

CHAPTER



# DATA AND RESEARCH

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Research confirms the conditions of school facilities have a direct impact on learning, teaching, overall education, and communities. School facility improvements should be recognized as extremely positive investments both short term and long term educational benefits. This is why we believe the CIC approach has significantly more relevance in the future of education. Many schools and school districts struggle to find ways to improve their tired and generic infrastructures. It is important to have good data highlighting the value of using art to transform learning spaces.

Following are three excerpts from education articles that shed light, support documentation, and research, explaining why school facility improvements are vital.

### **There is always something to learn...**

#### **Maine Department of Education Quarterly Newsletter Volume 10 October 2019 Facilities & Construction**

The Maine Department of Education's Office of School Facilities and Transportation works to ensure that all Maine students have access to healthy, safe, and educationally appropriate facilities.

School facilities have a direct impact on student performance. Providing students with a high quality learning environment helps to ensure they are able to receive the education they need to reach their greatest level of achievement.

The Maine DOE provides financial and technical support and administers a variety of programs to assist Maine schools in addressing their facility needs, including temporary classroom space, health and safety repairs, building additions and renovations, and new school construction.

<https://www.maine.gov/doe/schools/facilities>

#### **Fresco News "How School Facilities Improve A Child's School Experience." October. 28, 2019**

Regardless of the country, good school facilities help determine the success of students and the effectiveness of a teacher's lesson. However, with tight budgets and staff costs, the condition of school facilities is often further down the list of priorities. Studies show that school facilities have an impact on the overall school experience of students and teachers. According to an article by Penn State University, school facilities affect teacher recruitment and retention. More importantly, they also affect the health, behavior and engagement of the students. Thus, adequate facilities make it easier for the school to deliver better education.

Many parents often do not consider the quality of school facilities as a factor in choosing a school for their children, looking only at exam rates. Good equipment and balancing academics with other important on-curriculum activities, whether science lab facilities or sports equipment. When a school invests in facilities, the benefits to the school go far beyond the initial capital costs.

<https://www.fresconews.com/how-school-facilities-improve-a-childs-school-experience/>

“You can’t use up creativity. The more you use, the more you have.”

–Maya Angelou

**Phi Delta Kappa:**  
**The Professional Journal for Educators**  
**“How Crumbling School Facilities Perpetuate**  
**Inequality” April 29, 2019**  
**Mary Filardo, Jeffrey M. Vincent,**  
**and Kevin J. Sullivan**  
*Student Achievement*

A growing body of peer-reviewed research finds a relationship between school facility quality and student achievement. A 2002 review of the literature, compiled by Mark Schneider, the current director of the Institute of Education Sciences at the U.S. Department of Education, found that, on average, researchers observed a difference in student achievement between above-standard buildings and substandard buildings to be 5 to 17 percentile points. The studies cited in this review, and most studies done since, find significant correlations between poor structural, conditional, and aesthetic attributes of school buildings (including lighting, temperature and thermal comfort, acoustics, and indoor air quality) and low student learning and achievement (Earthman, 2002; Uline & Tschannen-Moran, 2008; U.S. Department of Education, Office For Civil Rights, 2014). For example, a 2004 study of 226 schools in Houston, Texas, found that poor facility quality significantly reduced daily attendance and increased dropout rates (Branham, 2004).

Improving school facilities can have a positive effect on student performance, as found in a 2004 analysis of student achievement and indoor environmental compliance ratings in the Los Angeles Unified School District (LAUSD), led by Jack Buckley, a former director of the National Center for Education Statistics. In the study, improvements that raised a school facility’s overall environmental compliance

rating from “worst” to “best” correlated to a 36-point average increase in a school’s Academic Performance Index, a nearly 6% increase over the districtwide 2003 base (Buckley, Schneider, & Shang, 2004b). Similarly, a 2014 study by economists at the University of Chicago and Princeton University on the effect of school construction in New Haven, Connecticut, found that students moving into a rebuilt or renovated school saw strong gains (0.15 standard deviations) in reading scores (Neilson & Zimmerman, 2014). And a 2017 study of the LAUSD found that moving students out of overcrowded and degraded school facilities and into new facilities brought about gains in both standardized test scores and non-cognitive measures of educational quality (Lafortune & Schönholzer, 2017).

#### *Teacher Performance and Satisfaction*

Researchers have also found that school facility quality affects teachers. For example, a 2002 survey of teachers in the Chicago Public Schools and the District of Columbia found that when teachers consider their school to be in poor physical condition, they are far more likely to report that they plan to leave their school or to leave teaching altogether than are teachers in facilities they consider to be in good or excellent condition (Buckley, Schneider, & Shang, 2004a). A 2017 study led by a University of Michigan environmental health researcher found that improved ventilation and indoor air quality at schools improved teachers’ self-reported job satisfaction (Batterman et al., 2017).

In short, it appears that good facility conditions can improve the teaching experience and reduce teacher turnover, while poor school conditions can hinder

teachers' work (U.S. Department of Education, 2014). In particular, teachers delivering 21st-century education and preparing students for 21st-century jobs need such physical instructional elements as science labs, technology, and special education spaces. Aging school buildings that have not been modernized often lack these important features.

Researchers and education practitioners now see school climate and positive social relations as necessary ingredients for academic achievement (Bryk & Schneider, 2002; Thapa et al., 2013), and facilities play a strong role in these areas. Properly planned, designed, and maintained school facilities promote the health, well-being, and performance of children and adults in schools and even encourage children to want to come to school (Maxwell & Schechtman, 2012). In her study of 236 New York City middle schools, Cornell University environmental psychologist Lorraine Maxwell (2016) found that school building condition is linked to school climate and attendance, and higher ratings of school social climate predicted lower student absenteeism, which in turn predicted higher standardized test scores.

#### *How School Buildings Affect Health and Community Well-being*

Substandard school buildings and grounds can negatively affect the health of children and adults in schools (Uline & Tschannen-Moran, 2008). Researchers have found that exposures to mold, poor ventilation, uncomfortable temperatures, inadequate lighting, overcrowding, and excessive noise all have potential to harm student and teacher health, contribute to absenteeism, and reduce cognitive abilities — all of which affect academic achievement (Fisk et al., 2016). Dampness and mold in school buildings exacerbate children's and teachers' asthma symptoms (Dangman, Bracker, & Storey, 2005), and both children and teachers perform better with increased fresh air ventilation (Myhrvold, Olsen, & Lauridsen, 1996).

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#### *Inadequate Facilities Disproportionately Affect the Poor*

Capital funding for facility infrastructure remains the most regressive element of public education finance. On average, local districts are responsible for 82% of their capital budget, which covers building new schools and renovating existing facilities (Filardo, 2016; National Center for Education Statistics, n.d.). In contrast, on average, local school districts are responsible for only about 45% of their annual operating budget, which pays for teachers, staff, administration, materials, and facility maintenance and operations. The federal government historically contributes 10% on average for local education operating costs (mainly under Title I), but it provides less than 1% of total capital expenditures by U.S. public school districts, mainly through the Federal Emergency Management Agency (FEMA) for after-the-fact disaster recovery.

Because local school districts shoulder the vast majority of their capital facilities costs, poor and low-wealth districts are frequently unable to adequately maintain their buildings and grounds, much less modernize their schools. Therefore, districts and zip codes with higher enrollments of students from low-income families are more likely to have buildings in poor condition (Alexander & Lewis, 2014; Filardo et al., 2006).

Poor communities whose school facilities need the most attention have typically received the least facility funding, as seen in a national study of more than 146,000 school facility improvement projects

from 1995 to 2004, which found that the projects located in high-wealth zip codes had more than three times the capital investment than the schools in the lowest-wealth zip codes (Filardo et al., 2006). Recent studies of Texas (Rivera & Lopez, 2019) and California (Brunner & Vincent, 2018) both found that school districts with lower property values raised significantly less facility funding from local and state sources, compared to districts in areas with higher property values. These differences in funding mean that students from affluent districts are more likely to attend school in bright, comfortable, and healthy facilities, while students in poorer districts are likely to attend school in dilapidated, obsolete, and unhealthy facilities that pose substantial obstacles to learning and overall student well-being. Further, because they lack access to capital dollars, poorer districts end up making expensive emergency and short-term repairs out of their operating budgets — thus using the money that otherwise goes to pay teachers, purchase instructional equipment, and other day-to-day educational necessities. A 2015 study by University of California, Berkeley, researchers found that this is a pervasive problem across California — districts serving low-income families spend a higher proportion of their total education budget per student on the daily upkeep, operation, and repair of their facilities than do high-wealth districts (Vincent & Jain, 2015).

Older, less well-maintained buildings are also more vulnerable when natural disasters strike, leading their students to experience more adverse effects, such as dislocation and prolonged school closures. In 2005, a total of 372,000 students were dislocated in Louisiana as a result of Hurricane Katrina, with an estimated 160,000 dislocated for months and sometimes years. According to a 2017 report by FEMA, “older school facilities are particularly vulnerable to natural disasters and in most cases school administrators do not have the financial resources to address these vulnerabilities” even though they have “a moral, and in many cases, legal responsibility to make these schools more resilient to disaster.”

<https://kappanonline.org/how-crumbling-school-facilities-perpetuate-inequality-filardo-vincent-sullivan/>