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In many American schools, students and teachers find themselves in a physical environment that adversely affects their morale, and, in some cases, their health. Although hard evidence is scanty, a few studies also indicate that when a school building is in disrepair, student achievement suffers.

School systems often reluctantly elect to postpone repairs and delay construction of new facilities to save money during periods of financial austerity. Making cuts in these areas, while unpalatable, is considered less devastating than slashing academic programs.

The fallout of such decisions, however, is that the condition of school facilities in the U.S. is rapidly failing. A recent national survey conducted by the American Association of School Administrators found that 74 percent of school facilities should be replaced or repaired immediately; another 12 percent were identified as inadequate places of learning (Hansen 1992).

To address a situation that is literally deteriorating, principals, superintendents, school business officials, school boards, and others are beginning to pursue innovative, grassroots solutions to the many challenges associated with maintaining school facilities.

WHY IS THE INFRASTRUCTURE CRUMBLING?

Constitutionally, education is the state's responsibility, whereas school facilities are generally the local district's responsibility. State and federal mandates for educational programs and environmental safety are almost never accompanied by funds needed to implement them. These mandates place a financial burden on local districts. In most cases, districts must rely on taxpayers' ability or willingness to help meet capital expenses. This results in glaring inequities in school environments among districts in the same state (Lewis 1988).

States, facing their own budget shortfalls, have been unable to offset school districts' mounting financial needs. In 1991, thirty-seven states were affected by budget shortfalls. In times of austerity, maintenance costs are often slashed first. The consequences of electing to defer maintenance include premature building deterioration, indoor air problems, increased repair and replacement costs, and reduced operating efficiency of equipment. The price tag for deferring maintenance has quadrupled in eight years, from \$25 billion in 1983 to \$100 billion in 1991 (Hansen). Rising energy costs have also cut into the maintenance budget. When utility costs exceed the budgeted amount, 40 percent of districts in the nation report using funds earmarked for maintenance to meet energy-related expenses (Hansen).

The problems with school facilities are unevenly distributed across the nation. Although

the best facilities built in the 1980s far exceed anything in the past, most children will never attend these schools. And thousands of school districts will continue to face serious facilities problems because of erratic data collection and variance in state involvement in planning and financing school facilities (Lewis).

DO SCHOOL FACILITIES PROVIDE AN ENVIRONMENT CONDUCIVE TO

LEARNING? It has been firmly established that people are influenced and affected by their environment. Children exposed to the environmental conditions in school facilities are no exception. Deferred maintenance can create an environment of peeling paint, crumbling plaster, nonfunctioning toilets, poor lighting, inadequate ventilation, and inoperative heating and cooling systems. This, of course, affects both the health and the morale of staff and students.

Most alarming is the effect of poor indoor air quality on school-age children. Research indicates that the quality of air inside public school facilities may significantly affect students' ability to concentrate. The evidence suggests that youth, especially those under ten years of age, are more vulnerable than adults to the types of contaminants (asbestos, radon, and formaldehyde) found in some school facilities (Andrews and Neuroth 1988). It is unreasonable to expect positive results from students, teachers, and principals who daily work in an adverse environment.

In its report on the condition of urban schools, the Carnegie Foundation for the Advancement of Teaching found that those schools are under-funded, morale is low, facilities are decaying, and the dropout rate remains high year after year. Other crises--a flood, health epidemic, a garbage strike, or even snow removal--would generate emergency intervention, the foundation suggests. But the condition of urban schools is met with calm acceptance (Carnegie Foundation for the Advancement of Teaching 1988).

DOES THE CONDITION OF SCHOOL FACILITIES AFFECT STUDENT ACHIEVEMENT?

The relationship between student achievement and building facilities, while assumed, has not been rigorously studied. In most of the literature the rationale for repairing and refurbishing school buildings is to protect the local government's capital investment, not to protect students or to provide an environment for optimum learning.

The hypothesis that there is a correlation between student achievement and building conditions was tested in the Washington, D.C., school system. After controlling for other variables, such as a student's socioeconomic status, Edwards (1991) found that as a school's condition improved from one category to the next for example, from poor to

fair--students' standardized achievement scores rose an average of 5.45 percentage points. If a school improved its condition from poor to excellent, an increase of 10.9 percentage points in average achievement scores could be expected, Edwards claims.

The Saginaw Schools Project is another study that noted the relationship between student achievement and building facilities. Guided by the belief that schools can influence and control variables that contribute to school learning, the Saginaw Public Schools launched a "grassroots" project involving thirty-one schools. A School Improvement Survey was administered to the staff of each school. Survey results were used by building staff to identify and then solve problems. Goals listed in each school building plan were attained at a 70 to 100 percent level. Goals related to student achievement in reading and mathematics were also encouraging. During the five-year project, student achievement in both math and reading rose in the highest achievement category and dropped in the lowest achievement category (Claus and Girrback 1985).

HOW WILL WE MEET TOMORROW'S CHALLENGE?

Billions of dollars are needed to refurbish school facilities, fund new construction, accommodate changing programs and philosophies, and bring schools into compliance with safety regulations. This challenge can only be met if federal leadership is forthcoming. Legislation such as the Higher Education Facilities Act of the 1960s provided facilities to accommodate the influx of students at colleges and universities after World War II. Our invaluable network of community colleges also would have been impossible without such legislation. The same level of commitment must be directed toward overhauling our nation's public school facilities (Carnegie Foundation for the Advancement of Teaching 1988).

Local districts would also benefit from state involvement in data collection and facilities planning. The availability of statewide information and analyses would enable policy-makers to focus on priorities and anticipate a need for increased funding or a change in funding strategy. In addition, every state department of education would benefit from having a school facilities planner. At present the number of facilities planners in state departments of education varies widely. Of thirty-eight states surveyed by the Educational Writers Association, thirteen had one or fewer employees responsible for building facilities. At the other extreme were Florida with fifty-five facilities planners, Georgia with twenty, New York with eighteen, and Maryland with sixteen (Lewis).

To avoid repeating past mistakes, those responsible for planning school facilities should consider flexibility in architectural design. If student enrollment drops significantly, design flexibility allows schools, or parts of school buildings, to be used by other social service agencies.

WHAT DO WE DO IN THE MEANTIME?

Until more funds become available at the state and federal levels, improvements will be achieved through local efforts. Parent involvement appears to positively affect the condition of school buildings. Edwards found a statistically significant relationship between the PTA budget per pupil and the overall condition of the school building in Washington, D.C., schools. The PTA can influence the condition of the building in various ways. Members can exert pressure on local officials to obtain funding from the city, volunteer time to improve the situation, or support a political candidate or educational measure (Edwards).

Some school districts have used bond measures to obtain funding from local taxpayers. A district's success in passing bond measures will depend largely on how effectively the district communicates its needs to local taxpayers. Without firsthand knowledge of the district's pressing needs, taxpayers will likely consider the request unnecessary.

Performance contracting is a technique some districts have used to refurbish a building facility. The Phoenix Union High School District, for example, formed a partnership with a private firm that offered financing and expertise in energy efficiency. The district received a substantial renovation program, and future energy savings over a ten-year period will pay for all the costs (Hansen).

When the need to restructure education is discussed, there is often no mention of improving the physical site of learning. However, failure to repair and remodel educational facilities may offset benefits derived through restructuring the instructional program. This underscores the need for commitment at local, state, and federal levels to upgrade school facilities.

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