

**FINANCING U.S.
EDUCATION REFORM:
IMPLICATIONS FOR
USAID AND
COUNTRIES**

by

Allan Odden
University of Southern California
Los Angeles, California 90089-0031

Prepared for the National Governors Association.

April 1990

CONTENTS

INTRODUCTION	
1. THE U.S. EDUCATION FUNDING STRUCTURE	
Early Childhood Education	
Elementary and Secondary Education	
Fiscal capacity equalization	
Categorical aid programs	
Private school financing	
Post Secondary Education	
Second Chance Programs	
Workplace Education and Training	
2. SOURCES OF NEW EDUCATION DOLLARS IN THE 1980S	
Economic Growth	
Importance of Subnational Governments	
Tax Rate Increases	
Non-Broadly-Based Tax Sources	
Dedicated Revenue Sources	
3. NEW U. S. SCHOOL FINANCE ISSUES	
School-Based Improvement and Performance Incentives	
Funding New Teacher Salary Structures	
Schools of Choice	
4. EFFICIENCY, COST-EFFECTIVENESS AND PROGRAM PRODUCTIVITY ...	
Education Generally as a Public Investment	
Trade-offs Among Buildings, Personnel, Technology and Textbooks	
Prevention Versus Remediation Programs	
General Educational Productivity	
Educational production functions	
Scale economies	
Class size	
Time	
Other programmatic interventions	
Conclusions	
5. BEST BETS FOR RAISING AND USING NEW EDUCATION REFORM REVENUES	
REFERENCES	

FINANCING U.S. EDUCATION REFORM: IMPLICATIONS FOR USAID ANE COUNTRIES

by

Allan Odden

United States education funding is very different from that of many Asian and Near Eastern (ANE) countries. United States funding structures vary by level of education, the private sector provides major funds at nearly all levels, subnational governments provide the bulk of funds at nearly all levels, and there is wide variety across the fifty states in funding structures and sources of revenues. Most education funding in Asian and Near Eastern countries derives from the national government.

Despite these differences and cutting across the U.S. funding diversity, however, is a conclusion that pertains both to the U.S. and Asian and Near Eastern countries: the health of education funding is determined primarily by the health of the national economy. In other words, the key strategy for producing funds for education at all levels is a growing and strong national economy. That has been the key factor in producing funds for the 1980s U.S. education reforms and, as this paper will argue, likely will be the key factor in producing revenues for education reforms in Asian and Near Eastern countries.

This argument is developed in the first two sections of this paper. Section one describes the U.S. structure of education funding from preschool through higher education, and section two reviews the evidence of the sources of new dollars for the U.S. education reforms of the last decade. The next section discusses a variety of issues related to how new funds should be used with the focus on using new education investments in ways that will produce large improvements in student achievement. This section discusses several new topics on the U.S. education finance agenda including choice, performance incentives, and teacher professionalism proposals. Section four addresses several issues on educational productivity: findings from education production function research, scale economies, class size and time, and recent thinking about educational productivity.

Drawing on recent U.S. experiences, section five suggests several strategies for ANE countries to invest new education dollars to produce large system improvements. Throughout the paper, however, implications are provided for Asian and Near Eastern countries in the USAID project.

1. THE U.S. EDUCATION FUNDING STRUCTURE

U.S. approaches to funding education vary by level of education and, in some cases, by the programmatic focus of concern. This section reviews the funding structure for early childhood education (ages 3-4), elementary and secondary education (ages 5-17), postsecondary education, second-chance programs for youth and adults, and workplace education and training. The focus is on the roles various governmental levels, the private sector and individuals play, not on the details of the specific funding arrangements.

Early Childhood Education

This education level is characterized by a variety of both public and private providers, with the private sector dominating. Providers also represent diverse philosophies of approaches to early childhood education, including structured approaches such as Montessori methods, social and academic readiness developmental methods, approaches that emphasize more direct and intensive academic preparation, or more "custodial" non-formal environments. This program diversity exists even for governmental funded early childhood education programs, unlike the alleged homogeneity of public funded elementary and secondary education. In addition, churches and religiously affiliated organizations are major providers of early childhood education programs, although there are major restrictions which prohibit these providers from receiving

governmental funds. Nevertheless, this education sector is characterized by great diversity in both program philosophy and service providers.

Attendance for all programs is voluntary, i.e., is not compulsory, except in the state of Florida which requires migrant 3 and 4 year-olds to attend an early childhood education program.

Funds derive primarily from private, individual sources. In other words, most programs charge tuition to parents of the students enrolled. In 1988 it is estimated that about 28 percent of 3 year-olds and 48 percent of 4 year-olds attended some type of pre-school program, of which the bulk were private, non-governmental supported programs.

The major exception to private funding of early childhood education is the federal Head Start Program, which enrolled _____ 3 and 4 year-olds in 1988. In that year, federal funding totaled approximately \$1.7?? billion. Head Start was created in the mid-1960s as one of the War on Poverty's key programs. The belief was that if poor children were provided a "head start" they would perform better in elementary and secondary school. While early evaluations provided mixed evidence on this belief, subsequent research has essentially supported their claim (Slavin, Karweit and Madden 1989; Barnett, 1985).

There is a consensus among federal, state and local policymakers that early childhood education programs "work" for at-risk, i.e., poor 3 and 4 year-olds. They generally are aware of the few longitudinal studies that show that higher proportions of poor children with a head start experience graduate from high school, attend college, do not go on welfare, do not engage in crime, and have higher employment rates (Berrueta-Clement, Schweinhart, Barnett, Epstein and Weikart, 1984). In part as a result, many states created and at least partially funded early childhood education programs for at-risk, poor four and in some case poor three year-olds as part of their 1980s education reforms. In 1988, state funding for early childhood education totaled about \$541 million (Education Commission of the States, n.d.).

There is a proposal in the U.S. Congress to "fully fund" Head Start; the price tag is about \$7 billion. The proposal would provide a Head Start early childhood education program for all eligible, i.e., low income, three, four and five year old child in the country. If funded, U.S. governmental funding for early childhood education would increase dramatically. Pundits of Congressional politics predict that this Head Start proposal, or a variation of it, will be funded during the next few years as one response to the Education Summit between the President and the 50 state governors and the setting of national goals, particularly the goal that all children should be ready for school.

Elementary and Secondary Education

The diversity of early childhood education and the dominance of individual private funding gives way to public sector dominance in both funding and service provision for U. S. elementary and secondary education for kindergarten through twelfth grade, ages 5-17. Private schools enroll only about 13 percent of children in this age range. Attendance is compulsory in all states, except for kindergarten which varies by state, which is primarily voluntary but increasingly compulsory. The age for which compulsory education ends also varies by state; age sixteen is the most common end point for compulsory schooling. In a sense, as the policy switches from voluntary to compulsory attendance, funding policy also switches, from private to public. Most state (but not the federal) constitutions require the state to provide a system of free, public elementary and secondary education.

The most unique characteristic of the U.S. elementary and secondary education system, including funding, is its reliance on subnational, i.e., state governments. Education is not a function mentioned in the U.S. constitution; thus it is a function reserved for the state. In other words, education is a state responsibility in the United States. All states, except for Hawaii, created local school districts to administer education, deliver education services and to raise funds to finance education.

Indeed, while there has been a shift in sources of revenue between state and local levels of governments (Table 1), the federal fiscal role has never risen to even 10 percent and state and local governments dominate public school financing. The federal role peaked

TABLE 1

**Percent Revenues by Source for U.S. K12 Public Education:
1960 to 1988**

Governmental Level	1960	1970	1980	1988	
Federal	4.4 %	8.0 %	9.8 %	6.3 %	10¢ per ed. dollar - 70's. Decline
State	39.1	39.9	46.8	49.5	Down 4%?
Local and Other	56.5	52.1	43.4	44.1	Decline 44.?

per ed. dollar

Source: National Center for Education Statistics, Digest of Educational Statistics: 1989, Washington, D.C.: U.S. Department of Education, 1989; and National Center for Education Statistics, Public Elementary and Secondary State Aggregate Nonfiscal Data, by State, for School Year 1988-1989; and School Revenues and Current Expenditures for Fiscal Year 1988, Washington, D.C.: U.S. Department of Education, 1990.

in 1980 at just under 10 percent. Indeed, during the U.S. education reform period of the 1980s, federal financing as a percent of total financing fell by nearly a third (it also fell in real terms). While historically, local revenues accounted for the bulk of education funds, states became the dominant fiscal player in the 1970s, maintained that role during the 1980s, and now provide about 50 percent of all K12 public school revenues. In 1988, the federal government provided about \$10.7 billion, state governments \$84 billion, and local governments \$74.9 billion, for a grand total of \$169.7 billion or 3.5 percent of GNP.

ANE countries should seriously consider having subnational governments raise funds for elementary and secondary schools. While a subnational tax infrastructure would need to be developed overtime (all pieces of property in the U.S. are identified through the property tax structure), the potential for raising significant new dollars -- outside of the

federal revenue structure which is strained in both the U.S. and ANE countries -- should be given serious consideration for future developments.

This tripartite governmental mixture in U.S. education funding raises several issues concerning the fiscal role for each level. These issues have dominated U.S. education finance throughout the 20th century. Very generally, local school districts -- which in nearly all states are able to raise revenues from a local property tax -- provide general purpose revenues (and also raise funds for capital purposes -- school buildings, buses and equipment). State governments, generally through state sales and income taxes, have provided general aid through fiscal capacity equalization programs (discussed below), categorical aid for special student needs (such as for the handicapped), special district needs (such as for transportation), and in the 1980s for education reforms. The federal fiscal role has focused primarily on special student needs such as Chapter I for low achieving students in districts with large numbers of poverty children (which totaled about \$5 billion in 1988), special education for handicapped children (which totaled about \$1.5 billion in 1988), vocational education (about \$ billion in 1988), and several other smaller programs.

Fiscal capacity equalization. The fiscal capacity equalization role of state governments has received the most attention. Local school districts vary dramatically in their ability to raise local property taxes. Some districts have a large per pupil property tax base and can raise large amounts of revenues with low tax rates. Other districts have small per pupil property tax bases and are able to raise only small amounts of revenues per pupil even with large tax rates. These fiscal inequities have been the focus on state fiscal school finance, fiscal capacity equalization formulas throughout this century.

How states should resolve these inequities, though, has raised two value issues: equality or local choice. The *equality value* argues that since education is a state function, public schooling should be provided to all students throughout the state on an equal basis (albeit with appropriate adjustments for special student and district needs). Thus, the state

role is to insure that spending per pupil is equal across all school districts (again with appropriate adjustments for special student and district needs).

The *choice value* argues that local parents and taxpayers should decide on the level of local school spending, that local control has been a maxim of American public education for over two hundred years. While there are mechanisms that can make local choice options to spend at different levels fair for both property poor and property rich districts (such as state guaranteed tax base programs -- See Guthrie, Garms and Pierce, 1988), the local choice value cedes fiscal decisions on taxing and school spending levels to local district taxpayers. As a result, local choice accepts differences in spending per child, as long as it is determined by local choice on tax rate levels and not local wealth advantages.

This issue has been litigated in several courts and states have taken various approaches to resolving the fundamental structural inequities produced by heavy reliance on local property taxes to raise school revenues (Odden, McGuire and Belsches-Simmons, 1983). The different state approaches reflect differing views of whether the equality or choice value should dominate state school finance policy. Should ANE countries decide to develop a property tax structure and use it to raise education revenues, this value dilemma would need to be confronted and resolved. It continues to be a source of misunderstanding in the U.S. education finance structure and rarely dealt with directly or linked clearly to a school finance structure.

Interestingly, the fiscal disparities within states are mirrored by similar fiscal disparities across states, which can only be remedied by some type of federal, interstate fiscal equalization program of general aid. This federal role has always been an idea whose time has never come! While the fact of interstate fiscal disparities has been recognized for years, Congress has never taken seriously a proposal for federal, interstate school fiscal capacity equalization. Nevertheless, if an ANE country were to shift from a federally funded to a mixed funded public elementary and secondary school structure, it would need to address this issue directly.

Categorical aid programs. In addition to general aid programs, states and the federal government have developed a series of categorical aid programs for a variety of purposes. The U.S. is still determining the appropriate governmental roles for for three types of categorical programs: those focused on special student needs, those focused on special district needs, and those focused on improving the regular school program. Strong roles for both federal and state governments have been carved-out for special student need programs. Combined, spending for compensatory education -- programs for low achieving, poor students -- totaled about \$ billion in 1988; the dominant role was played by the federal government which provided about \$5 billion. Combined, spending for special education for handicapped students totaled about \$ billion in 1988; the dominant roles was played by state governments with \$ billion while the federal government spend only about \$1.5 billion. Programs for limited English proficient students were provided about \$ billion in 1988, with \$ from the states and \$ from the federal government. While the federal government initiated these programs, they are no longer the dominant funds provider for them. Even vocational education, for which there has been a federal role for 50 years, is dominated by state funding, which provided about \$ billion of the overall \$ billion for vocational education in 1988. In short, the states seem to play the largest fiscal role in categorical programs for special student needs, although the federal government still dominates in compensatory education. While the federal programmatic role in education has been characterized as focusing on special needs students (and civil rights protections), funding these programs has largely been left to the states, i.e., to subnational governments.

The same can be said for transportation, capital construction and the education reform categorical programs that emerged in the 1980s. Virtually all transportation costs are borne by state and local governments, and except for a small federal funds under the impact aid program, states and local school districts also provide the funds for building, rehabilitating and maintaining school buildings. Even during the 1980s, when education

reform emerged and generally was supported by federal officials and the federal government, there were no major new federal initiatives, and new types of education reform categorical programs -- such as mentor teacher, career ladder programs, longer day and year programs, writing programs, science laboratories, etc. -- were state creations and supported with state, and sometimes local dollars. In short, categorical aid programs also tend to be a financial responsibility of subnational governments -- the states and local school districts.

Private school financing. Private schools, which enroll about 13 percent of children aged 5-17, had total revenues of \$ billion in 1988, compared to the \$170 billion for public schools. Nearly all private school revenues derive from tuition paid by parents of students who attend private schools. A small portion of private school funds derive from contributions. Interestingly, private school contributions are deductible on both federal and state income tax returns, but private school tuition and fees are not deductible, except for a very small program in Minnesota.

While elementary and secondary school attendance is compulsory, parents can choose to send their child either to a public or a private school. This choice is protected by the U.S. Constitution and U.S. Supreme Court decisions. The option of attending a private school provides at least some choice for some parents, although the choice entails an extra cost -- paying private school tuition. Nevertheless, for a variety of reasons, parents of about 11 percent of all school-aged children choose to send their children to a private school.

ANE countries could decide to stimulate development of a private school sector by, for example, allowing private school contributions -- and even tuitions -- to be deductible from federal taxes. This policy option could have the effect of both expanding school supply and demand with the use of private resources, as well as expanding education supply by "released" public education dollars.

Another way to bring more private funds into elementary and secondary school funding would be to adopt the Korean approach of charging half of high school costs as a tuition cost to be borne by the student's families. While tuition would need to be income-contingent, this policy works relatively well in Korea which has vastly expanded both elementary and secondary education during the past two decades.

Post Secondary Education

At the postsecondary level, attendance is no longer compulsory, and funding and provision reverts back more strongly to the private, nongovernmental sector.

Nevertheless, state and federal governments (and in some cases local governments) play major and significant roles in financing U.S. postsecondary education. Postsecondary education is characterized by a mixture of public and private providers, somewhat inbetween the situation of of early childhood and elementary and secondary education. There is a very strong private, postsecondary sector and strong postsecondary institutions in all states. Interestingly, just as with elementary and secondary education, the federal government does not administer or run postsecondary institutions.

Table 2 shows revenues by source for postsecondary education institutions for 1985-86, the last year for which comparable data are available. The data reveal several characteristics about how the U.S. finances postsecondary education. First, the federal government plays a small role, providing only 12.7 percent of the total revenues for postsecondary education. Further, federal funds flow to public and private postsecondary institutions in almost equal proportions; put differently, the federal role in financing postsecondary education does not dramatically favor either the public or private postsecondary education sector. Second, the state role totals only 29.8 percent, or just under one third. Further, the combined state and local government roles total only 32.3 percent, again under one third. In short, all levels of government provide less than fifty

percent of postsecondary funding in the U.S. Or put differently, the private sector -- tuition and other nongovernmental sources (which are primarily private contributions and interest on endowments) -- provides the bulk (55 percent) of revenues for postsecondary

Table 2

**Sources of Revenues by Source for
U.S. Postsecondary Education: 1985-86 (billions)**

Sources of Revenue	Public Institutions	Private Institutions	Total Postsecondary
Federal	\$ 6.9 (10.5 %)	\$ 5.9 (16.5 %)	\$ 12.7 (12.7 %)
State	29.2 (45.0 %)	0.7 (2.0 %)	29.9 (29.8 %)
Local	2.3 (3.6 %)	0.2 (0.6 %)	2.5 (2.5 %)
Tuition	9.4 (14.5 %)	13.7 (38.6 %)	23.1 (23.0 %)
Other	17.2 (26.4 %)	15.0 (42.3 %)	32.2 (32.0 %)
Total	\$ 65.0	\$ 35.4	\$ 100.4

Source: National Center for Education Statistics, Digest of Educational Statistics, Washington, D.C.: U.S. Department of Education, 1989.

education. These percentages vary across public and private postsecondary institutions, but the numbers show that the national strategy is to finance most of postsecondary education with private, nongovernmental funds.

A major policy issue for both the federal and state governments has been whether to support postsecondary education through institutional grants, thus supporting the supply side, or through student aid, thus supporting the demand side. Most states provide a substantial amount of postsecondary institutional support. Thus, public institutions usually charge lower tuitions because a larger proportion of their costs are covered by public appropriations. The figures in Table 1 reflect this practice; tuition comprises, on average, a smaller proportion of funds in public than it does in private postsecondary institutions. Indeed, this is a general pattern in U.S. postsecondary education financing.

The level of tuition, however, varies across the states and reflects different philosophies of governmental involvement in financing postsecondary education. In some states, such as California, tuition in public institutions is very low; the philosophy is that the state should provide free, or nearly free, postsecondary educational opportunities. These states argue that even generous student financial aid programs might hinder postsecondary attendance for poor individuals and feel that the fairest strategy is low or no tuition. As a result, states with this philosophy usually provide very little aid for more expensive private postsecondary institutions, and many times less proportionately for elementary and secondary education. These states discover that providing free postsecondary education is expensive!

Other states, such as New York, provide institutional aid for a postsecondary education system, but charge substantial tuition as well. To offset the higher tuition, the state also supports a major student, need-based financial aid program. In many instances, the financial aid is available to students whether they attend a public or a private institution. Indeed, the amount of aid often is higher for attending a private institution, generally because the tuition at the private institution is higher. These states, thus, help support a postsecondary education system that includes a greater mixture of public and private institutions. Further, such states often spend proportionately less on postsecondary education (and sometimes proportionately more on elementary and secondary education) because there are greater amounts of private funds supporting the overall system. These states argue that the personal returns to higher education (Murphy and Welch, 1989) are substantial and warrant higher personal contributions for postsecondary education and training.

In the early 1970s, the federal government wrestled with its approach to supporting high education. Rather than supporting institutions, it decided to provide financial aid mechanisms which students could use at any postsecondary institution, public or private. The federal government now provides a variety of aid programs, from Pell grants which

are income-contingent and cover all costs up to a fixed amount (thus covering costs in only some public institutions), to work study programs, to subsidized, guaranteed student loans for poor as well as middle income students. In addition, the federal government supports the research side of higher education by being a major funder of basic and applied research.

There are two implications for ANE countries from the U.S. approach to funding higher education. First, there may be an increased role for private postsecondary institutions. The United States has shown that private postsecondary institutions can complement government subsidized postsecondary institutions and that access to both can be provided with a rich mixture of student financial aid. Such an approach reduces the amount the government needs to spend on postsecondary education. Providing tax deductions or credits for contributions to postsecondary institutions is another mechanism to stimulate creation of a private postsecondary education sector. Second, there may be an increased role for private funding through charging higher tuition at public institutions. Research also shows that individual returns to higher education are substantial in non-U.S. developed as well as developing countries (Psacharopoulos, 1989, for example). In other words, it pays for individuals in developing countries to invest in postsecondary education. Both of these new approaches would relieve the federal budget for postsecondary education, while maintaining a vibrant postsecondary education sector and access to postsecondary education, and "free-up" funds for investments in K12 education reforms.

Second Chance Programs

Second chance programs are designed generally for high school aged youth and young adults who have not succeeded in secondary school, have dropped out or otherwise need a second chance to attain education and training. Second chance programs are characterized by wide diversity and are provided by nearly all sectors -- K12 school

districts, community and technical colleges, workforce education and training, military training, integrated services programs, and local community programs.

Funding derives from all sources as well: the federal government, state and local governments, the private sector and individuals. Some programs are financed with federal funds only. Others use federal and state funds. Some programs are supported only with local, private funds. Still others use a combination of federal, state, local and private finances. Because of the intertwined nature of programs offered and funding sources used, it is nearly impossible to identify a total dollar figure for second chance programs. The involvement of all levels of governments as well as the private sector suggest that there is widespread support for second chance programs.

If one goal of these programs is to have individuals earn a high school diploma or a general education equivalency degree, these variety of programs work, at least to some degree. For example, while the national high school drop out rate (i.e., the percent of a freshmen class cohort who do not graduate from high school four years later) is about 25 percent, by the time that cohort is 21, half have earned a high school diploma or its equivalent. In other words, "second chance" programs already in place help reduce the adult drop out rate to about 12-13 percent (Frase, 1989). These studies, unfortunately however, do not indicate which programs help which categories of students.

There are five basic strategies used in the U.S. to provide youth with a "second or alternative chance." The first includes alternate programs within local school districts, sometimes called continuation school programs (Raywid,). These programs generally are provided in non-traditional school settings and are usually publically funded programs. Since the student already has dropped out of school, or is at-risk of dropping out, funding can be provided through regular state and local K12 funding structures, because if the student is enrolled, s/he is entitled to the regular per pupil funds available for all students. These schools are usually small (less than 300 students), flexible in their organization and

management, provide a more personal environment both in their scale and style of operation, and provide a more individualized curriculum to students.

The second includes the many programs provided in community and junior colleges that are either parts of state K14 school systems or state postsecondary education systems. Many community colleges have programs specifically geared for individuals and adults who want to earn a high school degree. These programs too obtain funding from regular K14 or postsecondary channels, and they also might have categorical funds from the state and federal government for such students.

A third is generally called adult secondary programs, programs designed for youth and adults over 16 years of age who want to earn a high school degree. These programs provide tutoring in basic literacy skills, assistance in completing high school diploma requirements, instruction in English as a second language, and/or occupational training. Students can attend day or evening classes to earn Carnegie Units to earn a high school diploma, take competency-based tests to earn a high school diploma after demonstrating competency in several areas, take correspondence courses to earn high school credits, or enroll in the General Educational Development program run by the American Council on Education to earn a high school equivalency diploma. In 1985, these programs had \$8.5 million in federal funds and about \$89.2 million in state funds, or a total of \$97.7 million.

Fourth, the federal Job Training Partnership Act (JTPA) offers educational training, job training, retraining and job search assistance for dislocated workers, and generally works through local officials and community business leaders. The program is focused on economically disadvantaged youths and adults. Its budget in 1989 was about \$5.8 billion.

Fifth, the military provides a large amount of training and serves as a mechanism to redirect some at-risk youth into programs and activities that lead over time into productive lives. In 1989, the military budget included \$17.6 billion for training in all service branches. If the salaries of officers are excluded from this amount, the military

appropriated \$2.8 billion for training: \$1.2 billion for the Army, \$1.0 billion for the Navy and Marine Corps, and \$0.6 billion for the Air Force.

In short, the U.S. has adopted a wide variety of strategies to provide "second chance" opportunities to youth and adults who are at risk of or actually have dropped out of school. The strategies run the range of alternative programs in local public schools to opportunities in the military to job training and job search. While a total funding figure is difficult to identify, the country spends billions on the activity, with a total that easily could exceed \$10 billion, or five percent of K12 revenues, about half from the federal government if military training is included.

The implication for ANE countries is that some level of effort in second chance programs is needed. The least costly seem to be programs imbedded within the K12 or community college structure; if those students stay in school, albeit in alternative settings, they qualify for regular funding.

Workplace Education and Training

In addition to governmental provided and induced education and training programs, there is a "gigantic" education and training function provided by U.S. companies and corporations that needs to be considered as a component of a nation's overall education improvement strategy. The amounts invested are staggering, totaling about \$150 billion in 1985 (Vaughn and Berryman, 1989). While corporate heads talk of their high expenditures for training in the basic skills, the fact is that the private sector provides more training for individuals who enter the system with higher levels of education and training. In general, the economically disadvantaged tend to have low-income jobs for which little training is provided. Individuals who have good school and university training enter the corporate world in managerial, professional and technical jobs, and it is these individuals

on whom corporations spend high sums of money over time to upgrade skills and knowledge.

more to come

2. SOURCES OF NEW EDUCATION DOLLARS IN THE 1980S

While the pattern may not continue forever, one of the enduring features of elementary and secondary education finance in the U.S. is that, each decade, revenues per pupil continue to rise in nominal and real terms. The American people like their schools, believe that education is a way to improve the American society, and continue to put money into their schools. Indeed, most of the numerous, recent federal, state and local blue ribbon commissions on economic development target education reform as the key strategy to maintaining U.S. economic competitiveness.

Table 3 shows total revenues and revenues per pupil in nominal and real terms from 1960 to the present. The numbers bolster the previous point. Expenditures per pupil, adjusted for inflation, i.e., in real terms, increased by 57 percent between 1960 and 1970, by another 27 percent between 1970 and 1980 and again by another 22 percent between 1980 and 1987. Other research shows that between 1980 and 1990, real revenues per pupil increased by more than 26 percent (Odden, 1986). In other words, whether enrollments rise or fall, whether the "external threat" is defense or international economic competition, school funding rises in real terms. The good news is that, when threatened or faced with a new insecurity, Americans see school reform as a major element in addressing the problem.

Table 3

**Total Revenues and Total Expenditures Per Pupil
in Nominal and Real Terms, 1960 to the Present**

Year	Total Revenues	Total Expenditures Per Pupil (Nominal)	Total Expenditures Per Pupil (1986-87 dollars)
1960	\$ 4.7 billions	\$ 472	\$ 1787
1970	40.3	955	2812
1980	96.9	2506	3569
1987	158.8	4365	4365
		Real increase 1960 to 1970:	57 percent
		Real increase 1970 to 1980:	27 percent
		Real increase 1980 to 1987:	22 percent

Source: National Center for Education Statistics, Digest of Educational Statistics: 1989, Washington, D.C.: U.S. Department of Education, 1989.

Economic Growth

The obvious question becomes: what has been the source of this revenue growth? To lead with the conclusion, the answer is twofold: (1) a healthy national economy which produces natural increases in tax revenues and (2) tax rate increases. In other words, there are no easy answers, no magic sources of revenues. New revenues derive from a growing economy or from the political tough decision to increase tax rates.

While some (Odden, 1987) have suggested that education reform produced the real education revenue increases during the 1980s, recent research (Hawkins, 1989) finds that economic growth is the primary variable. Hawkins collected data for all fifty states over a multiple time period in a study to find the determinants of increased education revenues during the 1980s. She identified an education reform variable and, depending on the

comprehensiveness of the state's reform efforts, grouped states into strong, medium and low education reform categories. She also included several economic and demographic variables. Her analyses showed that the economic growth variables dominated and that none of the education reform variables were statistically significant. She concluded that the country's, and as a corollary, a state's economic growth was the major factor in producing education revenue increases during the 1980s. She did not disparage the saliency of education reform, and suggested that reform impetus helped to keep education on the country's policy agenda. But her statistical results documented the strength of economic over political variables.

Anecdotal evidence for this finding derives now also from the economic plights of many of the Northeastern states. Both New York and Massachusetts face large state budget deficits because their state's economy is in recession. As a result, even though each state has enacted major education reforms, education is taking a back seat to the budget balancing task. In Massachusetts, elementary and secondary education aid was cut. In both states, education revenues are unlikely to increase at the rate they did during the 1980s when these states had vibrant economies.

The implication for ANE countries, of course, is that the strongest vehicle for producing new education revenues is to adopt broad strategies that keep the nation's economy healthy and growing. While over time, improved education contributes to economic growth, for near term education reforms, a growing national economy is the key ingredient for producing new education revenues.

Importance of Subnational Governments

In the U.S., education revenue increases also derived from subnational governments, i.e., states and local school districts. While the decentralized feature of U.S. elementary and secondary education is somewhat unique, the economic results in terms of

the sources of increased education reform revenues points to the importance of trying to find sources of education revenues beyond the national treasury. Indeed, in the U.S. federal revenues declined not only as a percent of all K12 education revenues during the 1980s, but also declined in real terms (Odden, 1990). Even more important, rises in local property taxes increased almost as much as rises in state revenues, and the local role increased as a percentage of total education revenues. Put another way, if U.S. education reform financing had depended on increased federal revenues, the results would have been a disaster. During the 1980s, education reform financing in the U.S. was provided by state and local governments, not the national government.

Tax Rate Increases

While a growing economy was the major factor in producing increased education revenues, hikes in tax rates also played a role, but again at the state and local district level, not at the federal level. The 1980s witnessed major declines in national tax rates, particularly income tax rates. Indeed, the story of U.S. federal taxes in the 1980s is one of multiple cuts in rates (which some argue eventually led to the large federal deficits). Given the large cuts in federal income tax rates and the rising federal deficits, it is not surprising that federal education revenues did not decrease.

On the other hand, many states and numerous local school districts hiked tax rates to produce new revenues to finance education reform. At the state level, increased state sales tax rates were the most popular tax rate increase strategy. States such as Arkansas, Florida, South Carolina, Tennessee, Texas and Utah all raised the sales tax rate and generally used the proceeds to help fund major education reforms. In addition, these same states mandated increases in local property tax rates to produce even additional revenues. In the Southeast, moreover, this tapping of the local property tax was a major new tax strategy. The property tax in most of these states traditionally had been an underused tax;

property tax rates and property tax burdens historically were far below national averages. During the 1980s, state policymakers took note of this unused tax potential and hiked the rates.

The implications for ANE countries is perhaps three-fold. First, at least over the long haul, there may be untapped potential in developing subnational tax structures as a means to raise revenues for education (and other local services as well such as police, fire and sanitation). Second, non-income taxes -- sales taxes and property taxes -- might be the preferred tax rate increase approach, at least drawing upon strategies in the U.S. Third, there might be great potential in developing a local property tax structure. It has been a stalwart part of local finance, and particularly school finance, in the U.S., and it was tapped heavily in states where it had been an underused tax. While there can be problems with a property tax, technologies exist to remedy most of them. Developing a property tax structure could prove to be beneficial for education and many other functions, and could relieve the federal tax system from current onerous burdens.

Non-Broadly-Based Tax Sources

New education revenues from sources other than income, sales and property taxes, always the hope of many, were tried in some states and local school districts but produced only small amounts of funding. There is much talk in the U.S. of local school foundations, i.e., nonprofit fund raising organizations for a local school. Contributions to these organizations are deductible on both state and local income taxes and are a potential source of additional revenues. Foundations have been tried in several school districts. But even in affluent communities, they produce very little additional revenues -- less than 1 percent of the budget (Meno, 1984).

Several states also have enacted lotteries during the past decade. Indeed, the American people like lotteries. When put to a popular vote, lotteries nearly always are

approved. But lotteries are very inefficient revenue raisers and generally produce only small amounts of new revenue. Lotteries are inefficient because, for marketing purposes, fifty percent of lottery sales are used for prizes. Another five percent is given to lottery vendors. About another 10 percent is needed for administration costs. Thus, every \$1 of lottery sales produces only 35 cents of net revenue. In California, which dedicates the lottery to K14 education, the lottery produces about \$150 per child on a total budget of about \$4000 per child, or about 3.75 percent. While this amounts to a large total -- currently about \$750 million -- it still constitutes a small percentage of the overall budget.

In other states, lotteries revenues range from less than one percent to a little more than 5 percent of total state revenues (Mikesell and Zorn, 1986). Generally, the story of lotteries is that they are popular, inefficient revenue raisers, and small revenue producers. The revenues they produce are simply much smaller in scale compared to the level of revenues that can be produced from broadly based income, property and sales taxes. Put differently, if big money is the goal, lotteries and local school foundations are not the answer.

Dedicated Revenue Sources

Another U.S. strategy for producing education revenues has been to "dedicate" a revenue source (such as the sales tax) or a tax rate increase (such as the 1 cent sales tax increase in Arkansas and South Carolina) or even a portion of the state general budget (such as California's Proposition 98) to education. The theory is that dedication will insure that all the revenues will go to education and that over the medium and long run, dedication means more money for the schools.

The short conclusion is that dedication does not work. In a recent review of this issue, Gold (1990) concluded that dedicating tax resources for education or any function does not work. There simply are too many legislative ways around dedication

requirements. First, policymakers can reduce the increase in revenues from other sources; thus, dedicated revenues simply replace what would have been provided by other sources. Second, there may be a negative reaction to the dedication requirement -- that education now has a dedicated revenue source and should not draw upon the general revenues available for other functions. Third, even dedicating a portion of the general fund budget for education -- the new version of dedication created by California in 1989 -- does not work. Legislators can redefine the general fund budget, thus reducing the dollar flow to education. Further, legislators, at least in California, while wanting to increase education funding did not want to do so at the expense of other social functions such as welfare, health, senior citizen programs, prisons or trauma centers. Indeed, there now is a legislatively drafted California ballot initiative that would repeal the 1989 proposition that dedicated a portion of the state's general fund budget to the schools.

The implication for ANE countries is that dedicating a revenue source for education or education reform is probably not a wise strategy to pursue. While the politics of revenue raising and allocating clearly vary across countries, the nearly universal failure of dedicated revenue sources in the U.S. suggests that this should, at best, be a last gasp strategy.

3. NEW U.S. SCHOOL FINANCE ISSUES

While U.S. school finance has been dominated by revenue raising and revenue distribution issues, recently several new issues have emerged, generally related to how funds should be used. While countries that do not have a decentralized education structure have probably identified the resource use issue as the key issue, surprisingly, it has only become a dominant state and local policy issue during the past decade of education reform. One reason for discussion at the higher government levels is that they, especially the states, have assumed a more prominent financial role. Whatever the reason, there is intense policy interest in dollar-quality linkages, i.e., in what is known about "the student achievement

bang for the educational buck." This section reviews three new finance topics: 1) funds for school improvement programs, including performance incentives; 2) funding teacher salaries; and 3) funding school choice programs.

School-Based Improvement and Performance Incentives

Prior to the 1980s, schools received little discretionary funding. Schools generally were not allocated dollars but were allocated things -- teachers, administrators, custodians, books, materials, supplies, etc. Put differently, higher level authorities, generally district administrators, decided what money should buy, including time, and allocated time, personnel and materials to schools.

Recent research on school improvement (Fullan, 1982 and Fullan, 1985), effective schools (Purkey and Smith, 1983; Good and Brophy, 1986; Rossmiller and Cohn, 1988) and site-based management (Hentschke, 1986; Malen and Ogawa, 1989) suggest that the school site is the locus for education improvement and that site-based management and budgeting have potential for dramatically improving the efficiency of resource use as well as student performance. A consensus is emerging which argues that central governments should set clear and specific student performance objectives, develop and disseminate curriculum frameworks that outline the school curriculum to which all students should be exposed, use student performance assessments linked to those frameworks to assess the status of student achievement, and let school sites decide how to meet those performance objectives, including considerable authority over hiring personnel and deciding how to spend school resources.

Two focused finance initiatives derive from this new perspective. One is to provide some level of discretionary resources to school sites to allow them to plan and implement ongoing education improvement programs. Several states have adopted various school improvement programs, some of which actually provide such discretionary resources

(Odden and Dougherty, 1982). California's School Improvement Program (SIP) is the most generous program in the states and provides participating schools about \$85 per pupil in discretionary resources -- funds that the school decides how to spend. Research has shown that the program can be quite effective as a school site improvement strategy (Odden and Anderson, 1986). More recent research on the California SIP program suggests that a state, vision driven SIP program, such as described above or such as was included in California's 1983 education reform program, was a more powerful strategy for improving local schools than the SIP program without a substantive vision of education reform (Marsh and Bowman, 1989).

Another piece of the emerging consensus around the policy strategy that will produce major system improvements is performance incentives. Up until recently, U.S. schools were funded the same and treated the same whether they did a good or a poor job, i.e., there were neither incentives for good performance nor sanctions for unacceptable performance. During the 1980s education reforms, several states began to include a variety of incentives to stimulate and reward district and school performance. For example, California's reforms included incentives for schools to lengthen the school day and year, and grants for teachers to develop innovative curriculum programs. Nearly all districts participated in the incentives and in the short term, expenditures for instruction increased (Picus, 1988), a major goal of the incentive program. Other states enacted school based performance incentives (Richards, 1989). In South Carolina, schools receive a per pupil bonus (about \$30 per pupil) if student achievement increases and if school performance improves on a number of other factors. Florida, Pennsylvania, and Texas have adopted variations of school incentive programs, and one has been proposed in Kentucky. Contrary to the expectations of many that only good schools would earn performance incentives, the incentive bonuses in South Carolina were distributed to a variety of schools, both rich and poor (Richards, 1990).

Picus (1990) suggests that incentives need to be conceptualized in broad terms. Some incentives can be direct, such as those in Florida and South Carolina that depend on actual school performance. Others can be indirect, such as those in California which were designed to increase instructional expenditures. Budget incentives can also be included, such as those that give schools a lump sum of money for substitute teachers and maintenance, rather than having these expenses funded from a "bottomless" central district source (Hentschke, 1988). Regardless of the focus of incentives, Picus outlines the many design issues that incentives must address: size, criteria, how allocated, restrictions on use, time period to quality, etc., and shows how the design itself can affect how the incentives operate.

For ANE countries, the implication is to consider providing both discretionary funds to local sites to be used to design and implement education improvement funds, and to provide both direct and indirect performance incentives. Based on U.S. levels, the programs combined would not have to entail more than \$100 per student, and the costs seem to stimulate the release of substantial local energy towards state or country defined reform goals and objectives.

Funding New Teacher Salary Structures

Another potential costly, yet very important use of dollars, is teacher salaries. The U.S. has given teacher policies considerable attention over the past five years and several proposals to transform teaching into a full profession have been proposed (Carnegie Forum on Education and the Economy, 1986; The Holmes Group, 1986). The costs of the proposals are high, approaching in the U.S. an extra 26 percent in real dollars (Odden, 1990). The actual teacher compensation structure itself, however, has not been given much analytic discussion, and many proposals for recruiting and retaining able individuals in

teaching undershoot and overshoot the mark. The ANE countries do not have to make these mistakes.

First, some programs are effective and other ineffective for recruiting individuals into training for a profession. Generally, loan forgiveness programs have been ineffective (Arfin, 1986). Loan forgiveness programs are popular across the states in the U.S. but are unlikely to function as powerful incentives for recruiting teachers. Prospective teachers first must pay all college costs and sign loan notes. Loan forgiveness programs are economically similar to a salary bonus after teacher training when a teacher begins to work. Because of the design of loan forgiveness programs, the programs become a \$2-4,000 salary bonus, not all that large a salary increment. Research on loan forgiveness programs to recruit individuals into rural health professions showed them to be ineffective (Arfin, 1986).

On the other hand, fellowship programs with service paybacks are effective recruitment strategies. In both health and military professions, these programs, which defray all college costs, provide an immediate benefit and are successful recruiting devices (Arfin, 1986). These strategies also have been especially effective in recruiting individuals to the health professions in rural areas. The student cost is to work in the profession for a fixed number of years, or if s/he decides not to work in the profession, to pay back the college costs often at more than a 1-to-1 ratio.

Second, beginning salaries are effective for recruiting individuals into teaching: the higher the beginning salary, the greater the quantity and quality of individuals recruited into teaching. Research both on beginning teacher salaries (Ferriss and Winkler, 1986 and Jacobson, 1989) and beginning salaries in other professions (Ferriss and Winkler, 1986) show that higher beginning salaries are effective both in recruiting more individuals into the profession, and in recruiting more talented individuals into the profession. The policy issue, then, is whether there is a target for beginning teacher salaries. Should beginning

teacher salaries simply be as high as possible, or is there a recruitment pool that can be identified as the primary universe from which teachers are recruited?

This issue is just being raised in the U.S. (Odden and Conley, forthcoming). Most new teacher policy proposals suggest that all teachers, especially K8 teachers, should have a solid liberal arts education (Wise, ; Darling-Hammond, ; Holmes Group, 1986). This means that teachers first should have a Bachelor of Arts (BA) degree. These proposals also suggest that advanced technical knowledge is not the critical teacher ingredient, again at least for grades K8. A broad education in the liberal arts, with either a humanities or mathematics/science concentration is what is needed. By implication, then, beginning teacher salaries should be equivalent to beginning salaries for individuals with a BA degree. This policy target would put teaching on an equal beginning salaries basis in recruiting individuals into teaching.

Third, an overhaul in the design of the compensation structure once individuals begin to teach are needed. Salary increments for education and experience are not the best approach for rewarding or retaining teachers. Research has not shown these teacher characteristics to be strongly related to system productivity (Hanushek, 1986). At best, teachers with some experience are more productive than teachers with no experience. Murnane (1981) articulated the strongest argument for basing compensation on experience. He argued that in an organization where cooperation is required to be productive -- such as schools -- paying for experience helps, at least indirectly, to support collegial work relationships. Merit pay also does not work for teachers and education (Murnane and Cohen, 1986).

Conley () and Odden and Conley (forthcoming) suggest that the preferred architecture for teacher salary structures are those that pay for professional expertise -- content knowledge, pedagogical expertise and proof of knowing when to apply different teaching strategies. They argue that the greater the professional expertise, the more successful teachers are in producing student achievement, the key goal of the education

system. Developing professional expertise also requires collegial interactions within schools; "worker" participation in technical decisionmaking has been shown by research in both education (Rosenholtz, 1989) and noneducation (Blinder, 1990) to improve system productivity. Collegial interactions over the "business of teaching and learning" help engender continual development of professional expertise which leads to improved student achievement, teacher satisfaction and teacher decisions to remain in teaching, according to Rosenholtz (1989). McLaughlin and Yee (1988) also show that career oriented teachers view rewards as opportunities to engage in professional development opportunities. A compensation structure based on teacher professional expertise not only reinforces system goals -- student achievement -- but also stimulates teacher interaction, satisfaction and decisions to remain in teaching. In short, such a compensation structure is good for the education system, is good for teachers, and helps retain the best teachers in the profession.

Schools of Choice

Another major new policy initiative that now accompanies education reform in the U.S. is public school choice, i.e., allowing students (or parents for grade K8 students) to choose the public school which their child attends. While there are many variations of this theme (Education Commission of the States, 1989), the new policy is one that shifts the attendance decision from the school system to the parent or the child. While this policy is not without controversy, and while to date, only eight states have enacted forms of interdistrict open enrollment programs, it is a policy that is increasingly popular, and a policy supported by both political parties.

The financing of public school choice proposals, though, has received scant attention. While most of the funding issues pertain to the decentralized nature of U.S. school structures (i.e., how much money will a student carry in attending a school outside the district of residence?), there is a more fundamental finance issue that has potential for

application in ANE countries. The key problem in the U.S. concerns the mismatch between a *district* based funding structure and a *school* based attendance policy. Odden (1990) proposes to remedy this mismatch with a new, two-tiered funding system. The state would provide all districts (and schools within them) with revenues needed to deliver a quality base education program. Unlike the current system, *districts* would be prohibited from spending above the base. This element of local fiscal control would revert to schools. Each school would be allowed to enact an income tax surcharge, with the per pupil yield set by the state at a higher level than the amount of revenue raised at any school. This approach begins to place a small "price" on the decision to attend any school, because parents of all children attending the school would be subject to the income tax surcharge.

The implication for ANE countries is that a similar school site, fiscal add-on could be enacted either as a mechanism to undergird public school choice or as a mechanism to get more private/individual revenues into the public school system. Again, the mechanism would need to be attached to some national tax, preferably a tax that shelters the poor, and a per pupil yield schedule would need to be backed by the national government, so that all schools with a similar surcharge would receive the same amount of extra revenues per pupil.

4. EFFICIENCY, COST EFFECTIVENESS AND PROGRAM PRODUCTIVITY

The issues of efficiency, cost-effectiveness and program productivity, while always part of the U.S. resource use conversation, are being taken more seriously today. First, there is widespread knowledge that resources increased by over 25 percent in real terms during the 1980s education reform decade, but a feeling that achievement went up much less, that there wasn't much bang for the educational buck. Second, there is new information on "what works" in education, and thus empirical data for engaging in cost-effectiveness analyses (Levin, 1988).

Education Generally as a Public Investment

Education in this country generally is viewed as a good public investment. Research shows that both private (individual) and social (governmental) rates of return to investments in education are sizeable, and rank with other conservative or governmental investment opportunities. Murphy and Welch (1989) show that the wage premium to college education increased dramatically in the 1980s, after falling somewhat during the 1970s. Cohn (1979) showed that returns to high school education in the 1970s were far above yields of long term governmental bonds. And Psacharopoulos (1989) shows that rates of return can reach 45 percent for elementary education in developing countries, 20 percent for high school education and even 20 percent for college education, all more than competitive with investments in the private market. In short, research evidence in both the U.S., other developed countries and developing countries shows that private and social rates of return are more than comparable to those for private investments, and that rates of return to elementary education can exceed private investment rates by a factor of four-to-one.

Trade Offs Among Buildings, Personnel, Technology and Textbooks

There has not been much work in the U.S. on the tradeoffs among education investments in buildings, personnel, technology and books. Some general comments can be made, however. First, the education production function literature rarely finds expenditures on capital construction to be significantly related to student performance (Hanushek, 1986). While students need classrooms and classrooms must be built or leased, there is no research finding that lavish buildings make a difference. Even the size of libraries has not been shown to be significant in producing differences in student

learning. One would guess that the number of books students read would be related to reading achievement, given new findings in effective ways to teach reading and reading comprehension (the new study ex summary, 1990). Exposure to books, however, might not be related to the size of the library.

As for personnel, there is growing understanding that funds are not necessarily wisely spent in training or hiring teachers with highly technical and specialized expertise (Monk, 1988). Rather, as mentioned above, the emerging consensus strategy is to recruit teachers, especially for grades K8, with solid training in the liberal arts, i.e., with a broadly based education in both the humanities and the sciences. Such teachers are more able to teach all subjects well at the elementary level, and most subjects well even up to the eighth grade.

Further, new approaches in mathematics and science suggest integrating these subjects and teaching general knowledge, concepts and principles, rather than specialized knowledge. The problem is that insufficient numbers of teachers are able to provide solid foundations in science and mathematics in the K8 years, which are crucial for latter success in these areas. The belief is that most students who might benefit from advanced training in these fields drop out of these disciplines long before high school, and that the most effective strategy is to provide more students with a solid foundation in mathematics and science by the end of grade 8, i.e., to increase the number of students who would be able to take and benefit from advanced training in mathematics and science. The key to this strategy is teachers with a solid liberal arts education, not a mathematics or scientific specialist.

Technology is increasingly seen as a potential tool for improving educational productivity. Computer simulations have been used successfully as an aid in teaching advanced science (cite) and actually to teach some advanced mathematics classes (cite). Indeed, many rural school systems in the U.S. have used computer programs to provide advanced science and mathematics courses (cite). Further, distance learning, i.e., classes

taught through satellite communications, also have been successful in providing advanced mathematics and science classes in the U.S. (cite) and also in many developing countries (cite). While other strategies, such as peer tutoring, can have large impacts and can be more cost-effective than some typical computer assisted instruction uses in the U.S. (Levin, Glass and Meister, 1987), there nevertheless is the belief that wider uses of computer technologies is a key to productivity improvements in the U.S. education system (Johnston, 1987).

Finally, the impact of textbooks in this country has not received much attention, although there is a major push to upgrade the quality of textbooks (Honig, 1989). However, there is research in developing countries that shows that the existence of textbooks can dramatically improve student learning (cite). Thus, in countries where the norm does not include a textbook for every student, relatively small investments in textbook purchases could be a major productive use of small amounts of new governmental resources.

These comments do not, however, provide clear directions on tradeoffs in educational expenditures among buildings, personnel, technology or textbooks. The information suggests, however, that small investments in textbook materials in contexts where students do not have them is likely to be cost-effective, and that investments in personnel -- teachers -- should emphasize recruiting broadly trained individuals in the liberal arts for grades K8, and not on costly specialists for teaching advanced courses in the latter school years. Finally, the comments suggest that as technology advances and programs and courses are developed, computer simulations, computer programs and distance, telecommunicated learning are likely to be cost-effective strategies for providing courses and training in advanced mathematics and scientific areas.

Prevention Versus Remediation Programs

There is widespread consensus in the United States that investments in programs designed to prevent school failure or enhance school success, especially for poor children, are good public investments. Research shows that preschool programs for poor children have long term benefits (Slavin, Karweit and Madden, 1989) and high cost-effectiveness ratios. Even when future benefits are discounted to present values, investments in comprehensive, early childhood programs for poor four year-olds have benefit-cost ratios of up to six-to-one (Barnett, 1985). Early childhood programs for poor three year-olds have benefit-cost ratios of up to three-to-one (Barnett, 1985).

Research also shows that extended day kindergarten, i.e., full day kindergarten for poor children, also helps students perform adequately in subsequent elementary grades. In fact, extended day kindergarten can help students increase their school performance by up to a half a standard deviation on achievement tests (Slavin, Karweit and Madden, 1989). Further, both early childhood and extended day kindergarten combined help poor children improve their success rate in elementary school.

Almost as interestingly, intervention programs to prevent school dropouts also have relatively high benefit-cost ratios. Levin (1989) shows that the costs of programs designed to provide poor students, i.e., students at-risk of dropping out of high school, a program that succeeds in keeping them in high school and earning a high school diploma, have positive benefit-cost ratios. While the ratios are lower than those for prevention programs, the positive results nevertheless show that even late, remediation programs "pay-off" in the long term. It is better to save human capital than to waste it!

Nevertheless, while it is smarter to invest in prevention programs it also is wise to invest in remediation programs that work, such as early childhood education for low income three- and four-year-olds, and extended or full day kindergarten programs for low income children. All such programs more than return the public expenditure of funds.

General Educational Productivity

While the general educational production function literature has been inconclusive, there are several findings that are important and point to ways not to spend money and, when combined with other research on educational intervention effects, identify programs on which investments will produce desired student performance impacts.

Educational production functions. First, the conventional conclusion from most educational production function research is that there are few educational resources that are consistently related to student performance, and that higher educational expenditures are rarely related to increased student performance (Hanushek, 1989). *The important message from this research is that if additional education revenues are spent in the same way as current education revenues, student performance increases are unlikely to emerge.* New revenues need to support new strategies in order to produce significant student achievement gains. The message is not that money does not matter. The message is that the way money is used matters. Even Hanushek (1989) argues that raising teacher salaries will likely recruit more able individuals into teaching, and that more able individuals are better teachers.

A "kinder and gentler" interpretation of the education production function literature has been provided by Murnane (1983). He identifies five factors from this literature that are consistently associated with increased student learning:

- teacher verbal ability.
- at least some teacher experience, between 3 and 5 years.
- effective teaching strategies.
- teacher attitudes and expectations
- socio-economic composition of students.

These findings generally reinforce the previous comments on how to pay teachers. Higher beginning salaries will help recruit more able, i.e., higher verbal ability, individuals into

teaching. A compensation structure that pays for professional expertise is one that rewards the use of effective teaching strategies, and indirectly rewards experience since the longer a professional oriented individual is in teaching, especially in effective schools, the greater the professional expertise developed. Thus, the suggestions on teacher compensation policies, in part, subsume the key findings from the educational production function research on factors related to increased student performance.

Scale economies. There is a strong belief among many U.S. education policy makers that larger school districts and larger schools are better -- more cost effective -- than small districts and schools. Indeed, the U.S. has been consolidating schools and school districts for the entire twentieth century. Fifty years ago, there were 100,000 local school districts; today there are only approximately 16,000.

The evidence on scale economies is quite scarce, however. Guthrie (1979), Fox (1981), Riew (1986), Monk (1987a) and Monk (1987b) generally conclude that scale economies are unresolved for school district size, and rarely can be documented for elementary or secondary schools above 400 students! While scale economies exist for schools with enrollments up to 400 students, economies are hard to document for larger schools. This finding is especially disconcerting given the large size of most U.S. high schools in metropolitan areas, where a high school of 2000 students would be considered modest in size, and where high schools in the largest city districts can enroll 4- 5,000 students.

The implication for ANE countries is to skirt the school consolidation issue except for very tiny (under 400 students) schools, and certainly not to create large schools with enrollments over 1000, even at the high school level. In terms of the scale economies research in the U.S., smaller is better (although tiny is not).

Class size. Another tenet of U.S. education is that small classes produce higher achievement and teacher satisfaction. Small classes are an expensive policy option. But, here, too, the research base is thin, if not misinformed. The Glass and Smith (1979) meta-analysis of class size and student achievement concluded that class size below 20, and especially down to 15, produces significant gains in student performance. Slavin (1984), however, criticized this research on three grounds. First, a meta-analysis includes all studies, both those that are methodologically sound and those not methodologically sound. Slavin argues that only studies with methodologically sound research designs should be analyzed. Second, even for such a reduced sample, the meta-analysis includes several studies where student achievement is not academic achievement, but physical achievement such as learning to play tennis. Slavin argues that these studies should be excluded, and that only studies investigating class size and student academic achievement should be analyzed. Third, Slavin shows that the effects for classes with fewer than 20 students are statistical artifacts, not based on empirical examples. Classes with between 14 and 18 students had very modest positive impacts on student achievement, there were no classes with between 3 and 14 students, and the classes with large achievement gains were essentially 1-to-1 or 1-to-2 tutoring programs.

Thus, Slavin (1989), Tomlinson (1989) and Odden (forthcoming) conclude that the research evidence for small class size only supports one-to-one or small group (up to three students) tutoring. Further, Slavin, Karweit and Madden (1989) and Odden (forthcoming) argue that one-to-one tutoring in grades one and two can be a powerful intervention, with achievement impacts of more than 0.5 standard deviations and up to one full standard deviation, and can keep children in these grades performing at grade level. In short, the research on class size and student achievement primarily supports one-to-one tutoring especially for students in the early grades.

The policy implication for ANE countries is two-fold. First, policy objectives to reduce classes to twenty or below should not be pursued. They are unlikely to produce

student performance increases and they are very expensive. Indeed, even the Glass and Smith (1979) meta-analysis showed little achievement impacts from reducing classes from 40 to 20 students, a beginning point much closer to class size in ANE countries. Second, one-to-one tutoring is an effective intervention strategy especially for students in grades one and two. It is costly, but when focused on low achieving first and second graders can have large achievement impacts and can help them perform on grade level.

Time and curriculum. While many 1980s U.S. education reform reports called for extending the school day and year, few states have done so in dramatic ways and the research evidence supporting those recommendations is again thin, at best. Such reforms are expensive. Since the school year is about 180 days in most states, it would take a ten percent increase to extend the year to 200 days and another ten percent to extend it to 220 days, the length of the year in many other countries. The costs roughly would be ten and twenty percent of current expenditures, or between \$20 and \$40 billion, a huge increase.

But, research analyzing differences in achievement across countries shows that time variables, such as the length of the school day and year, are insignificant and that the content of the curriculum is the key determinant of achievement differences (McKnight, 1989). These studies suggest that U.S. student achievement would be much better if the curriculum were restructured to cover more topics and concepts, and focus on problem solving rather than the basic skills. Rather than lengthening the school day or year, the policy implication is to improve the curriculum program!

Another "time" policy proposal in the U.S. has been to eliminate "social promotions," i.e., to retain students until they achieve at acceptable levels. But research is also quite conclusive that this strategy does not work (Holmes and Matthews, 1984; Smith and Sheppard, 1987). The issue is whether similar students, some of which are held back and exposed to the previous grade's curriculum again, and some of which are promoted and exposed to the new grade's curriculum, achieve at different levels. The answer is that

the promoted students achieve at a higher level; they achieve better on the previous grade's topics and they know more of the new grade's topics. The cost of holding children back, moreover, is high; it is equivalent to providing an entire extra year of school. A much cheaper and more cost-effective policy would be to promote them and provide supportive assistance; the costs would be lower and the effects would be higher!

Thus, the major legitimate time issue is how time is used (just as the money issue is how money is used). A large body of research shows that the higher the student academic learning time, i.e., the amount of time allocated for instruction during which the student is engaged at high success levels, the higher the learning (Denham and Lieberman, 1980; Rosenshine, 1986; Brophy and Good, 1986; Levin 1984; Walberg, 1990). This research shows, moreover, that a large portion of time allocated for instruction is not used productively. The conclusions imply that if current time were used to deploy research-based effective teaching strategies, significant improvements in student achievement would improve. This conclusion, combined with the information on exposure to curriculum content, suggests that major curriculum restructuring combined with wider use of effective teaching practices -- within current school time allocations -- would produce impressive gains in system performance. These "time" policy changes, moreover, are low cost.

Other programmatic interventions. In addition to the programmatic deployment of resources outlined above, there are three other strategies -- all generally low cost -- that will be mentioned. The first is peer tutoring. This program entails students, usually older students, tutoring usually younger students in academic subject areas. This type of program requires organizational mechanism at the school level to facilitate implementation, and some initial staff training in how to structure the program and to help students play the tutor roles. Another tutoring strategy is adult tutoring, which is similar to peer tutoring except that adults, with modest amounts of training, perform the tutoring function. In a comparison of several programmatic interventions, Levin, Glass and Meister

(1987) found that both peer and adult tutoring were more cost effective than extending the school day, lowering class size or computer assisted instruction. Other research (Slavin, 1989; Slavin, Karweitt and Madden, 1989) show that peer tutoring produces large achievement gains (usually more than one-half a standard deviation) for both tutor and tutee.

Cooperative learning (Slavin, 1989; Slavin, 1983) is another classroom organizational strategy that produces large gains (more than one-half a standard deviation) in student performance. Moreover, cooperative learning entails heterogeneous groups of students (with both high and low achieving students in each group) working together on tasks, and research shows that achievement improves for all students, both high and low achievers. In addition, cooperative learning produces improvements in affective domains as well, including greater respect for other cultures, ethnicities, races and dominant language use, and thus is an effective intervention strategy in situations with diverse student bodies.

Conclusion

In conclusion, there are several developments in the U.S. on the productivity and resource use side that offer promise for improving the efficiency of dollar use and thus the productivity of the education system. Both social and private rates of return to education investments compare favorably with investments in other financial instruments; rates of return are especially high for just elementary education in developing countries.

Definitive comparative work has not been conducted among dollar trade-offs for investments in buildings, personnel, technology and textbooks. Research suggests that small investments in textbooks to insure that all students have a text should produce high achievement payoffs in developing countries. Research also suggests higher payoffs for investments in broadly trained K8 teachers, rather than specialists at the high school level.

Finally, technology is viewed as a productivity enhancing strategy in the long term; in the short, term computer simulations have been developed for science education, computer programs have been developed to teach advanced mathematics, and distance learning has been shown to be effective both in rural areas of the U.S. and in developing countries.

Investments in both prevention programs (early childhood for low income three- and four-year-olds, and extended day kindergarten for low income children) and remediation programs (compensatory education programs that keep children in school until they graduate) have positive benefit-cost ratios, although the ratios are higher for prevention programs.

Education production function conclusions suggest that investments in higher quality teachers, teachers with at least some experience, and in training teachers to use effective teaching strategies, including how to maintain positive expectations for students, likely will produce impacts in terms of student achievement.

Research on scale economies suggests that school consolidation may work, i.e., produce efficiencies, up to a school size of about 400, but there is little evidence that large schools exhibit scale economies.

Research on class size shows that student achievement gains (more than one-half standard deviation and approaching more than one full standard deviation in some instances) occur only by reducing class size to a one-to-one or two- to three-to-one ratio . Very little achievement gain is produced for the costly policy of reducing class size from 40 to 30, or from 30 to 20, or from 20 to 15!

Finally, longer days and years, and retention policies -- costly time policies -- have weak effects. The key time issue is how current time is used in terms of curriculum exposure and effective teaching strategies -- low cost time issues. Setting clear student performance goals, outlining curriculum frameworks that emphasize problem solving, conceptual development and probing content areas in depth, and investments in staff development to enhance teacher professional expertise to deploy research-based effective

teaching strategies to teach that curriculum -- using current time better -- is the more cost-effective time policy.

4. BEST BETS FOR RAISING AND USING NEW EDUCATION REFORM REVENUES

This section draws from the previous three sections and the U.S. experience during the last decade of education reform to outline suggestions for how USAID ANE countries might raise new revenues for education reform and use them in highly productive, cost-effective education strategies.

Revenue Raising Strategies

1. Focus major efforts at maintaining a healthy and growing national economy. When the national economy improves, extra income is available for citizens and extra tax revenues are available for the government -- for education as well as other functions.
2. Consider creating tax structures and tax raising authority for subnational governments. Subnational governments produced all the real revenue increases for U.S. education reform. Subnational tax systems also can help alleviate overtaxed national systems over the long term. Specifically, consider creating local property tax systems. The property tax is a stalwart education revenue producer in the U.S. and has potential to be a good revenue raiser in other countries as well, for education as well as other functions.
3. Consider letting schools enact some type of income tax surcharge, with the per pupil yield schedule determined by the federal government to insure that all schools receive the same additional per pupil revenue for a school supported surcharge. This mechanism has the benefit of getting more private funding into the K12 system.
4. Consider charging an income contingent tuition at the high school level as another mechanism to infuse the system with more private money. Private returns to high

school education are substantial, and high school tuition is a strategy used successfully in some developing countries.

5. Provide tax credits for contributions to private schools and private universities to encourage development of a private K12 and postsecondary education system. Even a small private education system will help relieve the governmental burden of funding all K12 and postsecondary education. Also consider tax credits for private sector training on the part of corporations.

6. Consider charging higher tuition at postsecondary institutions, combined with income contingent financial aid mechanisms. This has been a successful strategy in many states in the U.S. Private returns to investments in higher education are attractive and in some developing countries there has been overinvestment in higher education.

Educational Programs Strategies

7. Invest in programs that prevent school failure such as preschool programs for low income 3- and 4-year olds, as well as extended or full day kindergarten. Research shows that the long term benefit-costs ratios are high, approaching 6-to-1 for four-year old programs.

8. Focus new education investments at the K8 level. Costs of investments at this level are lower than for high school and postsecondary education, and returns are higher. Social rates of return to elementary and middle school education are quite high, far beyond most private sector investments.

9. Provide classrooms but do not overinvest in physical facilities. Consider year-round school schedules (students attend school for 60 days and are off for 20 days at alternate times) to use buildings for 12 months during the year. This reduces per pupil facilities costs for building and operating, and provides opportunities for teachers to work full time.

10. Concentrate teacher recruitment on individuals with liberal arts training, not specialized or technical training. K8 teachers need solid training in language arts, history, mathematics and science. Aim to set beginning teacher salaries at the salary level that all BA graduates earn on average.

11. To recruit individuals into teaching positions in rural areas, provide full fellowships with service payback provisions, generally 4-5 years. Require payments of 2-to-1 for individuals who enroll in the program but do not teach.

12. Restructure teacher compensation structures away from education and experience and towards merit increments and promotions that are based on professional expertise -- content knowledge, pedagogy and demonstrated expertise in their application in different contexts. Make sure the content knowledge is that which is included in the country's curriculum frameworks and make sure that the pedagogical skills are research based effective skills for teaching the country's curriculum. This type of structure rewards teachers who exert energy to accomplish system goals, i.e., who continually develop the knowledge and skills that help them be better teachers and thus better at inducing student performance. Since professional expertise expands over time, the best experienced teachers should be the ones with higher merit increments and with more promotions. Such a system also fosters collegiality and the sharing of effective teaching strategies.

13. Set national student performance goals and create national curriculum frameworks, at least in language arts, history/social science, mathematics and science, that indicate clearly the topics, concepts and issues to which all children should be exposed. Focus all curriculum areas on problem solving and application of knowledge in real work situations. Use a literature approach in language arts, a process approach to writing and include lots of writing, emphasize reading comprehension, focus social studies on history, geography and economics and use a problem solving and manipulatives approach in mathematics. Teach for thinking, problem solving and understanding rather than emphasizing the basic skills.

14. Provide some amounts of money, perhaps US \$100/student, for schools to develop and implement education improvement programs focused on the national goals.

15. Provide cash incentives for schools that show improvements over time. Use factors for improvements in different areas, but have student performance as a key improvement area.

16. Invest in intensive early intervention in grades 1-2 for students not performing adequately. Use high achievement producing interventions such as 1-1 tutoring in grades one and two. Have as a system goal the delivery of all students to grade 3 performing adequately, or on level, for the national education goals.

17. Provide staff development and change school organization to deploy such additional strategies as peer tutoring, adult tutoring, and cooperative learning. These strategies require very small investments in staff development, yet have high pay offs in terms of large increases in student achievement.

18. Fund remediation programs for students at-risk of dropping out of school. Even remediation programs have positive benefit-cost ratios, i.e., even when benefits and costs are discounted to present values, they more than return the level of public investment.

REFERENCES

- Adams, Marilyn Jager. Beginning to Read: Thinking and Learning About Print. Champaign-Urbana, Ill.: Center for the Study of Reading, University of Illinois, 1990.
- Arfin, David M., "The Use of Financial Aid to Attract Talented Students to Teaching: Lessons from Other Fields," Elementary School Journal, vol. 86, no. 4, March 1986, pp. 405-424.
- Barnett, Steven, "Benefit-Cost Analysis of the Perry Preschool Program and Its Policy Implications," Educational Evaluation and Policy Analysis, vol. 7, no. 4, Winter 1985, pp. 333-342.
- Berrueta-Clement, J.R., Lawrence Schweinhart, Steven Barnett, A. Epstein and David Weikart. Changed Lives: The Effects of the Perry Preschool Program Through Age 19. Ypsilanti, Mich.: Monographs of the High/Scope Educational Research Foundation, 1984.
- Blinder, Alan, ed. Paying for Productivity. Washington, D.C.: The Brookings Institution, 1990.
- Brophy, Jere and Thomas Good. "Teacher Behavior and Student Achievement," in Merlin Wittrock, ed., Handbook of Research on Teaching. New York: Macmillan Publishing Company, 1986, pp.328-375.
- Carnegie Forum on Education and the Economy, A Nation Prepared: Teachers for the 21st Century. Washington, D.C.: Carnegie Forum on Education and the Economy, 1986.
- Cohn, Elchanan and Richard A. Rossmiller, "Research on Effective Schools: Implications for Less Developed Countries," Comparative Education Review, vol. 31, no. 3, August 1987, pp. 377-399.
- Cohn, Elchanon, The Economics of Education. Cambridge, Mass.: Ballinger, 1979.
- Conley, Sharon,
- Darling-Hammond, Linda. teachers have a BA
- Denham, Carolyn and Ann Lieberman, eds. A Time to Learn. Washington, D.C.: The National Institute of Education, 1980.
- Education Commission of the States, Policy Guide: A State Policy Maker's Guide to Public School Choice. Denver, Colo.: Education Commission of the States, 1989.
- Ferriss, James and Donald Winkler, "Teacher Compensation and the Supply of Teachers," Elementary School Journal, vol. 86, no. 4, March 1986, pp. 389-404.
- Fox, William. "Reviewing Economies of Scale in Education," Journal of Education Finance, vol. 6, no. 3, Winter 1981, pp. 273-296.

- Frase, Mary. Dropout Rates in the United States: 1988. Washington, D.C.: National Center for Education Statistics, 1989.
- Fullan, Michael. "Change Processes and Strategies at the Local Level," Elementary School Journal, vol. 85, no. 3, January 1985, pp. 391-422.
- Fullan, Michael. The Meaning of Educational Change. New York: Teachers College Press, 1982.
- Glass, Eugene and Mary Lee Smith, "Meta-Analysis of Research on Class Size and Achievement," Educational Evaluation and Policy Analysis, vol. 1, no.1, January-February 1979, pp. 2-16.
- Gold, Steve, "The Effect of Earmarked Revenue on School Spending," Paper presented at the 1990 meeting of the American Education Finance Association, Las Vegas, Nevada, March 1990.
- Good, Thomas and Jere Brophy, "School Effects," in Merlin Wittrock, ed., Handbook of Research on Teaching, New York: Macmillan Publishing Company, 1986, pp. 570-602.
- Guthrie, James W. "Organizational Scale and School Success," Educational Evaluation and Policy Analysis, vol. 1, no.1, January-February 1979, pp. 17-27.
- Guthrie, James W., Walter I. Garms and Lawrence Pierce, School Finance and Educational Policy, Englewood Cliffs, N.J.: Prentice Hall, 1988.
- Hanushek, Eric. "The Economics of Schooling: Production and Efficiency in Public Schools," Journal of Economic Literature, vol. 24, no. 3, September 1986, pp. 1141-1177.
- Hanushek, Eric. "The Impact of Differential Expenditures on School Performance," Educational Researcher, vol. 18, no. 4, May 1989, pp. 45-51.
- Hawkins, Evelyn K. "The Effect of the Reform Movement on Levels of Elementary and Secondary Public School Expenditure in the 1980s," paper presented at the annual meeting of the American Educational Research Association, San Francisco, Calif., 1989.
- Hentschke, Guilbert. "Budgetary Theory and Reality: A Microview," in David Monk and Julie Underwood, eds., MicroLevel School Finance. Cambridge, Mass.: Ballinger, 1988, pp. 311-336.
- Hentschke, Guilbert. School Business Administration. Berkeley, Calif.: McCutchan Press, 1986.
- Holmes, C.Thomas and Kenneth M. Matthews. "The Effects of Nonpromotion on Elementary and Junior High School Pupils: A Meta-Analysis," Review of Educational Research, vol. 54, no. 2, Summer 1984, pp. 225-236.
- Holmes, Group. Tomorrow's Teachers. East Lansing, Mich.: The Holmes Group, 1986.
- Honig, Bill. "California's Experience with Textbook Improvement," Educational Policy, vol. 3, no. 2, June 1989, pp. 125-136.

- Jacobson, Stephen L., "Change in Entry-Level Salaries and Its Effect on Teacher Recruitment," Journal of Education Finance, vol. 14, no., Spring 1989, pp. 449-465.
- Johnston, William. Workforce 2000. Indianapolis, Indiana: Hudson Institute, 1987.
- Levin, Henry, Eugene Glass and Gail Meister, "Cost Effectiveness of Computer Assisted Instruction," Evaluation Review, vol. 10, no. 1, Spring 1987, pp. 50-72.
- Levin, Henry. "About Time for Educational Reform," Educational Evaluation and Policy Analysis, vol. 6, no. 2, Summer 1984, pp. 151-164.
- Levin, Henry. "Cost-Effectiveness and Educational Policy," Educational Evaluation and Policy Analysis, vol. 10., no. 1, Spring 1988, pp. 51-69.
- Levin, Henry. "Financing the Education of At-Risk Students," Educational Evaluation and Policy Analysis, vol. 11, no. 1, Spring 1989, pp. 47-60.
- Malen, Berry and Rodney T. and Ogawa. "Professional-Patron Influence on Site-Based Governance Councils: A Confounding Case Study," Educational Evaluation and Policy Analysis, vol. 10, no. 4, Winter 1988, pp. 251-270.
- Marsh, David and Gregory Bowman, "Top-Down versus Bottom-Up Reform," Educational Policy, vol. 3, no. 3, September 1989, pp. 195-216.
- McKnight, The Underachieving Curriculum
- McLaughlin, Milbrey and Sylvia Yee, "School as a Place to Have a Career," in Ann Lieberman, ed., Building a Professional Culture in School, New York: Teachers College Press, 1988, pp. 23-44.
- Meno, Lionel. "Sources of Alternative Revenues," in L. Dean Webb and Van D. Mueller, eds., Managing Limited revenues, Cambridge, Mass.: Ballinger, 1984.
- Mikesell, John L. and C. Kurt Zorn, "State Lotteries as Fiscal Savior or Fiscal Fraud: A Look at the Evidence," Public Administration Review, vol. 46, no.4, July/August 1986, pp. 311-319.
- Monk, David. "Production Function," Education Evaluation and Policy Analysis, 1988.
- Monk, David. "School District Enrollment and Inequality in the Supply of Classes," Economics of Education Review, vol. 6, no. 4, 1987a, pp. 365-377.
- Monk, David. "Secondary School Size and Curriculum Comprehensiveness," Economics of Education Review, vol. 6, no. 2, 1987b, pp. 137-150.
- Murnane, Richard and David Cohen, "Merit Pay and the Evaluation Problem: Why Some Merit Pay Plans Fail and Few Survive," Harvard Educational Review, vol. 56, no. 1, February 1986, pp. 1-17.
- Murnane, Richard. "Quantitative Studies of Effective Schools: What Have We Learned?" in Allan Odden and L. Dean Webb, eds., School Finance and School Improvement: Linkages for the 1980s, Cambridge, Mass.: Ballinger, 1983, pp. 193-209.

- Murnane, Richard. "Seniority Rules and Educational Productivity: Understanding the Consequences of a Mandate for Equality," American Journal of Education, vol. 90, November 1981, pp. 14-38.
- Murphy, Kevin and Finis Welch, "Wage Premiums for College Graduates: Recent Growth and Possible Explanations," Educational Researcher, vol. 18, no. 4, May 1989, pp. 17-26.
- Odden, Allan and Beverly Anderson. "How Successful State Education Improvement Programs Work," Phi Delta Kappan, vol. 67, no. 8, April 1986, pp. 582-585.
- Odden, Allan and Van Dougherty. State Programs of School Improvement. Denver, Colo.: Education Commission of the States, 1982.
- Odden, Allan, and Sharon Conley. "Teacher Professionalism Proposals: The Economic, Productivity and School Finance Agendas," Los Angeles, Calif.: Center for Education Productivity and Finance, University of Southern California, forthcoming.
- Odden, Allan, C. Kent McGuire and Grace Belsches-Simmons, School Finance Reform in the States, 1983, Denver, Colo.: Education Commission of the States, 1983.
- Odden, Allan, "Education Funding Changes During the 1980s," Educational Policy, vol. 4, no. 1, March 1990, pp. 33-47.
- Odden, Allan, "The Economics of Financing Education Excellence," paper presented at the annual meeting of the American Educational Research Association, Washington, D.C. 1987.
- Odden, Allan. "A New School Finance for Public School Choice," paper presented at the American Educational Research Association, Boston, Massachusetts, 1990.
- Odden, Allan. "Class Size and Student Achievement: Research Based Policy Alternatives," Educational Evaluation and Policy Analysis, forthcoming.
- Picus, Lawrence O. "Incentive Funding Programs and School District Response." Paper presented at the annual meeting of the American Educational Research Association, Boston, Massachusetts, 1990.
- Picus, Lawrence O. The Effect of State Grant-in-Aid Policies on Local Government Decision Making: The Case of California School Finance. Unpublished doctoral dissertation. Santa Monica: The Rand Graduate School, 1988.
- "PreKindergarten," in Clearinghouse Notes. Denver, Colo.: Education Commission of the States, n.d.
- Psacharopoulos, George, "Time Trends of the Returns to Education: Cross-National Evidence," Economics of Education Review, vol. 8, no. 3, 1989, pp. 225-231.
- Purkey, Stewart and Marshall Smith. "Effective Schools: A Synthesis," Elementary School Journal, vol. 83, no. 4, March 1983, pp. 427-452.
- Raywid, Mary Ann.

- Richards, 1989 on state incentive programs.
- Richards, 1990 on distribution in South Carolina.
- Riew, John. "Scale Economies, Capacity Utilization and School Costs: A Comparative Analysis of Secondary and Elementary Schools," Journal of Educational Finance, vol. 11, no. 4, Spring 1986, pp. 433-446.
- Rosenholtz, Susan. New York: Longman, 1989.
- Rosenshine, Barak and Robert Stevens. "Teaching Functions," in Merlin Wittrock, ed., Handbook of Research on Teaching, New York: Macmillan Publishing Company, 1986, pp. 376-391.
- Slavin, Robert, Nancy Karweit and Nancy Madden, eds. Effective Programs for Students at Risk, Boston: Allyn and Bacon, 1989.
- Slavin, Robert. "Achievement Effects of Substantial Reductions in Class Size," in Robert Slavin, ed., School and Classroom Organization, Hillsdale, N.J.: Lawrence Erlbaum Associates, 1989, pp. 247-257.
- Slavin, Robert. Cooperative Learning. New York: Longman, 1983.
- Slavin, Robert. "Meta-Analysis in Education: How has it Been Used?" Educational Researcher, vol. 13, no. 8, October 1984, pp. 24-27.
- Smith, Mary Lee and Lorrie A. Shepard, "What doesn't Work: Explaining Policies of Retention in the Early Grades," Educational Leadership, vol. 45, no. 2, October 1987, pp. 129-134.
- Tomlinson, Tommy M. "Class Size and Public Policy: Politics and Panaceas," Educational Policy, vol. 3, no. 3, 1989, pp. 261-273.
- Vaugh, and Sue Berryman, 1989.
- Walberg, Herbert J. "Productive Teaching and Instruction: Assessing the Knowledge Base," Phi Delta Kappan, vol. 71, no. 6, February 1990, pp. 470-478.
- Wise, Arthur.