

Green Schoolyards

DEFINITION: School yards that incorporate environmental elements such as stormwater management, gardens, play spaces, and wooded areas. Often, it is combined with outdoor classrooms and/or outdoor education.

THE PHILADELPHIA GREEN SCHOOLS VISION: schools have green schoolyards that incorporate stormwater management and other environmental services as well as creative play spaces

CASE STUDY: WILLIAM DICK ELEMENTARY SCHOOLYARD Philadelphia, Pennsylvania



Before



After

Photo credit: Stamm, Jenna. Trust for Public Land. Digital Image. Available from: <https://www.tpl.org/william-dick-elementary-schoolyard-design-and-construction-journal> (accessed December 13th, 2015).

Approximately, 20 green schoolyards currently exist in Philadelphia public schools. One example is the William Dick Elementary school. In 2012, the Trust for Public Land partnered with the school, Philadelphia Water Department, and Philadelphia Eagles. The participatory design process took 10 weeks, and was finished in June 2014 with new play equipment, shade trees, an artificial turf field, running track, and the largest rain garden in any Philadelphia school. Before, most of the playground was covered in asphalt, which prevented rain from being absorbed into the ground.

For more information, please visit <https://www.tpl.org/william-dick-elementary-schoolyard-design-and-construction-journal>.

The literature on green schoolyards has identified numerous benefits for students, teachers, schools, families and communities, and the environment. Here are a few.

IMPROVED PERCEIVED HEALTH

The percentage of green space inside a one kilometer and a three kilometer radius has a significant relation to perceived general health. Elderly, youth, and secondary educated people in large cities seem to benefit more from the presence of green areas in their living environment than other groups in large cities.

The research study surveyed 250,782 people & 104 general practices.

Source: <http://jech.bmj.com/content/60/7/587.abstract>

INCREASED SOCIAL ACTIVITY

People become more sociable in green spaces. Researchers found that green spaces contained on average 90% more people than barren spaces. People are also more attracted to engage in social interactions in greener spaces. On average, there were 83% more individuals involved in social activity in green spaces than in barren spaces. The research study conducted 758 observations in 59 locations in Illinois.

Source: <http://www.willsull.net/resources/Sullivan-papers/SullivanKuoDePooter.pdf>

LEANER BODIES AND LONGER SLEEP

High-quality outdoor environments at child day care centers are associated with leaner bodies, longer night sleep (on average 16 mins/week more than low quality centers), better well-being and higher mid-morning higher energy levels. The research study metered and surveyed 253 children from 9 day care centers in Sweden.

Source: <http://onlinelibrary.wiley.com/doi/10.1111/apa.12047/pdf>

REDUCED STRESS

Natural areas in schoolyards enable students to escape stress, focus, build competence, and form supportive social groups. Researchers observed and surveyed 169 students between the age of 6-18. 46% of the survey responses for the high school students used key words like calm, peace, and relaxation, and 98% reported positive effects.

"I'm able to complete my homework faster, because I'm in a better place to do other things... because there's no deadline here." Laurel (age 17)

Source: <http://www.sciencedirect.com/science/article/pii/S1353829214000379>

CASE STUDY: IMPROVED ACADEMIC ACHIEVEMENT IN MICHIGAN

A research found that the view of nature outside classroom and cafeteria windows is associated with more Michigan Merit Award scholarships, higher graduation rates, and more four-year college plans among students, explaining between 3.7% and 8.7% of their variance. The research studied 101 public schools in Michigan.

Source: http://deepblue.lib.umich.edu/bitstream/handle/2027.42/61641/rmatsuok_1.pdf;jsession-id=D90D6CD3D2787602DD110C24C37FF0AF?sequence=1

LEARN MORE

Making the Case for Philadelphia Greenschools

Center for Green Schools

The Natural Learning Initiative

Green Schoolyards America

Evergreen's Greening School Grounds Program

San Francisco Public Schools Green Schoolyards Program

Ecoschools

Urban Waters Partnership

Environmental & Placed-Based Education

DEFINITION: Uses the local community and environment as a starting point to teach concepts in all disciplines across the curriculum, including local history, culture, social problems and economics. It emphasizes hands-on, real-world problem solving by engaging with local citizens, community organizations, and environmental resources.

THE PHILADELPHIA GREEN SCHOOLS VISION: teachers utilize the school grounds and surrounding neighborhood for environment and place-based education, and the curriculum incorporates real-world problem solving and service learning

CASE STUDY: BARNES ELEMENTARY SCHOOL

Burlington, Vermont



Barnes elementary is part of the Sustainable Schools project, a program for civic engagement and service learning. A class of fourth and fifth graders at the school noted a lack of safety signs alerting people of the school zone. The students were able to expedite the sign installation. A teacher stated, “[Our students] are very comfortable now with business owners, extremely comfortable with the Mayor, with the City Council, and with the Neighborhood Planning Committee because they’ve spoken there. And there they go to speak, people listen.”

Barnes Elementary School, Burlington, Vermont
Photo credit: “Why PBE (PEEC 2006) self study version”, Placed-Based Education Evaluation Collaborative. Digital copy: http://www.peecworks.org/PEEC/PEEC_Reports/S01798779-017989F9.

Source: <http://www.peecworks.org/index>

The literature on placed-based and environmental education has identified numerous benefits for students, teachers, schools, families and communities.

IMPROVED ACADEMIC ACHIEVEMENT

The State Education and Environment Roundtable found that students who have been in placed-based educational programs academically outperformed their peers in traditional programs. They compared 39 cases regarding language arts, math, science, social studies, and comprehensive assessment. 92% of these comparisons indicated students not exposed to these program did worse.

Source: <http://www.seer.org/pages/GAP.html>

IMPROVED CRITICAL THINKING

97% of 250 educators from 40 schools across the U.S. reported students exposed to placed-based education were more proficient in solving problems and thinking strategically, and 89% reported better application of systems thinking. "Now, I find myself trying to make connections in everything I do. It's a subconscious thing that happens. After you learn this way for two years, it just comes naturally." -Doug, junior at Lincoln High School, California.

Source: <http://www.seer.org/pages/GAP.html>

IMPROVED SOCIAL BEHAVIOR

Once exposed to environmental and placed-based education, students begin to treat each other with more care and exhibit more self discipline. 98% of 350 educators from 40 schools reported students having a better ability to work in group settings, 94% of the educators reported students gaining stronger communication skills, 93% reported students acting in greater civility toward others. The researchers also found that students in these programs had improved behavior, attendance, and attitudes.

Source: <http://www.seer.org/pages/GAP.html>

ENCOURAGES STUDENTS TO BECOME ENVIRONMENTAL STEWARDS

Children who have interacted with "wild nature" and "domesticated nature", e.g. hiking, playing, planting, are more likely to develop pro-environmental behaviors in adulthood. Researchers found that direct participation with "nature" had significant effects on their adult environmental attitudes. The study evaluated 2,000 adults age 18-90 living in urban areas from various demographic and socioeconomic backgrounds.

Source: <http://www.outdoorfoundation.org/pdf/NatureAndTheLifeCourse.pdf>

INVIGORATES EDUCATORS

Placed-based education can invigorate educators and encourage them to collaborate with their peers. An educator from Gilford Elementary School, New Hampshire, states, "Because of CO-SEED I'll never again be the same teacher...It's transformed my whole vision about how I teach my kids. It gave me the tools, it gave me the vision, it gave me the opportunity. The results are just phenomenal. Between writing and reading, the kids are hooked, and I will never teach the same again."

Source: <http://tinyurl.com/PEECBrochure>

LEARN MORE

Making The Case for Philadelphia Green Schools
Antioch University

Placed-Based Education Evaluation Collaborative
National Association of Environmental Education
National Environmental Education Foundation
Environmental Education and Training Partnership

Project Learning Tree

Project WILD

Project WET

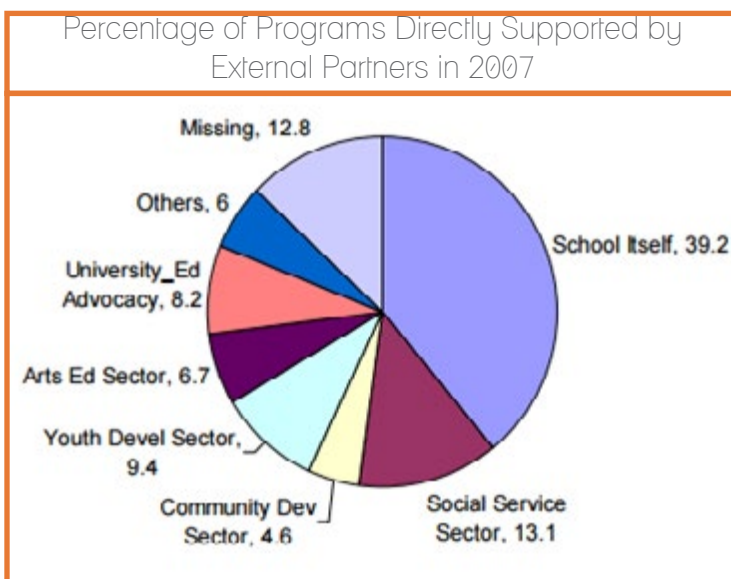
Community Schools

DEFINITION: A place and a set of partnerships between the school, parents and other community resources, with an integrated focus on academics, health and social services, youth and community development, and community engagement. Schools become centers of the community and are open to everyone after school hours.

THE PHILADELPHIA GREEN SCHOOLS VISION: schools become accessible hubs that actively engage and provide resources to community members of all ages. Schools engage community partners in this effort.

CASE STUDY: CHICAGO COMMUNITY SCHOOLS INITIATIVE

Chicago, Illinois



Approximately 15% of the organizations engaging with the Chicago Community Schools are from the business sector. Over 400 partner organizations concentrate in critical areas such as health and social services (17%, combined), youth development and community advocacy (13%), arts and cultural education (12%), and recreational services (5%).

The Chicago Community Schools Initiative began in 2002. It includes 120 public schools, about a fourth of the schools in the district. Financial and program support comes from partner organizations, which helped make its success. They work with over 45 major partners to provide resources like gyms, computer rooms, and out-of-school time activities. These resources are available for students, families, and communities members to deepen social and family support services. In 2006, each school had an average of 12 out-of-school activities, and every year participation increased.

Source: http://www.aypf.org/documents/CSI_ThreeYearStudy.pdf

Photo credit: Wahalen, Samuel. Three Years Into Chicago's Community Schools Initiative, University of Chicago, 2007. http://www.aypf.org/documents/CSI_ThreeYearStudy.pdf.

The literature on community schools has identified numerous benefits for students, teachers, schools, families and communities. Here are just a few.

RETURN ON INVESTMENT

The National Center for Community Schools calculated that for every \$1.00 invested, community schools return an average of \$12.55 in social value to students, families, and the community. The cost reflects the monetary value of the resources required to operate community schools, and the outcome data is the perceived benefits translated into a monetary value.

Source: <http://www.childrengainsociety.org/files/CASE%20STUDY%20final.pdf>

HIGHER GRADUATION RATES

"It's relationships, not programs, that change children." - Bill Milliken, Founder of Communities in Schools (CIS). CIS is a non-profit organization dedicated to drop-out prevention by bringing community resources into public schools. They serve 1,480,000 children, and 99% of them stay in school. 91% of CIS students graduate, in comparison to the national average of 81%.

Source: <http://www.communitiesinschools.org>

IMPROVED ACADEMIC ACHIEVEMENT AND ATTENDANCE

The Coalition for Community Schools is an alliance of national, state, and local organizations committed to building community and educational services. The staff conducted a survey for 20 community school initiatives across the U.S. 15/20 of the initiatives found improved grades in school courses and/or scores in proficiency testing. 8/20 showed improved attendance.

Source: <http://www.communityschools.org/assets/1/Page/CCSFullReport.pdf>

NARROW THE ACHIEVEMENT GAP ATTRIBUTED TO POVERTY

Researchers tested 18 community schools and 18 non-community schools in Tulsa, Oklahoma. They found that fully diffusing the community school model into schools enhanced student achievement and narrowed the achievement gap attributed to poverty. The study compared low income students given reduced/free lunches in both community schools and non-community schools, and found that students in community schools tested significantly higher in comparison.

Source: http://www.tacsi.org/?page_id=3374

CASE STUDY: WAYFINDER SCHOOLS

Wayfinder Schools offers a program with a core curriculum, work programs, experimental learning, and residential living. It also provides a safe home-based for young parents aged 14-20. It has a long history of healing students and supporting students' academic goals. "It's all about pulling people back into relationship, pulling dropouts and struggling youth back into school, back into community. We say to them: 'You belong in school. You belong in our society with a high school diploma...We know it doesn't work to punish, exclude, and isolate.'" -Dorothy Foote, Head of School.

Source:<http://wayfinderschools.org/>

LEARN MORE

Making the Case for Philadelphia Green Schools
Coalition for Community Schools
Antioch University CO-SEED
National Network of Partnership Schools
A New Wave of Evidence, National Center for Family & Community
Student, Family, and Community Partnerships
Communities in Schools
Center for Community School Strategies
Netter Center for Community Partnerships

Philadelphia Green Schools

Factsheet Analysis

A critical evaluation of the research on green schoolyards, environment and placed-based education, and community schools

Alisha Pegan

12/17/2015

MIT Ecological Urbanism 2015

Green Schoolyards

Improved Perceived Health¹

Research Article: Jolanda Maas et al., “Green Space, Urbanity, and Health: How Strong Is the Relation?,” *Journal of Epidemiology and Community Health* 60, no. 7 (July 1, 2006): 587–92, doi:10.1136/jech.2005.043125.
<http://jech.bmj.com/content/60/7/587.abstract>

Fact: The percentage of green space inside a one kilometer and a three kilometer radius has a significant relation to perceived general health. Elderly, youth, and secondary educated people in large cities seem to benefit more from the presence of green areas in their living environment than other groups in large cities. The research study surveyed 250,782 people & 104 general practices.

Who is responsible: The research was published in 2006 from the *Journal of Epidemiology & Community Health*. The researchers are affiliated with the Netherlands Institute for Health Services Research.

Methodology: The researchers surveyed 250,782 from 104 general practices. The researchers accounted for people of various demographic and socioeconomic characteristics, e.g. sex, age, education, employment status, health insurance, and ethnicity. The surveys asked respondents to state their perceived health from the following categories: very good/ good/ neither good nor poor/ poor/ very poor. They also derived information regarding the respondent's living environment using the National Land Cover Classification database. The living environments were categorized into agricultural green, natural green (forests, peat grasslands), and urban green. Urbanity was also measured based on the number of households per square km. Researchers analyzed the data with multilevel logistic regression analyses that set the control variables to be the sociodemographic characteristics.

Critical evaluation: The benefit of this research is its large sample size, which increases its validity. There are some things to take note. The measurement of urbanity may not be the best metric for the case of Philadelphia Green Schools. A better metric would have been impervious pavement since that is the metric the Philadelphia Water Department uses, and it best reflects the conditions in the city.

¹ Jolanda Maas et al., “Green Space, Urbanity, and Health: How Strong Is the Relation?,” *Journal of Epidemiology and Community Health* 60, no. 7 (July 1, 2006): 587–92, doi:10.1136/jech.2005.043125.

Improved Social Activity²

Research Article: William C. Sullivan, Frances E. Kuo, and Stephen F. Depooter, “The Fruit of Urban Nature Vital Neighborhood Spaces,” *Environment and Behavior* 36, no. 5 (September 1, 2004): 678–700, doi:10.1177/0193841X04264945. Accessed on <http://www.willsull.net/resources/Sullivan-papers/SullivanKuoDePooter.pdf>

Fact: People become more sociable in green spaces. Researchers found that green spaces contained on average 90% more people than barren spaces. People are also more attracted to engage in social interactions in greener spaces. On average, there were 83% more individuals involved in social activity in green spaces than in barren spaces. The research study conducted 758 observations in 59 locations in Illinois.

Who is responsible: The research was published in the *Environment & Behavior Journal* in 2004. The researchers are affiliates of the Department of Natural Resources and Environmental Sciences at the University of Illinois, Urbana-Champaign.

Methodology: Researchers observed 59 outdoor spaces. The researchers took photos of these outdoor spaces and rated the front, back, and sides of the spaces on a scale from 0 to 4. 0 = no trees or grass, 1 = a little green, 2 = somewhat green, 3 = quite green, and 4 = a space completely covered with tree canopy. Spaces with a score between 0 -1 were considered barren, and the remaining spaces were considered green.

The 59 spaces were observed four times from September to October 1995. Three of the four times were on weekdays for 3 hours in the afternoon, and one time on Sunday for 5 hours in the afternoon. Human activity was recorded as eating, doing chores, socializing, entertaining, resting, and playing, which was then categorized into social and non-social activities. The data was analyzed by an analysis of variance.

Critical Evaluation: The research implies that green spaces can create vital neighborhood spaces, which is attractive to building the case for Philadelphia Green Schools. This research is especially useful because the observations were taken in an urban region, similar to the urbanity of Philadelphia. However, the number of observations could be greater, as well as a broader range of spaces. All the spaces were in Illinois, which may be too specific.

² William C. Sullivan, Frances E. Kuo, and Stephen F. Depooter, “The Fruit of Urban Nature Vital Neighborhood Spaces,” *Environment and Behavior* 36, no. 5 (September 1, 2004): 678–700, doi:10.1177/0193841X04264945.

Leaner Bodies and Longer Sleep³

Research Article: M Söderström et al., “The Quality of the Outdoor Environment Influences Children's Health – a Cross-Sectional Study of Preschools,” *Acta Paediatrica* 102, no. 1 (January 1, 2013): 83–91, doi:10.1111/apa.12047. Accessed on: <http://onlinelibrary.wiley.com/doi/10.1111/apa.12047/pdf>

Fact: High-quality outdoor environments at child day care centers are associated with leaner bodies, longer night sleep (on average 16 mins/week more than low quality centers), better well-being and higher mid-morning energy levels. The research study metered and surveyed 253 children from 9 day care centers.

Who is responsible: The research was published from *Acta Paediatrica* in 2012. The researchers are affiliated with the University of Copenhagen, University of Lund, Karolinska Institutet in Stockholm, and Linnaeus University in Kalmar, Swedish University of Agricultural Sciences, University of Gothenburg, and Soder Hospital in Stockholm.

Methodology: The authors worked with 253 children, age 5-9, and their parents from nine different outdoor play spaces in child day care centers. The children and parents were asked about the child's body mass index, waist, night sleep, daily mood, and morning and afternoon saliva levels. The outdoor environment was rated by the Outdoor Play Environmental Categories tool. The data was analyzed by MANOVA and ANOVA.

Critical Evaluation: The researchers had a small sample size, and did not obtain data of preschools in low socio-economic areas. There are research studies in the U.S., however, that shows that children from very poor areas benefit more from high-quality environments compared to their off peers.⁴ There is also a concern of the limits to which the research can be generalized, since the children are raised in Sweden are expose to a very different culture. Overall, the procedures are diligently executed and the researchers successfully account for multiple health variables.

³ M Söderström et al., “The Quality of the Outdoor Environment Influences Children's Health – a Cross-Sectional Study of Preschools,” *Acta Paediatrica* 102, no. 1 (January 1, 2013): 83–91, doi:10.1111/apa.12047.

⁴ Wells N, Evans G. Nearby nature: a buffer of life stress among rural children. *Environ Behav* 2003; 35: 311–30.

Reduced Stress⁵

Research Article: Louise Chawla et al., “Green Schoolyards as Havens from Stress and Resources for Resilience in Childhood and Adolescence,” *Health & Place* 28 (July 2014): 1–13, doi:10.1016/j.healthplace.2014.03.001. Accessed on: <http://www.sciencedirect.com/science/article/pii/S1353829214000379>

Fact: Schoolyard natural areas enable students to escape stress, focus, build competence, and form supportive social groups. Researchers observed and surveyed 169 students between the ages of 6-18 about different green spaces. 46% of the survey responses for the high school students used key words like calm, peace, and relaxation, and 98% reported positive effects.

“I’m able to complete my homework faster, because I’m in a better place to do other things... because there’s no deadline here.” Laurel (age 17)

Who is responsible: The research was published in the *Health & Place* journal in 2014. The researchers are affiliated with University of Colorado, Mapleton Public School in Colorado and Jemicy School in Maryland.

Methodology: The researchers documented student survey responses towards green schoolyards in two elementary schools and four high schools in Maryland and Colorado. They examined three types of green schoolyards: a wooded area for recess play, an outdoor classroom, and a garden. The researchers also conducted interviews and ethnographic observations (videos, photos). The sample sizes at each site were relatively diverse; non-white participants ranged from 7.1% to 100% for each sample, and the samples from Maryland were students with language-based learning disabilities. They extracted common themes from the students' interviews and survey responses.

Critical Evaluation: The research is based on interviews and survey responses, which has a higher chance of bias than quantitative data. Additionally, assessments of the green spaces are relative, e.g. definition of positive, peace, and calm are subjective terms, which can vary in different setting. However, the research does do in-depth analysis of student responses that describes the impact green spaces have on their lives. The authors do not make implications of the impacts; rather, the analysis is purely observational. This study is significant because the research results are only from students, which is the target group for Philadelphia Green Schools and it provides an important perspective to the effects of green schoolyards.

⁵ Louise Chawla et al., “Green Schoolyards as Havens from Stress and Resources for Resilience in Childhood and Adolescence,” *Health & Place* 28 (July 2014): 1–13, doi:10.1016/j.healthplace.2014.03.001.

Case Study: Academic Achievement In Michigan⁶

Research Article: Rodney H. Matsuoka, “Student Performance and High School Landscapes: Examining the Links,” *Landscape and Urban Planning* 97, no. 4 (September 30, 2010): 273–82, doi:10.1016/j.landurbplan.2010.06.011.

Fact: A researcher found that the view of nature outside classroom and cafeteria windows is associated with more Michigan Merit Award scholarships, higher graduation rates, and more four-year college plans among students, explaining between 3.7% and 8.7% of their variance. The research studied 101 public schools in Michigan.

Who is responsible: The research was published in the *Landscape and Urban Planning* journal in 2010. The author is affiliated with the University of Michigan.

Methodology: The research sampled 101 public schools throughout the southeastern region that encompassed six counties in Michigan. The study accounted for socio-economic status, ethnicity, age of the classroom building, and size of enrollment. The author also used GIS to calculate the urban/rural context. 61.4% of the schools were located in urban areas, 25.7% in the urban fringe, and 12.9% in rural locales. Campus areas, landscape areas, athletic fields, and parking lots were also marked. The researchers assessed a student's potential to access nature by measuring windowed classrooms, window area, and school policy to eat outdoors for lunch. Student performance was measured by the Michigan Merit Award, graduation rates, and four-year college plans. The Michigan Merit Award is dependent on the Michigan Education Assessment Program test that all high school students must take.

The researcher used a regression analysis with the four control variables (socio-economic status, ethnicity, age of building, and enrollment) to compare to each student performance metric.

Critical Evaluation: The results imply that larger views of more natural landscapes from the cafeteria, outdoor eating area, and classrooms correlate with improved student performance. These findings are consistent with related past studies that found green spaces to be associated with increased productivity, enhanced satisfaction, reduced stress, and higher test scores. The researcher was precise in executing the research and data collection. The results from this research affirm all the benefits of green space, and even take a step further by arguing that the more students have the opportunity to engage with the environment, their student performance improves.

⁶ Rodney H. Matsuoka, “Student Performance and High School Landscapes: Examining the Links,” *Landscape and Urban Planning* 97, no. 4 (September 30, 2010): 273–82, doi:10.1016/j.landurbplan.2010.06.011.

Environment & Placed-Based Education

Improved Academic Achievement⁷

Research Article: Gerald A. Lieberman and Linda L. Hooy, “Closing the Achievement Gap,” *State Education and Environment Roundtable*, 1998, <http://www.seer.org/pages/GAP.html>.

Fact: The State Education and Environment Roundtable found that students who have been in placed-based educational programs academically outperform their peers in traditional programs. They compared 39 language arts, math, science, social studies, and comprehensive assessment cases. 92% of these comparisons indicated students not exposed to the program did worse.

Who is responsible: The study was prepared by the State Education and Environment Roundtable in 1998, and supported by The Pew Charitable Trust. The Roundtable is a cooperative of educational agencies from 12 states working to improve student learning by integrating the environment into the curricula and school culture.

Methodology: The survey gathered test scores, GPAs, and attitudinal data from 40 schools, and interviewed 400 students and 250 teachers and administrators. All schools were identified to have successfully implemented environment and placed-based education into the school. 15 were elementary, 13 middle, and 12 high schools. The research team completed a general site survey, assessed student learning, observed teachers and instruction, and lastly, charted effects on students' knowledge, skills, retention, and attitudes. The research is mainly qualitative data rather than quantitative.

Critical Evaluation: The study is not research-based; therefore, a direct correlation from placed-based education to academic achievement cannot be drawn. Although the evidence cannot be considered conclusive, the study reflects a large amount of knowledge gained by educators and administrators. It is pertinent to Philadelphia Green Schools because it shares accomplishment that Philadelphia can achieve.

⁷ Gerald A. Lieberman and Linda L. Hooy, “Closing the Achievement Gap,” *State Education and Environment Roundtable*, 1998, <http://www.seer.org/pages/GAP.html>.

Improved Critical Thinking⁸

Research Article: Gerald A. Lieberman and Linda L. Hooy, “Closing the Achievement Gap,” *State Education and Environment Roundtable*, 1998, <http://www.seer.org/pages/GAP.html>.

Fact: 97% of 250 educators from 40 schools across the U.S. reported students exposed to placed-based education were more proficient in solving problems and thinking strategically, and 89% reported better application of systems thinking. “Now, I find myself trying to make connections in everything I do. It is a subconscious thing that happens. After you learn this way for two years, it just comes naturally.” -Doug, junior at Lincoln High School, California.

Who is responsible: State Education and Environment Roundtable, read case above.

Methodology: Please read case above.

Critical Evaluation: The results from the study are noteworthy because critical thinking and hands-on problem solving is something lacking in the current standardized tests-based education system. Placed-based education research shows that it can enhance their critical reasoning skills when they connect to their surrounding environment. What is missed in this study is how certain hands-on projects benefit students in different ways, and to what degree.

Improved Social Behavior⁹

Research Article: Gerald A. Lieberman and Linda L. Hooy, “Closing the Achievement Gap,” *State Education and Environment Roundtable*, 1998, <http://www.seer.org/pages/GAP.html>.

Fact: Once exposed to environment and placed-based education, students begin to treat each other with more care and exhibit more self-discipline. 98% of 350 educators from 40 schools reported students having a better ability to work in group settings, 94% of the educators reported students gaining stronger communication skills, 93% reported students acting in greater civility toward others. The researchers also found students in these programs had improved behavior, attendance, and attitudes.

⁸ Ibid.

⁹ Ibid.

Who is responsible: Please read first environment and placed-based education fact analysis.

Methodology: Please read first environment and placed-based education fact analysis.

Critical Evaluation: This outcome is qualitative data since the concept of civility is subjective. Furthermore, all the responses are predominantly from educators , and do not include the students, their parents, and friends.

Encourages Students To Become Environmental Stewards¹⁰

Research Article: Nancy M. Wells and Kristi S. Lekies, "Nature and the Life Course: Pathways from Childhood Nature Experiences to Adult Environmentalism," *Children, Youth and Environments* 16, no. 1 (2006),
<http://www.outdoorfoundation.org/pdf/NatureAndTheLifeCourse.pdf>.

Fact: Children who have interacted with "wild nature" and "domesticated nature", e.g. hiking, playing, planting, are more likely to develop pro-environmental behaviors in adulthood. Researchers found that direct participation with "nature" had significant effects on their adult environmental attitudes. The study evaluated 2,000 adults age 18-90 living in urban areas from various demographic and socioeconomic backgrounds.

Who is responsible: The study was published from the *Children, Youth and Environment* journal in 2006. The two researchers are affiliated with Cornell University.

Methodology: Individuals living in the 112 most populated areas of the U.S. were randomly selected to participate in the study. The survey was administered over the telephone with 108 closed-ended questions ("yes or no" or scale). Age, gender, race, education, and income of the individual were compared to evaluate a representative sample of the population. The questions fell under three categories: participation in nature in childhood, participation in environmental education in childhood, and childhood experiences in nature with other people before the age of 11. The two dependent variables were environmental attitude and environmental behaviors. The data was applied to the structural equation model and the cross-validation test.

Critical Evaluation: The research found a correlation to exposure and environmental attitudes and behavior, but found zero correlation to environmental education. The

¹⁰ Nancy M. Wells and Kristi S. Lekies, "Nature and the Life Course: Pathways from Childhood Nature Experiences to Adult Environmentalism," *Children, Youth and Environments* 16, no. 1 (2006),
<http://www.outdoorfoundation.org/pdf/NatureAndTheLifeCourse.pdf>.

research study suggests that the environmental education programs may not have included interaction with the space. The research is based on survey responses of autobiographical reminiscence, which is debatable in terms of validity and reliability. The research would be more reliable if the researchers track people's attitudes over 20 years in order to pinpoint the experiences that constituted as turning points when they were adolescent. Furthermore, what accounts for environmental attitude and behavior is extremely variable.

Invigorates Educators

Research Article: Duffin, M., & PEER Associates (2007). *Why use place-based education?: Four answers that emerge from the findings of PEEC, the Place-based Education Evaluation Collaborative, (Self-study/detailed report version)*. Retrieved from http://www.peecworks.org/PEEC/PEEC_Reports/S01248363-01248382

Fact: Placed-based education can invigorate educators and encourage them to collaborate with their peers. An educator from Gilford Elementary School, New Hampshire, states, “Because of CO-SEED I’ll never again be the same teacher...its transformed my whole vision about how I teach my kids. It gave me the tools, it gave me the vision, it gave me the opportunity. The results are just phenomenal. Between writing and reading, the kids are hooked, and I will never teach the same again.”

Who is responsible: The research was published for the Placed-based Education Evaluation Collaborative (PEEC) in 2010 by PEER Associates. PEEC is a group of organizations that work together to identify, develop, and disseminate techniques to apply placed-based education, and contribute to the research base underlying the field of study.

Methodology: The researchers drew from 4 years of evaluation data from 75 placed-based programs. The data include 700 adult interviews, 200 student interviews, 650 educator surveys, 1,500 student surveys, and extensive on-site observations. The schools were a mix of rural, suburban, and urban. The researchers used a dose-response method to measure the effectiveness of placed-based education on educators, and whether it was well-received. They also used anecdotal responses.

Critical Evaluation: The research is incredible expansive with thousands of interviews and survey responses. It should be taken into consideration, however, that most of the results are qualitative, which is more difficult to prove causation.

Community Schools Fact Analysis

Improved Academic Achievement¹¹

Research Article: Martin J. Blank, Atelia Melaville, and Bela P. Shah, *Making the Difference: Research and Practice in Community Schools* (Coalition for Community Schools, 2003), <http://eric.ed.gov/?id=ED499103>.

Fact: The Coalition for Community Schools is an alliance of national, state, and local organizations committed to building community and educational services. The staff evaluated 20 community school initiatives across the U.S. 15/20 of the initiatives found improved grades in school courses and/or scores in proficiency testing. 8/20 showed improved attendance.

Who is responsible: The Coalition of Community Schools funded and performed this research in 2003. It is not published in a journal. The Coalition's mission is to create a united movement for community schools, so their research is biased in finding results that support their mission.

Methodology: The researchers surveyed school initiatives that met these 5 conditions: 1) The school has a core instructional program with qualified teachers, a challenging curriculum, and high standards and expectations for students, 2) students are motivated and engaged with learning, 3) the basic physical, mental and emotional needs of the young people and their families are recognized and addressed, 4) there is mutual respect and effective collaboration among parents, families and school staff, and 5) a school climate that is safe, supportive and respectful and that connects students to a broader learning community.

The researchers found 20 community school initiatives that met those conditions, each initiative serves from 100 to 2,500 schools. Hence, the sample size for students served is quite large. Some of the initiatives include Children's Aid Society in New York, Communities in Schools, Schools and of the 21st Century. The samples display various funding models from state-funded to local districts.

Critical Evaluation: Even though the research is not published in a journal, its findings are consistent with the best available research and there are abundant anecdotal corroboration among participants and observers. The reason why the Coalition could not conduct a stringent research to prove causality was that it is difficult to test outside of a controlled setting, especially for thousands of schools across the U.S. It is worth noting

¹¹ Martin J. Blank, Atelia Melaville, and Bela P. Shah, *Making the Difference: Research and Practice in Community Schools* (Coalition for Community Schools, 2003), <http://eric.ed.gov/?id=ED499103>.

that most of the school initiatives studied are also programs promoting community schools, therefore, their data could be biased as well. Overall, the research is more a summary of recognized benefits across schools in the U.S., which is useful in building the case for Philadelphia.

Higher Graduation Rates¹²

Research Article: “Our Results : Communities In Schools,” accessed December 17, 2015, <http://www.communitiesinschools.org/our-results/>.

Fact: "It's relationships, not programs, that change children." - Bill Milliken, Founder of Communities in Schools (CIS). CIS is a non-profit organization dedicated to drop-out prevention by bringing community resources into public schools. They serve 1,480,000 children, and 99% of them stay in school. 91% of their students graduate, in comparison to the national average of 81%.

Who is responsible: The data provided is from Communities in Schools, a nonprofit dedicated to community schools. Their mission is to surround students with a community of support, empowering them to stay in school and achieve in life. Similar to the Coalition for Community Schools, Communities in Schools is biased because they want to prove the benefits of their model.

Methodology: The graduation rates were evaluated by an external consulting company, ICF International that conducted a national evaluation of all the CIS schools.

Critical Evaluation: Communities in Schools has proven to be a disciplined and thorough organization that internalized data collection into its model. All affiliates are under constant monitoring, adjusting, and evaluation. It is commendable that they requested an external evaluator to mark their progress, in order to reduce bias and other mistakes.

Narrow the Achievement Gap Attributed to Poverty

Research Article: Adams, C. (2010). Improving conditions for learning in high poverty elementary schools: Evidence from the Tulsa Area Community Schools Initiative (TASCI). Norman, Oklahoma: University of Oklahoma.
http://www.tacsi.org/?page_id=3374

¹² “Our Results : Communities In Schools,” accessed December 17, 2015, <http://www.communitiesinschools.org/our-results/>.

Fact: Researchers tested 18 community schools and 18 non-community schools in Tulsa, Oklahoma. They found that fully diffusing the community school model into schools enhanced student achievement and narrowed the achievement gap attributed to poverty. The study compared low income students given reduced/free lunches in both community schools and non-community schools, and found that students in community schools tested significantly higher in comparison.

Who is responsible: The research was published in 2010, and was supported by the Oklahoma Center for Education Policy. The researcher is affiliated with the University of Oklahoma, and the report was prepared for the Tulsa Area Community Schools Initiative. It is stated in the report that the investigator does not have a financial interest in the Tulsa Area Community Schools or community schools that could bias the findings.

Methodology: The study collected data from 2,130 students and 1,095 faculty members from community schools and non-community schools. The researchers used ANOVA, the Random Intercepts Means-as-Outcomes test, and the Random Intercepts and Slopes as Outcomes test.

Critical Evaluation: The research emphasizes the importance of reform diffusion. Community schools are most effective when they are at the mentoring and sustaining stage, this means quality is the key component. High quality is reached when the whole school is committed, especially the principal, there is frequent and open communication, and time to build capacity. The research is relevant to Philadelphia Green Schools because poverty is becoming a prevalent issue. This study shows that community schools are solutions, but it does require a lot of energy and time.

Return On Investment¹³

Research Article: “Measuring Social Return on Investment for Community Schools: A Case Study | The Children’s Aid Society,” accessed December 17, 2015, <http://www.childrensaidsociety.org/publications/measuring-social-return-investment-community-schools-case-study>.

Fact: The National Center for Community Schools calculated that for every \$1.00 invested, community schools return an average of \$12.55 in social value to students, families, and the community. The cost reflects the monetary value of the resources required to operate community schools, and the outcome data is the perceived benefits translated into a monetary value.

¹³ “Measuring Social Return on Investment for Community Schools: A Case Study | The Children’s Aid Society,” accessed December 17, 2015, <http://www.childrensaidsociety.org/publications/measuring-social-return-investment-community-schools-case-study>.

Who is responsible: The study was produced by The Finance Project and Children's Aid Society in 2013. The Finance Project is an independent nonprofit research, training, and consulting firm for implementing financing and sustainable strategies. The Children's Aid Society is also an independent nonprofit organization dedicated to helping children in poverty in New York. In 1992, they launched their community school initiative in New York, and currently work to build capacity for school and community partnerships.

Methodology: The study analyzed 2 schools that serve 1,300 students, and collected cost and outcome data for 3 years. The cost data reflected the monetary value of the resources required to operate community schools, e.g. staffing, materials, administrative costs, value of the space and food provided after school hours, and volunteer time. The outcome data was the perceived benefits translated into a monetary value using financial proxies, e.g. graduating students, student participating in out-of-school activities, health. The analysts identified 40 social, educational, environmental, and health outcomes for students, families and schools benefitted by community schools. The calculations also subtracted Deadweight, meaning the percentage of benefits that would have happened regardless of the presence of a community schools. Excel was used to track and calculate the total costs and outcomes.

Critical Evaluation: The case study only reflects 2 schools, which is a small sample size. In addition, the researchers attempted to compare the return on investment to 5 other non-community schools, but found that the data was skewed because the school enrollment numbers were much bigger, and they only found data from the New York City Department of Education. Overall, it does provide a possible estimate on the social return on investment for community schools. Additionally, the National Center for Community Schools published a guide to calculate the social return on investment for other community schools. This study is relevant because it provides a baseline for the financial costs and benefits for a community school.

Case Study: Higher College Attendance at East Hartford High

Research Article: Sasha's Case Study on Community Schools

Fact: Wayfinder Schools offers a residential with a core curriculum, work programs, experimental learning, and residential living. It also provides a safe home-based for young parents age 14-20. It has a long history of healing students and supporting students' academic goals. "It's all about pulling people back into relationship, pulling dropouts and struggling youth back into school, back into community. We say to them: 'You belong in school. You belong in our society with a high school diploma...We know it doesn't work to punish, exclude, and isolate.'" -Dorothy Foote, Head of School.

Who is responsible: There was not a research study, just a case study with anecdotes.

Methodology: None

Critical Evaluation: This case is relevant because it exemplifies a system that has worked for decades. The stories are moving, and the achievements from the students and staff are worth recognition. It is a private program, which may not be the right model for Philadelphia Green Schools. Nevertheless, it employs social justice and restorative justice practices, which is missing from many other programs.