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The current debate over the cost-effectiveness of America's schools is sparked by the public's desire for increased accountability and efficiency in public education, now a $300 billion enterprise. Taxpayers want to know where their money is going and whether additional funds are justified. Researchers are themselves divided. Some find that dramatic increases in funding over recent decades have brought little or no advancement in student achievement. Others are more optimistic, claiming that some expenditures are tied to improved achievement. Experts do agree on three points: resources are shrinking; research should examine how funds are actually spent; and schools must discover more cost-effective ways to allocate and utilize existing resources.

IS THERE A RELATIONSHIP BETWEEN EDUCATIONAL FUNDING AND

STUDENT OUTCOMES?Early production-function research, modeled on classical economic theory, tried to correlate a set of educational "inputs" to a single "output." Most of these studies were inconclusive. Because of the complexity of the schooling process and factors (like child poverty) outside schools' control, it has been difficult to isolate statistically significant one-to-one correlations between inputs and student learning.

The most common outcomes measured in such studies are standardized test results, graduation rates, dropout rates, college attendance patterns, and labor-market outcomes. Inputs usually include per-pupil expenditures; student-teacher ratios; teacher education, experience, and salary; school facilities; and administrative factors (Lawrence Picus 1995). The most famous production-function study was the U.S. Department of Education's 1966 "Coleman Report." This massive survey of 600,000 students in 3,000 schools concluded that socioeconomic background influenced student success more than various school and teacher characteristics (Picus 1995).

This type of research culminated in Eric Hanushek's 1989 study, which analyzed results of 187 production studies published during the previous 20 years. Using a simple vote-counting method to compare data, Hanushek found no systematic, positive relationship between student achievement and seven inputs.

Hanushek's findings have been challenged by recent studies using more sophisticated research techniques. When Larry Hedges (1994) and associates reanalyzed Hanushek's syntheses using meta-analysis, they discovered that a $500 (roughly 10 percent) increase in average spending per pupil would significantly increase student achievement. Likewise, Faith Crampton's comprehensive analysis (1995) of inputs affecting achievement in New York State schools found that expenditures seemed to matter when they bought smaller classes and more experienced, highly educated teachers.

WHAT ARE SOME REASONS FOR SCHOOLS PRODUCTIVITY PROBLEMS?

Although low student performance can be blamed partly on deteriorating social and economic conditions, lack of student effort, and diminishing parental involvement, several factors are controllable by schools.
Allan Odden and William Clune (1995) point to poor resource distribution across states, districts, schools, and students; unimaginative use of existing funds; schools' bureaucratic structure; and focus on services and labor-intensive practices that drive up costs.

A report from the Consortium on Productivity in the Schools (1995) attributes flat productivity to schools' "unstable governance, lack of incentives to leverage productivity improvement, structures favoring continuity over continuous improvement, and inadequate quality controls on innovations." Students' time could also be used more effectively.

School-district budgeting practices are also at fault. Educators' inability to obtain accurate school-level spending data is a "major impediment to efficient planning, equitable distribution, and client choice," says James Guthrie (1994).

A study of teacher compensation between 1970 and 1994 discovered another inefficient practice - paying disproportionately high salaries to veteran teachers. This practice obviates districts' expressed goals to attract and retain the best and brightest new teachers (Lankford and Wyckoff 1997).

Some researchers claim that regardless of available funding, "school districts tend to utilize their resources in the same basic proportions," with 60 percent earmarked for direct instruction and about 40 percent going for support services (Picus 1995). Others have shown that most new funding dollars over the past 30 years have gone for specialists and services, not the core instructional program (Odden 1997).

WHAT WOULD PRODUCTIVE SCHOOLS LOOK LIKE?

Combing the productivity, systems-analysis, and social-organizations literature, the Consortium on Productivity in the Schools (1995) discovered that clear focus, responsive internal and external adaptation mechanisms, intrinsic and extrinsic incentives, and continuous improvement were essential traits.
Employing the "x-efficiency" concept, which holds that dramatic organizational changes will produce greater efficiency gains than reallocation of resources, Henry Levin (1997) identifies five dimensions of productive firms. X-efficient schools would have a clear,

objective function with measurable outcomes; incentives linked to success; efficient access to information; adaptability; and use of the most productive, cost-effective technologies. These characteristics resemble those identified in the literature on effective schools and total quality management.

WHAT ARE SOME PROMISING RESEARCH AND POLICY DIRECTIONS?

Some research, like Crampton's study of New York schools, has isolated the types of expenditures that matter in the school-productivity equation. A good example is Harold Weglinsky's study (1997), which found that fourth- and eighth-graders' math achievement was positively associated with lower student-teacher ratios and with expenditures on instruction and school-district administration. Expenditures on facilities, recruitment of highly educated teachers, or school-level administration were not significantly related.
Another kind of efficiency research explores schools' resource-allocation practices. David H. Monk (1996) examined how teacher resources are distributed and utilized at various levels of the New York State K-12 system. The study found a 55 percent increase in secondary-level special-education instructional resources between 1983 and 1992, alongside modest increases in allocations of science and math teachers. Of course, legal mandates may prevent an "efficient" distribution of teacher resources across different subject areas.

In another cost-allocation study, Bruce S. Cooper and associates (1994) developed and applied a microfinancial measure, the School Site Allocation Model, to track financial resources through school systems. Test-site data from twenty-five school districts were analyzed to provide indicators of cost ranges required to operate central offices and schools. The model effectively reported schools' usage of funds by function (administration, operations, staff development, student support, and instruction), level, and type in a "user-friendly" manner.

A third research area takes an organizational-development or restructuring approach to improving school productivity. An example is Levin's "x-efficiency" study of schools using the Accelerated Schools model to improve efficiency along five dimensions.

WHAT ARE SOME PRACTICAL STRATEGIES AND IMPLICATIONS FOR

SCHOOLS?One obvious strategy is to reduce noninstructional expenditures through such means as conserving energy and restructuring food-service programs.

Another strategy is to restructure the instructional program. Odden (1997) points to

Karen Miles and Linda Darlington-Hammond's work with five "high-performance" urban schools. By imaginatively reallocating existing teaching staff, these schools reduced class size, personalized the learning environment, and expanded staff development. Ready-made high-performance models like New American Schools, Accelerated Schools, and the Edison Project can also aid schools' redesigning process.

Odden and Clune (1995) recommend that schools focus on clear outcomes (such as the 1990 National Education Goals), change teacher compensation to make beginners' salaries more competitive and veterans' remuneration more knowledge-based; make educational management more decentralized and participatory; and restructure school financing to be more equitable and goal-directed.

Some states' funding systems link schools' expenditures and outcomes into their funding systems, and several other states provide financial rewards for raising student achievement.

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