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ABSTRACT

This report argues that the academic performance of American students has not declined, but that schools and students are confronting new and higher demands. The fundamental challenge facing American primary and secondary education is how to increase productivity--how to make better use of its resources. In this document, the Consortium on Productivity in the Schools analyzes the relationship among various parts of the American educational system; identifies how other industries or sectors have increased their productivity; and recommends ways to change resource allocation to increase student learning. Part 1 looks at patterns in student performance, real expenditures for the average pupil, and social factors external to the school and concludes that productivity in education has held steady over the past 20 years, rather than declined. However, a priority must be placed on becoming more productive. When the education system is compared to other industries, its central problems involve difficulties with productivity-improving change. Part 2 describes eight subsystems of the education system that should perform the following functions: governance, management, finance, teaching and learning, adaptation and innovation, hiring and purchasing, outplacement, and maintenance. Part 3 analyzes how to improve the productivity of the education system and defines the roles of each of the eight interacting subsystems. The fourth part offers the following recommendations: (1) renegotiate the governance and management contract; (2) extend accountability of schools for student learning to accountability of major functions of the system; (3) use the education financing system to improve educational productivity; (4) create the conditions that let schools learn; (5) set up quality controls for innovations and develop mechanisms for legitimating better practices; and (6) make a contract among all citizens for the next generation. Biographies of consortium members and a list of advisory board members are included. (Contains 34 references.) (LMI)

USING WHAT WE HAVE

TO GET THE SCHOOLS WE NEED

A PRODUCTIVITY FOCUS

FOR AMERICAN EDUCATION

A REPORT FROM THE CONSORTIUM ON PRODUCTIVITY IN THE SCHOOLS

Generous support provided by:

Ball Foundation

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Using What We Have
To get the schools we need

A Productivity Focus for American Education

A Report from the Consortium on Productivity in the Schools

October, 1995

"When you read the myriad of recommendations these commission reports contain, it becomes clear that they are not informed by any conception of a system. That is a charitable assessment....those outside the system with responsibility for articulating a program for reform have nothing resembling a holistic conception of the system they seek to influence."

The Predictable Failure of Educational Reform:
Can We Change Course Before It's Too Late?
Seymour Sarason, 1990

"Changing the way education is delivered to increase its productivity is directly within the control of policymakers and educators and is our one best hope for increasing student learning across the system."

The Consortium on Productivity in the Schools

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PREFACE: BETTER EDUCATION ON $1.5 BILLION PER SCHOOL DAY

Most parents, educators, and policymakers share some goals for American schools. They want schools to give children the knowledge and skills that they need in order to earn a living, to become responsible citizens, and to fulfill their potential as individuals and as members of families and society.

Unfortunately, America's schools are falling short of these ideals. Employers and officials of institutions of higher education complain that many graduates of American public schools lack the literacy, numeracy, and other intellectual skills needed to function in today's world. American primary and secondary students consistently rank below their counterparts in other industrialized countries in comparative studies of academic achievement.

The fundamental problem is not as some have argued, that the academic performance of American students has declined. To the contrary, student performance has been stable over a period of two decades, higher scores on standardized tests for basic skills being counterbalanced by lower scores on items that measure reasoning abilities. *The basic problem is that schools and their students are confronting new and higher demands.* In the emerging global economy, it is no longer sufficient for most workers to master a body of knowledge and a set of skills that they can apply for an entire working lifetime. A growing proportion of jobs require higher order thinking skills—and the ability to acquire knowledge and learn new skills—that were necessary for only a minority of students in the past. In general, American schools are not providing students with the learning that they will need to function effectively in the 21st Century.

The inadequacies of American public schools cannot be attributed to a lack of resources. Obviously, the funding of some public schools is still inadequate. Huge inequities exist between rich and poor districts in their expenditures on education, and it is easy to identify urban and other schools where additional resources could plausibly yield higher student achievement. However, funding for public education has increased steadily over the past decades, both in real and nominal dollars, the bill being $285 billion, or about $1.5 billion every school day. In 1992 the United States spent a higher percent of GDP on public primary and secondary education than the average for the other industrialized nations.

"The fundamental challenge facing American primary and secondary education is to figure out how to make better use of its resources—in other words, how to be more productive."

even when purchasing power differences between nations are taken into account. Similarly, in 1992 average United States spending an average per public primary and secondary student was higher than in other industrialized nations (Tables F01 and F03, *Education at a Glance: OECD Indicators*, Paris: Organization for Economic Co-operation and Development, 1995).

The recent debate over the impact of additional funding on student achievement has now become moot. The current economic and social climate is such that these additional resources are not likely to be forthcoming. The rate of growth in spending for education is slowing. Simultaneously, the United States, like other industrialized countries, is trying to constrain public expenditures in all sectors. Schools will have to learn to function—and improve—within the bounds of existing resources.

The fundamental challenge facing American primary and secondary education is thus to figure out how to make better use of its resources—in other words, how to be more *productive*.

Productivity is not a familiar—and certainly not a popular—concept in education. It sounds like a mechanistic approach to a very human enterprise. Yet the studies show that productivity gains have been achieved in other fields associated with human resources. Even our health care system, troubled as it is in other respects, has shown a remarkable ability to create, implement, and evaluate improvements in medical services.

The Consortium on Productivity in the Schools was established in 1992 to address this key question of how American schools can increase the learning levels of students by using existing resources more effectively. The Consortium was managed by the Institute on Education and the Economy at Teachers College of Columbia University. It consisted of ten experts on productivity from the fields of business, economics, political science, systems analysis, organization theory and change, statistics, and education. These ten brought a range of expertise: elementary and secondary education systems in the United States, Europe, and Japan; international productivity; educational finance; simplifying complexity to the level of root causes; the theory of organizational change; and practical experience with change.

The tasks of the Consortium were three-fold. It sought to:

- Analyze how the various parts of the American educational system, such as

governance, management, finance, or classroom instruction, function relative to each other and relative to their effects on improving the productivity of the system.

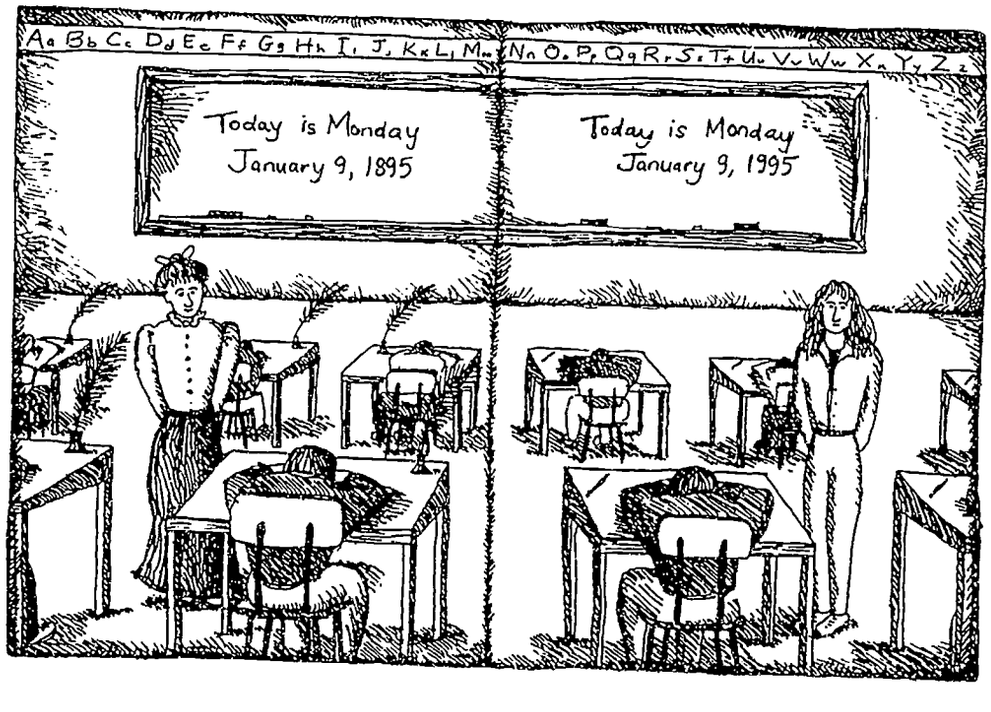
- Identify how other industries or sectors have increased their productivity.
- Recommend ways to alter the way American schools deploy existing resources so as to increase student learning.

In addressing these tasks, the Consortium began with the assumption that education in the United States is a complex system of interlocking parts. It is a vast combination of local schools, boards of education, teacher training institutions, research organizations, funding agencies, legislative bodies, and other organizational structures. These structures function on multiple levels—national, state, and local. They are only loosely connected and not infrequently work at cross-purposes. Understanding this vast, loosely coupled educational system is the important first step toward improving its efficiency.

Without a sense of the whole, we end up with what has become a familiar cycle of patchwork improvement and disappointment. The challenge of increased productivity cannot be met with any single new program such as school-based management, a new teaching technique, or a new set of assessments. Improvements in one element of the system will not succeed unless they are linked to improvements in other elements that affect its success. For example, increasing R&D in education will have little effect unless the quality standards for innovations are improved and incentives at the school level are changed to increase teachers' demand for better practice.

A striking characteristic of American education is that schools in fact change all the time. However, they do so in random and unstable ways, not in cumulatively improving ways. Partial and fragmentary fads constantly come and go—from the "new math" to "open classrooms" to "back to basics" to "parental choice". These changes are almost always ephemeral, in that they enter and exit the education system without altering its fundamental structure. This century has seen surprisingly few changes in the "core technology" of schooling—how schools go about their business. It has been said that if an auto worker, a medical doctor, a textile worker, a soldier, and a teacher were frozen in 1900 and unfrozen in 1995, only the teacher would be able to

"Without a sense of the whole, we end up with what has become a familiar cycle of patchwork improvement and disappointment."



resume work without missing a beat. Vast changes have occurred in medicine, automobile manufacturing, textiles, and warfare—improvements in the knowledge base, in the technology at the workers' disposal, and in the organization of work. But relatively little change has taken place in the practice of education.

The technology of education still revolves around paper, pencils, chalk, and blackboard. Teaching and learning is still organized for the most part aroun' a lone teacher in an isolated classroom. The dominant instructional method is "teacher talk," and students still move from one unconnected subject to another without profound understanding of how learning in one class relates to that in others. Instruction is organized around fixed quantities of time—not clearly defined learning objectives for all students, and a wide variation is tolerated in the knowledge and skills that various students acquire during their allotted seat time in school. Accountability for teachers and others is based more on conformity to process than on measurable results for students. Larry Cuban, writing on the slow adoption of one change —the use of technology— wrote, "The seemingly marginal use of computers. . . is due less to inadequate funds, unprepared teachers, and indifferent administrators than to dominant cultural beliefs about what teaching, learning, and proper knowledge are and how schools are organized for instruction" (Cuban, 1993).

In carrying out its work, the Consortium relied on the extensive literature on how large organizations, i.e. systems, function. A key concept of this literature is the need to focus on continuous improvement. The Consortium believes that American schools can achieve continuous improvement through techniques that have been successfully employed in other fields. These include focusing on clearly defined goals; aligning activities around those goals; identifying and incorporating effective educational innovations; establishing new ways to measure performance of all parts of the system, including its customers' expectations for it; holding students and educators accountable for results; and developing better ways to engage students, parents, educators, and members of local communities.

In its recommendations, the Consortium calls on leaders and the public at large at all levels—national, state, and local—to set clear and rigorous standards for public schools and to provide reasons to meet these targets. It urges a "new contract" between those who govern and manage the system and those who produce learning. The contract is autonomy with accountability: autonomy for users and suppliers of education in exchange for accountability to the community, state, and nation for learning results.

Many, though by no means all, of the ideas contained in the Consortium's report will be familiar to readers conversant with the school improvement literature of the last decade. We believe that this report is unique, however, in two ways. The report has organized these ideas around critical issues of increasing the system's productivity. The report also is unique in applying the principles of dynamic systems analysis to education. This discipline simplifies complexity to locate the root causes of what are intertwined, resistant, and often perplexing symptoms of problems in the educational enterprise. We hope that the Consortium's analysis and recommendations will launch further debate and prompt practical steps to use existing resources to produce much greater learning gains for a broader range of students.

"...the Consortium calls on leaders and the public at large...to set clear and rigorous standards for public schools and to provide reasons to meet these targets. ...The contract is autonomy with accountability."

P. Michael Timpane
President Emeritus, Teachers College

G. Carl Ball
Chairman, Geo. J. Ball, Inc.

Co-chairmen of the Advisory Board

PART I: THE PRODUCTIVITY CHALLENGE

Few question that our society needs better educational results for a broader range of the population. The nation is rapidly becoming a knowledge economy, in which growth is driven more by intellectual capital than by physical labor. Studies decisively document that the economy is shedding jobs for unskilled workers. Against these economic realities, the data show average student performance that is not very high and substantial variation around that average. The skills that students need are not just more of what the schools have always taught, such as basic skills in mathematics, but also skills that the schools have rarely taught—the ability to work with complex knowledge and to make decisions under conditions of conflicting or inadequate evidence.

Public education confronts this challenge in the context of several constraints.

- The level of performance has to go up at the very time that the backgrounds of greater numbers of children in the nation's classrooms make learning more difficult.
- The schools have to function in an environment of declining social and political cohesion. Large-scale forces, such as the internationalization of the economy, increasing income inequality among Americans, serious value conflicts, high rates of immigration, a revolution in communications, and major shifts in power relationships between nations are eroding the cohesion that makes educating easier.
- Public funding for education will probably not increase much, especially with competing demands from other service sectors such as health care and corrections. States and school districts will have to use tight resources to improve students' skills and knowledge for a population that is more difficult to teach with traditional methods and in the context of greater social and political conflict.

The Consortium on Productivity in the Schools believes that increased productivity in the education system is the only solution to bringing more students with more deficits to higher levels of learning on limited public resources. Schools must develop ways to get better results with the resources at hand.

Most educators flinch at the cold word "productivity." It evokes images of Charlie Chaplin's film, *Modern Times*,

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where human beings are cogs in a mechanized world, reduced to completing repetitive tasks at ever increasing rates. Educators react negatively even to the word, arguing quite validly that children's education is not an assembly line activity. However, "productivity" is in fact a neutral concept. Given the organization of work under mass production, productivity improvement inevitably took the form of Chaplin's film. As the organization of work in American companies changes to emphasize judgment and expertise even on the shop floor, improving productivity takes forms appropriate to enterprises such as teaching and learning.

Simply put, a measure of productivity tells us how effectively certain resources are used to produce certain outcomes. It is no more than the ratio of outcomes to inputs. In manufacturing, labor, energy, and steel might be resources, while the outcomes could be the number of automobiles produced. Productivity, then, would be measured by the number of cars produced by the labor, energy, and steel. Similarly, in the arts industry the resources might be the talent of the artist and the hours spent learning the craft, while the outcomes would be the quality of the musical performance or artistic work.

In education, productivity is the relationship between the student achievement that a school generates and the resources used. Resources include dollars and the inputs that they buy which affect student learning—the physical space, the quality of the preservice training that teachers bring to the system, the quality of teaching materials, or the amount of instructional time per year. Although it is more difficult to measure educational outcomes than manufacturing output, such as the number and quality of cars produced by an assembly line, learning assessments tell us what a student knows and can do after completing a certain level of education.

A more productive system is one that generates more output for any given amount of resources invested. Companies improve their productivity in several ways. They substitute cheaper but equally effective resources for more expensive ones. They switch to more effective resources that cost the same as less effective ones. They incorporate improved ways of using resources to produce better output—in other words, get more out of fixed resources. These factors include the quality of management, motivation and intensity of effort, the elimination of restrictive rules and regulations, technology that complements the skills of labor, and

better practices that produce more learning than alternative practices.

In education, any factor that affects the relationship between the resources used and the cognitive learning gained affects productivity. Productivity changes can include technological advances, such as the use of multimedia to teach mathematics; substitution of inputs with a higher rate of return (possibly teachers) for those with a lower rate of return (possibly administrators); a more intensive use of resources (using school buildings all year); increasing the amount of effort by staff and students by increasing the satisfaction that they derive from teaching and learning; focusing resources on student achievement rather than on ancillary activities; or increasing student homework, which could make classroom time and therefore teachers and other budgeted inputs more productive.

Has the System's Productivity Declined?

During the past 20 years, per-pupil spending has nearly doubled (rising from $2,985 per student in 1970 to $5,401 in 1990 in constant dollars), at the same time that the average test scores of students have remained stable. Although some observers have interpreted these trends as evidence of declining productivity in the provision of K-12 education, the Consortium reached a different conclusion. The growth in spending is partially attributable to cost pressures that affect all service sectors throughout the economy and by the allocation of increasing amounts of funds to meet the mandated needs of students with special needs. In addition, demands on the education system have grown as schools have had to serve an increasingly diverse student population. In fact, American education may well not have become any less productive over time.

> *"In fact, American education may well not have become any less productive over time."*

The key terms for estimating changes in educational productivity were changes in inputs, outputs, and the harshness of the environment in which educational outputs are being produced. In its most simplified terms, the Consortium defined the rate of growth in productivity as a function of: *the growth rate of output (learning) per student, minus the rate of growth of budgeted inputs, plus changes in the harshness of the environment.*[1] What

[1] The productivity of our education system cannot be directly observed. Hence, we must make inferences about it from information on learning outcomes, inputs, and the harshness of the environment. Starting from a model in which the rate of growth of student outcomes is decomposed into the rate of growth of productivity, inputs, and the harshness of the environment, we rearranged terms to obtain the following expression for the rate of change of productivity: $P' = O' - aI' + cE'$ where: prime (') = rates of change, P = productivity, O = learning outcomes, aI = budgeted inputs weighted by their contribution to learning outcomes, cE = environmental factors weighted by their impact on learning outcomes production

this tells us is that at the same level of system productivity and budgeted inputs, increases in environmental harshness will reduce learning; decreases in harshness will increase it.

Our assumptions raise two questions:

- Why did we include a measure of the harshness of the environment in the equation?
- Why did we not include a measure of student effort?

In terms of the first question, the Consortium recognized that the environment for learning is affected by factors beyond the school's control, such as the proportion of the students that come from disadvantaged households or the proportion requiring bilingual education. Schools that have above-average proportions of such children usually require more budgeted inputs, such as teachers, than the average school to produce comparable levels of learning. Put a different way, a deterioration in the environment reduces the amount of learning that occurs unless resources are increased to offset environmental factors that constrain learning.

Not taking the social environment into account biases assessments of school productivity. Any increase in resources used to offset social factors that inhibit learning will depress estimates of the productivity of schools unless a measure of environmental harshness lets us separate out this factor from the analysis. Schools can otherwise be criticized for declining or weak productivity when in fact the true culprits are factors largely outside the control of schools that make it more difficult to educate young people.

The other issue is why student effort is not treated as separate from the performance of schools. The Consortium concluded that student effort is a function of parental support of education and of how well the school structures the learning situation to stimulate student learning. The first component of student learning (the home) is largely out of the control of the school and is already captured in our measure of the harshness of the environment. The second is under the control of the school and can be expected to vary, depending on how productive the school is.

Using this formula, the Consortium analyzed how productively the education system has performed over time. Its analyses not only challenge the commonly held view that education is becoming less productive than before, but also challenge common assumptions about the learning outcomes generated by the system and the resources expended by K-12 education. While the Consortium could not exactly pinpoint the behavior of each factor that generates the results of the system over the last 20 years, the evidence suggests the following:

■ **Since the mid-1970s student performance as measured by test scores has not declined, but has remained stable.**

The commonly held but inaccurate belief that today's students are learning less than students of previous generations reflects the highly publicized decline in SAT scores. Such scores, however, are a misleading standard by which to judge overall educational trends. They provide information only about those high school students who plan to attend colleges and universities, and even within that segment of the student population they reflect socio-economic background as well as academic achievement. They are also influenced by whether or not a student has taken a test preparation course. More appropriate measures of student performance show change in average achievement for 9-, 13-, and 17-year-olds in writing, mathematics, reading, science, and civics over a two-decade period. Some gains in reading are offset by losses in science achievement; mathematics and writing show virtually no change. Improvements in basic skills are counterbalanced by declines in the proportion of students who can demonstrate effective reasoning skills. Overall, however, the record of average achievement in these time series measures is one of stability. At the same time, across the two decades specific subgroups (Blacks and Hispanics) improved their performances at particular ages in particular subjects (Mullis, Owen, and Phillips, 1990).

While American schools are not performing as well as they should, the Consortium believes that *the problem is not low quality compared with the performance of the past, but inadequate quality to meet the needs of the 21st Century.* During the industrial era that lasted for most of this century, a young person could drop out of school and still obtain a low-paying but decent job and earn an adequate living. Those who graduated from high school possessed the knowledge and skills necessary to get a factory or other job and work for an entire lifetime without further education. The economy required that only a minority of workers be able to handle abstract thinking skills and engage in some continuous learning throughout their careers. In today's post-industrial (or "information" or "learning" society) the bars have been raised. Jobs with living wages for high school dropouts have all but disappeared, and jobs that in the past could be performed with rote skills now require knowledge of

"Since the mid-1970s student performance as measured by test scores has not declined, but has remained stable."

mathematics, computer expertise, and other higher order thinking skills. Moreover, workers must be prepared to continue to learn new things throughout their working careers. The consequences of these changes for schools are enormous. They mean that schools must now equip most students with the thinking and other skills that in the past were required for only a small minority of students.

■ **Real per-pupil costs for K-12 education have increased, but not by as much as most people think. The increase has been greatly influenced by rising costs for special education.**

The common belief that more money is going into education is correct; the average per-pupil spending has increased significantly during the past 20 years. Even after adjusting for changes in prices as measured by the Consumer Price Index (CPI), total per-pupil spending between 1974 and 1993 increased by over 64 percent. However, this large percentage increase significantly overstates the increase in resources. For a true picture of the resources available to the typical student, one must use more appropriate adjustments for inflation than the CPI and examine the fiscal impact of the increase in special education students during the period.

Using the Consumer Price Index, or CPI, to adjust for inflation appears to overstate the increase in real spending on education. The CPI correctly indicates the inflation-adjusted impact of additional education spending on the ability of consumers to buy a general basket of goods and services. A more relevant measure of the real increase in education spending should use an index for the prices of the inputs used in K-12 education, not consumer goods in general. Such a price index is available only for the period 1975-1991. It shows that during this 16-year period, the price of inputs into education increased at a significantly faster rate than consumer prices in general. When this more appropriate deflator is used, the rate of increase in real spending falls to 31 percent for this period, substantially less than the 50 percent increase for the same period when the CPI is used.

The second factor influencing real spending in education is the influence of special education spending on overall expenditures. Costs of special education account for some of the increase in per-pupil expenditures during the period. The introduction of the 1975 Education for All Handicapped Children law has meant that roughly ten percent of all students receive more than twice as much in per-pupil funding as other students.

A 1988 study showed that it costs 2.3 times more on average to teach special education students, who are

legally entitled to such instruction, than it does to educate regular students (Moore, 1988). In 1994, the average special education student cost New York City $18,705—2.9 times the $6,500 cost for the average regular student (*New York Times*, June 27, 1994, p.B3). Thus, some of the measured increase in average per-pupil spending is targeted at special education children, with little or no benefit for the great majority of students who are not in special education.

Using the index of K-12 prices instead of the CPI and adjusting for the impact of special education, the Consortium arrives at a much lower increase in per-pupil spending. Since data on special education costs are available only for the 1978-86 period, Table 1.1 (below) is included simply to show the cumulative effects of general inflation, inflation of the prices of inputs specific to K-12, and special education costs on estimates of real increases in costs. Between 1978 and 1986, per-pupil spending increased by 107.5 percent, unadjusted for inflation. Adjusting for general inflation reduces this increase to 19.4 percent, and using the deflator more appropriate to K-12 inputs further reduces the percent increase to 12.1 percent. When the costs of special education students are excluded, the increase in per-pupil spending becomes 8.1 percent.

■ **Over time the environment in which schools are teaching and students are learning has become less conducive to learning.**

The U.S. student population is increasingly minority, disadvantaged, non-English speaking, living in broken homes, and subject to violence in the community and in school. These negative environmental factors

TABLE 1.1: PERCENT INCREASES IN PER-PUPIL EDUCATION COSTS (1978-1986)

UNADJUSTED FOR INFLATION (FALL ENROLLMENT)	107.5%
ADJUSTED FOR INFLATION USING THE CONSUMER PRICE INDEX (CPI)	19.4%
ADJUSTED WITH A MORE APPROPRIATE EDUCATION COST INDEX (DEFLATED BY EDUCATION DEFLATOR, NO ADJUSTMENT FOR SPECIAL EDUCATION STUDENTS)	12.1%
ADJUSTED WITH THE EDUCATION COST INDEX AND WITH SPECIAL EDUCATION STUDENTS EXCLUDED	8.1%

SOURCE: *Helen Ladd, memorandum 1994.*

"Changing the way education is delivered to increase its productivity is directly within the control of policymakers and educators and is our one best hope for increasing student learning across the system."

exceed positive changes in the environment, such as the increasing percent of children attending preschool, a rise in the education level of the average parent, and a decline in the use of drugs.

Taking into consideration these three factors—student performance, real expenditures for the average pupil, and the social factors external to the school that influence learning—the Consortium concludes that productivity in education has held steady over the past 20 years, not declined. In fact, if the Consortium were to have predicted current student performance levels one or two decades ago, based on current demographics, increased poverty of the school population, and current resources, we might have predicted school and student performance that is worse than it is now. However, student learning as measured by test scores is holding steady and even rising in some subjects for some students.

Regardless of how one interprets the recent past, the Consortium argues that schools have to become more productive in the future. At least two of the variables that have a direct bearing on educational outcomes—the harshness of the environment and real spending available to the typical student—may be difficult to control. Unfortunately, educators can do little about sociological factors that make schools more dangerous and students more vulnerable and less able to focus on learning. Similarly, with taxpayers in open revolt and reluctant to increase support for schools or other purposes, it is hard to imagine spending increasing noticeably for education, especially if taxpayers are cynical about the quality of our schools.

However, changing the way education is delivered to increase its productivity is directly within the control of policymakers and educators and is our one best hope for increasing student learning across the system. **The nation's need for an educated labor force in the 21st Century cannot be met unless the institution on which we depend to educate us finds ways to increase its productivity.**

Productivity Lessons from Other Fields

The Consortium examined how other industries and sectors have improved their productivity to see how K-12 education can yield a greater return on investment.

Placing a Priority on Productivity

Industries successful in raising productivity place a priority on improving relationships between quantities and types of resources and results. For example, they have redesigned their internal processes to make more effective use of fixed resources.

Historically, educators and policymakers have not used a productivity framework for improving education. They have attended sometimes to quantities of resources, sometimes to how resources are used, and sometimes to outcomes, but separately rather in relation to each other. *Productivity can improve only if the analytic framework that guides decisions relates 1 resources, to 2 how resources are used, to 3 outcomes.*

In the 1970s, policymakers concentrated on quantities of resources, especially in the context of school finance cases that brought to light huge disparities in per-pupil spending across school districts. In the early 1980s, spurred by *A Nation at Risk*, policy attention shifted to inputs, such as the number of school days, that might plausibly affect outcomes. Educators also began to look at how time was used, in terms of student course-taking patterns and requirements. However, initially these reform ideas were not well connected to outcomes. During the late 1980s and 1990s the policy focus shifted to outcomes, partly as a result of comparisons of the educational achievements of American students with those of their counterparts in the other industrialized countries. The effort to set goals and standards for the system represented a response to American students' relatively low performance.

> *"Contrary to popular beliefs, the United States provides more annual instructional hours at the primary level than most other industrialized countries..."*

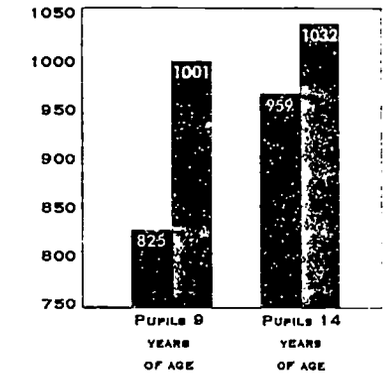
Had actors in the educational system focused on the relationships between educational inputs and outcomes—i.e., on productivity—they probably would have found input-outcome patterns that would have allowed a more effective response to the lower performance of American students in international comparisons. One of the best and well-known predictors of learning is time-on-task, a function of the number of classroom hours used in learning and hours spent on homework. The number of hours available for instruction per day or year is usually a fixed resource that can be used more or less effectively.

Contrary to popular beliefs, the United States provides more annual instructional hours at the primary level than most other industrialized countries for which we have data. We have fewer school days per year than several

countries, but each school day is longer, resulting in more instructional hours per year. Of 15 countries, including France, Germany, and Switzerland, the United States is second only to the Netherlands in the number of annual instructional hours (1001 versus 1019 hours), the average annual instructional hours for the 15 countries being 825. At the high school level, all countries increase their instructional hours, the United States by less than some other countries. At this level the United States is fifth out of 14 countries, providing an average instructional year of 1032 hours versus the average of 959 hours for all 14 countries (Table P12, p.168, *Education at a Glance: OECD Indicators*, Paris: Organization for Economic Co-operation and Development, 1995).

Given more instructional hours per year than many countries, the United States does not seem to be getting as much learning of the foundation subjects out of these hours as these other countries. The performance of American students often declines relative to their counterparts in other countries as they move through the grades. For example, in 1991 American nine-year-olds scored ninth in mathematics out of ten countries; 13-year-old Americans tied for last out of the same ten countries, and the gap between the average U.S. performance and that of the other nine countries was greater for the 13- than for the nine-year-olds. In other words, the value added of each additional year of education between ages nine and 13 was less than in comparison countries (U.S. Department of Education, 1993a, pp.50, 227-228, and 232-233).

FIGURE 1.1: NUMBER OF HOURS OF INSTRUCTION PER YEAR



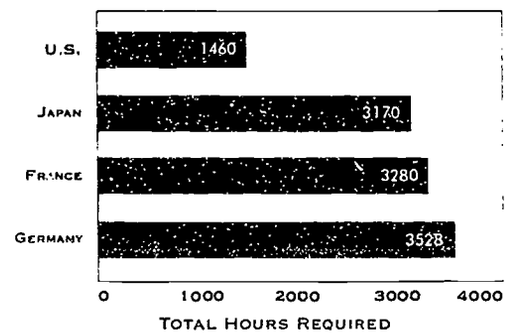
SOURCE: *OECD, Education At a Glance, Table P12, pp 168*

What is going on? There are several plausible explanations for these facts. However, a strong candidate is the cumulative effect over the grades of a less effective use of the school day and a less effective use of student time outside of school than other industrialized nations.

■ The National Education Commission on Time and Learning identified the standard school schedule of 51-minute periods as a basic

"design flaw" in our education system. Under the usual schedule, students rush from math class to physical education to history. Teachers are expected to reduce complex subjects into short blocks of time, sandwiched between driver's education and lunch. Those who need extra time to master subjects do not get it; those who do not need the time that is available find themselves bored and losing interest as the day wears on.

FIGURE 1.2: THE FINAL FOUR YEARS IN FOUR NATIONS' ESTIMATED REQUIRED CORE ACADEMIC TIME



SOURCE: *National Education Commission on Time and Learning*, 1994

- American schools typically teach too many subjects that stray too far from their central focus of developing knowledge and skills in the foundation subjects. Compared to schools in Japan, France, and Germany, American schools spend a much smaller percent of school time on *academic learning*. The graph above (Figure 1.2) shows that students in these other countries receive more than double the number of academic instructional hours as American students for the final four years of school. The Commission found that American students can receive a high school diploma even if they devote only 41 percent of their classroom time to academic subjects. During the 1980s, in response to concerns about American students' performance, policymakers seriously discussed adding days to the school year. However, in the absence of understanding *how instructional hours already purchased were being used*, this step would have added costs with only a diluted return in the form of more learning.
- The limited amount of homework required of students in most schools means that K-12 education fails to take advantage of two largely untapped resources—student effort and parent effort. As we see later, the cause of lower homework hours seems to be more the parents than the schools, in that many families have implicitly shifted almost all responsibility for educating their children to the schools. However, whatever the cause, among 13-year-olds in 19 countries, U.S. students had the second highest percentage who did no daily homework, had the seventh highest percentage who did only an hour of homework or less per day.

"Without a focus, our schools do more work and produce fewer results than they would otherwise accomplish."

and ranked fifteenth out of 19 in the percent who did two or more hours of homework per day. (U.S. Department of Education, 1993a, Table 46-4, pp. 356).

Clear Focus

Studies show that companies with a diffuse focus fail to raise productivity. Greater diversification reduces productivity; greater focus on core activities increases it (Lichtenberg, 1992). In the 1980s many U.S. companies produced a broad array of products under single corporate roofs, and profits declined. When they returned to their product basics, their productivity improved.

The analogy to education is obvious: schools have taken on more functions than they can carry out well. As Shanker (1993) says, schools have become "mushy all-purpose institutions" that lose sight of the basic purpose—academic instruction. Typical comprehensive high schools, for example, have diffuse missions defined by external funders and regulators. Staff have no overarching goal, being caught up in fragmented programs such as attendance outreach, parenting classes, ethnic music and art programs, drug prevention programs, AIDS education, and housing for homeless students. Some of these programs are worthwhile and perhaps even essential. Problems arise when these separate programs displace the overarching learning goals or are not articulated with them. Compared to schools with focused missions, schools with diffuse missions graduate a significantly smaller percent of students, and a smaller percent take the SAT, with lower average combined SAT scores (Hill, Foster, and Gendler, 1990).

This lack of focus on academics squanders the longer hours of instruction at our schools and further depresses their productivity. Without a focus, our schools do more work and produce fewer results than they would otherwise accomplish.

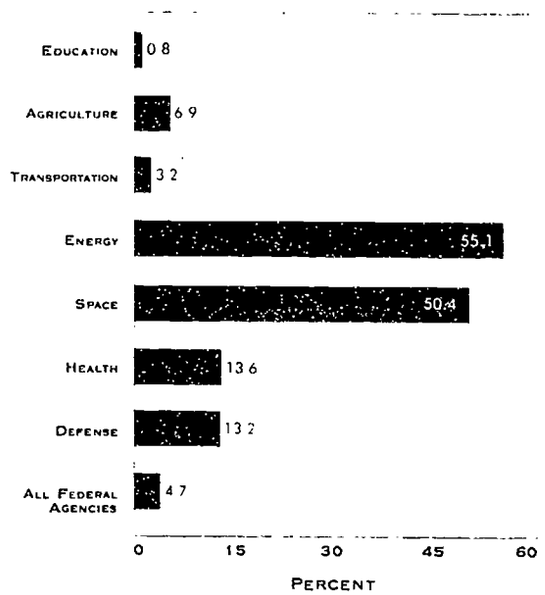
R&D Investments

A major source of productivity gains is developing better practices and improving existing ones. Although some of these improvements may occur by chance or emerge out of practitioners' daily activities, they are often the result of deliberate investments in research and development (R&D) and strategies for assessing the effectiveness of innovations. There is clear evidence that increased investments in R&D in the private sector result in productivity payoffs. In the global economy, countries supporting industrial R&D are moving ahead of those that are not.

Much of modern society is a direct result of research—from the development of jet engines and lifesaving medicines to computer technology.

In education, the incentives operate against local and even state investments in educational R&D. Although there are laws protecting intellectual property rights, such as books or ideas about better corporate management, these rights are much more difficult to protect than products backed by the patent law. In fact, publicly funded R&D is in the public domain—in other words, unprotected in that it is available to the public. Thus, the results of R&D funded by Massachusetts are available to the schools of Wisconsin. This situation is a classic example of what economists call the free-rider problem—in other words, parties who do not contribute to the production of the R&D get a "free ride" with regard to its results.

FIGURE 1.3: FEDERAL R&D IN SELECTED AREAS AS A PERCENTAGE OF TOTAL FEDERAL EXPENDITURES IN EACH AREA, 1990



SOURCE: *Atkinson and Jackson, Research and Education Reform, pp 102*

With major changes in the governance, management, and financing of the educational system, one can envision the emergence of private companies willing to invest in educational R&D because they can sell better practices to schools for a profit. However, for the foreseeable future, educational R&D is a common or public good, making the federal government the natural provider. And in fact, although the federal government is the primary funder of R&D in education, its investment is minuscule, amounting to only 0.08 percent of the sector's total recurrent and capital costs of $229.9 billion for 1990-91. In contrast, the federal government invests 13.2 percent in R&D for total national expenditures in defense, 13.6 percent of total federal expenditures in health, and 1.3 percent of total national expenditures in health. In the private sector the average R&D investment is three percent of total costs.

The federal government also invests heavily in disseminating best practice in agriculture through agricultural exten-

sion services and in medicine through the National Institutes of Health. But the educational equivalents—national centers and laboratories funded by the U.S. Department of Education's Office of Educational Research and Improvement—are grossly underfunded relative to their missions. While the tools of other professions have been extensively tested, in education it is the clients—students—who are tested, not the tools. (Carnine, 1994)

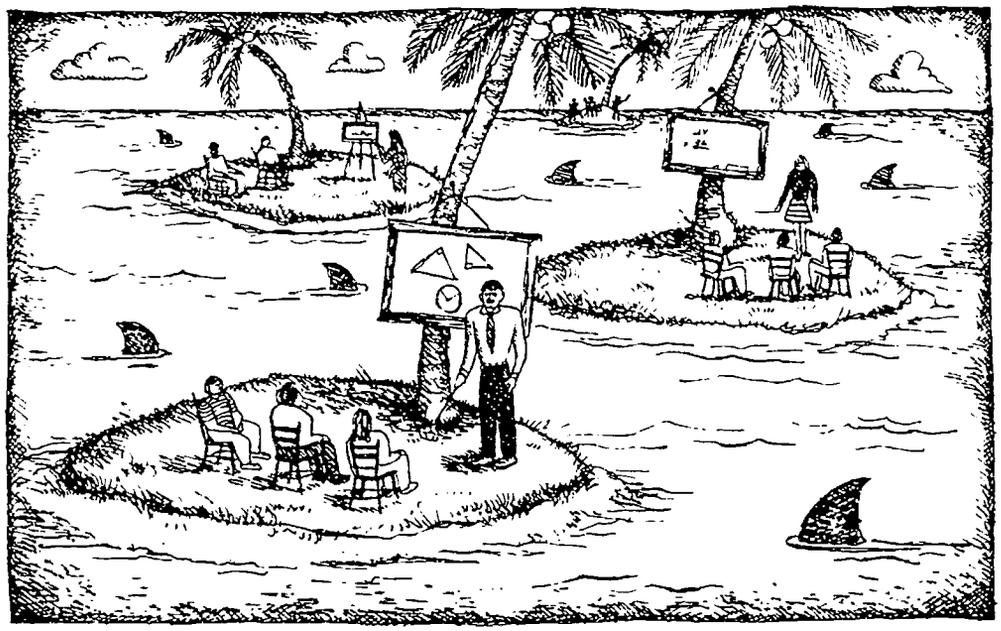
"Inadequate research for developing and using effective instructional tools and practices paralyzes genuine educational reform. A grocery shopper can find out more from a label on a box of cereal than an educator can about a set of educational tools —textbooks, activity guides, computer programs, films, etc.—that cost millions of dollars to develop and market. Science in the Public Interest made national news in June of '92 when it reported that packaged peach juice had more grape, apple and lemon juice in it than peach juice. Yet provisions do not exist to determine the safety and efficiency of the educational tools that are at the heart of our educational system. According to the Education Product Information Exchange, such tools are used from 75 percent to 90 percent of the 30 billion hours in which America's 40 million students are in school (Komoski, 1992)." (Carnine, 1994)

Incorporating Best Practice

Large productivity gains occur in industries when firms analyze the success of other companies and incorporate superior practices into their own production and management environments. Schools do not behave like firms, in that better practices usually fail to diffuse. Thus, many schools in the system are operating suboptimally and could improve their productivity simply by adopting available best practices.

Policymakers and reformers in education tend to believe in the theory of spontaneous diffusion: schools seek improved practice and thus will naturally find and adopt examples of better practice once these are visibly demonstrated. In the words of the movie *Field of Dreams*, "If you build it, they will come." This is the theory behind federal packaging and dissemination legislation, lighthouse schools, model schools, and experimental schools. Unfortunately, several empirical studies, beginning as far back as 1972, have discredited the theory. Demonstrated better practices do not automatically diffuse among K-12 schools.

Part of the problem is that schools do not look outside of themselves to learn best practices used by other schools, school districts, or industries. As we see later, the prevailing management of schools creates incentives for schools to look upward at the bureaucratic hierarchy rather than outward for improved practice.



In sum, when the education system is compared with other industries, its central problems all involve difficulties with *productivity-improving change*. The issue is not that individual teachers and schools do not innovate and change all the time. They do. The problem is with the kinds of changes that occur in the education system, their fragile quality, and their random and idiosyncratic nature. The changes that occur are not necessarily productivity-improving changes, in that they are often not well tested and tend to be at the margins of practice rather than at the core of teaching and learning. Change is often fragile, being unduly dependent on particularly gifted teachers and leaders and disappearing as these individuals leave or tire. And change is rarely industry-wide. In other words, the education system is reduced to fighting for improvement foxhole by foxhole, or school by school, because mechanisms for industry-wide improvement seem to be missing.

It is to solve these puzzles that we now turn to the next section.

PART II: A COMPLEX SYSTEM

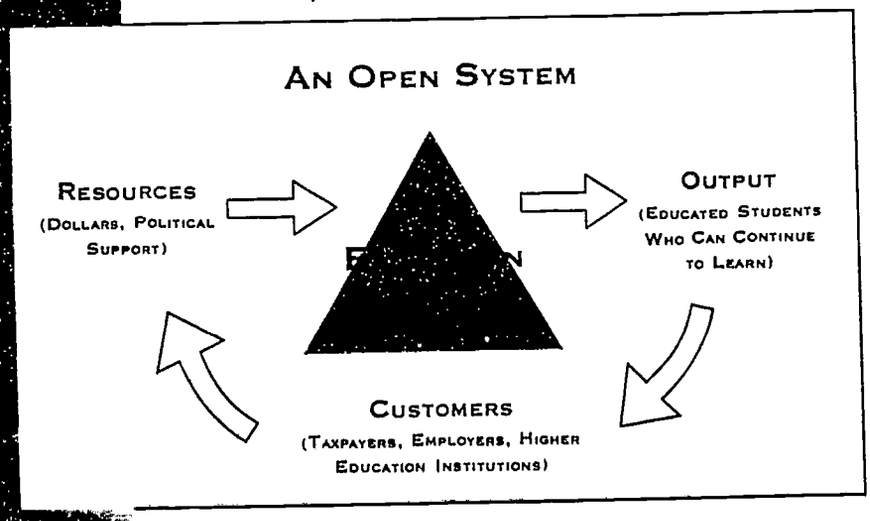
"...It is as though an artist were to gather the hands, feet, head, and other members for his images from diverse models, each part excellently drawn, but not related to a single body, and since they in no way match each other, the result would be a monster rather than a man."

-Copernicus in letter to Pope Paul III (1543)

Elementary/secondary education is a complex enterprise; it is governed at multiple levels with over 84,000 schools reporting to more than 15,000 districts that report to 50 states. It also is determined by the interactions of nearly 200,000 district administrators, over 120,000 principals, 2.5 million teachers, and 43 million students. It includes millions of school nurses, bus drivers, parents, volunteers, and paraprofessionals.

The behaviors of all those who are part of the system are deeply motivated by their goals and their perceptions of the institution's goals and by the intended and unintended incentives that reward and punish them for different actions. They also are influenced by the way the system is organized, the available knowledge base on how to improve student learning, and the way information flows from school to district and school to school. The education system is essentially an invisible web of basic relationships between people and functions that affects the behavior of everyone operating in schools.

All biological systems, such as human beings, and social systems, such as K-12 education, are open systems. This means that they depend on the external environment for their continued existence, in that they must obtain resources from the external environment to renew cycles of input, production, and output. In education the system takes in political and financial resources, uses them to create a unique product or service, and sends the results into the surrounding environment of communities, states, and the nation.



Recognizing that the education system is an open system has a particularly important implication. In open systems groups outside the system affect the system's survival and ability to change. Public education survives only as long as those who provide the resources that the system needs—taxpayers, legislators, school boards—find the product acceptable. It has been argued that publicly funded systems will change only if they, like private sector companies, are subject to competitive forces. In fact, both public monopolies and companies die if they do not satisfy those who provide those resources needed to continue. It takes longer for public monopolies than for companies to die, but public monopolies that do not satisfy those who finance them will not survive. The mechanisms by which those who provide resources register their rejection can also differ—for example, taxpayer revolts rather than just shifting to competitive brands, but customers of both public monopolies and private companies will ultimately find ways to force change.

The American Association of School Administrators points out that the first problem of systemic change is to find the system before you fix it: "In American education it's become cliche to blame 'the system' and demand *systemic change*, yet there is little agreement as to what the system actually looks like. Some even question whether or not there is a system. Yet, there is a system there. People who work in schools increasingly sense that 'everything-seems-connected-to-everything-else' — that their work settings are made up of parts that influence one another..."

Functions of the Education System

The system itself—the area within the triangle of the last chart—is comprised of many parts that interact. The continuous process of taking in resources, creating the unique educational product of student learning, and sending that product into the larger society is carried out by subsystems. Each of these subsystems performs a special function. Together they determine the output of the educational system as a whole, that is, the quality and quantity of student learning.

The Consortium conceptualized the education system as consisting of eight subsystems that should perform the following functions:

- **The governance subsystem** sets goals and accountability standards for the education system;
- **The management subsystem** aligns resources, subsystems, and organizations to meet the goals of the system's governors; spends resources and monitors their expenditure; measures system performance to determine if it is meeting the stakeholders' needs, wants, and expecta-

tions; and resolves conflicts between hierarchical levels;

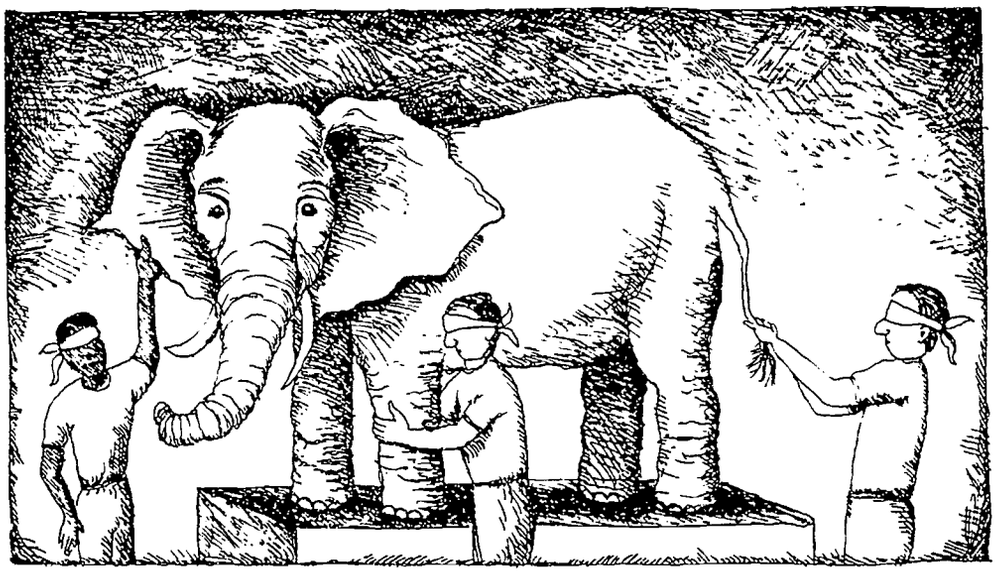
- **The financing subsystem** allocates resources and provides incentives for the subsystems to align their activities around the meeting of the priorities for the system;
- **The teaching and learning subsystem** delivers the service that defines the sector's unique place in society;
- **The adaptative and innovative subsystem** counteracts tendencies of the other subsystems to persist rather than change; measures performances of subsystems and the system as a whole; scans the environment for changes in customer needs; ensures essential R&D; and fosters and diffuses productivity-enhancing innovations;
- **The hiring and purchasing subsystem** obtains from the environment the human and physical assets needed to produce learning;
- **The outplacement subsystem** ensures that external customers—such as colleges, employers, and the public—accept the schools' graduates and trust that the school system has provided these graduates with the necessary knowledge and skills; and
- **The maintenance subsystem**, including personnel operations, building and vehicle maintenance units, and accounting services, provides the internal support that keeps the system running.

Each of these functions, discussed at length in Part III, is not an isolated or disconnected activity. Each is a crucial part of the whole system, whose results are a joint product of how well each of its functions are performed.

The Whole Elephant

Understanding that education is a system has a major implication. Systems have integrity, and reforming subparts of systems without understanding their larger context risks failure. The history of reform in education is largely a history of mistaking parts of the K-12 education system for the whole. Educators, policymakers and the public have usually attributed all problems to whatever piece they happen to know, championing solutions that address only part of the problem, and becoming disappointed by the limited leverage that their solutions turn out to have.

The Sufi tale of the three blind men and the elephant describes the usual pattern of educational reform. The first blind man felt the ear, exclaiming, "It is a rough thing, wide and broad, like a rug." The second blind man, holding the tail said, "No, it is a rope." The third blind man, touching a front leg, argued, "I have the true facts. It is mighty and firm, like a pillar."



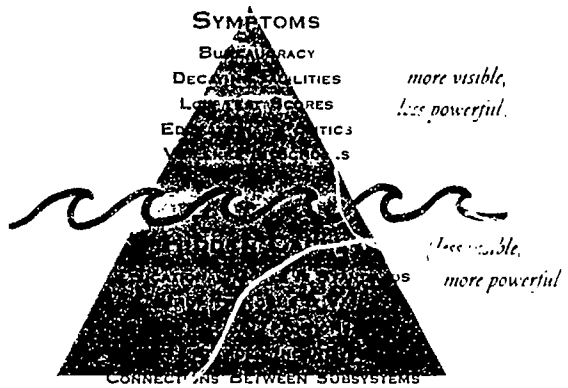
As Senge says in *The Fifth Discipline*, dividing an elephant in half does not produce two small elephants; it produces a mess. Leverage for change lies in interactions between all parts of the system and that cannot be seen from looking only at the piece in one's hands. For this reason, **any reform that tackles only a piece of the problem will fail.**

For decades many good ideas have foundered because they addressed only part of the complete system. Site-based management, for example, can initially increase teacher engagement and motivation, but research is showing that other conditions have to be in place for this reform to realize its potential. In the absence of effective governance, destructive politics at the district level can—and often do—simply shift to the school level. Although site-based management gives teachers the autonomy to innovate, they have not automatically blossomed with innovative ideas that had been thought to be suppressed by the old system. For example, when Austin, Texas schools were given complete authority over their budgets, only three schools out of 16 tried anything new in the area of teaching and learning (Murnane, 1995). What is becoming apparent is that teachers often lack knowledge of the educational practices that might improve their school's performance and that the supply of productivity-enhancing ideas is meager and usually untested.

The Iceberg and Unseen Forces

Social systems are like icebergs. The part above the surface is easily visible but much less powerful in defining the whole than the part below

The Iceberg Effect



the surface. The education system is no exception. The easily observed parts of the system, such as school facilities, outcomes measured by test scores, the hierarchies of the bureaucracy's reporting relationships, and school violence, are less powerful in defining how the system operates. The real drivers of the system's behaviors—its "root causes"—are less visible: hidden goals, community values and standards, the community's political culture, teacher traditions and norms, student values and beliefs, and implicit incentives such as performance standards.

Inevitably, it is the parts above the surface that tend to draw the most attention and that are the focus of most efforts to improve schools. Getting real leverage on the system requires looking beneath the surface of what the education system appears to be to understand the root causes of its behaviors.

Senge (1990) shows how "seeing" systems in particular ways helps to see beneath the surface.

- **Structure influences behavior.** In all organizations, not just those in education, when performance fails to meet expectations, the tendency is to blame someone or something—either external forces or individuals' mistakes. However, systems cause their own crises. The best work in the social sciences on institutional change—institutional economics, organization theory, political science, sociology, social psychology, and systems analysis—shows that actors behave in accord with their perceptions of the institution's goals; constraints that they face, whether in the form of power, information, or skill; and intended and unintended incentives that reward and punish them for different actions. In short, they behave in accord with the framework constructed around them.

  This explains why we find behavioral similarities across industries for people who have the same responsibilities.

- **The interrelationships between people in the system control the behavior of the system.** These relationships are the "operating policies" that people use to translate perceptions, goals, rules, and norms into

"In education as in other fields, change does not necessarily mean improvement. Determining if change is positive requires ways of checking performance."

action. Those who are part of the system talk about these rules and norms as "the ways we do things here." These "operating policies" can impede improvements as when people see themselves as relatively powerless or threatened, which can cause them to interact competitively. Changes in these "policies" can spark dramatic change. Because people are part of the structure, they also have the power to alter the structure.

- **Leverage comes from new ways of thinking.** Problems within the system and hopes for improvement are tied to how those inside and outside of education think about the system. Understanding the structures that cause a system's behaviors simultaneously reveals the real power to change its behaviors.

These ideas helped the Consortium understand why system behaviors stay the same and how they might be changed. They offered insights into how people who shift responsibility for failures onto others, continuing actions they know to be ineffectual, can be mobilized to alter the system.

Creating Improvement: Effective Feedback and the Dynamics of Change

In education as in other fields, change does not necessarily mean improvement. Determining if change is positive requires ways of checking performance.

Effective feedback

Educators and policymakers need mechanisms to monitor the course of change. These mechanisms, sometimes called corrective feedback loops, operate like heating and cooling thermostats. A goal is set—70 degrees for a thermostat or a rank of first for American students in international achievement assessments of mathematics. Measures are used to determine current performance—sensors for a thermostat or mathematics tests for students. If a gap is detected between the goal and current performance, corrective action is taken—the air conditioning switches off or more instructional time per week is devoted to mathematics. Gradually performance improves—the room gets warmer or test scores slowly move up.

If efforts to close a gap between mathematics achievement goals and students' mathematics performance fail, we know that these efforts have run up against forces that keep pulling the system back to its stable state. Resistance to change is neither capricious nor

mysterious. It almost always arises from threats to traditional ways of doing things. The leverage for change in a system lies in intervening at the point of these implicit norms and goals.

Change dynamics

Educators and policymakers need ways of "seeing" how different parts of the system are interacting. Are the parts interacting to pull the system downward in vicious circles or to generate continuous improvement?

Vicious circles. Not all change is good. Changes introduced in the name of reform may actually conspire to lower school and student performance. School districts reinforce poor performance, for example, when untested fads are imposed on the schools without adequate study and training. Nobody benefits from the reform, which will likely be abandoned in a few years for a lack of results. These failures erode the public's performance expectations for the system, eventually eroding the political and financial support necessary to the system's survival. Failures also increase the natural conservatism of teachers, making the next change more difficult to implement. Like all workers responsible for creating their industry's basic product, teachers are properly wary of change. It is turbulent, and it interferes with "getting the job done," which is how teachers are asked to define their jobs and are judged. Using merit pay for individual teachers as an incentive also has negative effects. It creates rivalry among teachers who need to be encouraged to share ideas about improving student learning rather than competing and hiding successful strategies.

The Consortium found a number of examples of downward spirals in the system. For example, low quality standards for educational R&D help reduce demand for R&D by teachers, and low demand reduces supply of R&D. A number of factors combine to diminish the capacity of schools to change. These factors explain the puzzling observation that the frequent changes in the education system do not alter the fundamental way that teaching and learning take place.

"School districts reinforce poor performance, for example, when untested fads are imposed on the schools without adequate study and training."

Continuous Improvement. Changes can reinforce each other and build, like compound interest, to produce continuous change in a positive direction. A simple example of a virtuous circle occurs when teachers give students positive attention for good work. This

"...education lacks incentives to develop better practices, accepted ways to discriminate between effective and ineffective innovations, or the mechanisms for bringing them to scale."

motivates students to work harder and to perform better, which triggers more praise, and so on.

Comparing education and health care reveals how poorly the education system is structured to generate cumulative improvement. Although health care is no shining example of the equitable delivery of services, it does show how an industry has been able to steadily replace inferior practice with better practice. If we are sick, it is much better to be sick in 1995 than it would have been in 1900. In contrast, education lacks incentives to develop better practices, accepted ways to discriminate between effective and ineffective innovations, or the mechanisms for bringing them to scale.

Time Delays. Virtually all efforts to change a social system take time. Time delays are the elapsed time between an effort to produce a change and when the change occurs. A familiar biological delay occurs in the period between eating dinner and no longer feeling hungry. Another example is when one regulates the water temperature of a shower. If the water is too hot, the cold water is turned on, but it will take a short time for the effect to be felt. Time delays do not matter so much for short-term issues. However, they are very important in long-term activities, such as district-wide school reform. Failing to anticipate the time that it takes for change to be implemented and to influence other parts of the system results in "overshooting" the goal, premature termination of the effort, and other inappropriate responses.

Indicators of Productive Education Systems

The basic problem with the U.S. education system appears to be its very limited capacity to continuously improve its productivity. The literature on productivity, social organizations, systems analysis, and education systems here and abroad gave the Consortium initial entry into this problem. Using the concepts and insights of this literature to solve the productivity puzzle was hard work and often frustrating. However, six "signals" or indicators of an education system that is productive emerged from the work. These indicators are used explicitly and implicitly to structure the subsequent analysis.

Focus

Actors in a productive system set a very limited number of fundamental goals that are stable long enough to achieve them. A limited number of goals *focuses* the efforts of the actors in the system.

Alignment

Actors in a productive system align or organize all of the system's functions around the achievement of the goals.

Internal Adaptation

Actors in a productive system routinely establish standards for and measure the performances of the major subsystems. They have corrective mechanisms in place, which are mobilized when performance gaps are detected.

External Adaptation

Actors in a productive system monitor not only how well they are achieving their own goals, but also what their customers—such as the business community or parents—want from the system. They use customer feedback to modify goals for the system.

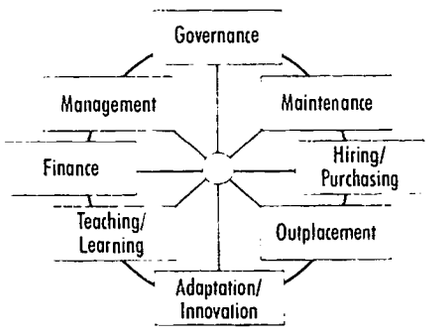
Incentives

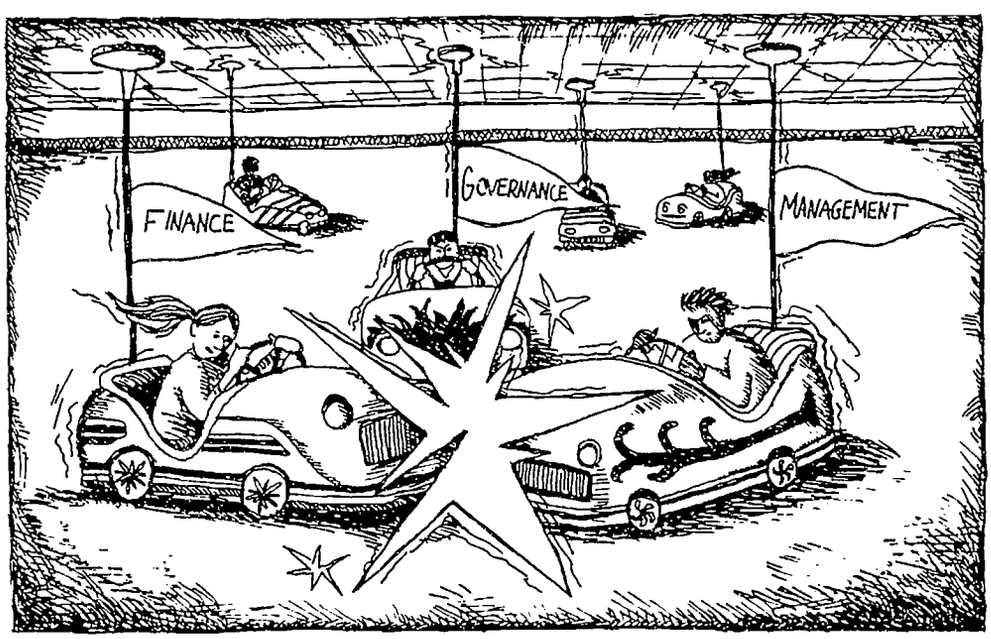
In a productive system, actors who design its incentives rely primarily on *intrinsic* incentives to motivate action. Intrinsic rewards are ones that emerge from the task activity itself. Well-designed work activities satisfy human needs for originality, learning, collaboration, role elaboration, initiative, the use of judgment and discretion, and self-determination. Relative to incentives that reward and punish, intrinsic incentives are more effective at altering the attitudes that underlie behaviors and at creating enduring commitment to a value or action. Productive systems rely less heavily on *legal compliance* to rules and regulations, incentives that derive their motive force from the fear of punishment, and *extrinsic* incentives, such as pay, promotion, and praise. These two forms of incentives are needed and useful. For example, safety regulations are important and must be enforced, and some jobs do not lend themselves as easily to intrinsic, as opposed to extrinsic, incentives. However, these two types of incentives create winners and losers and tend to secure temporary compliance rather than commitment. In educational systems, where what is being motivated is essentially an intellectual effort, intrinsic incentives acquire particular importance.

Continuous Improvement Processes

It is not enough for an organization just to meet its original goals. Improving productivity is not a job that is done just once. It requires continual re-examination and redirection of the system to meet new and higher goals. Benchmarking is one way to continuously improve. Benchmarking combines careful measurement of the organization's current performance with a search for practices elsewhere that generate better performance.

PART III: THE EDUCATION SUBSYSTEMS





The education system consists of eight interacting subsystems that sometimes operate against one another rather than in harmony. As the U.S. Department of Education noted in "Education Counts" (1991), "There is a) lack of agreement on a conceptual model of an optimally functioning education system....Agreeing on a set of measures to describe the health of the education system requires broad consensus on how the various pieces of the system fit together. That consensus is elusive and certainly does not exist at present."

This section provides much of the technical information underlying the Consortium's analysis of how to improve the productivity of education. It defines the roles of each of the subsystems and problems in these areas that affect the productivity of the system as a whole.

These subsystems include the following:

- Hiring and purchasing, teaching and learning, and outplacement encompass the basic workflow;
- The maintenance subsystem provides the internal services that let the system continue this process;
- The adaptive and innovative subsystem encompasses ways in which the process can be improved or must be changed in response to changes in external requirements;
- The governance, management, and finance subsystems steer the system and set accountability standards for it, ensure that the system meets these standards, and assure its solvency. Not surprisingly, failure in these subsystems almost always causes system-wide problems.

These subsystems are functions, not particular work units or organizational locations within the system. For example, the governance function is carried out by school boards, legislatures, and the Congress. It is not restricted to any one level of government or organizational location. Similarly, the maintenance function is not just custodial services—it refers to all the functions that get students to and from school (transport departments); get bills paid (accounting departments); hire, fire, pay, and promote teachers and staff (personnel departments); and generally keep the system working.

FIGURE 3.1: RELATIONSHIPS BETWEEN SYSTEM FUNCTIONS

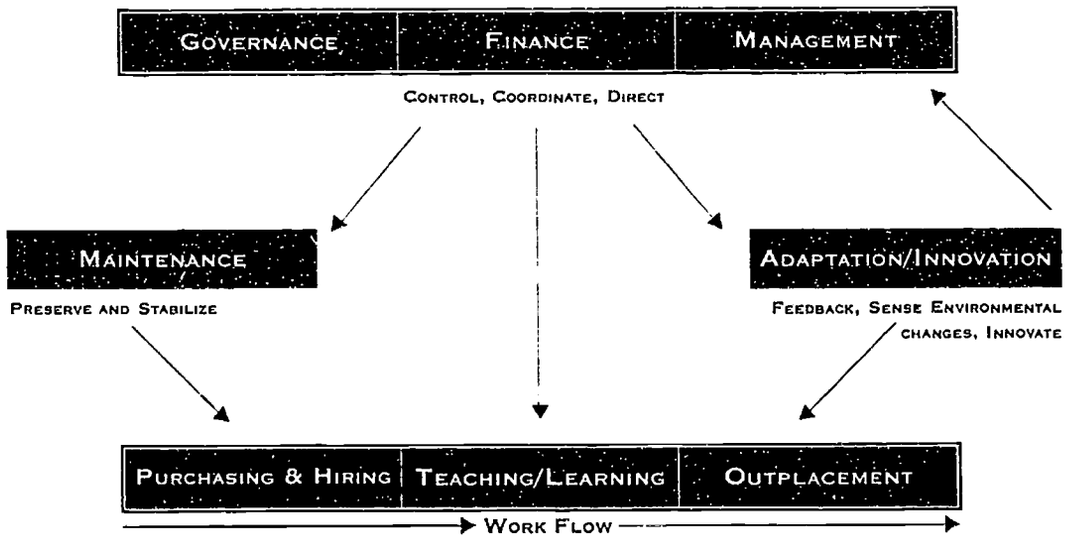
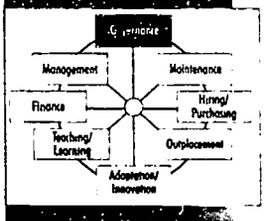


Table 3.1. The Roles of the Subsystems In Creating a Productive Education System

Subsystems	Indicators of a Productive Education System					
	Focus	Alignment	Internal Adaptation	External Adaptation	Continuous Improve-ment	Incentives
Governance	☆					✓
Management		☆				✓
Financing						☆
Teaching & Learning	✓				☆	✓
Outplacement				☆		
Adaptation & Innovation			☆	✓	☆	
Hiring & Purchasing		✓			✓	
Maintenance		✓	✓			✓

Key: ☆ = primary function for the subsystem ✓ = ancillary function for the subsystem

The Consortium examined each of the eight subsystems to determine their focus and alignment, how well they monitor performance and can adapt, and their capacity for continuous improvement. Table 3.1 summarizes which subsystems are responsible for crucial areas of performance required to raise the productivity of the education system.



Governance

Governance is about effectiveness: ensuring that the organization or system is doing the right job. In the public sector governance (legislative) bodies, such as local school boards or the education subcommittees of the U.S. Congress, are responsible for steering the system—setting goals, establishing the basis for its accountability—setting performance standards, resolving goal conflicts among constituents, and raising and allocating resources.

The American system of educational governance is unique among industrialized countries, in that we have no centralized ministry of education or core national curriculum reinforced by a national examination system. Since the U.S. Constitution is silent about education, the legal obligation to provide public education falls to the states, which in practice delegate the responsibility to the 2.7 million members of locally elected school boards. Thus, all three levels—federal, state, and local—retain a role in school

"The United States has less an education system than a political system that purports to provide education."

governance. Each level must set goals and quality standards, resolve conflicts among constituents and among themselves, and raise and allocate resources.

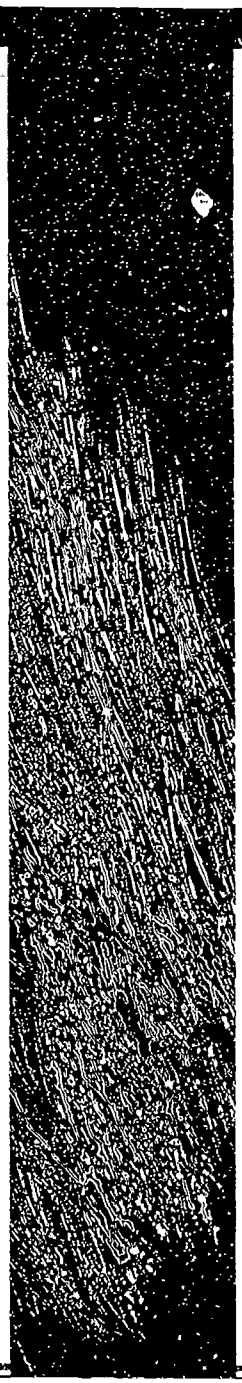
The United States has less an education system than a political system that purports to provide education. Politics, understood as the process by which we reconcile public differences in interests, preferences, and values, is proper in the public sector. In all countries the politics surrounding education are greater than in most other public sectors because of education's three main functions: socialization of the child to the community and the nation state, development of the skills required for economically productive activity, and the allocation of opportunity. Thus, discussions of schooling involve people's dreams for their children and their concepts of civic duty and the harmonious society. Inevitably education becomes a magnet for wider social issues, such as the prevention of crime and the enhancement of ethnic pride.

Health is another sector deeply involving people's dreams and hopes, and political battles are fought over its costs and R&D priorities. But there are limits. Political conflicts do not affect the technical practice of medicine as much as they do the practice of teaching. In part, this is because the technical base is much less well developed in education than in health. Accordingly, in education technical expertise poses a weaker barrier to the involvement of interested parties and technical criteria a weaker filter for the relevance of issues that are raised (Hannaway, 1993). Another reason is that the health sector has more quality assessment mechanisms than the education sector, allowing patients to rely more on mechanisms such as medical training, licensing, board certification, the Federal Food and Drug Administration, and, in

What Do Effective Goals Look Like?

Effective goals are:

- very limited in number (no more than five and preferably fewer) to enable focus and alignment of all subsystems around their achievement. Multiple goals dissipate focus and prevent the amassing of resources that a smaller number of goals allows and that achieving goals at high performance levels requires.
- stable and unchanged unless there is compelling evidence to alter the course.
- focused on the first mission of the sector, which is learning, not social welfare. As the Committee for Economic Development (1994) argues, social services may be placed in the schools, they may be delivered



flagrant cases, malpractice suits to protect their interests.

Education presents a different picture. School boards across the nation seem "awash in bitterness and contention as they wrestle with divisive political and social agendas" (Committee for Economic Development, 1994). In districts school boards, parent groups, teachers unions, principals, and administrators often organize around "narrow interests, competing to influence policy and trying to deflect initiatives adverse to their own special interests... in a perpetual tug-of-war over the issues" (Public Agenda Foundation, 1993, p.1). Even active parents, who might be expected to try to protect the students' interests, end up navigating their own children through the system, agitating and pressuring until a specific problem affecting their child is resolved and then leaving the field. The superintendent of one district described his district as a "giant dysfunctional family," and a businessman compared the superintendent's task of reconciling competing interests to trying to get a Middle East peace agreement (Public Agenda Foundation, 1994). In these "politics of hyper-pluralism," it is not surprising to find high turnover rates for superintendents: they average less than six years on the job, and big-city superintendents average 2.3 years.

This ugly picture shows the roots of many problems in the system. *The system's governors change goals and multiply goals to an extent that disables the system's accountability mechanisms.*

Goals Are Unstable

The political process behind goal instability is power instability. Parties with the greatest power at the moment own the school agenda and pull it in their direction. An example is the takeover of school boards by the extremist groups, who try to bring schooling, such as curricula and textbooks, into conformity with their values. As power shifts, the new owners of the agenda tug the schools in a different direction. *In fact, what may be called "school*

through the schools, but they should not be made the responsibility of the schools.

- focused on the outcomes of the sector, not on the means to achieve outcomes. If goals should remain stable, means should remain flexible, allowing educators to respond to local conditions in meeting core learning objectives. Confusing ends and means also encourages goal proliferation.
- translated into clear performance standards around which teaching and learning can be organized. These standards can be measured so that progress in achieving them can be monitored and creditably interpreted.
- understood and accepted as legitimate by all parties key to the achievement of the goals.

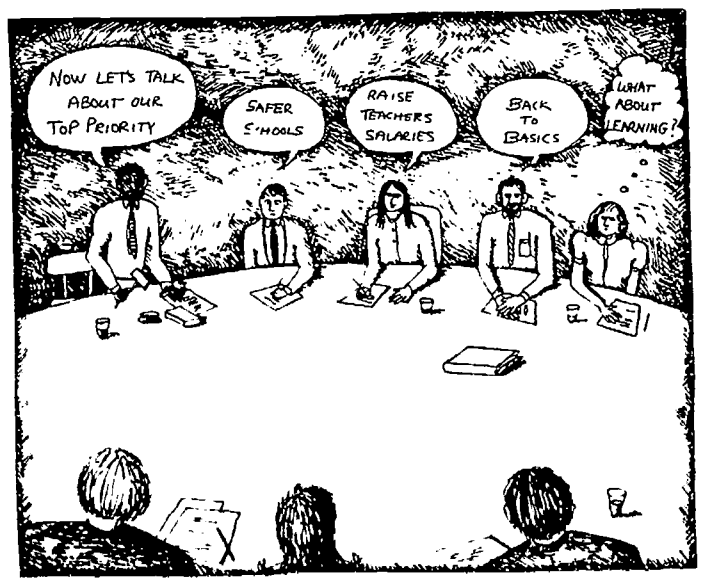
reform" often simply signals a shift in power. As the centers of power have multiplied in the society, this process throws education into constant, destabilizing turbulence, which exacts a very high price.

The basic price of goal instability is that it disables the system's basic accountability mechanism. It undermines the system's ability to monitor performance relative to goals or to take corrective action to close gaps between desired and actual performance. Implementing new goals takes time. When goals are a moving target, one is never sure whether changes in the system address new priorities or are the result of implementing old goals. Without appropriate diagnostic information, any corrective action taken will have questionable relevance.

Unstable goals exact other costs. Unstable goals result in a continuous sense of failure and cynicism, because goals change too rapidly for people to be able to achieve them, no matter how hard they try. The high turnover rate of superintendents stems in part from the political cross-fires that generate unstable goals. They also reduce the returns on investments to achieve goals because the value of the investment is rarely realized before the incompletely implemented program is replaced with a new one.

Goals Multiply

The same political process that produces unstable goals also produces multiple goals or "goal loading." Here political conflict over goals is handled not by *shifting* goals, but by *multiplying* them. To quiet "squeaky wheels" in the political process, a district, state, or federal government will add regulations, new goals, categorical programs, and mandates. As the Committee for Economic Development (1994) has pointed out, policymakers at all levels of government have shifted the burden of resolving major national problems onto the schools, using them to implement expanding social and ideological agendas. Goals have to be achieved in what



are always limited resources and time. As goals multiply, those responsible for meeting them are forced to ignore some, vacillate between them, or rob Peter to pay Paul. The fact that, in comparison to other countries, American students have a relatively high number of formal instructional hours but a low number focused on academic subjects, is probably explained by attempts of schools to meet multiple non-academic as well as academic goals simultaneously, producing an infringement of non-academic activities on academic time.

Both unstable goals and multiplying goals diffuse focus, the first by changing focus rapidly in short periods of time and the latter by asking schools to respond to too many goals at a time. They also result in "flavor of the month" reform or "reform du jour." Research indicates that schools caught in constant reform turbulence pay significant costs in terms of students' annual learning gains (Kyle, 1993)[2]. They have no stable or limited objectives around which teachers and students can consolidate their teaching and learning efforts.

Since both unstable goals and multiple goals make it impossible to achieve any goal well, they fuel a vicious circle of declining customer expectations for the system (goal erosion), thus endangering the political and financial support that the system needs to survive. In undermining the schools' ability to meet goals, goal instability and goal loading ultimately lower the expectations that actors external to the system have for schools and the performance standards to which they hold them accountable. When actors never see success because goals are moving targets or there are too many goals to achieve, they begin to lower expectations. People ask increasingly less of the system. An example of goal erosion is least common denominator standards for the system. These reflect not only political compromises, but a "giving up" on getting much more out of the system. The steady downward spiral leading to lower and lower expectations (goal erosion) particularly damages the financial and political support that the system needs to persist.

The failure of the system's governors to build a stable consensus around a limited set of goals, thus taming otherwise lethal political conflicts, reflects Americans' deep ambivalence about government. The nation simultaneously wants government to solve its problems and does not trust it. Thus, we design our governance structures to prevent a concentration of power, in the process making leadership difficult to exercise. We have what we apparently

[2] Kyle (1993) compares the annual, average learning gains for students in three types of schools: (1) those engaged in systemic reform for the previous 3-5 years; (2) those engaged in multiple and transient reforms for the previous 3-5 years; and (3) "business as usual" schools that claim no reform efforts. Type 1 schools had four times the annual learning gains of the type 2 schools; type 3 schools had twice the annual learning gains of the type 2 schools.

> *"...we have a governance system that deliberately and intentionally diffuses and confuses responsibility. Being responsible for everything and to everybody, the governance system, in practice, becomes responsible for nothing."*

want: a governance system that is not focused on working to make the schools better, but on processing conflicting demands from different groups and creating attractive nuisances on which groups can focus their energies and resources. In other words, we have a governance system that deliberately and intentionally diffuses and confuses responsibility. Being responsible for everything and to everybody, the governance system, in practice, becomes responsible for nothing.

These political conflicts have become worse as the country has changed. Earlier in this century the nation absorbed newcomers by teaching them how to fit in, and the "common school" was part of this nationalizing process. State schools were a source of social cohesion, and their goals were defined by value-homogeneous power structures to which newer arrivals aspired. Today assimilation is often seen as a form of cultural coercion, and groups are encouraged to maintain some allegiance to their native cultures and languages. Whatever the merits of this position, it clearly multiplies the special interests brought to the educational table (Ravitch, 1993).

Since governance is the steering mechanism of the system, the failure of governance affects all other subsystems in major and negative ways. Absent reform of the governance function, reforms of other subsystems will have only diminished or no impact on the system's performance. The Consortium agrees with the Committee for Economic Development (1994) and with the governance task force of the Twentieth Century Fund (1992) that, although issues such as choice, school-based management, higher standards of teacher preparation, or student assessment are important, these reforms will have only limited impact *unless and until severe governance problems are addressed.* The responsibility of the system's governors is to steer and periodically to check the compass to ensure that the ship is going in the right direction. What they have given us is a ship that changes direction every other mile and that is so overloaded with freight that it wallows in the waves. Training the ship's officers or rearranging how staff are managed will not solve these problems.

The Bottom Line:

- The system's governors change goals and multiply goals to an extent that disables the system's accountability mechanisms.
- Since both unstable goals and multiple goals make it impossible to achieve any goal well, they fuel a vicious circle of declining customer expectations for the system (goal erosion), thus endangering the political and financial support that the system needs to survive.
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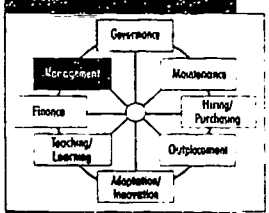


Management

If the role of governance is to define the right job, the role of management is to get the job done right. The managers of the education system include principals at the site level, superintendents and other officials at the district level, state department administrators, and officials in the U.S. Department of Education. Collectively these officials are responsible for organizing resources and subsystems to meet the goals of the system's governors, spending resources and monitoring expenditures, establishing and managing measures of the system's performance, and resolving conflicts among different levels of the organization.

The governance problems of the system seriously affect its management. *Unstable goals and multiple goals make it impossible to align subsystems around goal achievement*, leading to wasted resources. The absence of shared goals also makes it difficult for the multiple layers of managers to set priorities among conflicting objectives.

Goal proliferation also expands the middle management and support staff required to administer the many programs and regulations that multiple goals spawn. Expanded middle management drains resources from the school and fragments services. It encourages an upward rather than outward orientation on the part of staff at the school level that screens out customers of the system and technical

knowledge available outside of the bureaucracy. It focuses attention at management and school levels on conforming to regulations rather than on education. "Job descriptions for principals invariably lean heavily upon managerial duties that carry out the intentions of the school board and superintendent.... Policy manuals listing all the district's rules and procedures seldom remain out of the reach of a principal's arm. If no one had even heard about the image of Principal as Bureaucrat, that image would have been invented" (Cuban, 1986).

Table 3.2 shows the distribution of teaching and non-teaching staff for all levels of education (preschool, elementary and secondary, and postsecondary). For all levels the United States has the lowest teaching to non-teaching staff ratio of the nine industrialized coun-

Table 3.2. Comparative Percent of Educational Staff by Function and Ratios of Teachers to Non-Teaching Staff for All Levels of Education

Country	Percent of Total Staff[1]			Ratios	
	Teachers[2]	Pedagogic Staff[3]	Support Staff[4]	Teachers/ Pedagogic Staff[5]	Teachers/ Pedagogic + Support Staff[6]
United States	43.6	24.2	33.9	1.8:1	0.75:1
Australia	69.1	7.1	28.6	9.7:1	1.9:1
Japan	77.4	-	22.6	-	3.4:1
Belgium	80.0	10.0	10.0	8:1	4:1
Denmark	57.9	28.1	15.8	2.1:1	1.3:1
France	60.0		40.0	-	1.5:1
Italy	76.4	7.3	14.5	10.5:1	3.5:1
Finland	60.8		39.2	-	1.55:1

Source Table P31, pp. 176-177. *Education at a Glance: OECD Indicators*, Paris: Organization for Economic Cooperation and Development, 1995

[1]The percents for different categories of staff do not always add to 100 for reasons of rounding error.

[2]Teachers are defined as those whose professional activity involves transmitting knowledge, attitudes, and skills stipulated in a formal curriculum to students enrolled in a formal educational institution.

[3]Pedagogic staff includes principals, headmasters, supervisors, counselors, psychologists, librarians, etc.

[4]Support staff includes clerical personnel, building operations and maintenance personnel, food support workers, etc.

[5]Teachers include principals, deputy principals, and senior teachers mainly involved in administrative tasks.

[6]Principals and vice-principals are included in "teachers", other staff, in "support staff."

tries for which we have data. The ratio of teachers to the combined non-teaching staff (administrators and support staff) is 0.75 teacher to one non-teaching staff member, whereas the other countries have from about 1.5, 2, 3, or 4 teachers per non-teaching staff member.

International data do not yet exist on the ratios of teachers to non-teaching staff at the elementary/secondary level alone. Obviously countries differ in the contribution of each level of education to the numbers in Table 3.2, some having more preschool staff and others more higher education staff. The ratios of teachers to non-teaching staff also differ by level. For example, for the United States in 1992 at the K-12 level, teachers constituted 52 percent of the total staff; non-teaching staff, 48 percent; at the higher education level, faculty constituted 36 percent; non-teaching staff, 64 percent.

Table 3.2 is nonetheless very revealing. *For all countries the elementary and secondary level represents the lion's share of staff*--in the United States, for example, this level contributes about 75 percent to the total staff for *all* levels of education. Thus, for all countries the numbers in Table 3.2 disproportionately reflect the ratios of teaching to non-teaching staff at the elementary and secondary level.

As simply a hypothetical exercise, the ratios of teaching to non-teaching staff that prevail for all levels of education for other countries can be applied to the U.S. K-12. For the country that has the closest ratio to the United States of teaching to non-teaching staff (Denmark), 265,000 non-teaching staff could be saved —or, if these slots were converted into teaching slots, about three teachers per public elementary and secondary school could be added. For the country with the ratio that differs the most from the United States (Belgium), 1.3 million non-teaching staff could be saved, or, if these slots were converted to teaching slots, over 15 teachers per elementary and secondary school could be added. Whether converting non-teaching staff slots into teaching slots would increase or reduce the total staff bill depends on the relative prices of administrators, support staff, and teachers.

". . .the United States has the lowest teaching to non-teaching staff ratio of the nine industrialized countries. . ."

The management pattern that prevails in American education separates responsibility for student learning from the authority to make the decisions needed to meet this responsibility. Teaching and learning occur at the school level, and teachers and schools are held accountable for the results.

However, individual schools have little control over their own resources and enjoy little autonomy. Compared with 13 other nations, the United States ranks next to last in the percentage of decisions made at the school level. It has by far the largest percent of decisions made at the district level, and is joined by only two other nations in having none of the many important decisions made at the national level.

Ironically, most Americans do not approve of the large bureaucratic structure of public schools. Although the United States ranks near the bottom in terms of the authority granted to the schools, it is at the very top in the percentage of the population who thinks that it is very important for decisions to be made by the schools themselves (OECD 1995 p. 66).

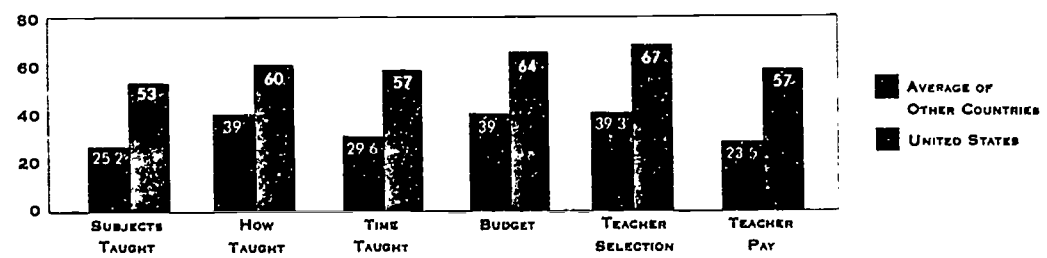
We can use four criteria for judging the allocation of management responsibilities: efficiency, accountability, equity, and productivity improvement. Two of these criteria, efficiency and productivity, imply lodging more decision-making at the school level than now exists.

This management pattern corresponds to concepts of site-based or school-based management. Evidence is accumulating, however, that the gains expected from site-based management are undercut by failing to address problems in other parts of the system.

- Site-based management does not necessarily protect the school from the goal instability and goal loading associated with governance failures. In the absence of a clear mission for the school, the destructive politics at the district level can—and often do—simply shift to the school level (Hill, Foster, Gendler, 1990; Hannaway, 1993).
- Site-based management initially increases teachers' engagement and

FIGURE 3.2: DECISION MAKING AT SCHOOL LEVEL

(PERCENTAGE OF RESPONDENTS WHO THOUGHT IT WAS "VERY IMPORTANT" FOR DECISIONS TO BE MADE BY SCHOOLS THEMSELVES)



Source: *OECD, Education At a Glance, 1995, Table C-27, pp. 66.*

motivation. However, sustaining this initial enthusiasm requires answering the question, "Management to what end?" Site-based management does not substitute for the lack of stable, limited, and well-defined goals for the school. Defining the school's mission clearly allows the organization of management time around these goals and bounds the arena for decision-making, thus limiting the intrusion of site-based management responsibilities into time that should be reserved for teaching and learning.

- Site-based management does not produce the expected productivity improvements. Many education reformers assume that command-and-control management prevents teachers from using their better teaching practices and that site-based management will "release" this knowledge. In fact, observations of teacher management meetings reveal that teachers lack knowledge of the educational practices that might improve the school's performance. Accordingly, the agendas of these meetings tend to drift into non-academic and administrative matters, such as problems with the Xerox machine (Hannaway, World Bank seminar, 1994).

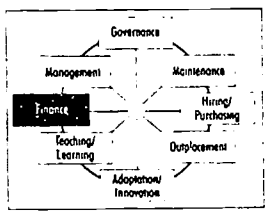
"...site-based management cannot overcome failures in other parts of the educational system."

These disappointing productivity results probably reflect in part that schools and workplaces are not well structured to facilitate learning by teachers. (See the discussion of teaching and learning, below.) They may reflect the newness of the chance to innovate and therefore lags in teachers' demand for better practices. They certainly reflect problems with the nation's knowledge supply. In part because teachers' demand for innovations is low, the nation's capacity to innovate, its mechanisms for diffusing innovations, and its quality standards for innovations are seriously underdeveloped. (See the discussion of adaptation and innovation, below.) Again, site-based management cannot overcome failures in other parts of the educational system.

The Bottom Line:

- Unstable goals and multiplying goals make it impossible to align subsystems around goal achievement, resulting in wasted resources.
- Goal proliferation expands middle management and support staff, the special programs and web of regulations that multiple goals spawn requiring more people to administer them. Expanded middle management diverts resources from the school.
- The typical management pattern in American education separates responsibility for student learning from the authority to make the decisions needed to meet this responsibility.

Finance



The U.S. Constitution allocates responsibility for education to the states rather than the federal government, and most of the funding for education is accordingly generated at state and local levels. In 1990-91, for example, 94 percent of the funding for K-12 education came from state and local governments; only 6 percent came from the federal government.

The responsibility for funding public education has traditionally fallen mainly to state and local governments, which provided 90.7 percent of all funding for education in 1991-92. Across states, the state government share of school funding averaged 46.4 percent in 1991-92, but ranged from a high of 90.3 percent in Hawaii to a low of 8.7 percent in New Hampshire. The variation in per-pupil spending is also great. In 1991-92, average per-pupil spending nationally was $5,421, varying from a low of $3,040 in Utah to a high of $9,317 in New Jersey. An equally large variation in per-pupil spending exists within states, largely reflecting variation among school districts in their capacity to raise local revenues. In areas of high poverty, districts are unable to generate enough funds to provide a basic level of public education.

Although money is a powerful incentive, governors and managers rarely use financing to create incentives for schools to improve their productivity. Money is rarely used to stimulate more productive expenditures of resources. In one sense, this is surprising: with annual bills running at about $285 billion for the nation or at an average of almost $6 billion per state or at $1.5 billion per school day, those who finance the system should have an interest in improving the system's productivity.

In another sense, it is not surprising. The conditions necessary for using financing to encourage productivity are only minimally in place. One condition is cost accounting systems in districts that clearly show the full costs of each activity, such as the full costs of a special program in the schools. A second condition is clear and limited goals around which to organize incentives. The instability of goals and their proliferation make it very difficult to target funding. A third condition is the existence of a knowledge base that those expected to respond to the incentives can use to meet productivity goals. Improving productivity requires a much better understanding than now exists about the relationships between inputs and outcomes (what are known technically as "education production functions").

The current system for raising and allocating resources creates serious inequities in the resources available at the school level. Historically, the equity standard, as delineated by the courts, has been stated in terms of reducing disparities in per-pupil spending across districts. This focus on per-pupil spending (equal per-pupil inputs) is problematic in an education system now trying to emphasize educational outcomes. It costs more per pupil to bring students from low socioeconomic backgrounds to acceptable levels of educational achievement. This variation in costs associated with equitable chances to attain minimum educational outcomes should be incorporated into the equity standard, but establishing such formulas in reliable ways requires a better understanding of input-output connections than we now have.

Complicating the discussion of remedies of inequities is the view that money does not matter. Part of the opposition to spending money to offset disparities stems from reasonable skepticism about whether additional money will solve the problem. For years the public has observed that increasing the money spent on education has not increased student test scores. The problem is with identifying a wise use of money. One high-expenditure district can be performing well; another, poorly. Why?

"For years the public has observed that increasing the money spent on education has not increased student test scores. The problem is with identifying a wise use of money."

As already noted, the finance system currently does not focus on school and district performance and thus creates no incentives to analyze and understand the sources of high versus low performance. This is another example of how productivity improvement is not a goal for the K-12 system. However, not understanding the relationships between inputs and

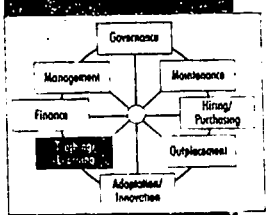
outcomes is not only an impediment to the efficient expenditure of resources. It also prevents empirically-based estimates of what is required to equalize opportunities to learn among students from vastly different homes and communities, leaving the resolution of the question to ideology and power politics.

As an open system, public education depends for its continued survival on satisfying groups that provide its political and financial support. *The system's lack of attention to these groups* (see discussion of export or outplacement subsystem, below) *contributes to the declining willingness of taxpayers to increase spending on education.* Goal loading by the system's governors has fiscal consequences, in that it often drives up local taxes. Combined with the downward spiral of increasingly lower expectations that unstable and multiple goals set in motion, and a general reluctance to pay more taxes, taxpayers are less willing to pay for education.

Reflective of multiplying goals, money is used to promote special purpose programs, such as educating the handicapped and other social mandates. *These programs diffuse focus at the school level and divert resources from the school's core function and from the majority of students who do not receive these special services.* For example, the federal law, Individuals with Disabilities Act, has put serious pressure on the financing system for K-12 education. One problem is simply that, as noted earlier, programs for students with special needs are expensive. New York City, for example, pays nearly three times the cost of educating a special education student as for a child in the regular education program. A second problem is that the services for special education students are often viewed by policymakers and the courts as entitlements while programs for students without disabilities are seen as more discretionary. Thus, the law creates perverse incentives for local school districts to classify more students as special education students than educationally warranted in order to get more funds. When these factors are combined with the reluctance of taxpayers to fully fund the needs of all students, students without disabilities are likely to be educationally shortchanged relative to students with special needs.

The Bottom Line:

- Although money is a powerful incentive, governors and managers rarely use financing to create incentives for schools to achieve explicit goals, such as using resources more effectively.
- The current system for raising and allocating resources creates serious inequities in the resources available at the school level, but our lack of attention to the relationships between inputs and outcomes leaves us unable to differentiate damaging inequities from harmless differences
- The system's lack of attention to its customers, especially the taxpayers, contributes to the declining willingness of taxpayers to increase spending on education.
- Money is used to promote special purpose programs that diffuse focus at the school level and divert resources from the school's core function and the majority of the student body not receiving those special services.



Teaching and Learning

This is where the work gets done that defines the unique place of the education system. If the system fails at this level, it fails overall. This subsystem has three central problems.

Schools are structured to reinforce continuity, not continuous improvement. Despite literally hundreds of reform efforts over the years, the core technology of the teaching and learning process has not really changed in a century. There is constant change in schools, but it tends to be ephemeral and at the margins. Individual teachers and schools innovate and improve student learning, but these successes are fragile and idiosyncratic, rather than industry-wide.

An astonishing number of factors coalesce to create schools that fail to learn and improve—i.e., that "learn to stay the same."

- **Unstable goals and multiple goals** encourage those responsible for teaching and learning to ignore external demands in order to meet their primary responsibilities.
- **A web of top-down regulations** created by managers external to the school marginalize the effects of variations in management within the school. The effect of these strictures

"Despite literally hundreds of reform efforts over the years, the core technology of the teaching and learning process has not really changed in a century. There is constant change in schools, but it tends to be ephemeral and at the margins."

is to reward compliance, removing or limiting teachers' initiative and responsibilities for improving their teaching practices. This hierarchical relationship between schools and management is reproduced and reinforced by the prevailing relationship between teachers and students at the classroom level. Teacher-centered instruction ("chalk and talk"), the prevailing mode of instruction, defines the role of the student as passive learner who looks upward to experts for "answers." This teacher-student relationship is reinforced by teachers' own years as students, years that create indelible mental models of what teaching should look like.

- **Conventional curricula** encourage conventional ways of thinking. Although there are significant efforts to improve curricula, the learning programs still tend to be fact-oriented, compartmentalized, and fragmented. Thus, students do not develop sense-making and problem-solving capacities or abilities to see alternative perspectives and whole stories. Teachers, who work daily in this curricular environment, lose the habits of thought and creativity needed to improve the school.
- **Feedback mechanisms** within the teaching profession that let teachers benchmark and improve their performance are poorly developed. As shown earlier, a feedback loop requires goals, measures to detect gaps between performance and goals, and mechanisms for closing gaps. The first problem is goals for teaching (standards of good teaching). These are only now being defined; the National Board of Professional Teaching Standards is conceptualizing and developing measures of what constitutes good teaching for different age groups of students and different subjects. The other problem is the means of correcting poor teaching performance. The professional development of teachers is poorly aligned with teaching performance, operating as a ritual means to salary increases rather than as a means to support improved teaching.
- **The lack of evaluation and other quality controls** on practices marketed as "better practices" undercuts teacher demand for innovations.
- **The technically weak pre-service training** that many teachers receive leaves them without an analytic framework for making a selective and effective use of innovations, further

diminishing their demand for this knowledge. Also, as Albert Shanker, President of the American Federation of Teachers, wrote in *The New York Times*, "Almost every other profession has a better system of induction for new members than teachers.... If teaching is ever to be a profession in the sense that medicine and law are, beginning teachers need a chance to learn what constitutes good practice with the help of accomplished colleagues instead of being forced to figure everything out for themselves." (Shanker, 1995)

- **The organization of work** and norms that govern teachers' professional relationships undercut the collaborative work that can improve teaching and learning. The usual organization of teaching of one teacher to a classroom excludes the learning possibilities and informal feedback that team teaching or team preparation can provide. Reinforcing solo work are the norms that govern teachers' professional relationships. These norms (e.g., Little and McLaughlin, 1993) are "hands-off" in terms of one another's professional practices, any other stance being construed as an invasion of classroom privacy.
- **Working and instructional hours** virtually preclude the levels of daily preparation, student feedback, collegial coordination, and professional learning required to maintain and improve teachers' performances.

Contrary to popular belief, not only are American students in school more hours a day (see Figure 1.1 on page 18), American primary and secondary teachers spend more hours in the classroom per week and per year than most other countries where teaching hours are measured. For 16 OECD countries, U.S. primary school teachers are second only to the Netherlands in the number of hours in the classroom per year; our junior and senior high school teachers are second only to Turkey in terms of teaching hours (*Education at a Glance: OECD Indicators, Paris*: 1995). In a series that looks at 19 countries (Nelson and O'Brien, 1993), the number of teaching minutes per week for primary school teachers ranges from 1000 minutes for Japan to 1830 for the United States—a difference of 10 instructional hours per week. At the primary level, American teachers have the second highest number of required working hours (classroom + non-classroom hours) per week of the 19 countries; at the secondary level, they have by far the highest. Unlike teachers in comparator nations, American teachers also have to use some of their non-classroom time on non-instructional activities such as lunch, recess, and study-hall supervisory duties, still further reducing the non-classroom time available for preparing lessons, grading papers, and working with colleagues.

The Public Agenda Foundation 1993 found that teachers worked in a "...pressure-cooker environment with little time to share resources, information, and experience among themselves. Teachers, as they described it, were locked into a stressful situation for many hours and then released to go home. There was little opportunity to reflect on the day and to draw on the experiences of colleagues." p.8.

The incentives in schools and classrooms neither inspire maximum and sustained effort from students, teachers, and administrators nor direct and focus their efforts around what should be the essential mission of the school: teaching and learning. Principals, teachers, students, and parents are co-producers of student learning. The role of incentives in the school is to mobilize the efforts of all parties around learning. Incentive issues within the school differ from those between the school and parents, and only issues within the school are discussed here. The school-parent relationship is discussed in a later section.

"A school is not only a workplace. It is a communal and a socializing institution, its mission being to prepare the young for human society."

Studies show important differences in how zoned comprehensive high schools, public magnet schools, and Catholic schools motivate their members and structure relationships among members. These differences are strongly related to differences in norms and values that arise out of the larger community and the educational bureaucracy. Motivational differences are correlated with differences in student outcomes (e.g., Hill et al., 1990; Bryk, et al., 1993).

A school is not only a workplace. It is a communal and a socializing institution, its mission being to prepare the young for human society. "Socialization" includes the acquisition not just of knowledge and skill, but also of values and acceptable patterns of behavior toward others. The deep politicization of education attests to this broader role of the school; parents and the community care about the values manifest in the school because it bridges the family and the larger society.

Catholic high schools and public magnet schools tend to organize around more shared goals, thus producing more communal relationship patterns. Comprehensive high schools tend to organize around individualistic and competitive interests and the administrative and bureaucratic interests of external funders and regulators. These orientations reduce the number of common goals around which principals, teachers, and students can organize their joint

efforts (Bryk, et al., 1993). Focus suffers, and so does the commitment of the members of the school to each other and to the enterprise.

The communal function of schools implies judging a student's academic performance partly on a willingness to commit one's best effort—to work toward the goals of the community. And in fact the prevailing motivational pattern in Catholic schools seems to be that "No one fails here who works hard." Comprehensive high schools organized around individualistic values tend to have a sorting perspective: "Some will fail here no matter what they do," a view stressing inherent ability as opposed to effort and inevitably alienating some number of students (and those who teach them) from the school. The motivational patterns of these schools, which often serve families of higher socio-economic status, reflect what the competitive parents of these students want.

Some comprehensive schools tend to convey a view that "No one fails here who shows up" (Bryk, et al., 1993). This motivational pattern reflects a bureaucratic orientation and, unfortunately, since many schools displaying this view tend to serve families of lower socio-economic status, a silent conspiracy of low academic expectations for students between the school and the parents.

These differences in prevailing motivational patterns show up in differences in how the teaching and learning function is treated. Comprehensive schools tend to assume that the child is an adult capable of making academic decisions and therefore accountable for those decisions. A failure to choose wisely is seen as the student's individual failure. In contrast, magnet and Catholic schools tend to have centripetal curricula that draw all students toward learning certain core skills and perspectives. The strong emphasis on a common core of academic experience and only modest levels of student choice attenuate some of the powerful differentiating influences at work in comprehensive public schools. In these schools, greater curricular choice reinforces prior inequities, in that less advantaged students are more likely to choose nonacademic over academic courses.

"Some comprehensive schools tend to convey a view that 'No one fails here who shows up.' This motivational pattern reflects a bureaucratic orientation ... and a silent conspiracy of low academic expectations for students between the school and the parents."

As socializing and communal institutions, schools are expected to

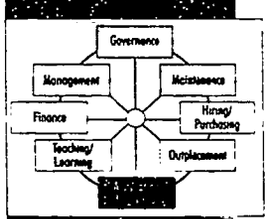
attend to the moral values and behaviors of children. Although public schools have extensive codes of conduct and elaborate systems for adjudicating misconduct, they are relatively silent about any larger socialization goals. Public schools often look like Grant's (1988) portrait of a comprehensive high school, where the central norm is learning how to manipulate the rules to maximize self-interest. Lightfoot (1983) describes an affluent suburban public high school where the primary emphasis was on individual success, defined as academic achievement now in order to ensure economic success later. By contrast, Catholic schools aggressively mold students' attitudes and values, emphasizing secular ethics of honesty, reliability, fairness, and respect for others, the adults in the schools being expected to shape adolescent lives through personal interaction and individual example.

The factors that create schools that stay the same, their prevailing incentive regimes, and large-scale social forces (such as the increasing labor force participation by mothers) marginalize parents as co-producers of their children's learning. Parents' levels of commitment to the school affect those of their children. Parents are shut out and shut themselves out of the school, creating a vicious circle. The top-down control of schools encourages school staff to look up rather than out, leaving parents with the (valid) sense that they have to take on the whole bureaucracy to get anything done and sometimes producing what to those within the system seem to be excessive attacks. Since top-down management limits the authority and discretion of teachers, it simultaneously limits parental power and therefore commitment). Teachers with little discretion within the school can do little to accommodate the different needs of parents.

However, parents also shut themselves out, a lack of time being one root cause. Today many more mothers work; both mothers and fathers are working longer hours and commuting longer distances; and the growth in single-parent families means more households with no second adult to share the work. The result has been what is often called "burden shifting," parents implicitly wanting the school to take care of their children without bothering them too much. Parental resistance to homework is an example. This attitude interacts with top-down control in a vicious circle: when teachers reach out to parents, they get little response; when parents reach out to the school, they hit a vertical wall.

The Bottom Line:

- Schools are structured for continuity rather than for continuous improvement.
- The incentives in schools and classrooms do not inspire maximum and sustained effort from students, teachers, or administrators or direct and focus their efforts around what should be the essential mission of the school: teaching and learning.
- Factors within and outside of the educational system marginalize parents as co-producers of their children's learning.



Adaptation and Innovation

This subsystem counteracts the tendencies of other subsystems to persist rather than change. It measures the performances of subsystems and the system as a whole; it supports mechanisms (such as benchmarking) which encourage schools and policymakers to aspire to and achieve the highest standards; it scans the environment for changes in customer needs; and it fosters and diffuses productivity-enhancing innovations.

Unfortunately, the education system does a poor job of assessing why, when, and how it needs to change. As a result, schools and other units in the system either stay the same or change for the wrong reason.

This subsystem is very undeveloped, a fact that helps explain why the system is not showing strong productivity gains.

- National and state assessments of student learning are in place. Descriptive statistics on the system are constantly improving. However, there is little measurement of the performances of most subsystems, such as governance or management. Even subsystems as unglamorous as hiring and purchasing and maintenance should be measured, process completion times, quality, and costs being pedestrian but basic. Policymakers do not make effective use of increasingly available international comparisons.
- The lack of feedback from the system's customers other than postsecondary education undermines the system's ability to detect changes in external needs.
- Improvement processes that are becoming standard in the private sector, such as benchmarking, are rarely used. Conducted properly, benchmarking is a powerful strategy

Positive incentives to supply and demand knowledge about better practice are missing.

for locating and importing world class standards, wherever they occur. For example, Convex Computer analyzed the facilities management of Disney World to learn about best practices; Xerox selected L.L. Bean as best-in-class in the warehousing and materials-handling function to improve its own warehousing operations; Corning Glass, which has a manufacturing unit designed to meet customers' emergency needs, analyzed best-in-class hospital emergency wards to understand how to organize teams for crisis work.

- R&D investments in education are minuscule relative to recurrent costs and relative to R&D investments in private sector industries and other public sectors. (See Figure 1.3 on page 21.) The investments which are made are quite ineffective in terms of improving industry-wide practices.

Positive incentives to supply and demand knowledge about better practice are missing. Comparisons to the incentives in the health sector are revealing and sobering. In health, the society and patients reveal unbounded expectations for—and confidence in—medical R&D, as evidenced by continued higher funding levels for the National Institutes of Health and for various "wars" on dread diseases.

The professional and financial rewards for medical innovation are many and potent, including Nobel Prizes, prestigious professorships, and financially attractive patents. The costs of innovations, unless designated experimental, are covered by third party payments (insurance), providing incentives for hospitals to purchase new technologies and fueling a competitive dynamic that acts to diffuse innovations through medical institutions. Doctors have incentives to seek out new knowledge. Although it works crudely, their pay system rewards knowledge and skill, and staying up to date helps doctors reduce their vulnerability to financial loss through legal suits for negligent practice. And pre-service and in-service medical training programs have incentives to incorporate new knowledge into the teaching curriculum. Since leading researchers and specialists staff the academic medical centers, best practices quickly become incorporated into current definitions of acceptable medical training, and doctors' demand for up-to-date knowledge encourages continuous training that teaches best practice.

Some incentives in health work too well (e.g., every hospital buys an MRI instead of pooling resources and use); others, not well enough (e.g., many doctors fail to keep up in their fields). However, they interlock to generate a relatively steady demand for and supply of new knowledge and better practice. The earlier analysis of factors that

combine to create schools that stay the same is an analysis of a sector with weak or no demand for knowledge and innovation. On the supply side, education has many ideas, but a weak technical base—in other words, not much of a cumulative body of tested and commonly accepted knowledge and practice.

Schools structured to stay the same and low standards for innovations combine in a vicious circle to undercut the supply and demand for innovations. As the discussion of teaching and learning showed, there are few incentives in schools to seek information about better practices.

"In education, untested fads sweep through the profession, gaining authority by the number of schools using them, not by proven gains in learning.... Educators need to establish a process that distinguishes between claimed innovations and proven reforms." (Carnine, 1993.)

As damaging, there are virtually no quality controls on innovations. The lack of standards undermines trust in educational R&D and therefore demand by teachers, parents, and funders for innovations, which in turn ultimately reduces supply.

Although the sector certainly has some carefully evaluated and demonstrably effective innovations, standards for and assessments of innovations are generally very weak. As Carnine (1993) states: "In education, untested fads sweep through the profession, gaining authority by the number of schools using them, not by proven gains in learning.... Educators need to establish a process that distinguishes between claimed innovations and proven reforms."

The education sector has no accepted norms or standards for evaluating innovations before they can be marketed, such as the counterparts of experimental trials in medicine. We have more standards for marketing hamburger than we do for introducing changes in the schools. The sector has no accepted expert judgment, as represented in the *New England Journal of Medicine* or the consensus development process of the National Institutes of Health, and no analogue to the Federal Food and Drug Administration. It has no analogy to Scotland's Her Majesty's Inspectorate of Schools, which plays an important role in interpreting curricular standards, defining what constitutes good professional practice, and building consensus about best practice.

The cost of the lack of standards and evaluations of educational innovations is incalculable. It results in a lack of confidence in the innovative process

on the part of taxpayers, policymakers, parents, teachers, students, and other customers, a factor that probably helps to explain the low national R&D budget in education and teachers' and parents' resistance to change in the schools. Since field testing usually improves a product, the fact that educational innovations are not required to meet certain standards in field trials prior to marketing ironically dooms many otherwise potentially good ideas once they are implemented. The lack of standards and evaluations of innovations creates cynicism in those asked to integrate them into their practice—teachers and principals—and encourages habits of ritualistic, pro forma responses to new practices.

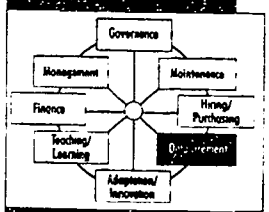
The long-term casualty of this downward spiral of weak demand, small supply, and virtually no quality controls is the technical base in the sector. Although the process is imperfect, the health sector steadily replaces less effective with better practices. Over time this process builds a cumulative and powerful knowledge base. We see no such process in the education sector. In its absence the sector periodically revives practices that were demonstrably ineffective in their earlier incarnations. Merit pay for teachers is an example.

The Bottom Line:

- The adaptation and innovation subsystem is very undeveloped, a fact that helps explain why the system is not showing productivity gains.
- Positive incentives to supply and demand knowledge about better practice are missing.
- Schools structured to stay the same and low standards for innovations combine in a vicious circle to undercut the supply and demand for innovations.
- The limited supply and unmonitored quality of innovations interact to dramatically slow the development of a cumulative knowledge base in the education system.

Other Functions of the K-12 System

Problems in the other functions of the system—student placement, hiring and purchasing, and maintenance—largely derive from problems in the subsystems discussed earlier. Resolving problems in the earlier subsystems will facilitate solving problems in these three.



Outplacement

The outplacement function is analogous to the sales and marketing activity in companies. It ensures that customers outside of the school accept its students. The willingness of individuals or agencies outside of the system's boundaries to accept the system's product begins the feedback link that lets the system obtain new inputs and continue organizational life. Even organizations that do not sell their products or services still depend on outside users, clients, or publics for acceptance of what is produced. In the case of public schools, such groups include employers of graduates, institutions of higher education, parents of students, and the larger taxpaying public in communities and states.

This subsystem almost does not exist. Except for higher education, there is virtually no feedback between the system and its customers. Schools are not set up to help their graduates enter markets other than postsecondary education; they rarely understand markets other than the postsecondary market; they have virtually no developed dialogue with their broader set of customers; and the measures that they have on the qualities of their graduates are primarily useful and interpretable only to institutions of higher education.

This function is almost missing for several reasons. *Schools do not derive their revenues directly from their immediate customers and hence financial survival is not directly tied to the satisfaction of clients.* Since schools derive their financing primarily from locally-elected school boards and state legislatures, they tend to look "up" for signals about their performance, not "out" at their primary customers. However, governance bodies usually abdicate from leading a dialogue that produces a shared commitment to a few goals for schools. Thus, the signals that they send back to the schools tend to be blurred, scrambled, and often conflicting.

"Since schools derive their financing primarily from locally-elected school boards and state legislatures, they tend to look "up" for signals about their performance, not "out" at their primary customers."

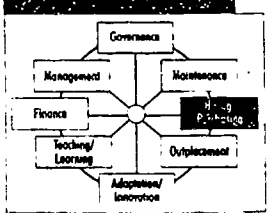
The number of the system's customers is large, and they have diverse and conflicting preferences that the system's governors have failed to consolidate and resolve.

- In terms of employers, no institutionalized signals interpretable by the schools flow from employers back to the K-12 schools except data on employment trends. These data reflect supply as well as demand factors.
- Schools do listen to their higher education customers. Selective higher education institutions have clear requirements. They want public schools to sort students and to set high standards for those on the academic track. Thus, they reinforce the existing system. SAT and ACT examination scores signal students and their parents about their likely admission chances. However, these examinations are deliberately designed to be unrelated to any specific curriculum and thus give K-12 schools virtually no guidance on what areas under their control they should improve. The requirements of open admissions institutions, such as community colleges, are much less clear; in fact, their open admissions policies really mean that they will take anyone.
- Parents have a bewildering array of requirements: custodial care; entrance to a prestigious university or college; equity of educational opportunities, or, more extremely, equality of educational outcomes; preparation for a "job," a preference usually held with little parental understanding of changes in the economy that affect the level and type of education that their child needs; acculturation to certain cultural traditions (e.g., European, African, Hispanic, Asian, American Indian); social activities, such as dances; active sports programs with winning teams; moral development, "moral" being defined in various ways, depending on the nature of the parents' moral views; "discipline"—learning to stay in bounds and to take orders; the development of the innovative, curious, humanist individual. The list could be longer, and it certainly gets worse when we recognize that different parents want different combinations of these objectives.
- We know little about what students, as opposed to their parents, want, reflecting our general lack of knowledge of customers' preferences, the prevailing view of students as passive vessels into which learning is poured and thus without needs and preferences, and the view that students' preferences are often not in their own "best interests" and thus do not need to be elicited.
- The community/taxpayers' group has an amorphous mix of requirements: social control—keep the kids off the street; preparing productive contributors to the economy; socializing the young as law-abiding and participa-

tory citizens; and maintaining the social hierarchy. This group is generally apathetic about the schools, barely participating in local school board elections and thus leaving the field open to well-organized minorities who can usually capture the school board. The beliefs of the general public about the schools are relatively undifferentiated and shaped more by their general social and fiscal views than by any realities of the community's schools.

The Bottom Line:

- This subsystem almost does not exist. Except for higher education, there is virtually no feedback between the system and its customers.
- Schools do not derive their revenues directly from their immediate customers and hence financial survival is not directly tied to the satisfaction of these clients.
- The number of the system's customers is large, and they have diverse and conflicting preferences that its governors have failed to consolidate and resolve.



Hiring and Purchasing

The hiring and purchasing function recruits students, teachers, administrators, and support staff; purchases or obtains curricula, textbooks, teacher guides, workbooks, supplies, and equipment (laboratory, gymnasium, playground, vehicles, computers); and purchases or constructs school buildings.

There are three major problems with this subsystem.

The productivity chain (inputs-transformation-outputs) starts with this subsystem. However, reflecting the fact that the system as a whole does not focus on continuous improvement, *purchasing and hiring criteria do not support a productivity focus.* Many input decisions are made, not on the basis of the most effective use of resources relative to outcomes, but on fairly mechanical criteria, such as student/teacher ratios, or on political grounds, such as those that affect textbook selection in many states.

The criteria used in hiring and purchasing reflect low standards. The low credentialing standards for new teachers impose the most extensive damage on the system. In most states those who

want to teach have to pass an examination that is no more than an advanced basic skills test, a test of perfunctory professional knowledge in fields such as child development and pedagogy, and a test of subject matter knowledge. It is a paper and pencil, multiple choice, machine-readable examination without a performance-based component. This examination screens out the hopelessly incompetent; it does not select in the truly competent. As damaging, these tests define acceptable training for the profession. Poor teacher preparation, usually laid at the door of schools of education, is properly attributed to the education system itself and the standards that it sets to enter the profession.

> *"Many input decisions are made, not on the basis of the most effective use of resources relative to outcomes, but on fairly mechanical criteria, such as student/teacher ratios, or on political grounds..."*

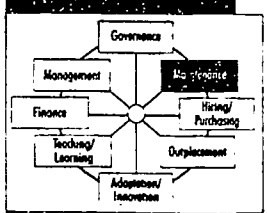
Well-trained teachers are key to continuously improving schools. If policymakers and the public trust the credentialing standards, they will be more willing to give schools the autonomy and discretion that they need to improve their performance. However, as we have already seen in assessments of site-based management, autonomy is not sufficient. Teachers must have the technical knowledge to be able to make effective use of discretion.

The standards for textbook selection vary from state to state, but selection often occurs "by committee." Although the textbook publishing industry is often blamed for fragmented and unchallenging texts, they, like schools of education, are responding to signals from the education system itself. Fragmented and bland ("inoffensive") texts reflect committee processes—multiple agendas and conflicting values.

The criteria by which inputs are selected are often not aligned with each other. "Alignment" refers to a consistency of the standards by which different inputs are selected. Thus, curricular frameworks, textbooks, assessments, teacher credentialing standards, and criteria for selecting administrators should align with or reinforce one another. However, assessments are often out of line with curricular frameworks; credentialing standards do not seem to connect with much of anything; and the basis for selecting administrators tends to be managerial, not educational, expertise. Alignment problems reflect failures in goal-setting.

The Bottom Line:

- Although the productivity chain (inputs-transformation-outputs) starts with the hiring and purchasing subsystem, purchasing and hiring criteria do not support a productivity focus.
- The criteria used reflect low standards, the low credentialling standards for new teachers imposing the most extensive damage on the system.
- The criteria by which inputs are selected are often not aligned with each other.



Maintenance

Maintenance functions are inherently conservative in that their purpose is to keep the organization going as it is. This function deals with physical plant, vehicles, grounds, and equipment; disbursement of supplies; personnel functions—such as promotion and compensation; and keeping track of accounts receivable and payable. Like all organizational functions, maintenance has its own characteristic dynamic that it tends to pursue beyond the point of maximum advantage for the system as a whole. Maintenance of a reasonably steady state often seems to be carried to the point of organizational rigidity, unnecessary policies and procedures being imposed in the name of control and stability. In fact, maintenance units are chronic problems in both private and public sector organizations.

Horror stories abound about trying to get schools repaired, bills paid, or teachers transferred, especially in urban school districts. However, there are few good analyses of this function, and reliable generalizations are not possible. What is clear is that this function enforces or sets conditions that help create and maintain schools that "stay the same." Changing these conditions requires changes in the governance and management functions and in management-union relationships.

The maintenance subsystem does not align the professional development of teachers with evidence of improved teaching performance. De facto professional development is usually a ritual means to salary increases, without requiring that the training be connected to improved teaching performance or using training strategically to support continuous improvement at the school level.

It sets classroom and total work hours for teachers that preclude the level of daily preparation, student feedback, collegial coordination, and professional learning required by teachers to maintain and improve their performance.

It relies heavily on the less effective means of motivating the adults in the system: legal compliance, which includes a fear of punishment for infractions, and extrinsic rewards, which include pay, promotion, and praise. Rules and regulations are somewhat effective in setting performance standards, but even under these circumstances the allowable minimum tends to become the maximum level of performance. If the motivational base for performance is compliance with a rule, there is no motivation to exceed that requirement, rendering rules and regulations notoriously ineffective in motivating the kinds of spontaneous, cooperative, and inventive behaviors that go beyond job descriptions but do much to increase organizational success.

"It [maintenance] relies heavily on the less effective means of motivating the adults in the system: legal compliance, which includes a fear of punishment for infractions, and extrinsic rewards, which include pay, promotion, and praise."

The teacher unions reinforce the use of these less effective ways of motivating educators. The unions were established to protect teachers from common management abuses and to allow for collective bargaining. Today, although national and state bodies are often supportive of and eloquent on the need for change and continuous improvement in order to yield better results and maintain funding, many rank and file members and building level "shop stewards" are still operating in traditional modes. They encourage their representatives to operate like old industrial unions that protected seniority, discouraged collaboration with governors and managers, and placed a higher priority on political action than on improving results.

The prevailing pattern of management (top-down control) and many local branches of the teacher unions make it almost impossible for this subsystem to use the most effective motivator: intrinsic rewards. Teaching can offer intrinsic gratification from seeing children learn, opportunities for originality, role elaboration, initiative, the use of judgment and discretion, and service to others. However, the role of teacher is heavily circumscribed and routinized, as indicated by phrases like "teacher proof." The standard pattern for managing schools will have to change before the maintenance function can create the conditions that the intrinsic rewards of teaching require.

The Bottom Line:

- The maintenance subsystem does not align the professional development of teachers with evidence of improved teaching performance.
- It sets classroom and total work hours for teachers that constrain daily opportunities for professional improvement.
- It relies heavily on legal compliance and extrinsic reward for motivating the adults in the system, motivators that are less effective.
- Top-down management and many local branches of the teacher unions make it almost impossible for this subsystem to use the most effective motivator: intrinsic rewards.

Basic Findings

The analysis looked for characteristics of a productive education system: focus, alignment of functions around the focus, internal adaptation to correct performance shortfalls, adaptation to changes in external requirements, continuous improvement processess, and incentives that encourage these hallmarks of productive systems.

It found:

- a failed governance subsystem and therefore failed focus;
- a management subsystem unable to align functions around a focus because that focus was missing;
- a financing subsystem using money mechanically, not to encourage productivity improvements;
- a teaching and learning subsystem structured for continuity rather than continuous improvement;
- an outplacement subsystem that virtually did not exist, leaving the system without feeback on changes in external requirements; and
- a seriously undeveloped adaptation/innovation subsystem, undermining the system's ability to adapt internally or to continuously improve.

Part IV: Priorities for Improving K-12 Productivity

The root causes of many of the problems in American education lie in these functions: governance, management, and finance; teaching and learning; and adaptation and innovation. Problems in hiring and purchasing, maintenance, and outplacement seem largely derivative of problems in these other functions.

This section describes a connected set of changes, targeted on the most compromised functions of the education system. Because these functions are interconnected in multiple ways and affect other system functions, changing all three is necessary for improving the productivity of the system. There should be no illusion that changing only one—or one only a little bit—will make much difference. This does not mean that all three have to be changed simultaneously. Some sequencing is advisable. However, *there has to be a change strategy* that includes the set of changes.

The Consortium makes six recommendations. The first five *as a set* focus on *direction* for the system's actors, *incentives* for them to follow that direction, and the *autonomy* and stronger *technical base* necessary to respond effectively to incentives. In other words, they address the institutional arrangements required to:

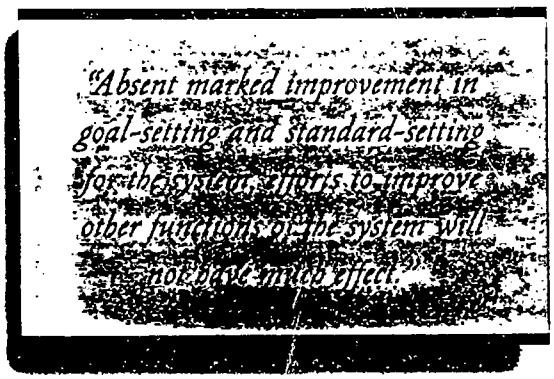
- define goals for the system's actors;
- motivate them to achieve them; and
- give them the tools—the technical knowledge and freedom of action—they need to achieve them.

The sixth recommendation addresses all of us in our individual communities. It defines the roles that we have to play to support these changes at the local level.

Basic Recommendations

1. Renegotiate the governance and management contract.
2. Extend accountability of schools for student learning to accountability of major functions of the system.
3. Use the education financing system to improve educational productivity.
4. Create the conditions that let schools learn.
5. Set up quality controls for innovations and develop mechanisms for legitimating better practices.
6. Make a contract among ourselves for the next generation.

This section does not make specific recommendations or implementation suggestions. The envisioned changes are sufficiently fundamental and interconnected that substantial debate and technical analysis are required prior to developing action plans. There is no idea here that has not been tried in other countries, other industries, or other occupations. Some ideas are already being tried in some states and some schools. However, education in this country goes on under many conditions, and broad ideas have to be configured to work under those conditions. All changes should conform to standards of effectiveness. This implies continuous learning: trials, measurement, analysis, and redesign.



1. Renegotiate The Governance And Management Contract

Absent marked improvement in goal-setting and standard-setting for the system, efforts to improve other functions of the system will not have much effect. The absence of stable and limited goals disables the system's abilities to set performance standards, to assess its performance, and to take corrective actions when performance falls below standard, the reason being that all of these activities require a target. Failed goals are also a source of inefficiencies in the other functions, in that there is nothing stable or sufficiently limited around which their operations can be aligned.

However, approaching the problem of goals and standards by trying to establish limited and stable goals at national or subnational levels may be doomed for the very reason that goal chaos exists in the first place. For decades Americans sought identity as "Americans" and subscribed at least to the mythology of common interests. The concept of the "common school" represented this social agreement. For a number of reasons common identity, values, and interests—or the mythology of common interests—are giving way to specialized values, interests, and identities. The deepening politicization of the schools, as indicated by conflicts over values, reflects this more sweeping social attempt to exert diversity and specialized identity. We are simultaneously becoming more international and more parochial and tribal.

This larger problem cannot be solved within the education sector. However, it warns us that using goals to

deal with the system's real and destructive goal chaos may not work.'

For the public K-12 system, the Consortium recommends that an agreement be struck that exchanges autonomy for accountability. Autonomy refers to the *autonomy of suppliers to start schools,* subject to state licensing requirements and possibly to performance contracts with the community's educational agents; the *autonomy of suppliers to manage schools,* except for issues such as conflicts of interest, equity, or economies of scale that are better managed at levels above the individual school; and the *autonomy of customers* to choose schools.

Autonomy for suppliers of public schooling and their customers should reduce the lethal politics that now surround schooling. Consensus has evaporated, but in special ways. There is apparently overwhelming agreement about the basic purposes of education and the core subjects that schools should teach. Consensus has disintegrated around social values, such as discipline, dress, prayer, sexuality, and the value and role of the family. The most divisive and destructive politics in education revolve around these issues. Autonomy for the suppliers and customers of public education lets families with particular values select schools which reflect those values.

"For the public K-12 system, the Consortium recommends that an agreement be struck that exchanges autonomy for accountability."

Accountability refers to the responsibility, assumed in exchange for autonomy, for the school to meet established performance criteria that reflect the interests of three levels of the society: the community, the state, and the nation. Failing to meet its performance responsibilities should have consequences in the form of the revocation of its state license and, if it is operating under a performance contract with a local school board, in the cancellation of its contract.

In other words, the point is to:

- use accountability mechanisms to assure that schools meet standards for which there is substantial consensus (high standards of learning in the foundation subjects); and
- use autonomy for suppliers and customers to avoid conflicts where we have little consensus. Autonomy for suppliers and families gives voice to subgroup preferences, in that families can select schools with values consistent with their own.

Some states have already tried to specify "outcome-based" goals with results that are not reassuring. As the Committee for Economic Development (1994) notes, these efforts tend to have multiple non-academic goals and academic goals too vague to serve as performance standards. For example, Pennsylvania has 55 learner outcomes that include non-academic goals such as "all students should know and use, when appropriate, community health resources."

Autonomy of Suppliers to Start Schools

The tax-supported, public system is already moving in this direction. Home schooling is growing, as are charter schools. As of January 1995, 134 charter schools had been approved in nine of the eleven states with charter school laws, 85 being new schools and 49 conversions of existing schools. In 1995 an additional 14 states may consider charter school legislation. Early data on charter schools reveal diverse and innovative instructional programs, such as teaching multiple subjects in the context of a common theme (citizenship, for example); multi-age grouping of students; or a focus on specific subjects, such as the arts or sciences (U.S. General Accounting Office, *Charter Schools*, 1995).

Since taxpayer dollars finance charter, as well as traditional, schools, how state licensing requirements for chartering a school are designed is key to the integrity of public education. Aside from issues of health and safety, requirements must be consistent with the U.S. Constitution and Supreme Court rulings in terms of the separation of church and state.

Autonomy of Suppliers to Manage Schools

If schools are to be held accountable for their performance, schools should have that level of management autonomy required to meet performance standards. School-level autonomy, in the form of site-based management, is increasingly used in the states. Site-based management arrangements vary in terms of the autonomy that schools have over the organization of instruction; planning and structure; the hiring and firing of staff; and allocation of resources to the school and within the school. For example, some charter schools operate as legally independent entities, such as nonprofit corporations or teacher-owned cooperatives. Others operate with no more autonomy than many traditional public schools.

Technical analyses and experimentation will help determine which decisions should be allocated to the school and which retained at higher levels. Experience in other countries, such as the United Kingdom, shows that certain decisions should not be delegated to the school level. These include decisions that entail conflicts of interest, such as the decision to close a school; economies of scale, such as the funding of costly laboratories better shared among adjacent schools; or the assurance of equity, usually poorly handled at school and local levels.

Autonomy of Customers to Choose Schools

Of the total students enrolled in grades 3-12 in either public or private schools in 1993, 81 percent were enrolled in assigned public schools, 11 percent in public schools that their

families had chosen, and 8 percent in private schools (U.S. Department of Education, National Center for Education Statistics, *Education Policy Issues: Statistical Perspectives*, Table 1, p.1, May 1995).

Of those who chose their child's school in 1993, the three primary reasons for public school parents were a better academic environment, special academic courses, and convenience. Almost 30 percent of poorer parents chose on grounds of convenience, versus 16 percent of wealthier parents (U.S. Department of Education, National Center for Education Statistics, *Education Policy Issues: Statistical Perspectives*, p.2, May 1995). The fact that parents differ in their value preferences means that parental choice does not necessarily protect community, state, and national interests in well-educated graduates. Whatever the basis for parental choice, buyers also need regular and objective measurement of the variables of concern to them, a requirement now poorly met.

Accountability to Community, State, and National Performance Standards

Education is one of the goods and services for which we, as a society, care about consumers' choices because of the civic, economic, and other implications of those choices. Accordingly, most state constitutions have equity clauses in their education laws. A democracy depends on an informed and educated electorate, and education increases the health status (World Bank, 1993) and economic growth of a society.

It is generally accepted that communities and states have an interest in well-educated graduates. The national interest is more controversial, partly because *national*, as opposed to *federal*, ways of protecting it have not been well defined. The Consortium argues that the nation, not just the states and local communities, has an interest in accountability. The effects of a weak education transcend state boundaries. Companies need workers with more skills,[4] disparities in wealth becoming increasingly related to disparities in education. Those states with weak education systems contribute less to the country's economy and leave the young, who often migrate to other states, less able to accommodate economic change, more apt to need government assistance, and less apt to form stable families. Responsible civic participation requires the ability to follow complex issues: trade treaties, environment versus growth debates, health reform, or the redefinition of America's international military

[4] The shift from mass to flexible production, the internationalization of the economy, and the role of trade in the U.S. economy all drive up skill requirements. For example, between 1950 and 1992 the sum of the value of trade (imports + exports) as a percent of the gross national product increased from about 9 to about 20 percent. More trade means more products and services that have to meet the exacting requirements of international customers.

role. Poorly educated voters affect the quality of our political debate and our national, as well as state and local, leadership.

> *"There are two basic accountability mechanisms . . . . One is learning assessments for different grades . . . The other is a national examination that has to be passed in order to graduate from high school. Although national in scope, these mechanisms should not be federal."*

Accountability mechanisms with consequences protect community, state, national, and customer interests. The publication of information about school performance that is required for accountability provides families with the basis for informed choice. Goals still have to be defined in order to design proper accountability measures, entailing substantial political work. Although the main national interest lies in students' performances on the core subjects used in economic and civic life, states and communities will have additional goals for which they will want to hold schools accountable—for example, their dropout and pushout rates. Thus, problems of consistency and limits among community, state, and national goals will emerge and will have to be worked out. However, once this political work is completed, the goals should be less vulnerable to instability and multiplication because they are stabilized and embedded in the measures.

There are two basic accountability mechanisms that protect the national interest in a well-educated citizenry. One is learning assessments for different grades, a process that already occurs, although too sporadically, through the National Assessment of Educational Progress. The other is a national examination that has to be passed in order to graduate from high school. Although national in scope, these mechanisms should not be federal. Assessments and examinations should be constructed by autonomous national bodies that include teachers, subject matter specialists, and testing experts.

To help schools prepare their students to meet learning standards, content and performance standards for particular fields should be available. Their use by states and schools should be voluntary. Starting with the National Council of Teachers of Mathematics, professional organizations in most of the major curricular areas have acted on their own initiative to draw up these standards. They have done so out of a growing concern for professionalism and a recognition that societal forces such as the emergence of a global economy are changing the knowledge

and skills that students need. These frameworks do not contain the content specificity common to national curricula in other countries or to the curricula of some states. They leave substantial room for state and local interpretation.

Accountability mechanisms have to have teeth. Some states work with "bankruptcy" procedures. The application of such procedures should be preceded by the use of "swat teams" of technical experts to help schools in trouble long before the situation reaches that of bankruptcy. Other possibilities now being considered include carefully specified performance contracts between schools and school boards, with explicit agreements about the grounds for closure of the school.

Several European nations, such as the United Kingdom, the Netherlands, Sweden, and New Zealand, pursue forms of this kind of governance and management contract. Their experiences should be used in an analysis of the costs and benefits of specific alternatives. The Netherlands gives substantial freedom to form schools, but any school formed must use one of three curricular plans (Catholic, Protestant, or humanist) and is held accountable for its students' performance on national examinations. Recognizing that autonomy without accountability leaves the nation and community without any means of assuring quality, virtually all countries have examinations. These are teacher-set and teacher-marked, some being national and some province- or state-level examinations. Countries vary in how they enforce a school's responsibility to meet national standards. The United Kingdom has upgraded its inspection system, initial and in-service teacher training, and training of head teachers to increase the chances that schools can meet their performance responsibilities. The Scottish experience suggests that "enforcement" is more profitable if it consists of frequent feedback on performance and early technical intervention in response to problems. Each school reports its examination scores annually to the regional authorities, making performance problems visible early and allowing the regional authorities to intervene with technical help quickly. Although every school is also inspected every five years by Her Majesty's Inspectorate of Schools, experience shows that if a school fails an inspection, it is too late. The school will already be in virtual receivership.

Renegotiating the governance and management contract for the public schools will affect the current distribution of power between levels of government and between the legislative and executive branches at each level. Depending on the details of the contract, it can redistribute power to the broad society to form schools. It gives much more autonomy to schools. The role of local school boards becomes unclear, although the idea of contracts between individual schools and the school board

"Accountability mechanisms have to have teeth. Some states work with 'bankruptcy' procedures. . . .Other possibilities now being considered include carefully specified performance contracts between schools and school boards, with explicit agreements about the grounds for closure of the school."

would define a clear role. In anticipation that regulations and mandates will be considerably curtailed, the district office can be considerably downsized, handling certain functions for reasons of economies of scale or conflicts of interest. The district office also competes with outside suppliers in providing certain services that autonomous schools purchase. Under this scenario, the state becomes important in several ways: licensing schools, financing them, and, depending on how termination grounds are worked out, revoking licenses on evidence of the failure to meet national and other standards. The state or a version of district central offices may play the role of continuous performance monitoring of and technical assistance to the schools like the Scottish regional authorities.

The federal level has a muted but critical role. It facilitates the consensus-building required for national goal-setting, standard-setting, and their embodiment in national assessments and examinations, but works through autonomous or semi-autonomous national bodies that include teachers. It finances the operations of these bodies.

2. Extend Accountability For Schools to Accountability for the Major Functions of the System

Schools are held accountable for student learning by means of assessments and examinations in selected subjects. However, it should now be clear that other subsystems powerfully affect the capacities of schools to meet their obligations. Thus, the principle of accountability should be extended to other major functions of the system. Implementing this principle requires deciding which activities of each major function most affect system improvement and developing measures inexpensive enough to allow frequent measurement. For example, an annual assessment of governance might include measures of whether the governors have increased or decreased the focus in the system, as indicated by the number of new regulations they have passed, the number of old ones they have rescinded, and the number of mandates only peripherally related to learning they have imposed on the schools.

These measures should have two purposes. One is to help those responsible for the activity improve by seeing how they are performing relative to certain standards. Another purpose is to create benchmarks for the system at national, state, community, and school levels. The Organization for Economic Co-operation and Development (OECD) has created education indicators (*Education at a Glance*) for nations--for example, a measure of inter-nation differences in the ratios of teaching to non-teaching staff. There is substantial evidence that national policymakers in the OECD countries compare or "benchmark" the efficiency and effectiveness of their particular system against that of other countries. An analogue to this international system is a U.S. system, where the states are the units of comparison, and a state-level system, where schools or communities are the units of comparison.

It is not always clear how actors responsible for different functions can be held accountable for their performance. For example, the governors for the system are either elected or appointed by those who are elected. Thus, in theory the ballot box constitutes the accountability mechanism. However, those who vote in local school board elections usually constitute fewer than ten percent of the registered voters, and votes for state and federal legislators reflect a combination of interests, education being only one. Indicators systems are a start, in that over time they begin to define "responsible" practice, "efficient" practice, and "effective practice," thus slowly changing the standards to which different actors in the system hold themselves.

3. Use the Education Financing System to Improve Educational Productivity

In education, the relationships between inputs, processes that transform inputs, and outcomes (what are called "education production functions") are not well understood.[5] This lack of knowledge remains a serious impediment to the efficient expenditure of resources in what in 1993-94 was a $285 billion public elementary and secondary education industry. It also prevents empirically-based estimates of what is required to equalize opportunities to learn among students from vastly

[5] Some educators reject that there are patterned relationships between educational processes and outcomes that can yield comparable results across teaching situations. The interactions between the teacher, subject, and student are believed to be so complex as to yield no generalizations. Each educational situation is thus idiosyncratic, success is random, and nothing is to be learned from anyone else's experiences, even from those of other teachers. This view seems implausible when the health and education sectors are compared. It is hard to believe that the interactions between patients, biological systems, illnesses, and alternative treatments are scientifically less complex than those between students' learning systems, learning problems, and teaching. However, the health sector continues to improve its ability to understand and manage these interactions.

different homes and communities, leaving the resolution of the question to ideology and power politics.

Historically, few incentives, other than simple incentives for additional spending, have been built into state aid formulas for education. However, a financing system can be used not only to provide funds for a public service but also to provide appropriate incentives for the relevant actors to strive for desired ends.

> *"Funding formulas could be used to link a steady reduction in regulations and mandates to a reduction in non-teaching staff."*

Designing such incentives requires technical expertise, but the objective would be to provide three types of incentives. One is to create incentives for school districts (ultimately schools) to keep their books in ways that clarify where the money goes. The budgets of many districts are not set up to relate costs to activities. For example, when outside auditors tried to help New York City estimate special education and bilingual program costs, they found that the Board of Education was using 277,000 different ledger accounts to track spending in its 45 divisions, bureaus, and offices and 32 school districts (*New York Times*, p. 40, August 14, 1994). New York City is not unique. The problem is that the cost accounting categories at district levels are not organized to answer important productivity and policy questions.

A second type of incentive, possibly in a framework of consortia of states and the federal government that pool R&D monies, would focus the R&D community on issues of productivity. The objective would be to improve technical knowledge about productivity payoffs to alternative inputs and more productive ways of using inputs, the results being used in the design of school funding formulas. For example, multi-media instruction, based on what we know from the cognitive sciences about how people learn, promises to create a powerful learning environment. By defining the role for the teacher as coach, it uses the teacher for non-routine—i.e., higher value-added—work; it develops students' higher order cognitive skills, badly needed in today's world; and it engages the students in learning, thus motivating them as co-producers of their own learning. If studies show that these results from "hot house" experiments such as at the Dalton School in New York City replicate more widely, funding formulas can be designed to encourage schools to begin incorporating these technologies.

As another example, Table 3.2 showed that the U.S., relative to other countries, has at all levels of the educa-

tional system a disproportionately large share of non-teaching staff to teachers. Given that elementary and secondary education accounts for the majority of the staff in any educational system, the probabilities are high that this high ratio of non-teaching staff to teachers for all levels applies to the K-12 level. At the extreme, applying the Belgian percent of non-teaching staff to the United States would have reduced the 1992 U.S. non-teaching staff by about 40 percent, or one million slots. At the same time, the large non-teaching staff stems in large measure from the number of regulations and mandates "funded and unfunded" in U.S. education. Funding formulas could be used to link a steady reduction in regulations and mandates to a reduction in non-teaching staff. This strategy would not only increase focus in the system, but also free up resources for other purposes.

How these resources should be reallocated again depends on careful studies of productive uses. Reducing teachers' time in the classroom is a strong candidate, but only if careful studies show that teachers in countries with smaller instructional loads use the released time for improving their practice. Another candidate is reducing student:teacher ratios. Although the evidence on class size is mixed, with some studies showing little or no beneficial effects of smaller class sizes on student learning, a recent analysis based on careful statistical modeling indicates that smaller class sizes enhance student learning (Ferguson and Ladd, forthcoming). A 1985 random assignment experiment (the STAR experiment in Tennessee) shows that children in early elementary school achieve at a significantly higher level in classes of 15 than they do in classes of 25. The gains are even greater for poor, minority children (Mosteller, forthcoming).

> "The surest way to destroy cooperation and, therefore, organizational excellence, is to force people to compete for rewards or recognition or to rank them against each other. For each person who wins, there are many others who carry with them the feeling of having lost." A. Kohn, "Why Incentive Plans Cannot Work," Harvard Business Review, September-October, 1993, p.58.

The third type of incentive is for schools to improve, such as programs already being tried in states such as South Carolina, Indiana, and Texas. These programs reward the schools with the best performance, as typically measured by gains in student test scores. Since the incentives are organized around the *school*, these programs should encourage organizations that learn; rewards organized at the level of

individual teachers defeat this purpose. These programs raise problems, such as the methodological challenge of accounting adequately for the different socioeconomic backgrounds of the students. However, this is a technical problem that can be solved with what are called "value-added" measures of achievement.[1] A more fundamental issue emerges from the early research on site-based management. The technical base for improving is so weak or so poorly disseminated that even schools that want to improve do not have reliable guidance on how to do so. Thus, incentives to improve may not yield much until the technical base improves.

4. Create the Conditions That Let Schools Learn

Renegotiating the governance and management contract is a necessary condition for helping schools learn. A changed contract would give schools the management discretion required to adapt and innovate; it would set performance standards that would provide targets for schools; and it would set up accountability assessments that should generate some performance pressure on schools and thus demand for performance-enhancing knowledge and strategies.

Several factors produce schools that learn to stay the same and suppress demand for better practice. Changing no one factor will be sufficient to reverse this situation, and most changes are not solely within the control of the school. The objective is to make effective use of renegotiated governance and management contracts. They provide the autonomy to change and performance pressure to change—accountability—. Other changes are required to create conditions for staff learning.

- Work within the school has to be reorganized to multiply professional interactions around improvement. Working in professional teams, rather than solo, is one obvious means. The importance of teams for creating *organizations* that learn underscores that performance rewards should be for the school or for teams, not for individual teachers. Merit pay for individual teachers undercuts team formation. Another means is school clusters that create "learning cells" for teachers; these can be geographically contiguous schools or members of reform networks, such as the Coalition of Essential Schools. Still another is introducing benchmarking into schools, inherently a team

[1] Schools should be judged not in terms of the absolute average test scores of their students, but rather in terms of how much learning has been added by the school. Schools with students from the upper middle classes will have higher scores by virtue of family background alone; schools with students from the lower classes are likely to have lower average scores. Value-added measures highlight schools whose students do better than would have been expected and those that do worse, given the characteristics of the students that they serve.

activity focused on locating and incorporating best practice.

Professional interactions require time. Increasing them may require reducing teachers' instructional time—at the least, making much more effective use of teachers' non-instructional time. The instructional hours—as well as total working hours—for U.S. teachers are very high relative to other industrialized countries. An objective time audit would reveal the time currently available for activities other than instruction. Reducing instructional hours is not only minimally under the control of the school, even with budget discretion, but, because of its potential budget implications, requires a careful analysis of the conditions that have to be in place for reduced instructional time and translate into skill enhancing interactions among teachers. However, *if analyses show that fewer hours in the classroom enhance teachers' practice, the costs almost certainly can be covered by reallocating resources from non-instructional staff to teaching staff.*

- Clear and high standards for teaching are a necessary condition. High standards for teaching have multiple virtues. When used in credentialing examinations for new entrants, they signal expected performances in the profession, information that schools of education can use to structure their training programs and goals toward which student teachers can strive. Credentialing standards are the most effective way to improve the quality of schools of education, in that schools whose graduates cannot pass the examinations required to practice either improve or close their doors. When used in board certifying examinations for experienced teachers, high standards create a merit basis for pay increases and promotion to positions such as master teacher. They also give teachers who meet these standards—and the activities in which they engage—much more credibility with the public. These activities include teaching, debates about introducing innovations, and setting national and state examinations and curricular frameworks.

"Credentialing standards are the most effective way to improve the quality of schools of education, in that schools whose graduates cannot pass the examinations required to practice either improve or close their doors."

However, their contribution to creating schools that learn lies in upgrading the technical knowledge, skills, and professional norms that practitioners bring to their practice and creating standards against which daily performance is judged. In other words, they can act as improvement goals for teachers in their daily practice. The

National Board for Professional Teaching Standards is well advanced in creating board certifying examinations of this type. These examinations are now beginning to be modified for certifying new teachers. In time the images of good teaching that these standards represent should become widely known and understood within the profession.

5. Set Up Quality Controls for Innovations and Develop Mechanisms for Legitimating Better Practices

Productivity in a sector is strongly related to the strength of that sector's technical base. The technical base in education is both weak and lacks the cumulative quality associated with technically more robust industries. No issue seems to stay settled. The education sector is heavily politicized in part because so many issues can only be decided on ideological, not technical, grounds. The system suffers from too much scattered and unevaluated change and too little systematic, well-evaluated change.

A priority for increasing technical progress in the sector is establishing

- a basis for knowing when new knowledge and practices can be trusted and under what conditions; and
- a means of reaching consensus within the professional community about best practices under particular conditions.

These steps are not sufficient for creating a strong technical base, but they are prerequisites to other needed steps, such as substantially increased levels of R&D investment. They attack the justifiable lack of confidence in the innovative process on the part of taxpayers, policymakers, parents, teachers, and students—a factor that helps explain the low national R&D budget in education and teachers' and parents' resistance to change in the schools.

Different industries, not just health, have faced the standards and consensus problem, and designing comparable mechanisms for education should be based on an analysis of the experiences of these industries. For example, the consensus development process of the National Institutes of Health is but one way of reaching consensus within the professional community about best practices. The technical base should reflect international knowledge and best practice, just as the technical base in health reflects research conducted all over the world. Thus, the knowledge and practice to be judged should be international, although field and other trials will often have to be repeated to assess effectiveness under American conditions. The criteria for judging knowledge and practice should be

developed with practitioners as well as technical experts. What do schools find they need to know in order to trust new knowledge and to invest the effort required to use a new practice? These criteria can operate as "check lists" for schools to use in adoption decisions.

"The criteria for judging knowledge and practice should be developed with practitioners as well as technical experts. What do schools find they need to know?"

6. Make a Contract Among Ourselves for the Next Generation

Each of us, in one role or another, is a stakeholder of the U.S. education system. In our role as citizens we set the basic constraints for education. As a result, we take on responsibility with educators and policymakers for establishing the conditions that let schools improve and students learn. This document was written in part to help citizens understand the root causes of some of the problems in education so we can use our power to support changes likely to yield long-term benefit.

Following are eight principles that should be kept in mind in any attempt to make broad-based systemic changes.

- **Evaluate reforms using a systems perspective.** Citizens and educators need change in education, but not the kind of change typical today. The basic assumption of a systems approach to increasing productivity in schools is that attention must be paid both to individual subsystems and to the way in which they relate to each other as parts of the greater whole. Citizens, and certainly the educators who have to implement reforms, have the right to ask for evidence that reformers have done their systems homework.

  Are reformers working at the level of symptoms or root causes? How do they know? What conditions have to be in place for the reform to succeed? Are they in place? How is the reform expected to affect the different subsystems of education? What resistance to the reform is expected? Have the ideas behind the reform been implemented elsewhere, and if so, is there credible, as opposed to anecdotal, evidence on problems and payoffs from the reform? If those proposing the reform cannot answer questions such as these convincingly, it would be advisable to reject the proposal

- **Resist attempts to use the schools to solve the community's social problems.** The Committee for Economic Development (1994) states this principle well. "Many look to the school instead of to parents and community as the front line of defense against every social or health problem . . . . As a result, school after school is accomplishing neither its academic nor its social goals . . . . Schools are often the only 'checkpoint' for identifying children's health and social problems. And in many communities, school buildings are the most logical institution in which to locate services. But the schools are only *one institution*, and their first mission is to educate....These 'social' services may be *placed* in the schools, they may be *delivered* through the schools, but they should not be made the *responsibility* of the schools." (pp.4-5) Several countries, such as Germany, use their schools in exactly this way. After the academic day, students use school premises for sports, club meetings, and additional classes of different kinds.

- **There are no quick fixes.** Overnight successes that disappear as quickly as they arise produce disorienting jumps that hurt long-term performance. For schools to achieve permanent improvements, the groundwork must be carefully laid and developed.

  Moreover, reforms that will work in the long run frequently lower performance temporarily as the school staff learns and adjusts to the change. Short-term "implementation dips" are common in business and should not be seized upon as evidence that a reform plan is failing. Any major change takes time. Trying to rush reform hurts its ability to raise performance in the long term.

- **Communities should focus on a few key academic goals.** When you try to focus on everything, you focus on nothing and only divert scarce resources away from the core purpose of improving academic performance. Communities need to determine their highest priorities and direct resources and time to solving these priority problems. It is difficult to choose to focus on some areas at the expense of others, but schools cannot change everything at once.

  Surveys show significant differences in how educators and the public view their schools. The process of setting priorities should be based on a number of dialogues among the stakeholders.

- **Move from shifting blame to sharing responsibility.** When educators and administrators are attacked, they naturally become defensive and, eventually, afraid of trying new reforms that might benefit the students. When there are problems with a new reform effort, teachers, administrators, parents, students, and other community members should work together to determine what can

be learned from the experience that can be used to increase the chances of success with future change efforts.

Everyone is part of the problem and part of the solution. Most communities shift the responsibility for education to the schools but every parent—and every citizen—should be accountable for their role in advancing student learning. The community needs to be involved in issues as mundane as enforcing limits on TV watching at home, making work time available for parents to attend school events, or sponsoring older children in tutoring programs. The whole community should work to improve all the education options available.

- **Let change happen.** Many communities want their children educated the same way they were and better results at no extra cost. All this may not be possible at once. Change for its own sake is not necessarily good, but since more of the same is unlikely to get us where we want to go, we must expect things to be different. Getting better results may require substantial reallocation of resources. For example, teachers need more time to stay current in their fields, to work collaboratively with colleagues, and to observe each others' classrooms to be more effective. However, parents tend to resist these changes in the belief that if teachers are not in the classroom, they are not working.

> *"Everyone is part of the problem and part of the solution. . . . Every parent— and every citizen— should be accountable for their role in advancing student learning."*

- **Insist on productivity improvement.** The entire community should link their support for school budgets to increases in school efficiency and student performance. Every policy should be evaluated against its ability to yield improvement in student learning. In addition, parents, business leaders, and policymakers should ask for data that evaluates efficiency in performance across the major subsystems, not merely teaching and learning.
- **Help expand the role of students as co-producers of their own learning.** Recognizing that time-on-task powerfully affects student learning, the public should insist that students make a greater contribution to the learning process (and to the cost of their education) by doing more homework. Until schools hold students more accountable for homework and require more time on core academic subjects, the public will not get a full return on its investment.

The Responsibility is Ours

We cannot shirk from the responsibility of giving the next generation the best education possible within the resources available. The productivity challenge requires that we stretch our imaginations and efforts to create a capacity for improvement. America is only as smart as its next generation and as skilled as the students it prepares. We can afford no less than to spend wisely the limited resources we have to help all young people become better learners, better citizens, better workers, and better prepared to adjust to uncertainty and change.

PART V: REFERENCES

A large literature from different social science disciplines and commissioned papers and memoranda by Consortium members informed this document. The references listed below are only those items cited in the report.

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PART VI: Acknowledgments

In 1992, a businessman with a long record of involvement in public education sought to determine how American education could contain cost and improve quality.

G. Carl Ball, chairman of Geo. J. Ball, Inc. and president of the Ball Foundation, noted that if his international seed business had invested as little in horticultural research as the nation invests in improving education, his company would have gone bankrupt years ago. Mr. Ball met with Dr. Sue Berryman, then director of the Institute on Education and the Economy at Columbia University's Teachers College, who with her co-author Thomas Bailey had just completed a major study, *The Double Helix of Education and the Economy*.

This study showed that the U.S. economy was changing rapidly and in ways that meant that American schools had to change what they taught, to whom, when, and how. Thus, the problem of change and the capacity of the education system to change emerged as formidable issues.

With funding from the Ball Foundation, Dr. Berryman, now a senior education specialist at the World Bank, brought together national experts from diverse fields: public sector management, productivity, finance, education, health policy, systems analysis, organizational change, and private sector management. One objective was to understand the apparent inability of the educational system to change in productive, rather than random, ways. The other was to identify levers that, by virtue of attacking the root causes of the system's problems, promised to move the system in a productivity-improving direction.

The panel convened five times over the past 2 1/2 years and reviewed drafts of this report. Not all panel members agree with everything that is in this document, but all agree with its basic premise and findings.

The Consortium is grateful to Sue Berryman, who was the catalyst for much of the work conducted by the Consortium and the principal author of this report. The Consortium also is grateful to its advisory board who provided ongoing expertise and feedback to improve this final document.

Special thanks goes to our funders—the Ball Foundation, which provided the basic operating support over three years; Citicorp, which funded the dissemination of our findings; the G. Victor and Margaret D. Ball Foundation; and the Robert and Terri Cohn Family Foundation. The Consortium also recognizes the contributions of the Framingham, Mass.-based consulting firm Innovation Associates, whose expertise in systems analysis helped shape the thinking of the panel, and The Widmeyer Group, which recruited and coordinated the advisory panel and edited and designed the final report.

The views and opinions expressed in the document are those of this author and the Consortium members and do not necessarily reflect those of the funders or the World Bank, any of its affiliated institutions, or members of its Board of Executive Directors and the countries they represent.

Following are biographies of Consortium members and a list of our advisory board.

CONSORTIUM ON PRODUCTIVITY IN THE SCHOOLS

SUE E. BERRYMAN, CHAIR

Sue E. Berryman is a Senior Education Specialist with The World Bank in Washington, D.C., where she provides technical expertise for the Bank's investments in education systems in the Middle East, North Africa, Eastern Europe, Central Asia, and the countries of the former Soviet Union.

From 1985-1992 she directed the Institute on Education and the Economy at Teachers College, Columbia University, in New York City, a research institute that focuses on the implications of changes in the U.S. economy and workplaces for the U.S. education and training system. She is and has been a member of a number of national advisory boards. She has been a member of the Judge's Panel for the New York State version of the Baldridge Award and an invited speaker at many conferences on education and employability in the United States. She has testified several times for different committees of the U.S. Congress and served on several National Academy of Science and National Academy of Engineering panels, such as the Academy's Committee on Postsecondary Education and Training for the Workplace. Her most recent book, co-authored with Thomas R. Bailey, is *The Double Helix of Education and the Economy*.

From 1973-1985 she was a Behavioral Scientist with the RAND Corporation. Before joining RAND, she was on the faculty of the University of Minnesota, worked as a research associate in the Director's Division of the oak Ridge National Laboratory, and taught at the Harvard Business School

After living in Singapore, Hong Kong, and Japan, Dr. Berryman obtained a Magna Cum Laude Bachelor's degree from Pomona College, graduate training in anthropology at the University of Pennsylvania, and her doctorate from the Social Relations Department of Johns Hopkins University.

LAWRENCE D. BROWN

Lawrence Brown is Professor and Head of the Division of Health Policy and Management in the School of Public Health at Columbia University. Dr. Brown writes on competitive and regulatory issues in health policy and on the politics of health care policymaking. He is currently (with Catherine McLaughlin) evaluating the Robert Wood Johnson Foundation's Community Programs for Affordable Health Care and their Program for the Medically Uninsured. He has served on the editorial boards of several journals and was editor of the Journal of Health Politics, Policy and Law from 1984-1989.

He was a Professor in the School of Public Health at the University of Michigan, has been a senior fellow at the Brookings Institution, and has served on the faculties of Smith College, the University of Virginia, and Harvard University. He received his B.A. degree from Harvard University in 1969 and his Ph.D. in government from Harvard University in 1973.

RICHARD F. ELMORE

Richard Elmore is a Professor of Education at the Graduate School of Education, Harvard University. He is also a Senior Research Fellow of the Consortium for Policy Research in Education, a group of universities engaged in research on state and local education policy, funded by the U.S. Department of Education, Office of Educational Research and Improvement.

His research focuses on state-local relations in education policy, school organization, and educational choice. Recent publications include titles such as: "Curriculum Policy"; "Public School Choice as a Policy Issue"; "Restructuring Schools: Reform and Retrenchment"; "School Finance Politics in California"; "Forward and

Backward Mapping: Reversible Logic in Analysis of Public Policy"; and "The Political Economy of State Influence in Education."

Professor Elmore was previously on the faculty of the Graduate School of Public Affairs, University of Washington (1975-85), where he received the University's Distinguished Teaching Award. He was also on the faculty of the College of Education, Michigan State University (1986-1990). He was a visiting professor at the Graduate School of Public Finance, University of California, Berkeley and the Institute of Public Administration and Organization Theory, University of Bergen, Norway. He held positions in the Office of the Secretary, Department of Health, Education, and Welfare and in the Office of the Commissioner, U.S. Office of Education (1969-1971).

He teaches regularly in programs for public sector executives. His government advisory positions have included the City of Seattle, the State of Washington, the U.S. Department of Education, and the National Research Council of the National Academy of Sciences. He holds degrees in political science from Whitman College (AB) and the Claremont Graduate School (MA), and a doctorate in education policy from the Graduate School of Education, Harvard University.

ROBERT L. KAHN

Robert L. Kahn is Professor Emeritus of Psychology and of Public Health at the University of Michigan. He is also Research Scientist Emeritus at the Survey Research Center of the Institute for Social Research, of which he was formerly Director.

Dr. Kahn is a psychologist (Ph.D., 1952, Michigan) with a long-standing interest in organizational theory and research. His research has concentrated on the determinants of organizational effectiveness, on organizational stress, and on organizational change. His most recent research is a study of interdisciplinary collaboration as it has developed in the research networks supported by the MacArthur Foundation.

Dr. Kahn's interest in the organizational problems of public schools began with his own early experience as a high school teacher in Detroit, and that interest has persisted. With colleagues at the Institute for Social Research, he initiated a program of research on high school students which has developed into a nationwide annual assessment of constancy and change during the adolescent years. Among his recent research studies is a longitudinal investigation of public school teachers, in

which their aspiration and expectations during teacher training were contrasted with their responses during the early years of teaching.

Dr. Kahn is a fellow of the American Academy of Arts and Sciences, the American Association for the Advancement of Science, the Academy of Behavioral Medicine Research, the American Psychological Association, and the American Statistical Association. Among his honors are the Ph.D. hon. from the University of Amsterdam, the Lewin Award for Social Psychology, the Distinguished Faculty Award of the University of Michigan, and fellowships at the Netherlands Institute for Advanced Study and the Center for Advanced Study in Behavioral Sciences.

HELEN F. LADD

Helen F. Ladd is a Professor of Public Policy Studies and Economics and Director of Graduate Studies in the Terry Stanford Institute of Public Policy at Duke University.

An expert on state and local public finance, Dr. Ladd has written extensively on education finance, the property tax, tax and expenditure limitations, intergovernmental aid, state economic development, and fiscal problems of U.S. cities. In addition, she has co-authored books on discrimination in mortgage lending and the capitalization of property taxes and edited a volume on tax and expenditure limitations. Her most recent book with John Yinger is *America's Ailing Cities: Fiscal Health and the Design of Urban Policy*.

She spent the 1994-95 academic year as a Visiting Fellow at the Brookings Institution in Washington, D.C.. Based on a conference she ran at Brookings, she is currently editing a volume on performance-based approaches to school reform.

She is active in the Association for Public Policy Analysis and Management and the National Tax Association, which she served as president in 1994-95. In addition, she is on the editorial board of various journals, and consults on tax policy and intergovernmental relations for all three levels of government. With others, she recently completed a major study for the Minnesota Legislative Commission on Planning and Fiscal Policy.

She has taught at Dartmouth College, Wellesley College, and Harvard University, first in the City and Regional Planning Program and then in the Kennedy School of Government. She graduated with a B.A. degree from Wellesley College in 1967, received a master's degree from the London School Economics in 1968, and earned her Ph.D. in economics from Harvard University in 1974.

FRANK R. LICHTENBERG

Frank R. Lichtenberg is professor and head of the economics group at the Columbia University Graduate School of Business and a Research Associate of the National Bureau of Economic Research in the Bureau's Productivity and Technical Change program. He has conducted research on a variety of topics, including productivity, corporate control, technological change, research and numerous scholarly journals and in the popular press. His book *Corporate Takeovers and Productivity*, an analysis of productivity effects of the corporate mergers and acquisitions of the 1980's, was published by MIT Press.

He has been a 1989-90 Research Fellow at the Jerome Levy Economics Institute at Bard College and a 1986-87 American Statistical Association/National Science Foundation/Census Bureau Research Fellow. He has been awarded a number of research grants, contracts, and fellowships, including a Fulbright Fellowship.

He has testified before Congress and served as a consultant to private organizations and government agencies, including the Securities Industry Association; the RAND Corporation; the U.S. Bureau of the Census; Pfizer, Inc.; the New York City Water Board; Touche Ross and Co.; and the American Federation of State, County, and Municipal Employees.

Dr. Lichtenberg has taught at Harvard University, the University of Pennsylvania, and the University of Adelaide (Australia); been a Research Fellow at the Brookings Institution; and worked at the U.S. Congressional Budget Office, the U.S. Department of Justice, and the U.S. Bureau of Labor Statistics.

He received a B.A. degree with Honors in History from the University of Chicago in 1973 and a M.A. and a Ph.D. in Economics from the University of Pennsylvania in 1982. Dr. Lichtenberg lives in Westchester, New York with his wife, Michelle, and his sons, Andrew and Alexander.

RICHARD J. LIGHT

Richard J. Light teaches statistics and program evaluation at Harvard, with a special focus on programs in education. His work emphasizes how to collect and analyze information to improve management. Dr. Light received his Ph.D. in statistics from Harvard in 1969 and was appointed a professor in 1975. His book *Summing Up* (co-authored with David Pillemer), published in 1984 by Harvard University Press, describes techniques for summarizing information from disparate

research studies to improve program management. His book *By Design* (co-authored with Judy Singer and John Willett), published in 1990 by the Harvard University Press, presents modern methods for assessing the effectiveness of educational initiatives.

At Harvard, Dr. Light is currently Director of the Seminar on Assessment. This is a consortium initiated by former President Derek Bok that brings together faculty and senior administrators from 24 colleges and universities to carry out research on college effectiveness. Now in its fifth year, this Seminar continues with the support of President Neil Rudenstine. It especially encourages innovations to strengthen the college experience for students. Two formal reports have now been issued, one in 1990 and the other in 1992. Dr. Light also currently teaches in the Kennedy School's Executive Program for Senior Managers in State and Local Government.

Outside of the university, Dr. Light has recently been president of the American Evaluation Association, an organization of scholars, scientists, and managers working to improve public sector services. He has chaired the Panel on Programs for Youth for the National Academy of Sciences in Washington, and serves on the National Advisory Board for the Program Evaluation Division of the U.S. General Accounting Office, the research wing of the Congress. In the fall of 1991, Dr. Light was honored with Paul Lazarsfeld Award for distinguished contribution to scientific practice.

Dr. Light earned a B.S. degree with Highest Distinction from the University of Pennsylvania in 1962. He earned his M.A. degree from the University of Pennsylvania in 1964 and his Ph.D. in Statistics from Harvard University in 1969. He lives in Belmont, Massachusetts with wife Patricia and two daughters.

FRANK J. PIPP

Frank J. Pipp is a retired Group Vice President of the Xerox Corporation, Stamford, Connecticut. Currently, he is a Director of the following companies: Delphax Systems, Inc., Advanced Hi-Tech, Inc., Nypro, Inc., Spectra, Inc., Saber Equipment Corp., SynOptics Communications Corp., and is Chairman of the Board of Xylogics, Inc.. He also continues to serve Xerox in a consulting role.

He has been a judge for the Malcolm Baldridge National Quality Award from 1988 through 1992 and for 1991 and 1992, served as Chairman of the Judges Panel. Currently, he is a member of the Board of Overseers.

Mr. Pipp joined the Xerox Corporation in 1971 after 21 years with the Ford Motor Company. At Xerox he held various management positions, including Assistant General Manager of the Manufacturing Division, Vice President of Manufacturing Staff and Procurement and Senior Vice President and General Manager of the Manufacturing Division. In 1975, he was appointed Group Director, Manufacturing, Engineering and Supply, for the company's London-based subsidiary, Rank Xerox Limited. Mr. Pipp returned to the United States in 1978, and was named Corporate Vice President and President, Reprographic Manufacturing Group. In May 1980, Mr. Pipp became a Corporate Group Vice President, and in October 1980, he was named President of the Reprographic Technology Group.

In June of 1981 Mr. Pipp became President of the Reprographic Business Group, which included the worldwide groups of manufacturing, engineering, product planning, and service. In January of 1984 he assumed the position of Group Vice President of the Corporation.

Mr. Pipp was born in Iron Mountain, Michigan. He received his B.A. degree in economics in 1948 from the University of Michigan and has attended courses in engineering and business administration at the University of Chicago and the University of Louisville. He served for two years in the U.S. Naval Air Corps. Mr. Pipp and his wife, Gloria, reside in Fairfield County, Connecticut. They have two children.

JOSEPH SENSENBRENNER

Joseph Sensenbrenner is a consultant in the application of advanced private-sector Total Quality Management and System Thinking approaches to public-sector service delivery. Total Quality Management, a philosophy and program of management developed in the United States by W. Edwards Deming and Joseph Juran and associated with leading Japanese and U.S. industries, is being widely adopted by corporations wishing to compete effectively on the basis of quality and cost. He is recognized by The Quality Review as one of the 1988's "Ten Most Influential Figures in Quality Improvement."

As three-term Mayor of Madison, Wisconsin, Mr. Sensenbrenner was the first public official to adopt these techniques on a citywide scale. From 1983 to 1989 he pioneered service improvements in virtually every municipal activity of the capital city. Madison's advance in police, streets, day care, data processing, and other areas have drawn considerable attention from private and public-sector leaders throughout the country and from the news media.

He has been Deputy Attorney General for the State of Wisconsin, Division Administrator for the Wisconsin Department of Justice, and the Chief of Staff for Wisconsin's Governor Patrick J. Lucey.

He received his B.A., cum laude, from Williams College in 1970 and his Doctor of Jurisprudence from the University of Pennsylvania in 1973. His wife, Mary Ellyn Drury, is an attorney, and they have two sons, David and Joseph.

EX-OFFICIO MEMBERS

G. CARL BALL

Advisory Board Co-Chair

G. Carl Ball joined the family owned company, Geo. J. Ball, Inc., a horticultural firm located in West Chicago, Illinois, in 1947. He was elected Chairman of the Board in 1962 and became President of the company in 1970. Mr. Ball also is President of the Ball Foundation in Glen Ellyn —a professional research organization directed at the identification and development of human potential through aptitude and ability testing and research.

Mr. Ball served as Chairman of the Board of the Corridor Partnership for Excellence in Education, is a Director of the Illinois Math and Science Academy, and serves on the IMSA Alliance, an advisory committee which extends the IMSA program throughout the State. He also is a board member of the Board of Overseers of Illinois Institute of Technology, West, and is a member of the Board of Trustees of Aurora University in Aurora, Illinois. He is a council member of the National Industry Council for Science Education (NICSE). Mr. Ball served on the National Academy of Science's Committee on the Federal Role in Education Research.

Mr. Ball was born and grew up in Glen Ellyn, Illinois. He served as a pilot in the Air Transport Command and Northwest Airlines, Northern Region, in Alaska and the Aleutian Islands from 1942 to 1947. He had attended Kenyon College from 1939-41, and after World War II, resumed his education at the University of Illinois, earning a Bachelor of Science degree in 1947. Mr. Ball lives in Glen Ellyn with his wife, Vivian Elledge Ball. The Balls have three children: George Dexter, Anna Caroline, and George Carl, Jr.

P. MICHAEL TIMPANE

Advisory Board Co-Chair

Mr. Timpane is the former President of Teachers College, Columbia University, the world's most comprehensive graduate school for the preparation of educational, psychological, and health professionals. He served previously as Dean of Teachers College and as Deputy Director and Director of the federal government's National Institute of Education. He has conducted research on educational policy as a senior staff member at the Brooking Institution and The RAND Corporation.

Mr. Timpane has edited and contributed to several books on education and social policy. During the past decade, he has been involved in many aspects of the renewed business involvement in education, writing about these issues for foundations, periodicals, and the Committee for Economic Development (*Business Impact on Education and Child Development Reform*, published in May 1991). He co-directs with Michael O'Keefe the Program for Education in a Changing Society, an annual seminar series on national education policy affiliated with the Aspen Institute. Through his work at the Aspen Institute and as advisor to state and federal policymakers, he has been much involved in the development of national goals and standards in education, new formulations of policy with respect to comprehensive service for young children, higher education, and national educational reform. He has served as co-chair of New Jersey's Quality Education Commission and serves on the boards of the American Council on Education, the American Association for Higher Education, and Children's Television Workshop.

Mr. Timpane received a magna cum laude B.A. degree in history and economics from Catholic University in 1956. He earned a M.A. degree in history from the same institution and a M.P.A. degree from Harvard University in 1970. He and his wife, Genevieve, have four sons.

STEVEN GOLDMAN

Steven Goldman originates from New York and graduated from Queens College of C.U.N.Y. with a Bachelor of Arts degree in psychology. He taught high school mathematics in the early 1970's and earned an M.B.A. in 1975 from Baruch College of the City University of New York. From 1976 - 1984, Dr. Goldman was Supervisor of Manufacturing Standards at Signode Corporation in Glenview, Illinois, and in 1982, he earned a Ph.D. in Industrial/Organizational Psychology from Illinois Institute of Technology in Chicago, Illinois.

In 1985, Dr. Goldman was named Director of the Ball Foundation in Glen Ellyn, Illinois which is a research and career counseling organization. The Foundation conducts research on the identification and development of human potential through the use of aptitude measurement and also provides career counseling to individuals needing academic and/or career direction. He has been instrumental in establishing the *Consortium on Productivity in the Schools* and the *School Design Collaborative*, two educational initiatives sponsored by the Ball Foundation.

Dr. Goldman is a member of the American Psychological Association, American Educational Research Association, American Counseling Association, American Institute of Industrial Engineers, and the Greater Chicago Association of Industrial/Organizational Psychologists, where he also serves on the steering committee. He has authored numerous reports and articles and presented before professional associations.

Dr. Goldman serves on the Wilmette Youth Commission and is a member of the Board of Directors of the Corridor Partnership for Excellence in Education. He also is a member of the President's Council of Illinois Institute of Technology. Dr. Goldman lives in Wilmette with his wife, Madeline, who is a computer engineer. They have one daughter, Lisa, who is a freshman at the University of Wisconsin-Madison.

THOMAS BAILEY

Thomas Bailey is the Director of the Institute on Education and the Economy and an Associate Professor in the Department of Economics, Education, Philosophy and Social Sciences at Teachers College, Columbia University. Since his work has focused on both education reform and innovative training and organizational developments in the workplace, he has extensive experience with data analysis, fieldwork, and on-site evaluations relating to both schools and workplaces. An expert on the educational and training implications of changes in the workplace, he has served as a consultant to many public agencies and foundations, including the U.S. Department of Labor, the U.S. Department of Education, the U.S. Congress Office of Technology Assessment, the Alfred P. Sloan Foundation, the William T. Grant Foundation, and several state and local economic development and educational agencies. He has led research and evaluation activities on employer training for organizations such as Levi Strauss, McDonalds, and the International Ladies Garment Workers Union and assisted in the curriculum development of vocational schools such as the Fashion Institute of Technology and Textile Clothing Technology Corporation.

Dr. Bailey has evaluated and reported on the youth apprenticeship model, the integration of academic and vocational education, employer participation in school-to-work programs, industry-based skills standards and certification, and education for all aspects of the industry in such publications as "The Integration of Work and School: Education and the Changing Workplace," "Can Youth Apprenticeship Thrive in the United States," and "Education for All Aspects of the Industry: Overcoming Barriers to Broad-Based Training." His articles on training in the textile and apparel industries have appeared in a wide variety of academic and trade journals, and he has authored or co-authored books on the employment and training of immigrants and the extent and effects of on-the-job training. His book, written with Sue Berryman, *The Double Helix of Education and the Economy*, examines the poorly understood link between the needs of the workplace and the contemporary understanding of effective learning and has been extensively at professional development conferences and in courses schools of education. His most recent book, *Classrooms in the Workplace: Employer Involvement in School-to-Work Transition Programs*, analyzes the roles of employers in the education system.

INNOVATION ASSOCIATES, INC., (IA)

An Author D. Little Company, IA is the pioneer and premier consulting and training firm enabling enterprises to become learning organizations. IA focuses its learning organization expertise in the areas of leadership and executive development of high-performance teams, and leadership for implementation of large systems change efforts. IA provides consulting, public and in-house training programs, and customized programs to a diverse client base, including AT&T, Federal Express, General Foods, IBM, Motorola, Xerox, Intel, and Monsanto, as well as other Fortune 1000, government, and health care industry organizations. IA partners with clients to transfer its organizational learning technology and tools, enabling clients to reach their most critical business objectives, including growth, implementing change and innovation, and achieving organizational and financial goals.

C. SHERRY IMMEDIATO

Sherry Immediato is a Senior Consultant with Innovation Associates. After a decade of work with corporate clients, she consults primarily to health care and education organizations, as well as on economic development issues with a focus on developing effective working relationships among competing stakeholders. Ms. Immediato's special interest is working with communities to explore issues which transcend organizational boundaries.

Over the past thirteen years, Ms. Immediato has specialized in translating the conceptual underpinnings of organizational learning-aspiration, collaborative conversations, and preparation for complexity into day-long meetings and multi-year strategies. Typical consulting relationships include co-designing and implementing organization strategy to complement business imperatives, support cross-functional teams in addressing system issues, and coach executive teams in their own development process as well as training sessions on the disciplines which increase organizational learning capacity.

Prior to joining Innovation Associates, Ms. Immediato worked in venture capital and economic development in both industry and government. She was also a member of the organization behavior faculty of the Radcliffe College Management Program.

Ms. Immediato has Master degrees in Business Administration and Public Policy from Harvard University.

JENNIFER M. KEMENY

Jennifer Kemeny is a Senior Consultant with Innovation Associates, and has consulted with Fortune 500 firms in a wide variety of industries, both nationally and abroad.

Ms. Kemeny's work is aimed at senior management teams facing cross-functional issues which have major business and organizational impact. Her major emphasis of late has been team learning, helping a variety of organizations make major organizational breakthroughs as they shift their inter-relationships from adversarial to advocacy and learn to resolve differences through a more systemic perspective. As an expert in systems thinking, Ms. Kemeny develops leveraged interventions that lead to long-lasting performance improvement and create organizational understanding and commitment.

Prior to joining Innovation Associates, Ms. Kemeny worked at Peat, Marwick, Mitchell & CO., consulting in the strategic use of information systems. She has also been an Adjunct Professor at Lesley College in Cambridge, MA in the Graduate School of Education.

Ms. Kemeny has a B.A. from Dartmouth College, and did doctoral work in the System Dynamics department of the Sloan School of Management.

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** Richard W. Riley served as an advisor for a brief period prior to his nomination as U.S. Secretary of Education.*

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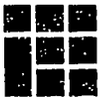

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