“In an era of financial stringency and demands for better school performance, it is useful to think about ways to increase learning effectiveness without increasing costs, reduce costs without diminishing effectiveness, or best of all, increase effectiveness while simultaneously reducing costs. The third option is unusual and potentially the most powerful, but likely to be more controversial and challenging of the status quo.”

– FROM THE INTRODUCTION

An ever-rising amount of money is being spent on public schools in the United States, yet the results are so poor that the nation’s prosperity is endangered. What can reverse the alarming trend of declining productivity? In Transformational Innovations in K-12 Education, Dr. Herbert J. Walberg describes some of the most promising ideas as well as some of the remarkable men and women who are implementing those ideas.

The transformational innovations described here are:

- **Transformational Budgeting** – allocating money to those policies that raise achievement at lower cost.
- **School Choice** – encouraging competition among schools and allowing or requiring failing schools to close.
- **Tiger Mothering** – highly motivated parents can make an enormous difference in a student’s academic achievement, since students spend 92 percent of their time outside schools during the first 18 years of their lives.
- **Differentiated Pacing** – allowing able students to progress more quickly while providing more time for slower students.
- **Superior Teachers** – finding and rewarding superior teachers is a much better strategy than the current focus on smaller class sizes and retaining less able teachers.
- **Performance-Based Pay** – imitate most successful professions by paying teachers partly based on their performance, not how many years they’ve taught or how many degrees they have earned.
- **Online Learning** – utilize new technologies and the Internet to provide cost savings and often-faster learning.
Acknowledgments

This essay is an edited and revised version of a publication prepared for the Center on Innovation & Improvement. The original version is available on the center’s Web site at www.centerii.org and is copyrighted by the Academic Development Institute, which kindly gave permission to The Heartland Institute to produce this new version.

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- 51 - 200 $3.21 each
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States, districts, and schools face two urgent problems: improving learning outcomes for all students, and making do under bleak budget projections and declining resources. Now is the time to think about achieving more while spending less, or at least achieving more without increasing spending to drive the change.

The Center on Innovation & Improvement turned to Herbert Walberg, our chief scientific advisor, to write this piece to prompt new thinking about costs and benefits. Herb has done seminal work on productivity over the years, tapping into research on learning outcomes, productivity, and cost-benefit analysis.

The center is a national content center administered by the Academic Development Institute, a nonprofit organization based in Lincoln, Illinois. It helps regional comprehensive centers in their work with states to provide districts, schools, and families with the opportunity, information, and skills to make wise decisions on behalf of students. Our Web site at www.centerii.org provides several documents containing guidelines and examples of effective policies and practices.

While this provocative publication is sure to stir our thinking, we also want to catalog practical suggestions for achieving more and spending less. To this end, we are soliciting contributions from readers to a database of innovative ideas for productivity. At www.centerii.org, in the upper left-hand corner of the home page, we have posted a link to a form you can use to submit proven strategies for reducing cost without negatively impacting learning, and for increasing learning outcomes without increasing cost.

We want to know what states, districts, and schools have done to become more productive. The ideas do not need to be grandiose: cost-cutting sometimes comes through the accumulation of many small efforts. Please help us spread the word about this solicitation.

Thank you.
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Introduction

In an era of financial stringency and demands for better school performance, it is useful to think about ways to increase learning effectiveness without increasing costs, reduce costs without diminishing effectiveness, or best of all, increase effectiveness while simultaneously reducing costs. The third option is unusual and potentially the most powerful, but likely to be more controversial and challenging of the status quo.

Improving productivity while reducing spending usually requires cross-disciplinary research involving both economics and psychological research on learning effects. An example documented here is employing fewer but superior teachers rather than hiring many mediocre teachers to reduce class size. The focus in the United States on smaller class size was a major public policy blunder and one reason that most advanced countries achieve more at lower per-student costs than the U.S.

The purpose of this essay is to summarize research on ways to significantly increase learning productivity while simultaneously reducing spending by schools, districts, and states. It was written for responsible officials in schools, districts, and states in the U.S. as well as concerned citizens and taxpayers and researchers in school reform and state finances.

Though the present document emphasizes new research, it builds on a large body of past research that looks specifically at increasing productivity without regard to spending. That research is described in a related book from the Center on Innovation & Improvement, also by this author, titled Improving Student Learning: Action Principles for Families, Classrooms, Schools, Districts, and States (Walberg 2011).¹

This essay focuses on “transformational innovations.” Unlike merely effective policies and practices, these may not only dramatically increase rates of learning but also reduce costs. Several of these innovations are less well researched but, in the current era of budgetary crisis, are increasingly put forward by policy analysts and legislators as having considerable potential to meet the new fiscal challenges. For these reasons, they deserve close attention here.

¹The book may be purchased from the publisher (see references) or freely downloaded from the CII Web site at www.centerii.org.
The term “transformational innovation” is used in a special way in this document. In education, innovation ordinarily means an incremental, piecemeal change in policy or practice in a given school or district. Here it means a substantial change seldom observed in most of the nation’s schools that appears to have the capacity to change other policies and practices and that promises to greatly improve learning without increasing costs or even reducing costs. The term as used here approaches what in economics is called “creative destruction” (Schumpeter 1975) and in business is called “disruptive technology” (Christensen 2006). These are sufficiently fundamental to change whole firms and industries.

As originally used, the term creative destruction emphasized entrepreneurs who employ radical new technologies that are substantially more effective, efficient, or appealing than past and current technologies. In promoting progress, they eventually destroy older technologies often employed by large established firms wedded to old ways. As a result, firms and even whole industries may decline and fall.

Unlike the relatively well-researched policies and practices described in Improving Student Achievement, transformational innovations may or may not yield substantial learning gains. It is too early to tell with assured confidence. But because of growing interest among parents, citizens, educators, and legislators in the promise to improve learning while also saving money, transformational innovations merit close attention. Even educators and policy makers who may find themselves philosophically opposed to the ideas may benefit from considering them before having to act or not act on them because of substantial budgetary shortfalls.

This essay begins by describing the need for increasing educational productivity at a time when fewer resources are available for K-12 schooling. It then presents seven methods of transformational innovation followed by brief profiles of two education leaders who transformed their school districts. Many of the references at the end of the essay are available online, and in those cases links are provided.

1. The Current Crisis

States and many municipalities face financial deficits totaling more than $130 billion. The deficits are likely to continue threatening and diminishing school spending. Since August 2010, an estimated 400,000 state and locally financed workers, including teachers and firefighters, have been laid off (Politi 2011). Policymakers and
educators face the challenge of maintaining or preferably increasing learning with the same or lower spending levels.

The failure of the current K-12 education system to produce high achievement levels has grown increasingly obvious in the past few decades. Scores on reading, math, and science stayed almost unchanged since 1970 despite dramatically increased spending. (See Figure 1.)

Despite substantially rising per-student costs, between 1995 and 2005, U.S. high school completion rates dropped from second to 21st among 27 economically advanced countries. Seventeen of the nation’s 50 largest cities have dropout rates greater than 50 percent (Swanson 2008).

Elementary and middle school students in the U.S. lag behind students from other economically advanced countries on achievement tests and often fall further behind the longer they attend school. Even more ominous, of 30 advanced economies, only Greece, Mexico, and Turkey had smaller percentages of 15-year-old students with advanced mathematical skills, prerequisite to the study of such high-paying fields as engineering, science, medicine, and finance that, along with related fields, contribute to the growth of the economy and national welfare (Hanushek, Peterson, and Woessmann 2011).
The top American research universities rank second to none in the world, but the usual colleges and lesser universities must increasingly provide remedial programs for ill-prepared high school graduates.

As pointed out nearly three decades ago in *A Nation at Risk* (1983), poor school performance has big consequences for student and national prosperity. The global collapse of communism has opened new markets for American goods and services while also exposing American students and workers to competition from workers who are eager to improve their condition in life. Globalization means American students and increased numbers of workers more directly compete with their counterparts in all parts of the world. Arriving at adulthood with the knowledge and skills needed for productive work is more important than ever before.

The public increasingly recognizes the seriousness of school productivity problems. An *Education Next* (2009) national survey showed the percentage of the public that gave schools a grade of A or B declined from 30 percent in 2005 to just 18 percent in 2009. These problems are even more important in a new decade when high levels of knowledge and skills partially determine national prosperity and citizens’ quality of life.

2. Transformational Budgeting

Extensive research has found that governors and state legislators can reduce spending on K-12 schooling without negatively affecting achievement, and in many cases the policy changes that would save money also could improve achievement. Petrilli and Roza (2011) recently summarized 15 ways to stretch school dollars. Taken as a whole, they appear to maintain or increase learning while reducing costs. They are as follows:

1. *End “last hired, first fired” practices.* Layoffs should be based on relative ineffectiveness rather than seniority.

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2 The words in italics are Petrilli and Roza’s, which are followed by my brief explanation or comments. Petrilli and Roza based their summary on an edited book by Hess and Osberg (2011). For one-paragraph summaries and additional points about stretching dollars, see Petrilli and Roza’s summary; for complete descriptions and data, see the original work edited by Hess and Osberg.
2. *Remove class-size mandates.* Small classes are costly and contribute little to learning.


4. *Eliminate state mandates regarding work rules and terms of employment.* As in other occupations, under-performers ought not be retained at the expense of student learners and taxpayers.

5. *Remove “seat time” requirements.* Some students can learn much faster than others; they can proceed more quickly and graduate early.

6. *Merge categorical programs and ease onerous reporting requirements.* Programs for English language learners and for children in poverty or with special needs create undue administrative complications and staffing costs while contributing little to student learning.

7. *Create a rigorous teacher-evaluation system.* Pay for performance requires a fair, objective assessment system based largely on student learning gains.


9. *Tackle the fiscal viability of teacher pensions.* Shift from defined benefit to defined contribution plans and require greater levels of employee contribution.

10. *Move toward weighted student funding.* Provide funding for each student based on student needs rather than school size, changes in school size attributable to declining enrollments, or losses of students to charter schools.

11. *Eliminate excess spending on small schools and small districts.* The relatively small positive effects of school and district size are insufficiently worthwhile to encourage.

12. *Allocate spending for learning-disabled students as a percent of population.* Basing extra funding for such students on district specification encourages over-identification.

13. *Limit the length of time that students can be identified as English language learners.* The sustained extra funding for such
students encourages schools to keep them in the program, reducing their exposure to English.

14. **Offer waivers of nonproductive state requirements.** Disallow such requirements provided achievement levels are sustained (or better, eliminate them altogether).

15. **Create bankruptcy-like loan provisions.** Allow districts to declare bankruptcy in order to sign new vendor and collective bargaining contracts.

In most states, policymakers haven’t acted on these reform ideas because saving money on K-12 education didn’t seem a top priority. Most states have increased per-pupil spending year after year for the past two decades, even as achievement remained stagnant and productivity fell. Elected officials pointed with pride to this “investment” in their state’s workforce, oblivious perhaps to the fact that it wasn’t actually making their states better places to live or work.

Slower economic growth and rising budget deficits have led taxpayers to look behind the curtain and realize that the higher spending hasn’t been buying better educational outcomes. With so much now at stake, it finally may be time for some of these ideas to be implemented.

3. **School Choice**

Allowing parents to choose which schools their children attend is a powerful way to promote student achievement as well as reduce spending. “School choice” can be promoted by allowing parents to choose among competing public schools, charter schools, tuition tax credits, or vouchers (Walberg and Bast 2003).

Increased school choice has a positive effect on student achievement when it is limited to public schools, as shown by research on the negative correlation between school district size and student achievement (Fowler and Walberg 1991). Schools that must compete with one another for students, funding, and teachers, even if that competition is muted and indirect, are less able to tolerate the waste and featherbedding that often accompany monopolies in a wide range of enterprises (Walberg 2007).

School choice limited to public schools may not reduce spending, and in cases where even small districts hire well-paid superintendents and other administrative staff, it may even increase spending. Other kinds of school choice, however, are proven to
save taxpayers money. This is consistent with economic research that finds private firms are routinely able to produce goods and services at half the cost of government agencies.

The bulk of the many research studies of charter schools indicate charter students learn more than those in comparable nearby public schools (Walberg 2007). The most rigorous study, a randomized comparison of students lotteried into charter schools with those lotteried out who remained in their assigned schools, showed charter students excelled, and the effect was larger for those that entered at younger ages and earlier grades. Because they employ many of the transformational budget policies (discussed earlier), the charter school per-student cost averages about 80 percent of nearby public schools’ cost.

For lack of space, the typical charter school must turn away many applicants, and despite their desirability, some states put severe limits on the number of charter schools. Ten states disallow them altogether. Because of these limits, the fast growth in the number of charter schools slowed in recent years; about 5,000, or 4 percent of the roughly 122,000 schools in the U.S., are charters. Charter schools enroll about 1.5 million students. If more states pass the trigger legislation described below, the pent-up demand is likely to substantially increase the number of charter schools and their students.

In 2010, voucher and scholarship tax credit programs operating in 12 states and the District of Columbia enrolled nearly 200,000 children (Campanella, Glenn, and Perry 2011). The oldest of these programs, operating in Milwaukee, was begun in 1990 and enrolls approximately 20,000 students.

The expansion of school vouchers and increase in the number of charter schools nationally have been frustratingly slow, but a breakthrough may have occurred in California. In January 2010, legislation called the “Parent Trigger” was signed into law. Supported by liberals and conservatives, the law empowers parents to make transformational changes to their local public schools if 50 percent or more of the parents of children attending a failing public school sign a petition demanding change.

In California, the changes that parents are allowed to demand through the Parent Trigger are limited to being allowed to enroll their children in a different public school, convert the local school into a charter, or implement one of two school reorganizations described in the national Race to the Top legislation. While this sort of parent empowerment is a bold step forward in its own right, the Chicago-based Heartland Institute has proposed and is promoting around the country an even more ambitious Parent Trigger (Bast et al. 2011).
In the Heartland version, the Parent Trigger allows parents of students attending any (not just failing) public school to petition for three types of transformation. The first two are the same as in California: public school choice or conversion to a charter school. The third choice, however, changes from reorganization to vouchers: Parents can demand vouchers to use to enroll their children in the schools of their choice, either public or private.

The American Legislative Exchange Council (2011), a bipartisan organization of cooperating legislators from 50 states, has produced model legislation for Heartland’s version of the Parent Trigger. In February 2011, more than a dozen states were considering versions of the legislation.

4. Tiger Mothering

Of the economically advanced countries, Taiwan, Hong Kong, and Korea took the first three places in advanced mathematics performance by 15-year-olds. Twenty-four percent of the students in these countries (on average) were advanced in contrast to only 6 percent in the United States (Hanushek, Peterson, and Woessmann 2011). East Asian countries have long done well on international comparisons in mathematics and science, and their economies have grown as much as three times the rate of Western countries. Despite potential socioeconomic and language handicaps, the children of East Asian immigrants to the U.S. also have excelled.

One plausible and evidenced-based explanation of stereotypical East Asian superior performance is the stimulating quality of the home environment. Walberg (2011) refers to the evidence that educators can encourage parents to academically enrich the 92 percent of time that students spend outside school in the first 18 years of life (see also Redding 2000 for practical principles and activities).

Even so, few non-Asian American parents, mothers in particular, rise to the heights of “tiger mothering” as described by Amy Chua (2011) – daughter of Chinese immigrants, mother of two daughters, cum laude graduate of Harvard Law School, author of two award-winning best-sellers, and chaired professor of law at Yale University. Despite the immense efforts of American assimilation, writing books, and becoming a chaired professor at an Ivy League university, Chua enforced with iron will more than strict discipline on her two daughters.

They were allowed no playmates. They were not allowed to be in a school play nor to complain about not being in a school play.
Her daughters had to be the number one students in every subject except gym and drama. Because she spoke a lesser dialect, Chua hired an elegant speaker of the preferred Mandarin to tutor her daughters. They were not allowed to play a musical instrument other than piano or violin. She forbade sports and other extracurricular activities.

Though a half-hour of study per day outside of school might be acceptable to many American educators and parents, Chua required three hours of her daughters. After that was music practice, up to six hours without dinner or a bathroom break on one occasion, for daughter Sophia to master a composition. The girls were nearly always first in all academic subjects, and Sophia played at New York City’s famous Carnegie Hall.

Despite such strict upbringing, the daughters acquired a sense of humor as well as a sense of fulfillment. In an open letter to her mother published in the New York Post, daughter Sophia Chua Rubenfeld (2011) declared her critics wrong in assuming “Lulu and I are oppressed by our evil mother. That is so not true. Every other Thursday, you take off our chains and let us play math games in the basement.” What she gained from it all: “To me, it’s not about achievement or self-gratification. It’s about knowing that you’ve pushed yourself, body and mind, to the limits of your own potential.”

Chua recently discussed her mothering book with the world’s elite political and business leaders at the World Economic Forum in Davos, Switzerland. Her book and article about it generated 5,000 passionate and conflicting comments on The Wall Street Journal’s Web site. The comments and Amazon reader reviews and ratings of Chua’s book (as of January 14, 2011) are also polarized: 19 five stars, 20 one star, and 11 between. Those rejecting her view preferred socialization including dating, sports, and other extracurricular activities, and allowing children and adolescents greater latitude to choose their friends and activities.

Perhaps recognizing the iron law of learning psychology, those favoring Chua’s view held that great lengths of engaged practice with high standards are the important ingredients of reaching the top. Many defending Chua’s views and practices maintained that mastery precedes creativity in most fields.

Given such conflicting views, what can educators do? They can hardly change child- and adolescent-rearing philosophy and practices, especially from one extreme to the other. But they can point out to parents the relationship between how their children spend their time outside of school and their success in school and possibly in life. Even small improvements in the amount and quality of academically constructive hours outside school are likely
to have more than moderate learning effects while contributing little or nothing to school costs.

Despite her distinguished law career and best-selling books, Chua’s ability to devote long hours of attention to her daughters should cause parents and educators to think carefully about how students spend their time outside the classroom. They may decide to act on their conclusions. So suggests the U.S. Secretary of Education, Arne Duncan, reacting to the results of the Organization for Economic Cooperation and Development’s international achievement survey, which revealed that a cross-section of Shanghai 15-year-olds took first place in science and reading among 65 participating countries. “We have to see this as a wake-up call. I know skeptics will want to argue with the results, but we consider them to be accurate and reliable, and we have to see them as a challenge to get better.” He added, “The United States came in 23rd or 24th in most subjects. We can quibble, or we can face the brutal truth that we’re being out-educated” (quoted in Dillon 2010).

5. Differentiated Pacing

It is obvious to most parents and educators that children come to school with different degrees of preparation and learn at different rates. Yet, conventional neighborhood schools largely employ a lockstep grade progression that is frustrating for educators, parents, and students as they grow progressively different from one another during the school years. Schools attempt to accommodate differences among students in the same grades by tracking: About 80 percent of U.S. public high schools practice tracking or assign students to classes of various levels of challenge according to their developed capabilities (Walberg, Reynolds, and Wang 2004). But even with tracking, students taking the same classes may differ greatly in their prior knowledge and skills; some find the material too difficult, others too repetitive. Grouping unlike students together may impair all their learning rates (Petrilli 2011).

There are several possible solutions. The Advanced Placement program allows bright high school students to take college-level courses and to demonstrate their proficiency on creditable national examinations. In principle and to a lesser extent in practice, able students can graduate from high school in less than four years and complete college studies in less than four years, saving their own time and also taxpayers and parents the costs of less-productive years of education.

A striking example of such acceleration was the core academic curriculum and mastery examination system adopted by the
University of Chicago in the mid-1930s. Students earned their degrees not by taking courses but by passing tough examinations. Some students were admitted early and able to graduate as early as age 18. Studies of the program indicated many of those young scholars went on for advanced degrees and successful lives – some highly notable. Reminiscent of Tiger Mother principles and of schools in Asia and Europe that concentrate on learning, the University of Chicago withdrew from the Big Ten football league and diminished the role of fraternities and sororities.

Other examples of acceleration are “governor’s schools,” such as the Illinois Academy of Mathematics and Science, which are residential and highly selective. Some advanced, often-specialized public schools require tough entrance examinations or counsel parents of academically less-promising students to send their children elsewhere. These schools are not necessarily less costly, but the amount learned per dollar spent exceeds ordinary schools.

6. Superior Teachers

Moderately good teachers confer huge achievement and later income advantages to their students. These benefits are apparent even when class sizes are relatively large. Nevertheless, American policymakers have focused on reducing class size rather than recruiting and rewarding superior teachers. (See Figure 2.)

![Figure 2. Student Teacher Ratios in US Public Schools](http://reason.com/archives/2011/02/22/losing-the-brains-race)

Hanushek (2011) studied the effects of teacher quality on student achievement and the lifetime earnings of students and arrived at the following startling conclusion:

A teacher one standard deviation above the mean effectiveness annually generates marginal gains of over $400,000 in present value of student future earnings with a class size of 20 and proportionately higher with larger class sizes. Alternatively, replacing the bottom 58 percent of teachers with average teachers could move the U.S. near the top of international math and science rankings with a present value of $100 trillion.

Superior teachers, not more spending, is the major reason other countries get better achievement results than the U.S. at lower costs. This was pointed out by Andreas Schleicher of the Organization for Economic Cooperation and Development:

Only 9 percent of the variation in achievement can be explained by how much is spent. High achieving countries have large classes taught by great teachers. Poor performers employ less effective teachers for smaller classes, recruiting the extra staff from further down the ability range (Economist 2010).

Though the research is not completely consistent, superior teachers tend to have a deep and broad grasp of the subject matter. High school mathematics teachers, for example, score high on advanced mathematics tests and have taken many rigorous mathematics courses.

Superior teachers also tend to engage in evidence-based teaching practices, among them “direct instruction,” in which the teacher returns graded homework from the previous assignment, briefly discusses with the class the past lessons to be sure they are mastered, engages in possible re-teaching if it they are not, logically presents new material and shows how it is related to students’ past learning, provides appropriate board and seat work, and assigns homework for the next day (see Walberg, 2010 and 2011, for more extensive descriptions of these and other practices).
7. Performance-based Pay

With or without recruiting superior teachers, carefully designed incentive systems also can improve teaching performance. Performance-based pay is widely practiced in private firms and increasingly used in government, including public schools (Kremer, Miguel, and Thornton 2009; Lazear and Shaw 2007; Podgursky and Springer 2006). Economists and behavioral psychologists have shown that appropriate incentives, both symbolic and real, powerfully shape behavior. Such thinking is entering or reentering education, including with respect to teachers. Policymakers’ interest in teacher incentives is rising, and the public supports them.

Still, nearly all public school teachers have been paid according to a “single-salary schedule” or “position-automatic system,” which means that, within a district, all teachers with a given number of years of experience and education level receive identical pay. Except during the first few years of teaching, neither of these pay determinants is linked to student achievement. Even special pay for hard-to-recruit subjects such as science and mathematics and “combat pay” for teaching in difficult schools are rare. Pay for performance is more common in private and charter schools, which on average excel in achievement.

Many educators and some policy analysts say the success of paying teachers based on their students’ learning is insufficiently demonstrated to justify further study or use in schools. Yet the achievement failures and rising costs of public schools suggest the opposite. Since performance pay is nearly universal in other occupations and professions, the burden of proof rests with those who defend the single-salary schedule. While questionable claims are made that performance pay is unfair to educators, the present single-salary schedule is actually unfair to the millions of children in public schools who are subject to poor teaching in repeatedly failing schools. It is also unfair to leave unrewarded educators whose performance excels.

Though performance pay systems can improve achievement, they require careful design and are subject to unanticipated effects. For example, a possible design problem could involve encouraging educators to concentrate on students below the proficiency cut scores, neglecting other students. To solve this problem, the average achievement gains of all students may be taken as the performance criterion rather than simply the percentage that crosses a particular cut score.
The best incentive programs align teachers’ raises or bonuses with student learning, but additional criteria may be used, such as giving the principal’s assessment half the weight of the overall performance rank. Also, it would be reasonable to pay principals based on school performance to encourage them to take greater care in assessing and rewarding high-performing teachers. Making the incentive half the total compensation for both teachers and principals may be too much, but 5 percent seems too little. Given the poor performance and high costs of public schools, large incentives relative to base pay seem to be in order.

Since students’ achievement at the end of an academic year is substantially predictable based on their standing at the beginning of the year, it is reasonable to gear payment to the test gains made under the teacher in question. Admittedly, more study of teacher incentive programs is required, but the prominence of incentives in economic theory, behavioral psychology, and much of the American workforce may be sufficient evidence for expansion on a much wider scale in schools.

8. Online Teaching and Testing

Technological change is leading to new products, services, and forms of organization, management, transportation, advertising, and financing. The Internet is replacing traditional publishing; digital is replacing film photography; television, cable, DVDs, and downloadable media are replacing theaters; mobile cell phones are replacing pay phones and hardwired home phones. Today, Google, Yahoo, iTunes, and other Internet technologies challenge newspapers, book publishing, and music distribution.

Academics continue to study these technological transformations. At the Harvard Business School, Clayton Christensen revived such thinking about industries in general and argued that “disruptive technologies” are likely to transform schools (Christensen 2008).

A recent survey of the public showed about a quarter thought middle and high school students should get credit for online courses (Howell, Peterson, and West 2011). Expanded access to electronic media offers today’s teachers and students effective and potentially cheaper new ways to teach and learn. In the long run, instructional technology is likely to prove more effective, cost-efficient, and time-saving than regular classroom teaching since technologies, particularly computer technologies, are generally improving with time.
Even now, as pointed out in *Improving Student Learning* (Walberg 2011), the most extensive synthesis of research covering 232 control-group studies found that student achievement, attitude, and retention were the same for classroom and online instruction. Eight separate meta-analytic reviews revealed that computer-based instruction had superior effects on student achievement. On average, students gained more knowledge in computer-based instruction and took more pleasure in learning than their counterparts in standard classrooms. Gifted students, in particular, derived great benefits from computer-based tutoring and accelerated classes.

New electronic media can add sound, color, animation, and interactivity to text, adding stimulation for engagement. The Internet offers instantaneous and free (or inexpensive) access to content. When low-speed Internet connections, slow computers, or both are a concern, CDs or DVDs provide a large amount of material, which can be easily distributed at a low cost. Providers’ Web sites or files on local servers also can provide access to materials for individual students or staff in education centers, schools, libraries, and classrooms – both for small-scale specific distribution and for uniform, large-scale curriculum adoption. But CDs and DVDs cannot be easily updated like material on the Internet – material that, like printed matter, needs to be vetted for accuracy, currency, and appropriateness of content (Walberg 2011).

It may seem premature to claim that technology now leads to better learning at less cost for the entire school curriculum. Even so, impressive results have been achieved in the important subjects of mathematics and reading. Educational technology is very likely to attain ever-increasing levels of efficiency.

Policymakers at the state and national levels seem to increasingly agree on the value of having a stable set of specific curriculum offerings and standards. This would make it far more worthwhile to develop online programs carefully designed and matched to the agreed-upon content and standards. Spending sufficient funds for high-quality programs would increase learning and reduce the unit costs to the extent that increasingly large numbers of students are taught using this technology.

9. Transformational Leaders

Michelle Rhee of the Washington, DC schools and Joel Klein of New York City were, at the time of this writing, the nationally best known of all recently retired superintendents. They were transformational in the sense used here of enacting bold policies
that affected many parts of the systems where they served as chief executives and inaugurated several of the reforms described above. Consider their views.

**Michelle Rhee**

Michelle Rhee, a former Teach for America teacher and the daughter of a Korean immigrant who worked as a doctor at the University of Michigan Medical School, has earned a reputation as a tough and straightforward reformer when she served as chancellor of schools in Washington, DC (Whitmire 2011).

When she began in 2007, schools in the nation’s capital were third-highest in cost per student among big cities, yet only 8 percent of the eighth graders were at grade level in mathematics. Among many changes, including closing 21 schools, she gained union agreement to a new contract with raises of up to 20 percent and bonuses of up to $30,000 in exchange for diminished tenure protection. She fired 241 teachers, most of whom had been given poor evaluations, and she put 741 employees on notice for dismissal. During her tenure, graduation rates and reading and mathematics scores improved substantially, and she gained much national attention for her school reform efforts.

After her bold leadership in Washington, Chancellor Rhee founded and is chief executive of StudentsFirst, dedicated to improving schools around the country. Reflecting her nationally recognized leadership, 100,000 people signed up as members of the organization during its first 48 hours and contributed $1 million in small online donations.

In an article titled “In Budget Crises, an Opening for School Reform,” Rhee (2010) emphasized that StudentsFirst’s efforts will concentrate on three initiatives. Paraphrasing her words, these are:

- **Treating teachers like professionals.** Compensation, staffing decisions, and professional development should be based on teachers’ effectiveness, not on their seniority. That means urging states and districts to implement a strong performance pay system for the best teachers, while discontinuing tenure as job protection for ineffective teachers. This will ensure that the money spent on teachers’ salaries goes to the hard-working professionals who are improving student achievement every day.

- **Empowering parents and families with real choices and real information.** Parents, especially those who live in lower-income neighborhoods, have limited educational options for
their children. StudentsFirst believes that states and school districts must remove the barriers that limit the number of available seats in high-quality schools. This includes allowing the best charter schools to grow and serve more students. It also means giving poor families access to publicly funded scholarships to attend private schools.

- Provide accountability for every dollar and every child.
  Due to the financial downturn in the states, it is critically important to ensure that every dollar spent on public education has a positive impact on student learning. Unfortunately, billions of dollars today are wasted on things such as paying for advanced degrees for teachers that have no measurable impact on student achievement.

Joel Klein

In his eight-year tenure as chancellor of the New York City Department of Education, Klein supervised the nation’s largest school district and worked under a mayor who boldly took responsibility for the schools. In his retirement account, Klein challenged the usual idea and observation that poor children can’t learn and cited “Harlem Success Academy, a charter school with all minority, mostly high-poverty students admitted by lottery,” which “performs as well as gifted schools that admit kids based solely on demanding tests” (Klein 2011).

“Traditional proposals for improving education – more money, better curriculum, smaller classes, etc. – aren’t going to get the job done,” Klein said. “Public education is a service delivery challenge, and it must be operated as such. Albert Shanker, the legendary teachers’ union head, was right when he said that education has to be, first and foremost, about accountability for ‘student outcomes.’ This means there must be consequences if children or adults don’t perform” (Klein 2011).

Klein maintained, “Whether it’s health care, education, or any other service, poorly-structured, non-accountable delivery systems cost a fortune and don’t work” (Klein 2011). To counter such dysfunction, Klein gave principals new authority over their school budgets, hiring, and choice of programs. He rewarded those that did well and removed those who did poorly. He closed almost 100 failing schools and increased the number of charter schools.
Conclusion

A slow economy, enormous government debts, and mounting evidence of low academic productivity have come together to create an opportunity to transform America’s public K-12 schools. This essay has shown there is no shortage of ideas on how this can be done.

Policy analysts at think tanks and advocacy groups have called for a long list of policy changes – Petrilli and Roza alone counted 15 of them – that promise to improve educational outcomes while reducing school spending. Many of these ideas are not new, and some of them would be difficult to implement, but what is remarkable is how little effort policymakers have made in the past to act on them. Perhaps now is the time for them to start trying.

School choice holds enormous promise to transform America’s schools by altering the incentives of administrators, teachers, parents, and students themselves. Expansions of choice can be modest, as in allowing parents to choose among public schools in their area, or ambitious, such as universal school vouchers. The Parent Trigger is an exciting innovation in this arena since it allows the parents of children attending public schools to decide whether their schools should be transformed and in what way. This should make school choice legislation more palatable to a wider range of elected officials.

“Tiger Mothering,” differentiated pacing, recruiting and rewarding superior teachers, and utilizing new forms of computer-assisted learning are other innovations that the latest research is showing could transform schools while reducing per-pupil spending. Again, these ideas are not especially new, yet elected officials and educators have been slow to consider and implement them. Now, with other options foreclosed by funding shortages, they may get the attention they deserve.

America’s educational system has produced exceptional leaders who have tried with some success to transform some of the nation’s biggest and most troubled school districts. But a well-designed school system doesn’t require exceptional leaders to get the job done: Such school systems are correctly designed to produce stellar results even when staffed with average people. America’s school system, then, needs substantial redesign.

This essay is deliberately concise and cites only a small number of studies and reports that support its findings on transformational reforms likely to reduce costs while maintaining or increasing student achievement levels. The cited references contain much
detailed material and useful examples. A complete review of the literature on effective practices that are not likely to increase costs appears in publications of the Center on Innovation & Improvement, including this author’s 2011 book, Improving Student Learning: Action Principles for Families, Schools, Districts, and States (Walberg 2011).

References


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Herbert Walberg is distinguished visiting fellow at the Hoover Institution, Stanford University. He serves as the chief scientific advisor for the Center on Innovation & Improvement, and he chairs the boards of the Beck Foundation and The Heartland Institute.

Dr. Walberg formerly taught at Harvard University and is emeritus university scholar and professor of education and psychology at the University of Illinois at Chicago. He was awarded a Ph.D. from the University of Chicago, where he is a member of the Fellows Society.

Dr. Walberg has written or edited more than 55 books and written about 300 articles on such topics as educational effectiveness and exceptional human accomplishments. Among his recent books are the International Encyclopedia of Educational Evaluation; Narrowing the Achievement Gap: Strategies for Educating Latino, Black, and Asian Students (with Susan Paik); and Testing Student Learning – Evaluating Teaching Effectiveness and School Accountability (both with Williamson M. Evers).

Dr. Walberg served as a founding member of the National Assessment Governing Board, referred to as “the national school
board” given its mission to set education standards for U.S. students and measure progress in achieving them. He was also a presidentially appointed, Senate-approved founding member of the National Board for Educational Sciences, which provides policy guidance and oversight of about $600 million for federal education research.

Appointed a fellow of four academic organizations including the American Association for the Advancement of Science, American Psychological Association, and the Royal Statistical Society, Dr. Walberg is a founding fellow of the International Academy of Education, headquartered in Brussels. He edited a booklet series for the academy on effective educational practices, which is distributed by the United Nations International Bureau of Education to some 4,000 education officials in more than 120 countries and on the Internet (at http://www.ibe.unesco.org/en/services/onlinematerials/publications/educationalpractices.html).
“In an era of financial stringency and demands for better school performance, it is useful to think about ways to increase learning effectiveness without increasing costs, reduce costs without diminishing effectiveness, or best of all, increase effectiveness while simultaneously reducing costs. The third option is unusual and potentially the most powerful, but likely to be more controversial and challenging of the status quo.”

– FROM THE INTRODUCTION

An ever-rising amount of money is being spent on public schools in the United States, yet the results are so poor that the nation’s prosperity is endangered. What can reverse the alarming trend of declining productivity? In Transformational Innovations in K-12 Education, Dr. Herbert J. Walberg describes some of the most promising ideas as well as some of the remarkable men and women who are implementing those ideas.

The transformational innovations described here are:

- **Transformational Budgeting** – allocating money to those policies that raise achievement at lower cost.
- **School Choice** – encouraging competition among schools and allowing or requiring failing schools to close.
- **Tiger Mothering** – highly motivated parents can make an enormous difference in a student’s academic achievement, since students spend 92 percent of their time outside schools during the first 18 years of their lives.
- **Differentiated Pacing** – allowing able students to progress more quickly while providing more time for slower students.
- **Superior Teachers** – finding and rewarding superior teachers is a much better strategy than the current focus on smaller class sizes and retaining less able teachers.
- **Performance-Based Pay** – imitate most successful professions by paying teachers partly based on their performance, not how many years they’ve taught or how many degrees they have earned.
- **Online Learning** – utilize new technologies and the Internet to provide cost savings and often-faster learning.