a model for math and science games with a more general focus.

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Driving more money into the classroom

Squeezing inefficiencies out of the system

States and school districts are under increasing pressure to reduce education costs, which constitute up to half of many state budgets. Even in states without large budget deficits, money for education is always limited and rarely keeps pace with costs.

How can states and school districts respond to today's unprecedented fiscal pressures without adversely affecting educational performance?

First, they can place a greater emphasis on the correlation between education dollars and outcomes. Comparing students' scores on the National Assessment of Educational Performance with a state's education spending shows that return on investment varies greatly across states. Utah and North Carolina post a 200 percent return on their investment while other states show disappointing results. Policymakers have tended to focus too much on inputs without paying enough attention to efficiency or to ensuring that educational dollars are delivering value.

Second, states and school districts can take steps to reduce non-instructional costs. Currently, 40 cents of every dollar spent on education is utilized for non-instructional purposes. Lacking economies of scale — and often, sufficient managerial expertise — many districts find it extraordinarily expensive to provide a full array of support and administrative services in-house. Strategies to achieve economies of scale and reduce non-instructional costs include consolidation, shared services and cooperative purchasing.

In 2008, Maine consolidated 260 school districts into 80, saving $365 million.

ACTION PLAN FOR REDUCING NON-INSTRUCTIONAL COSTS

In this era of tight budgets and loud calls for results and accountability, schools need to identify every means of saving money while improving capacities. A variety of proven strategies are available to shrink non-instructional costs and drive more money into the classroom:

Provide incentives for shared services

One promising approach is to reduce non-instructional spending costs through greater sharing of services across school districts. Arrangements can be made with other school districts, among schools within large school districts or with outside entities to share services across a range of school functions: transportation, food service and nutrition, instruction, safety and security, health services, purchasing, finance and payroll, facilities and real estate, human resources, technology services and administration (see figure 3-4).

Oregon's Reset Cabinet Report estimated the state could save more than $40 million a year if school districts shared certain services.

States can help in a variety of ways to identify best practices and drive innovation in shared services at the district level. The New Jersey Regional Efficiency Aid Program, for example, provides tax credits directly to homeowners as a way to publicly reward school districts and municipalities for sharing services.

In Ohio, Governor Ted Strickland chose Greene County, Ohio in 2009 to conduct a pilot program in shared school services. The idea for the initiative came from a private citizen, a school board member who volunteered to approach local foundations for money to help fund the initiative. No tax dollars would be used. Plans called for the county's six

3-4. School functions amenable to shared services

Capability	Fit for Shared service	Savings potential (Comparative)
Direct (Services to students)		
Transportation	●	●
Food service and nutrition	◐	◐
Instructional	◐	◐
Safety and security	◐	◐
Health services	◐	○
Indirect (Services to staff or infrastructures)		
Purchasing	●	●
Finance and payroll	●	◐
Facilities and real estate	●	●
Human resources	●	◐
Technology services	◐	●
Administration	◐	◐

Source: Deloitte Research

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> Shifting just a quarter of tax dollars spent by school districts potentially yield savings in the range of $9 billion.

school districts to work with Wright State University's Center for Urban and Public Affairs to conduct the pilot, which would help to define models for shared services and assess the fiscal impacts in order to inform a statewide strategy. The school districts formed committees to explore the potential for sharing services in six areas: advanced placement instruction and programs, administrative and financial services, information technology, contracted services and agreements, special education instruction and programs, and transportation.

Promote cooperative purchasing

Pooling purchasing power can yield substantial savings for school districts and their partners by reducing operating expenses for such items as utilities, equipment, services and supplies. New Jersey's Shared Services Program is a cooperative effort among Middlesex County municipalities that supports the towns by providing a way to reduce daily operating expenses through coopera-tive purchasing. The program began in 1998 by offering towns aggregate natural gas purchasing, resulting in a 5 percent savings on electricity for public buildings during the first year of the program. The municipalities share services for water and wastewater programs and the purchasing of natural gas, electricity, equipment, services and supplies.

Tap underutilized assets

Partnering with businesses can help school districts tap into underutilized assets such as land. For example, in exchange for land, private partners have provided some school facilities with fitness centers that are used by students during the day and by private clients outside school hours.

Common public-private partnership models include the sale of development rights on unused property, and sale-leaseback or lease-leaseback arrangements. In these solutions, school districts sell or lease surplus land to a developer who builds a school and leases it back to the district. In 1996, the Houston Independent School District used a lease-leaseback arrangement with a private developer to obtain two new schools, $20 million under budget and a year earlier than originally planned.

Innovative partnerships with the private sector can be structured in a number of ways to meet school modernization objectives. Private firms typically finance, design, construct and operate a public school under a contract with the government for a given time period, usually 20–30 years. Businesses usually provide non-core services such as school transport, food services and cleaning, while the government assumes responsibility for teaching.

on non-instructional operations to shared services could

Reduce energy costs

The Pennsylvania Department of Education Common Cents Shared Services Initiative piloted a program to implement cost-savings strategies through several shared service opportunity areas for school districts, including energy efficiency. Common Cent's cost-saving models were derived from data and analysis provided by the school districts and then tested for efficacy. Forty-nine out of 501 districts in the Commonwealth participated in the initiative. The Pennsylvania Department of Education estimates $14.4 million in potential savings for the 49 Common Cents districts. Participating districts in Pennsylvania's Riverside Intermediate Unit 6, for example, saved 55 percent on copiers. Meanwhile, Redbank Valley School District projected annual recurring savings of $10K on fuel tank installation with bulk fuel purchasing.

What works: James Oyster School's public-private partnership

Built in the 1920s, Washington's James F. Oyster Bilingual Elementary School was on its last legs by the early 1990s — leaking roofs, building code violations and accompanying shutdowns, lack of computer hookups, and limited space. The District of Columbia simply didn't have the $11 million required to build a new school, nor did it have the borrowing power. Lacking money and borrowing power, officials got creative. What the city lacked in financial assets, it made up for in physical assets; the school sat on 1.67 acres of prime real estate within walking distance of the National Zoo. The city converted its underutilized physical assets into a financial asset by dividing the property: Half for a new school and half for a new apartment building — designed and built by the private sector. In return for the sale of the land, Washington got its first new public school in 20 years — a state-of-the-art facility with double the space — without spending a single public dollar.

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Interview with
Michael Brown
Chief Executive Officer of City Year

Q...What is City Year, and who does it serve?

City Year is a national youth service corps. We send teams of idealistic and well-trained young adults full-time into high poverty schools in urban communities across the nation to help address the nation's dropout crisis and to help turn around low performing schools. Our corps members serve as tutors, mentors and role models during the school day and then stay through the extended day to tutor students.

We work against what Johns Hopkins University has discovered are the early warning indicators that a child will eventually drop out of high school: high absences, poor behaviors and course failure in math or english. If the child has even one of those off-track indicators in the sixth grade and is in a high poverty school, they have less than a 25 percent chance of graduating with their class six years later. But if they can get to the tenth grade on time, on track with no off-track indicators, they have over a 75 percent chance of graduating from that same school system.

Q...How do you decide which schools you're going to go into?

We've analyzed the high schools in the communities where we serve that have the highest dropout rates and determined which schools, K–8, feed into them. Johns Hopkins University has published studies which show that 12 percent of the high schools produce 50 percent of the dropouts in the country. So if you can serve in the places of highest need — the worst performing schools and the schools that feed into them — you're going to have a disproportionate impact. We've found that if you can reach 25 percent of the schools in most urban centers, you can reach 50 percent of the kids who are likely to drop out.

Q...How much do schools improve when City Year corps members come in?

Last year in Philadelphia, with Talent Development Secondary and Communities in Schools, we implemented a collaborative program called Diplomas Now at the Feltonville School of Arts and Sciences, a middle

school with 750 students. In one year, we were able to reduce the number of kids who were off track on attendance by 52 percent, and the number of kids that were off track on behaviors by 48 percent. The number of kids who were failing English fell by 80 percent, and the number failing math dropped by 83 percent.

Now tie that to Northeastern University studies that say that every student who drops out of high school in America costs the country about $300,000 — in lost wages, in incarceration rates, in lost taxes and in poor health. Every single grade that you keep a kid in, you're talking about huge savings in social costs.

Q…What kind of data do you have about which learning approaches work best for which individual students? And how are you able to use that data to help students?

Because City Year corps members are with students all day, every day they get a comprehensive picture of students' academic and socio-economic needs, which they can use to help improve student learning working hand in hand with teachers and other service providers. For example, every two weeks we sit at a table with a list of every single student in the sixth grade in a school, and we go through that list with the sixth grade teachers, the social workers and the City Year corps members. They talk about every single child and how they're doing against the early warning indicators of dropping out of school. And more importantly, what did we decide to do two weeks ago, and is it working? Is there something else we can learn about this child that can work?

That's where you get into best practices. You might find that this child's a kinetic learner, so we give them something to manipulate. Or this child has something going on at home that until a social worker intervenes, they are not going to be able to learn.

What this shows is that schools need data coordinators. It's one of the highest needs that I've seen in the country. If we could collect and use the data well, it would be a revolution.

Q…To what extent does the average school have data at the student level that would allow for customized learning?

Schools are at various degrees of capability with regard to data. The ones making the biggest gains are led by principals or school district leaders that get it and say, "I'm going to make sure that we have data walls and we're reviewing the data."

Governors can help by bringing in organizations at the cutting edge of building electronic data systems. They can use the bully pulpit to say to superintendents around the state, "Let's have a race to see who's going to build the best data approach to learning." And of course, they can give out innovation grants.

Q…Why is it so hard to scale these educational and social innovations? What are some of the lessons you've learned for how to do it?

One, you need to invest both in your outcomes, your product if you will, and in your systems, your capacity to deliver. Those dollars for capacity building are sometimes the hardest to get. Government, in particular, likes to fund one more unit of end product. And only very sophisticated philanthropists understand the need for dollars to train, to create human resources capacity, to build an IT infrastructure — all of these things that it takes to actually provide scale.

Another barrier is that government has a hard time picking winners and losers. There's often political pressure to give everyone a little bit of support, and create a series of small ecosystems of mom-and-pops. It's harder for government to say, "I'm actually going to pull on a big lever and scale something." Governments need to think about that and maybe even create a tiered investment system that says, "We're going to have a certain pool of funds for innovation, but we're going to have a second one for scale."

9 from big ideas to big results

8 innovation state

7 technology reboot

6 improving human services

5 responding to health care reform

4 closing state infrastructure gaps

3 21st century education

2 generating jobs

1 the journey to fiscally sustainable government