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Achieving More for Less in U.S. Education with a Value-Based Approach

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Reggie Gilyard, J. Puckett, Lane McBride, Adam Swersky, and Jeff Shaddix

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AT A GLANCE

Since the 1970s, student outcomes in the U.S. have remained relatively flat even though inflation-adjusted education spending per student has more than doubled.

Not All School Spending Is the Same

All spending is not created equal: *How* a school system spends its dollars is as important as—and perhaps even more important than—*how much* it spends. What's needed now: a value-based approach to publicly funded education.

The Benefits of a Value-Based Approach to Education

Maximizing the use of *available* funds negates assumptions that a bigger budget is the only way. This approach recognizes the tradeoffs inherent in spending decisions and calls on decision makers to continually consider the value that investments create for students as these leaders make spending increases and cuts.

Three Examples Explain the Value-Based Approach

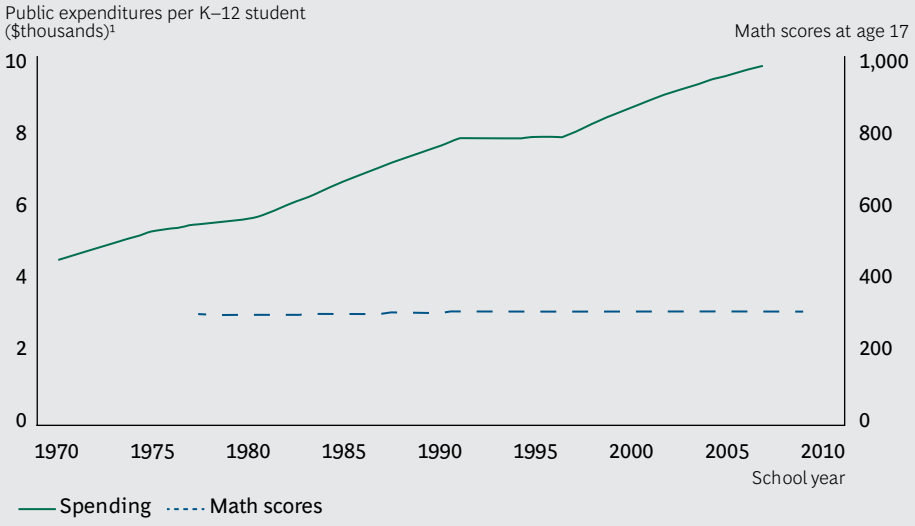
Three emerging examples highlight the value-based approach: identifying teacher characteristics that lead to improved student outcomes and investing to develop those; using digital technologies to boost the impact of high-performing teachers; and reallocating central-office savings to initiatives that support improved outcomes.

It's summer, and the budget knives have been out again in many school districts across the United States. Over the past few years, education spending has tightened, and relative fiscal austerity at the state and federal levels means that budgets are more likely to fall than to rise in the near future. In at least 30 states, according to a report by the Center on Budget and Policy Priorities, school funding now stands below 2008 levels—in many cases, far below.

But as taxpayers and local school stakeholders argue about whether the budget should be cut or increased, they're missing the bigger issues. All spending is not created equal: *How* a school system spends its dollars is just as important as—perhaps even more important than—*how much* it spends. For roughly 40 years, student outcomes have barely budged in the United States, even though inflation-adjusted education spending per student has doubled over the same period. (See Exhibit 1.)

The challenge is clear: since the 1970s, math and literacy test scores for U.S. students at age 17 have remained flat, according to the National Center for Education

Exhibit 1 | U.S. Spending on Education Has Risen, but Student Performance Has Not



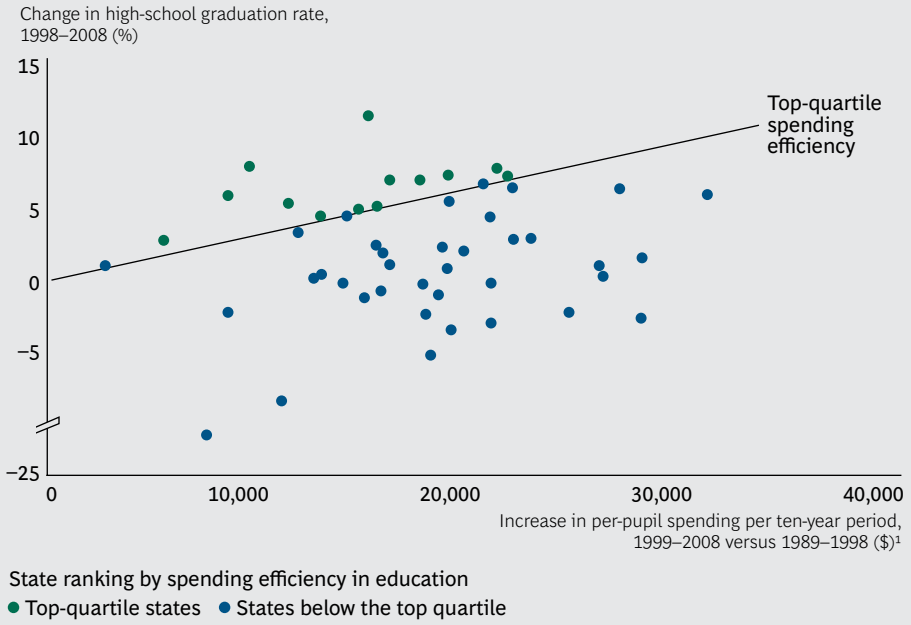
Source: National Center for Education Statistics.
[1]Adjusted for inflation, all amounts are reported in constant 2007–08 dollars.

Statistics of the U.S. Department of Education, and the country continues to fall in international rankings. Among the countries measured by the Organisation for Economic Co-operation and Development (OECD), the U.S. fell from twenty-third place in mathematics in 2003 to thirty-first in 2009. By comparison, Poland spends approximately one-third this amount per pupil yet ranked six places higher in 2009.

To view the problem another way, consider two U.S. students in 1994—one entering kindergarten and one graduating from high school. On average, an additional $25,000 was spent on the kindergartener over the 13 years (from 1994 through 2007), yet she achieved the same test scores as the 1994 senior.

Some states have managed their funds better than others. When we compare the ten-year period ending in 1998 with that ending in 2008, we see that the top quartile of states in terms of spending efficiency saw every $3,000 of additional cumulative per-pupil spending lead to an average increase of 1 percentage point in high-school graduation rates. By contrast, a similar spending increase among the lowest-performing quartile of states was associated with a *drop* in graduation rates, according to The Boston Consulting Group's analysis of data from the National Center for Higher Education Management Systems and the National Center for Education Statistics. (See Exhibit 2.) (Even accounting for the fact that different states calculate graduation rates differently, the data indicate an interesting correlation.)

EXHIBIT 2 | Higher Spending Did Not Correlate with Higher Graduation Rates



Sources: National Center for Education Statistics, "Digest of Education Statistics," and "National Public Education Financial Survey"; National Center for Higher Education Management Systems; BCG analysis.
[1]Calculated as the difference between the cumulative per-pupil expenditure for the ten-year period ending in 1998 and the ten-year period ending in 2008. This approximates the additional investment in pupils graduating in 2008 relative to those graduating in 1998.

Part of the problem lies in the nation's haphazard approach to allocating school funds, with new spending often directed at interventions that have unproven or limited impact. For instance, in 2009, California earmarked more than $41 million to hire additional gym teachers to combat childhood obesity—despite there being no shortage of gym instructors in the state or any evidence that hiring more of them would reduce obesity. The grants were not even targeted at schools with large percentages of overweight students, according to the report "Leaders and Laggards: A State-by-State Report Card on Educational Innovation," published by the Center for American Progress, the U.S. Chamber of Commerce, and Frederick M. Hess of the American Enterprise Institute.

Once such initiatives begin, they're rarely assessed for effectiveness—and rarely canceled. They persist year after year regardless of their value, layering legacy costs on top of other costs. Few legislators or administrators have been willing to acknowledge the tension between cost and outcome or to accept that spending in one area might deprive a more promising area of funds.

And the lack of a value-based approach is not limited to incremental initiatives. As "The Widget Effect," the pivotal report from the U.S. advocacy organization TNTP, argued, the education system has not taken a value-based approach in the way it treats its most important and most costly asset: teachers. Historically, differences in teachers' effectiveness have not been linked to differentiation in their recognition, support, compensation, or career trajectory.

A "value-based approach" to education recognizes the tradeoffs among spending decisions across the portfolio of current and proposed spending.

Taking a Value-Based Approach

If the only tool available were a change in the level of spending, society would be hard-pressed to find a way forward. There is, however, a more rigorous "value-based approach" to education—one that recognizes the tradeoffs among spending decisions across the portfolio of current and proposed spending.

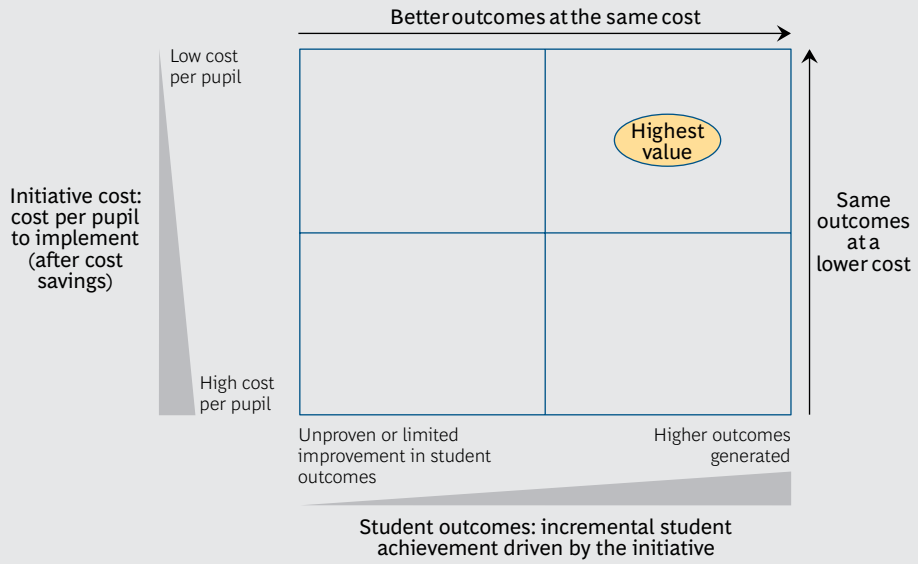
Rather than focusing only on the level of spending or only on improvements in student outcomes, the value-based approach seeks to improve outcomes at the same spending level or even at lower levels resulting from budget cuts. (See Exhibit 3.) Using this approach, school districts and states should not simply implement any initiative that might improve educational outcomes. Instead, they should select initiatives that deliver improvements cost effectively.

The value-based approach can work in one of two ways: by holding costs constant while improving outcomes or by freeing up funds that can be spent elsewhere. The essential "value test" that district leaders or policymakers can apply to any proposed initiative is this: "Would you be prepared to cut costs or end other programs to pay for it?"

Taking a value-based approach means rigorously screening any proposed program, as well as the existing portfolio of expenditures. Questions include:

- Does the potential gain from a new program compare favorably with alternative uses of the same funds?

EXHIBIT 3 | The Value-Based Approach Targets Improved Outcomes with the Same Dollars—or the Same Outcomes with Fewer Dollars



Source: BCG analysis.

- Can spending differently in a particular area improve the value equation—for example, increasing the class sizes of the most effective teachers and paying them more?

- Are there areas of current spending that add limited value to students' education—for example, in some areas of central administration? Would this spending deliver more value if it were reallocated to more promising programs?

Particularly in times of austerity, new interventions will need to be funded through cost savings sourced from existing programs. Identifying what *doesn't* work is as critical in an era of budget cuts as recognizing what *does.*

Three Examples That Illustrate the Value-Based Approach

The good news is that more education systems are experimenting with value-based investments. Three examples illustrate how the approach can work in practice:

- Identifying the teacher characteristics that lead to improved student outcomes and investing to develop those characteristics—instead of paying salary premiums for advanced degrees or years of experience

- Using digital technologies to restructure the classroom and extend the reach of high-performing teachers

- Reducing central-office costs and reallocating the savings to other initiatives that directly support improved outcomes

Investing in Effective Teachers

Everyone intuitively understands the value of a good teacher, but until fairly recently, there has been little evidence to definitively indicate how teachers' efforts might link to student outcomes. One of the most encouraging recent developments is the growing body of research around the value of effective teaching. A study by economists at Harvard University—NBER Working Paper, "The Long-Term Impacts of Teachers," by Raj Chetty, John N. Friedman, and Jonah E. Rockoff—showed that on average, having a "high value-added teacher" for one year raises a child's cumulative lifetime income by $50,000. The study also noted the positive effect of replacing ineffective teachers: it found that if an "average value-added teacher" replaces one whose added value is in the bottom 5 percent, the total lifetime incomes for a typical classroom are boosted by more than $1.4 million (equivalent to $250,000 in present value). The clear indication of the study is that good teachers create substantial economic value.

The best news is not simply that teacher performance can now be reliably observed and measured—it is that there are techniques for doing so on an ongoing basis. The Measures of Effective Teaching (MET) project, sponsored by the Bill & Melinda Gates Foundation, has been studying 3,000 teachers in seven school districts to determine the causal links between teacher characteristics and student outcomes. The MET team has used several types of classroom observations, tests of teachers' knowledge, student perception surveys, and test data to understand which measures are most predictive of a teacher's effectiveness from one year to the next.

The core finding is that multiple measures matter most: the best predictor of a teacher's impact is how well he or she scores on the combination of evaluation mechanisms, not on any one. It's also clear that factors such as a teacher's master's degree or seniority have a much smaller influence on student outcomes, the MET team reported in its 2012 policy brief "Gathering Feedback for Teaching: Combining High-Quality Observations with Study Surveys and Achievement Gains." Crucially, the practices that set the high performers apart are transferable. By combining different sources of data—as MET argued in the research paper "Learning About Teaching: Initial Findings from the Measures of Effective Teaching Project"—it is possible to provide diagnostic, targeted feedback to teachers who are eager to improve.

Multiple measures matter most: the best predictor of a teacher's impact is how well he or she scores on a combination of evaluation mechanisms, not on any one.

Progressive school systems are taking such findings seriously. The first value-based judgment that many are making is that it is worthwhile to measure teacher quality. Many districts are making huge investments (particularly in administrators' time, but also in money) in more rigorous teacher evaluations. The basis for these investments is the concept that such information will help the administrators make several types of value-positive decisions, including which teachers to promote, which teachers to compensate more generously, which kind of support to provide to teachers so that they improve, and which teachers to counsel out.

After establishing that these investments in measuring teacher effectiveness are valuable, the districts can begin the conversation about paying teachers on the basis of criteria other than degrees and experience. Those conversations need to happen nationwide; in most districts, unfortunately, teachers are rewarded for

characteristics that are not linked to the impact that they have on their students. Seniority-based pay accounts for 10 percent of all school spending in the U.S., even though evidence suggests that teacher effectiveness may actually *decline* on average after five years in the profession. Similarly, U.S. schools spend $8.6 billion per year on salary premiums for advanced degrees—yet 90 percent of these premiums do not lead to improved student outcomes, the Council of State Governments reported in its brief "Changing Teacher Compensation Methods: Moving Toward Performance Pay." That money could be redirected to retaining good teachers and rewarding them for higher-quality, higher-impact work.

Although changing the approach to teacher evaluation and pay is a politically sensitive move, several examples have demonstrated that it is feasible. Florida's Hillsborough County, one of the largest school districts in the country, recently designed a system that bases teachers' pay increments on a performance-related career ladder. Progress up the ladder is driven by classroom evaluations, as well as an averaged "value-added" metric based on students' progress in assessments. This approach allows exceptional junior teachers to earn as much as senior teachers. The local teachers' union, the Hillsborough Classroom Teachers Association, approved the new performance-based evaluation and compensation system with a "for" vote of more than 90 percent. "The teachers are taking the initiative to become more efficient," one principal noted. Initiatives like this—and the results of MET's work—demonstrate the practicality of measuring performance effectiveness and show its strong influence on student outcomes.

Seniority-based pay accounts for 10 percent of school spending in the U.S., even though evidence suggests that teacher effectiveness may actually *decline* on average after five years in the field.

The link that is still missing in the value-based equation is evidence that higher compensation can indeed attract and retain better teachers; this part is still theory rather than proven practice. But that must not be a reason for districts to postpone efforts to identify high performers, move low performers up the curve, and dismiss those who cannot make the necessary adjustments.

Using Digital Technology to Boost the Impact of High-Performing Teachers

In 1987, economist Robert Solow noted that "you can see the computer age everywhere but in the productivity statistics." By 2000, however, this observation no longer held true. Service sector productivity, always lagging behind that of manufacturing, tapped investments in information technology to catch up. Yet productivity in education still remained behind.

According to Gartner, an IT research company, labor- and knowledge-intensive industries such as professional services invested from 4 to 6 percent of their operating expenses on IT in 2010. The comparable figure for U.S. schools was just 1.6 percent of the operating budget, BCG found in its 2011 report *Unleashing the Potential of Technology in Education.*

The problem is not only that school districts have underinvested in technology but also that they have invested in using technology in less effective ways. Computers have typically been seen as machines that can automate or supplement existing practices (such as e-textbooks) or as a means of teaching students how to use technology (computer labs), rather than as tools to transform learning.

A more powerful role for digital technology is as a value-based investment for schools, raising the productivity of teaching staff and improving student learning through high-quality, individualized instruction at a more affordable cost. Realizing the benefits of technology, however, requires that schools and districts be willing to reorganize their instructional models.

The Knowledge Is Power Program (KIPP) Empower school in South Los Angeles offers an illustrative example. With 94 percent of its students qualifying for a free or subsidized school lunch, the school serves a population facing significant challenges. In the context of tight budgets, KIPP Empower chose to trade smaller class sizes—moving from a planned class size of 20 students to 28 students—for a series of investments in IT.

Digital technologies could also heighten the impact of excellent teachers by extending their reach.

By allowing students to work at their own pace and by providing teachers with daily reports on their areas of difficulty, KIPP's "blended learning" model improves the teachers' ability to target interventions where they can make the most difference. First-year results are quite positive, with 95 percent of kindergarten students exceeding the national average in math and 96 percent exceeding it in reading, according to The Hechinger Report's article "Kindergarteners at the Keyboard."

Several other schools have demonstrated even higher ambitions for technology. At Rocketship Education, a charter-school network founded in 2006, students spend a quarter of each day in a "learning lab" working on customized, computer-delivered material. During their lab time, students are supervised by tutors who earn lower wages than teachers do—cost savings that effectively render the initial IT investment cost neutral. The results attest to the model's potential: two Rocketship schools were recognized as top high-poverty schools in California, according to the education journal, *Education Next*. In addition, one North Carolina school district illustrates what is possible on a tight budget. (See the sidebar "Harnessing Digital Technologies in Innovative Ways.")

Digital technologies could also heighten the impact of excellent teachers by extending their reach. Public Impact, a national education policy and consulting organization, is identifying five major school sites to test this idea. It has posted more than 20 models that demonstrate how schools can extend the reach of effective teachers—some involve technology and some don't. For example, an excellent teacher with managerial skills could lead multiple classrooms, while other teachers follow and learn from her methods. Or a teacher could reach more children during the school day by allowing one class of students to learn basic concepts online while he works with another class in more enriched, higher-order learning.

More and more schools and school systems are making tradeoffs that alter the traditional classroom in which a teacher stands in front of 25 students. Many of the tradeoffs involve increasing the schools' use of technology while decreasing total labor costs. Although there's still plenty to be learned about digital education, the early results have been promising in several areas. For now, it is encouraging that schools and systems are no longer content that the status quo model *necessarily* offers the best value.

HARNESSING DIGITAL TECHNOLOGIES IN INNOVATIVE WAYS

The experience of five schools in Mooresville, North Carolina, shows how careful spending decisions can harness digital technologies in innovative ways without raising overall costs, as the *New York Times* recently highlighted in its article "Mooresville's Shining Example (It's Not Just About the Laptops)." The schools issued laptops three years ago to the 4,400 pupils in the fourth through twelfth grades.

Every Mooresville student gets a MacBook Air laptop for a leasing cost of $215 a year, including warranty, the article explained. The total annual cost for the district: $1.1 million a year, including software. The money was freed up largely by making tough decisions—for example, decisions that eliminated 65 jobs, including the dismissal of 37 teachers.

Mooresville students often collaborate in small groups, with the teacher checking in to consult with them. "Instead of defining transcendentalism for eleventh-grade English students, for example, one teacher had them formulate their own definition using Google Docs. "In math, students used individualized software modules, with teachers stopping by occasionally to answer questions. Teachers apportion their time based on students' needs, without the weaker kids having to struggle at the blackboard in front of the class; this dynamic has helped children with learning disabilities to participate and succeed in mainstream classes," the article explained.

The combination of new technology, budget innovation, and close involvement of district leaders, teachers, and parents has allowed Mooresville to show significant improvement in outcomes. The district's graduation rate was 91 percent in 2011, up from 80 percent in 2008. Comparable progress was made in state tests on reading, math, and science. The article explained that on average, "88 percent of students across grades and subjects met proficiency standards, compared with 73 percent three years ago" and that "Mooresville ranks 100 out of 115 districts in North Carolina in terms of dollars spent per student—$7,415.89 a year—but it is now third in test scores and second in graduation rates."

Reducing Central-Office Costs and Reallocating the Savings to Outcomes-Linked Initiatives

Although the rise in education costs has been driven largely by teachers' salaries and benefits, these expenditures are also the most politically sensitive to address; in some districts, in fact, they are also dictated by legal contracts. But they certainly are not the only areas in which value-driven decisions are likely to influence how that money is spent. Value-driven reformers must also look outside the classroom for funds that could be reallocated to initiatives that improve student outcomes.

One promising area is central-office administrative costs. These costs tend to build up over time, yet many of them no longer serve the goals of the districts or the priorities of their constituents. In general, districts are plagued with too many layers of management, fragmented approaches to procuring goods and services, and overlaps in central services such as payroll, finance, and IT support.

Given sufficient political will, districts can attain major cost savings through concerted, coordinated efforts to examine the efficiency of their programs. Cost savings of 5 to 10 percent of operating expenditures can be reallocated to more effective, outcomes-linked interventions, BCG's experiences with district and state education authorities have shown.

The question about central-office spending is not whether such spending delivers any benefit but whether it delivers *more* benefit than equivalent funds spent on proven programs. Major savings can be achieved at central offices around the country without hurting student outcomes, and this should be a high priority for value-driven educational improvements. The ideal should be a positive impact on student outcomes through a more efficient central organization.

Overcoming the Inevitable Challenges to Value-Based Reforms

With their relentless drive to deliver better outcomes without breaking the bank, value-based reformers will no doubt generate political heat. Three challenges in particular stand out, and all of them can be overcome with the right combination of change management techniques and strong leadership.

Reforms must engage stakeholders with different interests. Stakeholders—such as union leaders, district executives, parents, and government officials—start with inherently different viewpoints about education. Success in making the necessary tradeoffs will require close engagement with all of them in order to reconcile their goals and reassure them that their interests are being considered.

In Maryland's Montgomery County, for example, former superintendent Jerry Weast risked a revolt from parents in higher-income areas by proposing to redistribute part of their budget allocations to lower-income schools. Through a concerted strategy of community engagement combined with an appeal to self-interest—namely, the potential for enhancing the overall quality and reputation of the district—Weast quelled the dissent and maintained his investment agenda over several years, as outlined in a Harvard Business School case study, "Differentiated Treatment at Montgomery County Public Schools," by Richard Elmore, David A. Thomas, and Tonika Cheek Clayton.

Major reforms usually take years to plan and implement, making them difficult to sustain through several election cycles.

Effective reform calls for a committed effort over many years. Major reforms usually take years to plan and implement, making them difficult to sustain through several election cycles. But many tactics can ensure that a change program stays on track.

First, initiatives will need to be prioritized carefully to balance competing needs. Quick-win projects should be sequenced early on to build momentum and to

demonstrate to stakeholders that things really are different. A "sacred cow" program or spending area should be cut early on—say, by closing a nonperforming school—to prove the seriousness of the effort.

Second, one or more senior leaders with proven negotiation and communication skills should be dedicated to leading a program of value-based reforms, since communicating with the general public, the media, and influencers is critical to sustaining momentum. Third, districts and states need to recruit leaders experienced in broad-scale change management. Peter Gorman was one such leader. The former superintendent of the Charlotte-Mecklenburg school district in North Carolina has been widely applauded for breaking taboos around firing poor performers while rewarding excellent performance and for strategically placing top staff in underachieving schools.

Administrators may need to contract with partners, such as universities, that can perform the rigorous statistical analysis that supports value-based thinking.

A value-based approach requires good data. Schools typically start with low-quality data, making it almost impossible to judge the effectiveness of specific interventions. Existing efforts to measure school performance may generate more heat than light. For example, achievement reports that highlight only absolute test scores, instead of value-added measures—and that fail to reflect input costs—give a misleading picture of the value generated by each school.

Reformers will need to establish a strong base of data, including a quantitative baseline that shows where the system stands today. They'll need to set up systems for capturing data to make it easier to track progress toward clearly defined goals and intermediate milestones. They must also devise ways to reliably measure the efficacy, in terms of outcomes, of any given initiative. Administrators may need to contract with partners, such as universities, that can perform the rigorous statistical analysis that supports value-based thinking.

Raising the Odds of Success

Value has been an elusive goal in U.S. education. So much money is spent, and there are weak results for each incremental dollar. Yet there is promise in a new approach that can raise the odds of success by maximizing the use of existing resources and, therefore, enables change to happen.

A value-based approach is not easy to implement. There will always be calls for more spending as a way to resolve conflicts. That is why any value-based program should tightly link savings to spending from the outset. Leaders need to communicate to the public, again and again, that tradeoffs can be very worthwhile. Funds can be reallocated from seniority-based pay to the costs of measuring and recognizing differences in teachers' effectiveness, from classrooms with only expensive teachers to those with smart technology and teaching assistants, and from legacy expenses in central offices to proven frontline interventions in schools.

Making tradeoffs is hard, but that's not entirely bad. Value-based thinking demands proof for today's assumptions and practices. By persistently scouting out and documenting the initiatives that work well and can be scaled up, the U.S. may indeed be able to improve its educational system—and do so with fewer taxpayer dollars.

About the Authors

Reggie Gilyard is a partner and managing director in the Los Angeles office of The Boston Consulting Group and the coleader of BCG's U.S. education practice. You may contact him by e-mail at gilyard.reggie@bcg.com.

J. Puckett is a senior partner and managing director in the firm's Dallas office and the global leader of BCG's education practice. You may contact him by e-mail at puckett.j@bcg.com.

Lane McBride is a principal in BCG's Washington office and a core member of BCG's education practice. You may contact him by e-mail at mcbride.lane@bcg.com.

Adam Swersky is a consultant in the firm's London office. You may contact him by e-mail at swersky.adam@bcg.com.

Jeff Shaddix is a principal in BCG's Dallas office. You may contact him by e-mail at shaddix.jeff@bcg.com.

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