

Do Green Schools Improve a Student's Academic Performance?

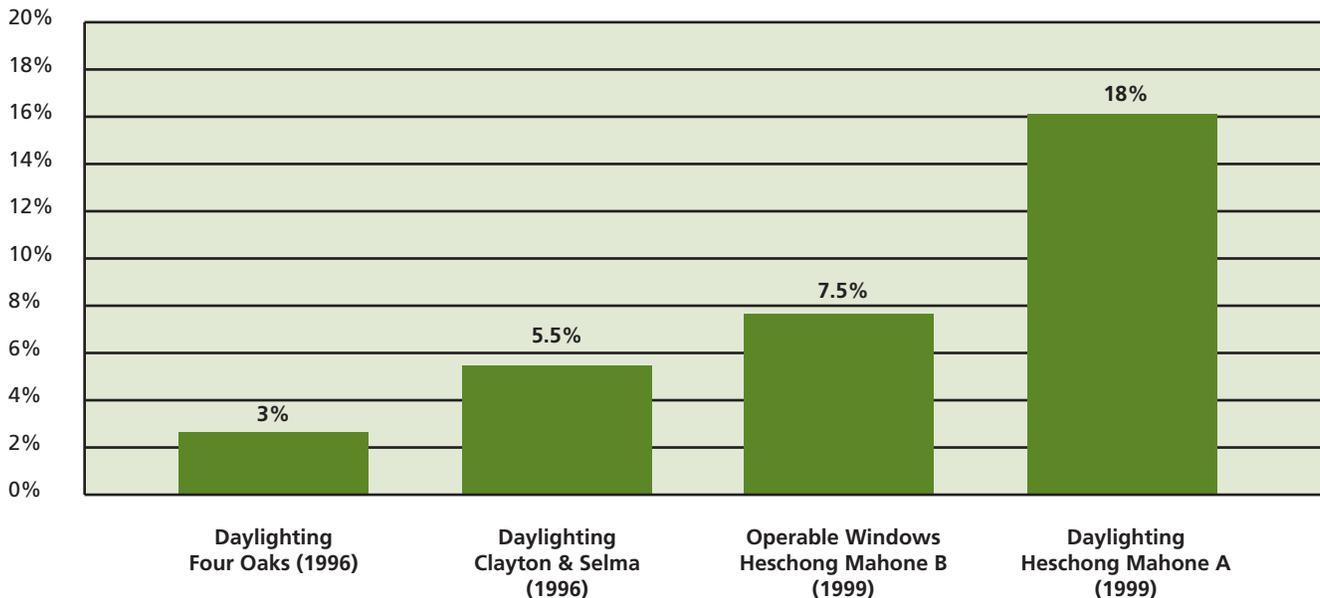
The quality of the school building has a direct impact on student performance -- students perform better academically in better buildings.

Given that the average public school was built 42 years ago, according to the National Center for Education Statistics, maintaining school infrastructure is important not only to protect the district's capital investment, but also to ensure high student performance. In fourteen studies comparing building age with student achievement, researchers found that students in old buildings scored 5-7 percentage points lower than students in new buildings. Poor facilities also affect the career decisions of teachers. Among teachers who rated their facilities C or below, over 40% said that these poor conditions led them to consider leaving their school and almost 30% of these teachers are thinking about leaving the profession entirely.

Facts:

- Each year since the 1997 restoration of Charles Young Elementary School, standardized test scores have risen at the school. Prior to the restoration, nearly half of all students scored in the bottom quartile of the national test scores. Since the restoration, well over half of the poorly performing students rose to national average attainment levels. Over twenty-three percent of all students score well above national averages in standardized testing.
- A number of studies have found a significant positive correlation between student achievement and temperatures falling within the human comfort zone. Students in non air-conditioned buildings performed 3-12 percentile rank points lower on various measures than students in air-conditioned buildings.

Test Score Improvement Studies



When building new schools, it is essential to incorporate the best design practices available. This is particularly relevant as numerous studies show that the central features of high performance schools -- including ventilation, daylighting, and acoustics -- have a direct impact on academic outcomes.

High performance schools tie the HVAC (heating, ventilation, and air-conditioning) system into the design of the building so it is easy to control and maintain. A well-run HVAC system affects the building's energy efficiency, thermal and acoustic comfort and indoor air quality. High performance schools recommend high-efficiency equipment (i.e. Energy Star), systems that are properly sized to the facility, and accessible controls to adjust easily.

- The study by the Hescong Mahone Group, covering more than 2000 classrooms in three school districts, indicated that students with the most classroom daylight progressed 20% faster in one year on math tests and 26% faster on reading tests than those students who learned in environments that received the least amount of natural light

Daylighting is a central component of high performance design. Providing natural daylight provides biological stimulation for hormones that regulate body systems and moods, provide opportunities for natural ventilation, and reduce the need for artificial light thereby reducing energy costs.

- A number of studies have demonstrated a positive correlation between appropriate acoustical conditions and student achievement. Good research indicates students simply do not learn when they can not hear well. A California study found that 3rd grade students in noisy buildings were .4 years behind in reading and .2 years behind in math of students in noisy buildings.

High performance schools use various construction and design methods to improve the acoustical environment. This includes using HVAC systems with little or no noise, increasing the amount of exterior glazing, and consideration of external noise factors like traffic.

- Green features may also be incorporated into school design as teaching tools. Students often learn better when abstract concepts are demonstrated to them visually. For instance, some schools have placed utility meters in visible location in the classrooms, others have incorporated stormwater management into the landscape design. There are also many innovative programs, such as the Center for Ecoliteracy, where teachers incorporate aspects of the classroom or school facilities into the curriculum.

Resources:

Designs for Learning: 55 Exemplary Educational Facilities from 21 countries. Published by the Organization for Economic Co-operation & Development, 2001

"Building Blocks; How Schools are Designed and Constructed Affects How Students Learn," Black, Susan. American School Board Journal; v188 n10 , p44-47 ; Oct 2001

"Do School Facilities Affect Academic Outcomes?" Schneider, Mark. National Clearinghouse for Educational Facilities, Washington, DC. Nov 2002

"School Facility Conditions and Student Academic Achievement" Glen I. Earthman, Virginia Polytechnic Institute (October 2002)

"Healthy School Environment and Enhanced Educational Performance: The Case of Charles Young Elementary School, Washington, DC." Berry, Michael A.(GA , Jan 2002)

Public School Facilities and Teaching: Washington, DC and Chicago. Schneider, Mark (21st Century School Fund, Washington, D.C.; Building Educational Success Together Initiative, Nov 2002)

Schoolyard Learning: The Impact of School Grounds. (Education Development Center, Global Learning Group, Newton, MA , Nov 2000)

The Need for Outdoor Recreational Space in Constructed and Natural Environments to Ensure Cognitive and Physical Well-Being. Johnson, Liz; Steinhagen, Renee (Education Law Center, Newark, NJ , 2000)

Cognitive and Physical Well-Being. Johnson, Liz; Steinhagen, Renee (Education Law Center, Newark, NJ , 2000)