



Administration's
Proposal

Urgent Need

Legislative
Updates and
Congressional
Action

Qualified Zone
Academy Bonds
(QZABs)

School Design

Resources

School
Construction
Home

Archived Information

Impact of Inadequate School Facilities on Student Learning

A number of studies have shown that many school systems, particularly those in urban and high-poverty areas, are plagued by decaying buildings that threaten the health, safety, and learning opportunities of students. Good facilities appear to be an important precondition for student learning, provided that other conditions are present that support a strong academic program in the school. A growing body of research has linked student achievement and behavior to the physical building conditions and overcrowding.

Physical Building Conditions

Decaying environmental conditions such as peeling paint, crumbling plaster, nonfunctioning toilets, poor lighting, inadequate ventilation, and inoperative heating and cooling systems can affect the learning as well as the health and the morale of staff and students.

Impact on student achievement

- A study of the District of Columbia school system found, after controlling for other variables such as a student's socioeconomic status, that students' standardized achievement scores were lower in schools with poor building conditions. Students in school buildings in poor condition had achievement that was 6% below schools in fair condition and 11% below schools in excellent condition. (Edwards, 1991)
- Cash (1993) examined the relationship between building condition and student achievement in small, rural Virginia high schools. Student scores on achievement tests, adjusted for socioeconomic status, was found to be up to 5 percentile points lower in buildings with lower quality ratings. Achievement also appeared to be more directly related to cosmetic factors than to structural ones. Poorer achievement was associated with specific building condition factors such as substandard science facilities, air conditioning, locker conditions, classroom furniture, more graffiti, and noisy external environments.
- Similarly, Hines' (1996) study of large, urban high schools in Virginia also found a relationship between building condition and student achievement. Indeed, Hines found that student achievement was as much as 11 percentile points lower in substandard buildings as compared to above-standard buildings.

- A study of North Dakota high schools, a state selected in part because of its relatively homogeneous, rural population, also found a positive relationship between school condition (as measured by principals' survey responses) and both student achievement and student behavior. (Earthman, 1995)
- McGuffey (1982) concluded that heating and air conditioning systems appeared to be very important, along with special instructional facilities (i.e., science laboratories or equipment) and color and interior painting, in contributing to student achievement. Proper building maintenance was also found to be related to better attitudes and fewer disciplinary problems in one cited study.
- 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).

Impact on teaching

- Lowe (1988) interviewed State Teachers of the Year to determine which aspects of the physical environment affected their teaching the most, and these teachers pointed to the availability and quality of classroom equipment and furnishings, as well as ambient features such as climate control and acoustics as the most important environmental factors. In particular, the teachers emphasized that the ability to control classroom temperature is crucial to the effective performance of both students and teachers.
- A study of working conditions in urban schools concluded that "physical conditions have direct positive and negative effects on teacher morale, sense of personal safety, feelings of effectiveness in the classroom, and on the general learning environment." Building renovations in one district led teachers to feel "a renewed sense of hope, of commitment, a belief that the district cared about what went on that building." In dilapidated buildings in another district, the atmosphere was punctuated more by despair and frustration, with teachers reporting that leaking roofs, burned out lights, and broken toilets were the typical backdrop for teaching and learning." (Corcoran et al., 1988)
- Corcoran et al. (1988) also found that "where the problems with working conditions are serious enough to impinge on the work of teachers, they result in higher absenteeism, reduced levels of effort, lower effectiveness in the classroom, low morale, and reduced job satisfaction. Where working conditions are good, they result in

enthusiasm, high morale, cooperation, and acceptance of responsibility."

A Carnegie Foundation (1988) report on urban schools concluded that "the tacit message of the physical indignities in many urban schools is not lost on students. It bespeaks neglect, and students' conduct seems simply an extension of the physical environment that surrounds them." Similarly, Poplin and Weeres (1992) reported that, based on an intensive study of teachers, administrators, and students in four schools, "the depressed physical environment of many schools... is believed to reflect society's lack of priority for these children and their education."

Overcrowding

Overcrowded schools are a serious problem in many school systems, particularly in the inner cities, where space for new construction is at a premium and funding for such construction is limited. As a result, students find themselves trying to learn while jammed into spaces never intended as classrooms, such as libraries, gymnasiums, laboratories, lunchrooms, and even closets. Although research on the relationship between overcrowding and student learning has been limited, there is some evidence, particularly in high-poverty schools, that overcrowding can have an adverse impact on learning.

- A study of overcrowded schools in New York City found that students in such schools scored significantly lower on both mathematics and reading exams than did similar students in underutilized schools. In addition, when asked, students and teachers in overcrowded schools agreed that overcrowding negatively affected both classroom activities and instructional techniques. (Rivera-Batiz and Marti, 1995)
- Corcoran et al. (1988) found that overcrowding and heavy teacher workloads created stressful working conditions for teachers and led to higher teacher absenteeism.

Crowded classroom conditions not only make it difficult for students to concentrate on their lessons, but inevitably limit the amount of time teachers can spend on innovative teaching methods such as cooperative learning and group work or, indeed on teaching anything beyond the barest minimum of required material. In addition, because teachers must constantly struggle simply to maintain order in an overcrowded classroom, the likelihood increases that they will suffer from burnout earlier than might otherwise be the case.

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