

# Facilities: Fairness & Effects

## Evidence and Recommendations Concerning the Impact of School Facilities on Civil Rights and Student Achievement



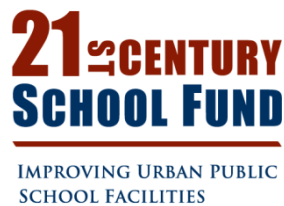
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Submission to U.S. Department of  
Education Excellence & Equity Commission

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Healthy Schools Network, Inc.



Center for  
Innovative School  
and Community  
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*Acute disparities in the access of public school students to adequate facilities, coupled with the compelling evidence of how poor quality school facilities are implicated in lower student achievement, make it imperative that any inquiry into the nature of inequity of education in the United States include an understanding of the conditions, design, utilization and location of public school facilities. In the attached paper, we provide background on the role and impact of school facility condition and recommendations to the U.S. Department of Education Excellence and Equity Commission. We are joined in expressing our concern about inequity in facility conditions by: Center for Cities and Schools, UC Berkeley, California; National Clearinghouse for Educational Facilities, Washington, DC; Innovative School Facilities, Portland, Oregon; Public Education Network, Washington, DC; Healthy Schools Network, New York; Designs for Change, Chicago, Illinois; and the ACLU of Maryland, Baltimore, Maryland.*

Before the resolution of the U.S. Supreme Court Brown v. Board of Education case in 1954, states could require or allow school districts to assign children to one school rather than another on the basis of race. The Supreme Court decided that separate IS unequal, but the key factors that motivated parents to take the remarkable steps to challenge segregation and get their children access to white schools was the poor quality of facilities, substandard materials, and the excessive travel time that African-American children experienced as compared to the white children from the same communities.

Driven by a new generation of parents who also want their children to have equal access to an adequate education, state courts, in a series of cases, recognized that equal access to adequate facilities was a rights issue on par with any other education issue. States have recognized the detrimental effect of poor quality school facilities, citing disparities in school facilities as a violation of student rights and as evidence of need for change in the school funding formula.

Abbott v. Burke articulated how the quality of facilities—the “need for maintenance, treatment of asbestos services, and heating of older, less energy-efficient school facilities”—should be equally considered with other aspects long-recognized as critical to the schooling environment: qualified teachers, achievement levels on standardized tests, and dropout rates. 100 N.J. 269, 269 (N.J.,1985). See also Abbeville County School Dist. v. State, 335 S.C. 58, 68 (S.C., 1999) (“this minimally adequate education required by our Constitution to include providing students adequate and safe facilities”); Campaign for Fiscal Equity, Inc. v. State, 86 N.Y.2d 307, 345 (N.Y. 1995) (“Children are entitled to minimally adequate physical facilities and classrooms which provide enough light, space, heat, and air to permit children to learn. Children should have access to minimally adequate instrumentalities of learning such as desks, chairs, pencils, and reasonably current textbooks.”); DeRolph v. State, 78 Ohio St.3d 193 (Ohio,1997) (“A thorough and efficient system of common schools includes facilities in good repair and the supplies, materials, and funds necessary to maintain these facilities in a safe manner.”).

Courts determined that facility quality is so integral to the basic educational experience that mechanisms that perpetuate facility inequities must be struck down. For example, Roosevelt Elementary School Dist. No. 66 v. Bishop struck down the school funding formula because it granted students from affluent school districts “the privilege of access to public schools containing basic facilities and equipment, thus affording them an opportunity to obtain the minimum education that we recognized...as their right,” while depriving students of poorer school districts “of an equal opportunity by forcing them to use substandard facilities and equipment.” 179 Ariz. 233, 245 (Ariz.,1994). In Campbell County School Dist. v. State, for instance, the Wyoming Court held that “deficient physical facilities

deprived students of equal education opportunity, and any financing system that allowed such deficient facilities to exist was unconstitutional.” 907 P.2d 1238, 1275 (Wyo., 1995).

***The quality of school facilities affects student achievement***

These and other court cases articulate the common-sense notion that the quality of school facilities affects student achievement through myriad factors. The quality of school facilities is a factor in student and teacher attendance, teacher retention and recruitment, child and teacher health, and the quality of curriculum. The impact of school facility quality on these important dimensions affecting the education experience makes it unsurprising that many studies in the field focus on the link between test scores and facilities. In a set of 20 studies analyzed by 21st Century School Fund, all but one study showed a positive correlation between the achievement of students and the condition of the school facility once student demographic factors were controlled for.

Amongst these studies, findings show: that the percentage of students passing the Virginia Standard of Learning tests was 2.2-3.9% higher in English, mathematics and science in standard buildings than it was in substandard buildings<sup>1</sup>; that higher suspension rates (2-9%), lower attendance rates in middle and high school (2-3%), lower test scores (~5%) are correlated with the number of unsatisfactory building systems<sup>2</sup>; that changing school facilities quality from worst to best in the Overall Environmental Compliance Rating leads, on average, to a 36

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<sup>1</sup> Bullock, C. C. (2007). The relationship between school building conditions and student achievement at the middle school level in the commonwealth of Virginia. (Ed.D, Virginia Polytechnic Institute and State University).

<sup>2</sup> Boese, S., & Shaw, J. (2005). New York state school facilities and student health, achievement and attendance: A data analysis report. Healthy Schools Network.

point increase in a school's Academic Performance Index<sup>3</sup>; that there is a 4-9% difference in achievement between students in schools in worst/best condition, and a 5-9% difference in achievement between students in oldest/newest schools<sup>4</sup>; that there is a 4% difference in graduation rates between students in schools in worst/best condition and between students in oldest/newest schools<sup>5</sup>; that there is a predicted increase in National Assessment of Educational Progress of .236 points per additional dollar/pupil invested in infrastructure<sup>6</sup>; that, all building design variables defined in one study demonstrated a statistically significant relationship with student achievement within each school category<sup>7</sup>; that significant relationships were found between high scores on three different facilities design elements and test score results<sup>8</sup>; that significant relationships for facility measures explained 10-15% of the differences in student test scores across schools after controlling for student demographics<sup>9</sup>; that a shift from the best facilities to the worst decreases student test performance by ~3%<sup>10</sup>; that for every 10% reduction in the percent of portable facility per student, test scores increased by 11 points and for every 10% increase in deferred maintenance, average test scores decreased

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<sup>3</sup> Buckley, J., Schneider, M., & Shang, Y. (2004). Los Angeles unified school district school facilities and academic performance. Washington, DC: National Clearinghouse for Educational Facilities.

<sup>4</sup> Blincoe, J. M. (2008). The age and condition of Texas high schools as related to student academic achievement. (Ed.D., University of Texas at Austin).

<sup>5</sup> Blincoe, J. M. (2008). The age and condition of Texas high schools as related to student academic achievement. (Ed.D., University of Texas at Austin).

<sup>6</sup> Crampton, F. E. (2009). Spending on school infrastructure: Does money matter? *Journal of Educational Administration*, 47 (3), 305-322.

<sup>7</sup> The relationship between school design variables and student achievement in a large urban Texas school district. (Ed.D., Baylor University).

<sup>8</sup> Tanner, K. (2009) Effects of school design on student outcomes. *Journal of Educational Administration*. 47(3), 376-394.

<sup>9</sup> Lewis, M. (2000). Where children learn: Facility condition and student test performance in Milwaukee public schools. Scottsdale, AZ: Council of Educational Facility Planners.

<sup>10</sup> Schneider, M. (2003) Linking School Facility Conditions to Teacher Satisfaction and Success. Washington, DC: National Clearinghouse for Educational Facilities.

by 0.61 points.<sup>11</sup> The overwhelming results of these studies show how counterproductive it would be to push for increased student achievement without providing school facilities that integrally support such achievement.

In still more studies, there is evidence that poorer school infrastructure is significantly related to lower attendance rates and drop-out rates, even controlling for demographic factors. One research project found that students are less likely to attend schools when buildings are in need of structural repair, use temporary structures, and have an understaffed janitorial service.<sup>12</sup> Another study found that in schools with poorer facilities, students attended less days on average. This lower attendance was in turn linked to lower scores on both the ELA and Math standardized tests.<sup>13</sup>

Similarly, teacher satisfaction and retention is also related to the adequacy of school facilities. In one study, approximately 75% of principals indicated that school facilities impacted teacher attitudes, teacher recruitment and teacher retention.<sup>14</sup> Such intuitions are borne out by studies showing that teachers working in schools with satisfactory facility conditions are significantly more likely to express positive attitudes about their classrooms than teachers in unsatisfactory

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<sup>11</sup> Sheets, M. E. (2009). The relationship between the condition of school facilities and certain educational outcomes, particularly in rural public high schools in Texas. (Ed.D., Texas Tech University).

<sup>12</sup> Branham, D. (2004). The wise man builds his house upon the rock: The effects of inadequate school building infrastructure on student attendance. *Social Science Quarterly*.

<sup>13</sup> Duran-Narucki, V. (2008). School building condition, school attendance, and academic achievement in New York City public schools: A mediation model. *Journal of Environmental Psychology*, 28, 278-286.

<sup>14</sup> Stevenson, K. R. (2001). The relationship of school facilities conditions to selected student academic outcomes: A study of South Carolina public school s. SC Education Oversight Committee.

buildings.<sup>15</sup> Research also indicates that poor facilities affect the health and productivity (attendance) of teachers and make retention of teachers difficult (especially for schools with a condition grade of “C” or less).<sup>16</sup> A national agenda that focuses on supporting teacher quality must attend to the condition of school facilities as an important component of this goal.

Another effect of poor school facilities is the detrimental impact they have on students’ basic health. Studies have continuously confirmed that the sensitivity students exhibit towards various facility factors, often overlooked, come together to form a healthy or unhealthy school environment that affects children and adults. As proclaimed by the Environmental Protection Agency, poor school design and facility conditions can lead to “sick building syndrome.”<sup>17</sup> Teachers in Chicago and Washington, DC reported missing 4 days annually because of health problems caused by adverse building conditions (with poor indoor air quality being the biggest problem).<sup>18</sup> Two thirds of teachers in the District of Columbia reported poor air quality in their classrooms.<sup>19</sup> A national survey of school nurses found over 40% of the nurses knew children and staff adversely impacted by avoidable indoor pollutants.<sup>20</sup> The General Accounting Office found that one in five students nationwide attend a school that suffers from poor ventilation; poor ventilation can

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<sup>15</sup> Earthman, G. I., & Lemasters, L. K. (2009). Teacher attitudes about classroom conditions. *Journal of Educational Administration*, 47 (3), 323-335.

<sup>16</sup> Schneider, M. (2003) *Linking School Facility Conditions to Teacher Satisfaction and Success*. Washington, DC: National Clearinghouse for Educational Facilities.

<sup>17</sup> Environmental Protection Agency. 2000. *Indoor Air Quality and Student Performance*. Washington, D.C.: EPA (No. EPA402-F-00-009).

<sup>18</sup> Buckley, J., Schneider, M., & Shang, Y. (2005). *Fix it & they might stay: School facility quality and teacher retention in Washington, D.C.* Teachers College Press, 10 , 1107-1123.

<sup>19</sup> Schneider, M. 2003. *Public School Facilities and Teaching: Washington, D.C. and Chicago*. Washington, D.C.: 21st Century School Fund.

<sup>20</sup> Preliminary survey results released by the Association of School Nurses (NASN) and Healthy Schools Network, January 11, 2011. [http://www.healthyschools.org/NASN-HSN\\_survey-press\\_Jan\\_2011.pdf](http://www.healthyschools.org/NASN-HSN_survey-press_Jan_2011.pdf)



boost rates of asthma and respiratory illness, both of which are disproportionately observed in urban schools.<sup>21 22</sup>The temperature and humidity in classrooms can affect children’s health and motivation. One study of Florida classrooms found many with mold growing inside ceilings, triggering allergic symptoms.<sup>23</sup>

Studies about acoustics, air quality and lighting are providing insight into how building design and condition operate on student and teacher attention, focus, attendance and ultimately performance. According to the Acoustical Society of America, for instance, a clear causal chain has been established that shows how acoustic design has a direct effect on acoustic performance, which in turn affects speech intelligibility and then ultimately student learning outcomes.<sup>24</sup> Researchers focusing on air quality in schools have found that student task speed increased when outdoor air supply rates were also increased by varying intervals, and that this effect was larger for children than adults.<sup>25</sup> Improvement was “14% in tasks for which a statistically significant effect could be demonstrated.”<sup>26</sup> Another study, which utilized standardized instead of specially designed tests, also found a linear relationship between outdoor air rates and student achievement.<sup>27</sup> Additionally, CO2 levels and ventilation have been linked to average daily attendance when confounding factors, including socio-economic status, ethnicity and gender were controlled for. There is also some evidence that exposure to daylight affects student performance. In a study by Kuller & Lindsten, students

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<sup>21</sup> General Accounting Office. 1995. School Facilities: American’s Schools Not Designed or Equipped for the Twenty-First Century. Washington, D.C.: GAO (ED383056).

<sup>22</sup> Environmental Protection Agency. 2000. Indoor Air Quality and Student Performance. Washington, D.C.: EPA (No. EPA402-F-00-009).

<sup>23</sup> Bates, J. 1996. Healthy learning. *American School and University*, 68: p. 27-29.

<sup>24</sup> Baker 26

<sup>25</sup> Baker 28, Wyon & Wargocki, 2007

<sup>26</sup> Id.

<sup>27</sup>

lacking access to natural daylight demonstrated a delay in seasonal cortisol production, which is positively associated with concentration abilities.<sup>28</sup>

***Tremendous disparities in facility conditions exist across the nation.***

Yet, despite evidence of the sensitive relationship between school facilities and performance and child health, tremendous disparities in facility conditions still exist across the nation. In Growth and Disparity: A Decade of U.S. Public School Construction, analysts found vast disparities in the amount of school construction for new and existing schools spent per student across zip codes. The study consistently shows that capital funds for school facilities failed to reach schools with children from low income communities. The researchers analyzed capital spending of school districts from 1995-2004 and found that school districts with 75 percent or more of their students qualifying for free or reduced-price lunch spent the least on facility construction per student—an average of \$4,800 per student over this ten year period. The school districts with the fewest students qualifying for free or reduced-price lunch, less than 10 percent, spent the most money per student—an average of \$9,361.<sup>29</sup> In districts where less than 10 percent of students qualify for lunch subsidies, there was an average of \$5,891 spent on improvement to existing schools per student, versus only \$3,037 in districts where 40 to 75 percent of students qualified for lunch subsidies.<sup>30</sup> The expenditure per pupil in high income districts, where median household incomes earn \$100,000 and more, was \$11,500 versus \$4,140 in districts where median household incomes

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<sup>28</sup> Baker 34.

<sup>29</sup> BEST—Building Educations Success Together, Growth and Disparity: A Decade of U.S. Public School Construction, October 2006, Pg. 18.

<sup>30</sup> Id., pg. 19.

were less than \$20,000. The national average is \$6,519 per pupil.<sup>31</sup> Although the disparity was not as great by race, as by income levels disparities in facilities spending between ethnic groups was also found. The amount spent on construction per student averaged \$7,102 in school districts that were predominantly white, where the enrollment was more than 90 percent non-Hispanic white. However, this is compared to school district spending on school construction per student of only \$5,172 in predominantly minority school districts, where the enrollment was less than 10 percent non-Hispanic white.

In a recent analysis of school construction spending from 2005-2008, stark disparities also emerge when data on school facilities is examined on a state level.<sup>32</sup> Eleven states contributed nothing to local districts for capital outlay funds, which are used to purchase physical assets with a multi-year life—building additions, building systems and component replacements, new construction, major alterations to buildings, as well as for purchase of equipment, furniture and fixtures: 14 provided less than 20%; 12 states paid between 20% and 50%; and 13 states paid over 50% of the capital outlay facility costs incurred by local school districts. The state ranking highest in average annual capital outlay (2005-2008) spent \$ 2,066 on average per student (Wyoming) versus \$ 336 per student (Kansas).<sup>33</sup> The 9<sup>th</sup> place state (Texas) spent an average of \$ 1,280 per student, just 62% of the amount provided by the highest spending state. .

Furthermore, most spending of the last decade has been spent on new school construction to fund new facilities in expanding communities. In contrast, only

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<sup>31</sup> *Id.*, pg. 21.

<sup>32</sup> State Capital Spending on PK-12 School Facilities, 21st Century School Fund, Nov. 2010.

<sup>33</sup> Capital outlay funds contributed by the District of Columbia, are not included in this discussion. With an average annual capital outlay of \$2,355, the District provided more than 50% of the capital outlay facility costs incurred by its school district.

24% of the capital spending of the last decade has gone to pay for improvements to existing facilities, where most low-income children go to school.<sup>34</sup>

### *Recommendations*

(1) A permanent federal grant program should be established to provide states with grants to support upgrading or replacing unsafe, overcrowded and educationally outmoded school buildings. Grants must be contingent on state's establishing a capital support program for local districts and schools (including charter schools), with needs prioritized based upon a statewide facilities needs assessment and a multiyear capital improvement plan. A bill introduced in the 110<sup>th</sup> Congress by Senator Harkin authorizes this type of program, and includes a provision requiring states to undertake a comprehensive facilities needs assessment and a statewide facilities master plan.”

(2) The Department of Education should work with Environmental Protection Agency and the Department of Energy to identify potential new federal funding sources for PK-12 public infrastructure improvements that will protect child health, save natural resources and better utilize the energy, water and land currently in the inventory of public school districts.

(3) The Department of Education's Civil Rights Office should investigate how capital funding structures within districts and states have disparate impacts on minority versus non-minority students. Based on this research, the Civil Rights

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<sup>34</sup> BEST—Building Educations Success Together, Growth and Disparity: A Decade of U.S. Public School Construction, October 2006.

Office can develop policies and guidelines on this specific matter and, where appropriate, initiate reviews that might lead to relief actions.

(4) The Department of Education should develop an in-house expertise regarding facilities matters so as to provide leadership, encourage research, develop standards, and share best practices. This expertise would also enable the Department to integrate facility elements into the ESEA and its school improvement initiatives and programs.

(5) The National Center for Education Statistics should collect and include data elements on facility inventory and condition in its common core of data that it collects annually from Districts and uses for the U.S. Census of Governments. Sufficient data shall be collected to enable comparative analysis on the level and allocation of capital funding among the states, in relation to all students and student subgroups.

(6) The General Accounting Office should update the research and conclusions of its 1995 national survey of public school facilities (*School Facilities: American's Schools Not Designed or Equipped for the Twenty-First Century*. Washington, D.C.: GAO (ED383056)) and do another national survey of public school facility condition, design, utilization and location.