On the Urgency

of Including Positive Outcomes Of U.S. School-based Practices that Support Whole Child and Adolescent Wellbeing in National and State Education and Child Health Policies

From Practitioner, Education, Pediatric and Research Communities

September, 2026

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In 2024, the National Academies of Science, Engineering and Medicine (NASEM) produced a consensus statement (*"Launching Lifelong Health by Improving Health Care for Children, Youth, and Families" FN-1)* that summarized 20+ years of its work, with a worrisome assessment of the declining health and wellbeing of the nation's children.

> *"Despite calls to improve the child and adolescent health care system that have been made for more than 20 years, the nation today faces a crisis with serious consequences for the coming decade. Without change, the next 10 years will see larger numbers of young people enter adulthood with chronic illness and disability and worse mental health, leaving fewer adults capable of productive work."*

At WholeHealthED we shared our concern about this grim projection with senior leadership at NIH's National Center for Complementary and Integrative Health (NCCIH), which leads the Institute's development of whole person health. At a presentation at the end of 2025 for its then-acting director and and deputy director we presented much of the argument made in this statement, notably the need to expand the research on school-based practices that support children's health. In early 2026 the Acting Director presented to the independent *Coalition for Whole Person Health Research* during which he referred to their plans for 2026 to focus on the challenges to children's health set out by NASEM, and noted WholeHealthED's participation in these efforts. [FN-2]

The undersigned are innovators, developers, implementers, and research specialists of school-based practices that have been in place in thousands of US schools for many years, largely as ancillary programs. Since 2000 they have also shown increasingly beneficial outcomes for students' cognitive, physical, emotional and behavioral health, and recently suggest economic benefits. But this history has rarely been included in state and national education and child health policy initiatives intended to address the deteriorating state of children's wellbeing.

This Joint Statement expands on the preceding version released in June 2026. It is directed toward research and policy leaders and funders who support children's health and education within government (NIH, CDC, HRSA), professional organizations (the American Academy of Pediatrics, Healthy Schools Network, AASA), state education organizations, and private foundations. This version of the Statement includes an ***Appendix of brief narratives*** describing student and school experiences and research examples for each of the *whole heath learning* practices that are the basis for this Statement.

Our purpose is to present a representative portrait of these practices – including their mature research and current-day availability – to advocate for their full consideration in policy, program development and funding decisions aimed at mitigating the persistent factors still challenging children's healthy development.

The nation's schools now represent a partially engaged, not well understood, but potentially transformational national infrastructure that can be leveraged to mitigate the trends and the outcomes that the NASEM has cited .

● The practices we focus on are referred to as "*whole health learning*"
- **Garden Education • Teaching Kitchens • Mindfulness • Nature-based Learning • Physical activities**

● Plus initiatives that strengthen building and grounds, services, and the school's place in the community:
- **The School Garden • Cafeteria Scratch Cooking ("Food as Medicine") • Prescribing Nature • Green Schoolyards**

(The student-centered, collaborative, hands-on and creative qualities inherent in participation in these activities has also shown positive impact for the objectives of Social and Emotional Learning [SEL] and Mental Health Literacy, important priorities for educators, and for community development.)

Research on each activity in isolation has consistently demonstrated positive impact on students' health and wellbeing, whether implemented for therapeutic care or for learning in upstream prevention and health promoting subjects. The outcomes embodied in the work and research that define the achievements of the undersigned represent a potent, respected but barely-tapped set of effective measures which among other things have been shown to: 1) strengthen students' academic achievement and their personal, social, emotional, and behavioral capacity, and 2) expand learning in subjects that engage multiple aptitudes and offer additional paths beyond high school.

Despite the longstanding evidence and the growing availability of these practices across the US, these outcomes are not fully nor coherently included in major prescriptions for mitigating the serious decline in American children's health. Post-COVID anxieties persist and are compounded by the pervasive presence of technology and AI, making children more susceptible to anxiety and uncertainty about their current school experience and their future prospects. Mental duress continues at high levels despite important population-based improvements.

These represent readily definable research gaps that we propose need immediate attention through research and associated funding if we are to confront – ***at scale*** – the urgency expressed in the National Academies' unequivocal assessment, and to support educator and family commitment to students' wellbeing. A rigorous and comprehensive research program will also build on observed outcomes of these practices related to brain health and function, cognition, nutrition, relational health, behavior, and the shaping of Positive Childhood Experiences (PCEs) as expressed during school years. It will also define the synergistic effects of combining multiple practices in a single school, across a district's schools, and sustaining the learning across grades, in real time.

The American public school system has been in a period of thoroughgoing re-examination since well before COVID. It has been a time of constant societal change. Our strong belief is that irrespective of the educational modifications to come, schools and the public can commit to strengthening student wellbeing and health as a matter of first duty.

The successful nationwide school implementations of whole health learning practices and related improvements on which this statement is based have in effect set the stage for schools, families, and districts to confidently embrace this commitment to student wellbeing.

The collaborative, hands-on, creative nature of these historically “nice-to-have” activities present three primary positive outcomes:

1. Schools’ ongoing efforts to counteract the persistent ill-effects of mental duress, stress, and adverse experiences are greatly strengthened, and may reduce the need for professional medical intervention;

2. Students develop skills and knowledge in subjects of lifelong consequence and in ways that support a sense of belonging and being (and feeling) successful at school;

3. Over time, and when delivered with intention, this learning helps students develop attitudes and mindsets that support their own self care (agency), just as instruction facilitates learned competencies in math and language arts.

We encourage leaders of national and state K-12 education and pediatric healthcare policy and funding bodies to ensure that this extensive body of research and observational knowledge becomes routinely included in policy and funding decisions, in particular to build on and strengthen the established and substantial research base. This will also help sustain support for proven programs (like USDA’s *Farm-to-School* and the CDC’s *Whole School, Whole Community, Whole Child (WSCC)* program.

Finally, it should also be noted that multiple whole health school-based practices align with the interconnected, patient-empowered, self-care vision embedded within healthcare’s transformational movement toward ***Whole Person Health***. The NIH – through the deep and comprehensive foundational work of NCCIH since before COVID – has identified Whole Person Health as key to addressing chronic illness and to improving the health of the Nation, notably including the wellbeing of the Whole Child. [FN-3]

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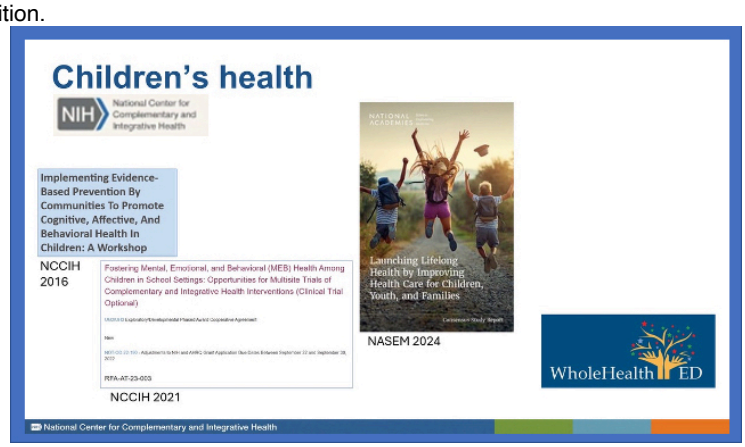
FN-1: National Academies of Sciences, Engineering, and Medicine. 2024. “Launching Lifelong Health by Improving Health Care for Children, Youth, and Families.” Washington, DC: The National Academies Press. https://doi.org/10.17226/27835.

FN-2: At the January 2026 NCCIH presentation to the Coalition for Whole Person Health Research, Acting Director David Shurtleff included this slide when discussing plans to address children’s health in 2026. WholeHealthED serves on the Steering Committee for the Coalition.



FN-3: “Make Our Children Healthy Again: Assessment,” from the MAHA Report, The White House https://www.whitehouse.gov/wp-content/uploads/2025/05/WH-The-MAHA-Report-Assessment.pdf

Signatories as of June 23, 2026

Stacy Alfonso PhD
Natural Start Alliance (NAAEE)
U of Washington Associate Faculty

Laura Bakosh PhD
Co-Founder and CEO
Inner Explorer

Christina Bethell, PhD, MBA, MPH
Professor, Johns Hopkins Bloomberg School of Public Health and JHU School of Medicine
Director, Child and Adolescent Health Measurement Initiative (CAHMI)

Cheryl Charles, PhD
International Co-Chair #NatureForAll
International Union for Conservation of Nature
Commission on Education and Communication

Amrita Chaturvedi
Director
Consortium for Human Flourishing
St. Louis University

Louise Chawla
Professor Emerita
Program in Environmental Design
University of Colorado

Whitney Cohen
Executive Director
Life Lab

Priya Cook
Director
Green Schoolyards & Communities
Children & Nature Network

Diana Fishbein, PhD, Nova Scholar
Senior Scientist,FPG Child Development Institute
University of North Carolina-Chapel Hill
President, National Prevention Science Coalition to Improve Lives

Ping Ho
Founder
Arts & Healing, UCLA

Cathy Jordan PhD
Professor of Pediatrics
University of Minnesota Medical School
Principal Scientist, Masonic Institute for the Developing Brain
Consulting Research Director, Children & Nature Network

Pamela Koch EdD, RDN
Mary Swartz Rose Associate Professor of Nutrition & Education
Teachers College Columbia University

Mary Jo Kreitzer PhD, RN, FAAN
Director
Earl E Bakken Center for Spirituality & Healing
University of Minnesota

Michael S. Kuczala
President
Kuczala Consulting Inc

Dr. Dhaval Patel
Co-Founder/Managing Director
Uncommon Market

Sean Slade
Chief of Innovation and Impact
EDLINK

David Sobel
Professor Emeritus
Education Department
Antioch University New England

Taylor Walsh
Founder, Executive Director
Center for Whole Health Learning in K-12

Dilafruz Williams, PhD
Consultant & Professor Emerita,
Leadership for Sustainability Education
College of Education
Portland State University

Building on Deep Experience, Collaborations and Research Across the U.S. K-12 Infrastructure

This Joint Statement is an introduction to the proposition that schools and the tradition of learning life's essential skills should now encompass wellbeing, vitality, and self care as surely as they do math and language arts: as foundational competencies.

We are grateful to colleagues who have joined together to make the case that a truly holistic view of all proven, effective measures and their outcomes that have come into the purview of schools in the last 20+ years -- from gardens and mindfulness, to green schoolyards, tree canopies, and scratch cooking, to the importance of relational health -- need much greater attention and inclusion in the thinking driving the many modifications being considered for American primary and secondary education.

If you are engaged in this work ----> ***we welcome your support, your signatures and participation in further activities!***

The Appendix that follows describes: a) student and school experiences and outcomes, and b) the research that has supported the adoption of practices in recent years. The portrait they paint illustrates the well-proven options educators and families now have available from a broad foundation of school-based measures that empower push back on persistent adversities, mental duress, and social determinants that have compromised children's performance and prospects so badly in recent years; while educating children with skills and knowledge that will apply throughout their lives.

We especially want to thank Cathy Jordan, Professor of Pediatrics at the University of Minnesota Medical School and Consulting Research Director, Children & Nature Network, and Pam Koch, Mary Swartz Rose Associate Professor of Nutrition Education at Teachers College, Columbia University, whose research encompasses the inventive nutrition and teaching kitchen programs at Wellness in the Schools, for their assistance in preparing the Statement. Both organizations have supported WholeHealthED since our inaugural symposium at Georgetown convened a not-dissimilar group of deeply knowledgeable specialists, physicians, teachers, and researchers all of whom were dedicated to improving the lives of children, but who at that point had never been in the same room together.

An Alliance for Whole Child and Adolescent Wellbeing

To sustain this effort and to ensure that the importance of student wellbeing during school years continues to be acknowledged, we plan to consider establishing an *Alliance for Whole Child and Adolescent Wellbeing*, In the fall of 2026 we'll host a conversation to explore this idea, ask who else should be involved, and set out next steps. We look forward to growing the Whole Child Wellbeing concept through the 2026-2027 school year. Thanks to everyone who has supported and contributed to this effort.

Organized by
WholeHealthED
The Center for Whole Health Learning in K-12
Taylor Walsh
Founder and Director
taylorwalshdc@gmail.com • 240.429.7337

www.wholehealthed.org

The Multi-layered K-12 Landscape of Wellbeing and Vitality Infused Learning

STORIES & RESEARCH NOTES

School Gardens

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Teaching Kitchen & Nutrition

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Mindfulness

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Physical Fitness & Physical Activity

•

Nature-based Learning

•

Green Schoolyards

School Gardens

School Gardens are often said to transform outdoor spaces into "living classrooms" that boost student collaboration: by working together to design, plant, harvest, and maintain the space, with learning often integrating math, science and artistic expression. Students develop teamwork and learn to communicate during the course of tasks and problem solving. This fosters an inclusive, respectful environment. Research at the NIH and the CDC has shown that this time connecting students around a defined task, with the physical activity garden work often entails, leads to shared understanding of the work and its outcomes. The measured lowering of cortisol levels can improve mood, self-esteem, relational strength; reducing stress, anxiety, and mental duress to provide a sense of student accomplishment and purpose -- as individuals and as task mates -- that many garden and K-12 practitioners have observed.

Over time and across appropriately designed grade clusters, the repeated variations of the garden experience, aligned with nutrition and food skills, academics, and family engagement can strengthen relationships, health outcomes, social comity, and personal resiliency sought in many school-based programs, and act as a living portal to climate education

SCHOOLYARD STORIES

Thanks to the ***Wisconsin School Garden Network*** in Madison for insights from educators and practitioners providing and measuring the impact of sustained garden experiences:

> "At **Frances Starms Early Childhood**, we plant three raised garden beds every spring. The children vote on what we plant based on books we read in our curriculum. *Sophie Squash* has been a huge hit with our K4 children. We harvest the squash and then act out the story. Multiple squash are out in the reading station for children to "read to."
>
> ***— Lisa Misky***

> "The high school FFA grew the majority of vegetable plants planted in our three elementary school gardens. When planting day came around this spring the high school students lent a hand to the elementary school students in planting the garden beds."
>
> ***— Heather Reitmeyer, Unified School District of De Pere***

> "The garden encourages families to think about food together. Parents see their kids wanting to try new vegetables. Parents learn about new foods side-by-side with their kids. Families develop a sense that food is communal. By choosing, prepping, and cooking vegetables together… meals become less top-down where parents make dinner and kids eat what they're given."
>
> ***— Jenn Sattler, Youth Program Manager, Growing Oshkosh***

> "We did a salad dressing and we used proportions of olive oil and lemon juice instead of measurements. One parent was so amazed that their kid came home and made salad dressing by themselves, without needing to use a recipe, just the proportions that we taught."
>
> ***— Jamie O'Neill, Executive Director, Grow LaCrosse***

"We had a salsa-making night during our school open house. Dozens of families came to harvest tomatoes, tour the garden, and even make salsa on the bike blender that we borrowed from Community Groundworks. It was a lot of fun and we hope to continue it as an annual tradition!"

— Courtney Woods, Lowell Elementary School

"Music is such a natural way for people of all ages to engage in the garden. Our smallest visitors love to bang (often loudly!) on the colorful pots and pans, while older children create complex rhythms together."

— Ginny Hughes, Education Director, Community GroundWorks

WISCONSIN SCHOOL GARDEN NETWORK

STORY BITES

https://wischoolgardens.org/story-bites-3

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Since the year 2000, the growth of school gardens across the nation's school and community infrastructure has been prodigious, as this **National School Garden Map** from EcoRise and GENTHRIVE illustrates.

Built with layers of social, economic, and climate data, the ever-changing landing page can be found here: https://bit.ly/sg-map

School Gardens

RESEARCH NOTE

The School Garden: A Social and Emotional Place

Pollin, S., & Retzlaff-Fürst, C. (2021). The school garden: A social and emotional place.
https://rootinnature.ca/school-course-partnerships/

"This study investigates the effect of biology lessons conducted in a school garden compared to a traditional classroom setting on the **social behavior and emotions of sixth-grade** pupils. The researchers aimed to determine if the school garden environment could serve as a beneficial space for social learning. The study employed a quasi-experimental design using pre-test and post-test measurements, though the comparison between the school garden and classroom was treated as a comparison of teaching locations rather than a strict control group. Sixty-grade pupils, aged 11-12 years, from a cooperating school participated, with 31 girls and 22 boys included in the analysis presented. The l**essons, focusing on "Plants and Soil,"** alternated weekly between the school garden and the classroom over a 10-week period. The school garden lessons were specifically designed to align with the basic needs for competence, autonomy, and relatedness as described by the **Self Determination Theory**. Data was collected through a self-report ***"emotion diary"*** completed by pupils after each lesson and through standardized observations conducted by trained observers focused on communication and cooperation.

"The findings indicated that **pupils exhibited more socially competent behavior in the school garden lessons compared to classroom lessons.** This was particularly evident in the categories of communication and cooperation. Furthermore, the school garden setting was associated with significantly more positive emotions and fewer negative emotions among the pupils. Positive emotions like happiness, pride, and surprise/**wonder** were perceived more often in the garden lessons, while negative emotions such as disgust and fear/anxiety were reported more often after classroom teaching. The reasons pupils gave for their emotions in the garden were frequently linked to experiences with gardening, plants, and animals. The study concludes:

> ***"School garden lessons, particularly when designed to satisfy basic psychological needs, appear to create favorable conditions for promoting social learning and positive emotional experiences."***

From: Frontiers in. Psychology., 21 April 2021
Sec. Environmental Psychology
Volume 12 - 2021 | https://doi.org/10.3389/fpsyg.2021.567720

Root in Nature emphasizes *therapeutic horticulture,* well known among practitioners of "healing gardens," and as part of the *clinical prescribing of time in nature*, including its growth in pediatric care.

Courtesy of Alexis Ashworth

Founder and CEO, Root in Nature

Gardens - Teaching Kitchen - Nutrition

RESEARCH NOTE

School Garden and Nutrition Education Associated with Increased Consumption of School Meals in Pilot Study

Katie Kerstetter, PhD1; Katherine J. Roberts, EdD, MS, MPH2; Raynika Trent, MEd, MA2; Pamela A. Koch, EdD, RD2; Caroline Casey, MPH1; Mia De Jesus-Martin, MSW1; Abigail Trinidad, BS1; Jennifer Mampara, MS3; Beth Bacon, MA3

 https://doi.org/10.1016/j.jneb.2026.01.018

Accepted January 30, 2026.

A Summary

ABSTRACT

Objective: To pilot test whether a multicomponent school garden and nutrition education intervention was associated with increased school lunch consumption.

Methods: Students in grades 1–5 from matched pairs of public schools (1 high- and 1 low-poverty intervention school, each paired with a comparison school) were observed using the System of Observational Cafeteria Assessment of Foods Eaten. Consumption was defined as the percentage of each entree and side salad eaten. Mixed-effects models analyzed data collected through direct observation over 13 days across 28 lunch periods.

Results: Students in intervention schools consumed 47.5% of the entree and 44.1% of the entree plus side salad, compared with 34.5% and 31.2% in comparison schools. Adjusted analyses showed students consumed 0.13 (P = 0.006) and 0.11 (P = 0.01) more portion units, with no significant treatment-by-pair interactions.

Conclusions and Implications: The intervention was associated with greater meal consumption, supporting the need for a cluster-randomized trial.

This research builds on the growing presence of the ***USDA Farm-to-School*** program across the United States: an adjunct to the 4.8 billion lunches USDA's School Lunch Program delivered in 2024. The

report notes that a 2023 Farm to School census showed that 74% of the nation's local school food authorities reported participating in farm-to-school programs: an increase of 9 percentage points from the 2019 Census..

Increasingly, schools are also hosting farm-to-school programs that connect students with fresh food and hands-on learning experiences that aim to increase students' knowledge and willingness to eat fresh produce. This may involve:

- Procuring food from local farms for school meals or taste tests,
- Implementing educational activities that teach students about the importance of fresh food and where it comes from, and
- Implementing school gardening activities to provide hands-on experience in growing and harvesting fresh food.

These programs operate on the logic that providing hands-on nutrition and gardening activities will increase students' knowledge of and positive attitudes toward fresh fruits and vegetables, and that gains in students' knowledge and positive attitudes will translate into increased consumption of fresh, healthy food.

As the number of farm-to-school programs has increased, so has research to examine their influence on students' consumption. A review of 14 articles that examined the relationship between gardening interventions and fruit and vegetable consumption determined that 10 of these studies found statistically significant increases after implementation of a gardening program.

THE STUDY

This study examines the implementation of a collaboration between Wellness in the Schools (WITS) and the FRESHFARM *FoodPrints* program. WITS is a national nonprofit that, through its *Cook for Kids* program, partners with school districts to provide nutrition education and assistance with preparing *scratch-cooked meals* as part of school lunch menus. FRESHFARM, a nonprofit based in the Washington DC region, operates a network of farmers' markets and farm stands and offers garden and nutrition education in schools through the *FoodPrints* program.

FoodPrints was developed using Social Cognitive Theory. To address the personal factors that enhance motivation for behavior change, the curriculum provides experiences for students to learn the benefits of eating the plant-based *FoodPrints* recipes through hands-on gardening and cooking. Social norms are increased through students eating what they cook together. The behavioral factors that facilitate the ability for behavior change are addressed through:

- learning food and nutrition knowledge
- cooking
- gardening skills

This study extends prior studies by examining whether students' previous exposure to preparing a scratch-cooked meal in their nutrition education class is associated with consuming a greater portion of

the same meal when it is served in the school cafeteria, compared with students with no previous exposure to the scratch-cooked meal in the classroom. It contributes to existing literature by examining whether the intervention is associated with increased consumption of school meals regardless of school poverty level, by conducting analyses of 2 matched pairs of schools, 1 high poverty pair and 1 low-poverty pair.

This study employed direct observation of school meal consumption on *FoodPrints* Days to assess whether this intervention was associated with increased consumption of *FoodPrints*WITS meals in the cafeteria. Results demonstrate that the *FoodPrints*WITS intervention is associated with increased consumption of the entree and side salad portion of *FoodPrints* meals served in the cafeteria. Students participating in *FoodPrints*WITS were significantly more likely to consume a larger share of the portion size of *FoodPrints* meals during school lunch, compared with students in schools without this programming.

This pattern held across both matched school pairs, regardless of school poverty level, supporting the consistency of the intervention's effect in diverse school contexts.

Grade level was not a significant predictor in any model, suggesting the intervention's effect was consistent across elementary grades. Although the post-only design used for this study does not allow assessment of whether the *FoodPrints*WITS intervention caused these changes, the results across multiple analytic approaches strengthen confidence in its effectiveness. The consistency of results across high- and low-poverty schools further supports the generalizability of the intervention. This multilevel intervention, based on the personal, behavioral, and environmental factors of Social Cognitive Theory, also seemed to be equally effective in both high- and low-poverty schools.

These findings align with previous research that suggests that food preparation and cooking experiences are critical components of efforts to increase the consumption of targeted vegetables in school meals. In one such study,14 US elementary school students who participated in *Cookshops*, where they cooked and tasted vegetables and whole grains, ate a larger portion of targeted foods in school lunch than students who had received no food education and students who had received food education without the experiential component.

The authors note that although the study was conducted before the coronavirus pandemic set in, these findings remain relevant to the current school food environment. Students are once again eating together in large groups as they were before the pandemic.

IMPLICATIONS FOR RESEARCH, PRACTICE, AND POLICY

Future studies using a pre-post design with matched comparison groups are needed to assess changes in students' school meal consumption from baseline to the end of year 1 of program implementation.

Other avenues for research:

- A larger study with more schools would provide greater statistical power to test school-level

differences and further examine implementation variability across diverse educational settings.

- Incorporating a matched-control group design into the pre-post study would allow for more confidence in connecting changes in consumption to the *FoodPrints*WITS intervention.

- A multiyear design, assessing changes in students' school food consumption over multiple years to see whether any changes in behavior can be sustained during the length of the intervention.

- Subsequent studies can incorporate individual-level demographic measures to more accurately determine the effects of the intervention on school meal consumption.

- Continue to assess the value of linking what students are growing, cooking, studying, and eating in their school gardens and teaching kitchens and the scratch-cooked meals served in their cafeterias.

Address for correspondence: Katie Kerstetter, PhD, Center for Social Science Research, George Mason University, 4400 University Dr 1H5, Fairfax, VA 22030; Email: katie@researchpartnersllc.com

Courtesy of Pam Koch PhD

Mary Swartz Rose Associate Professor of Nutrition Education
at Teachers College, Columbia University

Mindfulness

In 2025 pediatrician Eric Tyler MD of Alexander City, AL, a member of the American Academy of Pediatrics Alabama Chapter, guided the staff and students at Stevens Elementary (now Intermediate) School in the implementation of the mindfulness program offered by the firm Inner Explorer. The program is designed as a simple cost effective way to bring mindfulness into schools: a daily 10-minute audio lesson experienced simultaneously by the whole school. Stevens' faculty noted the behavioral changes students displayed during the year. Among their comments:

- "I've noticed their ability to monitor themselves."
- "Their self-awareness has really increased."
- "They're taking these tools their learning...not only in school but in their day-to-day lives."
- "We're hitting early some of the things that most adults are facing right now; something they can carry into adulthood."

For principal Lekisha Richardson, the impact was tangible: "After only seven months, we had 50% less office referrals" compared to the previous year. The only change was adding the mindfulness program. This change in the tenor of the school can be heard in the reflections of the students themselves when asked how they liked the program. Consistently, it was the calming effect.

- "calms me down"
- "gets my mind straight"
- "I don't stress out"
- "makes me happy, peaceful... joyful"

Hear directly from Stevens' faculty and students on this four-minute YouTube video:
https://youtu.be/FMpTpl96UKU?si=u-4QeB3z5Fqkg0F-

An example of longer duration with the daily audio-based practice took place at Sullivan Elementary school in Tampa, FL. Prior adopting the program, Sullivan ranked at the bottom of the school district in almost every academic measure. Principal David McMeen implemented the program in 2017. All classrooms and students began participating in the audio recording every school day. As a result, Sullivan's progress advanced steadily every year since its initiation, including very noticeably through the rise of COVID. So that in year five students exceeded the national averages for Math by 36% and for English by 50%. Sullivan has settled into the district's top echelon. And as a result of the school's mindfulness experience, disciplinary problems dropped "to near zero."

In 2024 National Public Radio featured the Sullivan experience. The NPR reporter observed a somewhat surprising moment: "They high-fived and applauded each other when their classmates got things right." The full story is here: https://www.npr.org/sections/health-shots/2024/01/26/1227056527/to-help-these-school-kids-deal-with-trauma-mindfulness-lessons-over-the-loudspea

Courtesy of Inner Explorer
https://www.innerexplorer.com

Mindfulness

RESEARCH NOTE

"School-based mindfulness education and children's emotion regulation: the mediating role of executive function"

Xuhong Wang 1* and Xuefei Dong 2
1Future Industries College, Xi'an Peihua University, Xi'an, Shaanxi, China, 2International Education College, Xi'an Peihua University, Xi'an, Shaanxi, China

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Background

In recent years, studies on mindfulness interventions in children's emotion regulation have made significant progress. Mindfulness-Based School Interventions (MBSIs) have been associated with small-to-moderate improvements in children's socio-emotional outcomes, including aspects of emotion regulation, although effects vary by program format and study design (Zenner et al., 2014; Phan et al., 2022).

Despite substantial empirical evidence linking mindfulness interventions with improved emotional regulation in children, the specific pathways through which executive function operates in this relationship remain insufficiently examined. Particularly among typically developing school-aged children, few studies have systematically tested the mediating roles of the three core executive components—*inhibitory control*, *working memory*, and *cognitive flexibility*—within a unified model.

This study systematically investigated the promotive effects of mindfulness-based education on children's emotion regulation, with a particular focus on elucidating the multiple mediation mechanisms of executive function.

> **A randomized controlled trial**: 150 children aged 8–10 years were assigned to either a mindfulness education group or a waitlist control group. The 8-week program assessed emotion regulation (ERC, Emotion Management Scale, Disappointing Gift Task) and executive function (Hearts and Flowers, DigiSpan, WCST).
>
> **Results**: The mindfulness group showed significantly greater improvements in emotion regulation strategies ($F = 15.37$, $p < 0.001$) and all executive function components. Mediation

analysis revealed significant indirect effects through inhibitory control, working memory, and cognitive flexibility, accounting for 53.8% of the total effect.

Conclusion: Mindfulness education enhances children's emotion regulation, both directly and through improvements in executive function, supporting its implementation in school mental health programs.

Compared with students in the control group, children in the mindfulness group showed greater gains in the use of emotion regulation strategies and teacher-rated externalizing behaviors at school, and exhibited different emotional-behavioral responses during the laboratory assessment. These results ... confirm that mindfulness training helps children be more non-judgmentally aware of their present-moment experiences, acknowledge the fluctuation of emotions without being impelled by them in the moment, and hence achieve more efficient cognitive and behavioral emotion management (Spencer et al., 2023; Pickerell et al., 2023; Rowland et al., 2023; Zenner et al., 2014; Phan et al., 2022; Shapiro et al., 2006).

Mindfulness training that asks children to attend to the breath trains inhibitory control; gently redirects attention when the mind wanders; strengthens working memory and cognitive flexibility; enabling children to adopt an open attitude toward the shift in internal experiences that cultivates cognitive flexibility in the moment (Chen et al., 2022; Zebdi et al., 2021). In other words, the above three basic components of executive function repeatedly activate and strengthen neural circuits.

The mediation analysis demonstrates that executive function serves as a significant mediator in the relationship between mindfulness education and children's emotion regulation (Groves et al., 2021; Pozo-Rodríguez et al., 2026). Rather than operating solely through direct pathways, mindfulness training substantially enhances emotion regulation by improving those three core executive function components...creating an identified *"mindfulness → executive function → emotion regulation"* pathway which reveals specific cognitive mechanisms through which mindfulness exerts its effects.

The complete pathway from intervention to mechanism to outcome provides a new theoretical framework for understanding and promoting children's psychological health.

Improved working memory allows children to simultaneously maintain emotional experiences and long-term goals, such as maintaining social harmony, thereby facilitating more adaptive regulatory strategies (Gouveia et al., 2019; Children and Adolescent Mental Health Research Group, Institut de Recerca Sant Joan de Déu, Barcelona, Spain, 2019). Increased cognitive flexibility helps children disengage from negative emotional contexts and flexibly shift perspectives, reducing rigid, maladaptive response patterns.

This study advances self-regulation research by connecting macro-level behavioral outcomes with underlying cognitive mechanisms—executive function—and linking these mechanisms to an evidence-based educational intervention. The complete pathway from intervention to mechanism to outcome provides a new theoretical framework for understanding and promoting children's psychological health.

Cross-cultural considerations

Although culture can shape how mindfulness is perceived and accepted, core components of mindfulness (including present-moment-attention regulation and a non-judgmental, accepting stance toward internal experiences: Shapiro et al., 2006) are not dependent on culture-specific beliefs. In the present setting, the brief, skills-focused classroom format and its alignment with daily school routines may help explain the program's feasibility and its benefits for children's executive function and emotion regulation, and why mindfulness-based education can be successful in this context despite potential cultural differences in attitudes toward mindfulness.

Future Directions

The report notes several study limitations and key future directions.

- The sample from specific regional community schools limits generalizability,
- The study relied primarily on parent and teacher reports for emotional regulation assessment. Future research would benefit from incorporating physiological measures such as heart rate variability and EEG to establish a more comprehensive assessment framework.
- The focus on short-term, post-intervention effects leaves unanswered questions about the long-term sustainability of mindfulness and associated neural impacts.

Key future research directions:

- Longitudinal follow-up studies are essential to examine the sustained durability of mindfulness effects.
- Neuro-imaging approaches, notably (fMRI), could elucidate the neural substrates through which mindfulness influences brain development in children
- Practical strategies for integrating mindfulness education into standard school curricula
- Personalized interventions tailored to individual characteristics such as temperament and baseline executive function levels.

This randomized controlled trial demonstrates that a structured mindfulness education program effectively enhances emotion regulation for school-aged children and that executive function serves as a central mechanism linking mindfulness training to improvements operating through its three parallel pathways: inhibitory control, working memory, and cognitive flexibility. These findings elucidate the underlying cognitive-neural pathway of mindfulness efficacy, showing that systematic training and reinforcement of core cognitive functions facilitate the development of children's emotion self-regulation, and offer a scientific basis for the implementation of mindfulness education in school settings to promote children's psychological health and socio-emotional development.

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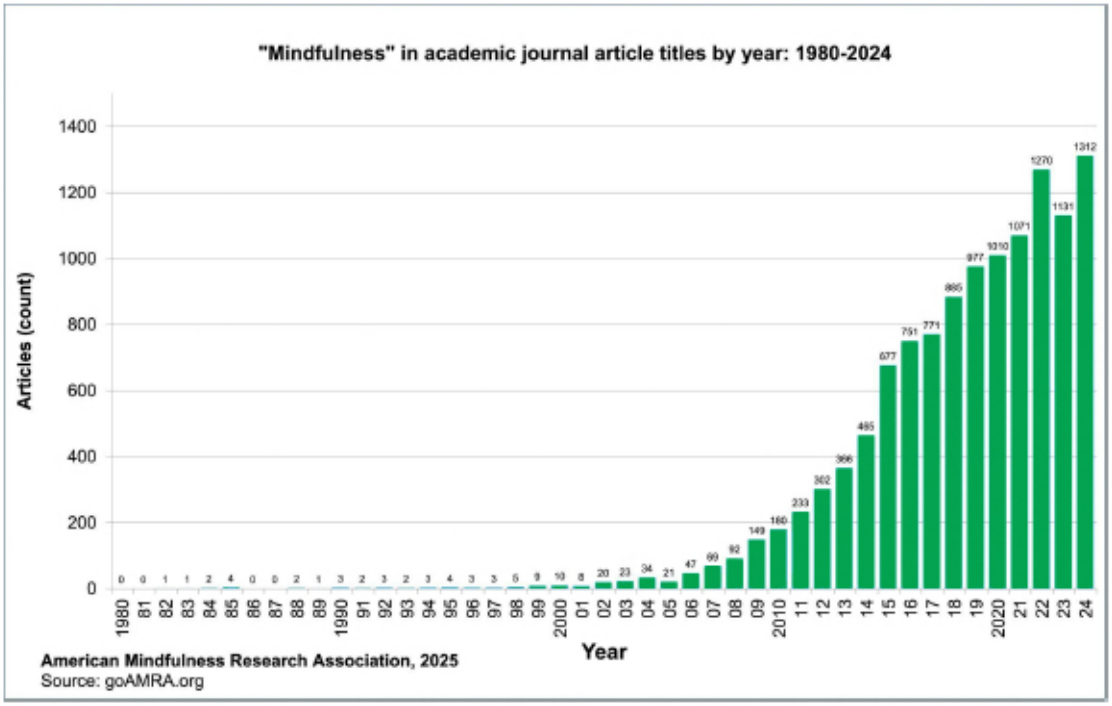
MINDFUL AWARENESS RESEARCH ABSTRACTS 2024

The practices associated with mindful awareness have been scientifically studied for over 40 years and include 10,600 published scientific journal articles.

An example of growth in the mindful awareness research literature from 1980 - 2024



Physical Fitness & Physical Activity

RESEARCH NOTE

In Chapter 1 of *SPARK: The Revolutionary New Science of Exercise and the Brain* (2008), author John Ratey -- a Harvard Associate Clinical Professor of Psychiatry -- focuses on the groundbreaking work that was taking place at Naperville Central High School, in Naperville, Illinois. At NCHS, the director of physical educators and his team transformed PE from a traditional sports-and-games model into a fitness-based program designed to enhance both physical health and academic performance. **By emphasizing cardiovascular fitness, individualized goal setting, heart-rate monitoring, and regular vigorous exercise, teachers helped students improve not only their physical conditioning but also their readiness to learn**.

The chapter highlights how students participating in ***Zero Hour PE*** and ***Learning Readiness PE*** showed gains in *attention*, *mood*, *stress management*, and *academic achievement*, supporting the idea that **exercise prepares the brain for learning** by increasing blood flow, stimulating the release of neurochemicals that **support cognition**, and creating optimal conditions for memory and executive functioning.

The academic results speak for themselves: **First in the world in science** and **Sixth in the world in math** on the *Trends in International Mathematics and Science Study (TIMSS)*. In addition, the rates of obesity and overweight were far below the national average. Ratey presents the Naperville educators as pioneers who demonstrated that physical education can be a powerful academic intervention rather than merely a break from classroom learning.

By 2010, the U.S. Department of Health and Human Services Centers for Disease Control released their report that solidified the value of physical activity in America's schools and classrooms. The ***Association Between School-Based Physical Activity, Including Physical Education, and Academic Performance*** was critical to "synthesize the scientific literature that has examined the association between school-based physical activity, including physical education, and academic performance, including **indicators of cognitive skills and attitudes, academic behaviors, and academic achievement**".

References

SPARK and Naperville

Ratey, J. (2008). SPARK: The revolutionary new science of exercise and the brain. New York, NY: Little, Brown and Company.

CDC's 2010 Summary Report

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Adolescent and School Health. (2010, July). The association between school-based physical activity, including physical education, and academic performance

Additional Studies

Research that has influenced physical activity and physical fitness in schools and classrooms:

- University of Kansas showed that physically active lessons of moderate intensity improved overall performance on a standardized test (Donnelly & Lambourne, 2011)

- University of Mississippi showed a statistically significant positive correlation between physical fitness and standardized test scores in language arts and math and a statistically significant **negative relationship with absences** (Blom, Alvarez, Zhang, & Kolbo, 2011)

- **Classroom-based physical activity** has an estimated effect size of an impressive 1.51 in the United States (Erwin et al., 2012)

- A review of research published in the British Medical Journal concluded that even short bursts of exercise – 10 to 40 minutes – lead to **an immediate boost in concentration** (Konigs, Oosterlaan, Scherder, & Verbeurgh, 2014)

- A study of 153 Finnish children between the ages of 6 and 8 showed that the boys who spent the most time sitting and the least amount of time moving had poorer reading skills than the rest of the group, which was also found in the math skills of the youngest boys (Brage, et al., 2016)

- A multi-level analysis of physical activity interventions during childhood concluded that **school-based physical activity can improve executive functions** while also contributing to academic outcomes (Vasilopoulos et al., 2023)

- Across the literature, the authors found evidence suggesting that physical activity is positively associated with academic achievement, particularly when activities are implemented regularly and intentionally within the school setting. One of the most important conclusions was that increasing physical activity during the school day does not appear to harm academic outcomes and may improve them, **particularly through effects on attention, behavior, and cognitive functioning** (James et al., 2023)

References (for the bullet points above)

Blom, L. C., Alvarez, J., Zhang, L., & Kolbo, J. (2011). Associations between health-related physical fitness, academic achievement, and selected academic behaviors of elementary and middle school students in the state of Mississippi. Journal of Research in Health, Physical Education, Recreation, Sport & Dance, 6, 13–19.

Donnelly, J. E., & Lambourne, K. (2011). Classroom-based physical activity, cognition, and academic achievement. Preventive Medicine, 52(Suppl. 1), S36–S42. https://doi.org/10.1016/j.ypmed.2011.01.021

Erwin, H., Fedewa, A., Beighle, A., & Ahn, S. (2012). A quantitative review of physical activity, health, and learning outcomes associated with classroom-based physical activity interventions. Journal of Applied School Psychology, 28(1), 14–36. https://doi.org/10.1080/15377903.2012.643755

Haapala, E. A., Väistö, J., Lintu, N., Westgate, K., Ekelund, U., Poikkeus, A.-M., Brage, S., & Lakka, T. A. (2017). Physical activity and sedentary time in relation to academic achievement in children. Journal of Science and Medicine in Sport, 20(6), 583–589. https://doi.org/10.1016/j.jsams.2016.11.003

James, J., Pringle, A., Mourton, S., & Roscoe, C. M. P. (2023). The Effects of Physical Activity on Academic Performance in School-Aged Children: A Systematic Review. Children, 10(6), 1019. https://doi.org/10.3390/children10061019

Vasilopoulos, F., Jeffrey, H., Wu, Y., et al. (2023). Multi-Level Meta-Analysis of Physical Activity Interventions During Childhood: Effects of Physical Activity on Cognition and Academic Achievement. Educational Psychology Review, 35, 59. https://doi.org/10.1007/s10648-023-09760-2

Verburgh, L., Königs, M., Scherder, E. J. A., & Oosterlaan, J. (2014). Physical exercise and executive functions in preadolescent children, adolescents and young adults: A meta-analysis. British Journal of Sports Medicine, 48(12), 973–979. https://doi.org/10.1136/bjsports-2012-091441

Thanks to Michael S. Kuczala
President, Kuczala Consulting Inc.
www.mikekuczala.com

Mike Kuczala is well known throughout the world for his work in creating kinesthetic classrooms – places where movement, physical literacy, and embodied cognition meet motivation, differentiation, academic achievement, and joy.

Nature-Based Learning (NBL)

Nature-Based Learning (NBL) shifts the traditional educational model by moving lessons outdoors for any or all curricular subjects. Rather than teaching *about* nature per se, NBL uses the natural environment as a meaningful context for learning, turning natural objects and out-door phenomena into instructional tools. This approach represents the "how" rather than the "what" of formal schooling, offering a powerful pedagogical approach appropriate for pre-K through high school.

Accumulating evidence shows that NBL frequently outperforms traditional classroom instruction (Kuo, Barnes & Jordan, 2019). Even when academic results are comparable to indoor environments, the simultaneous improvements in physical health, mental well-being, and social-emotional growth make NBL an incredibly valuable educational strategy.

The Dual Engine: How Nature Drives Academic Success

An integrative review established that nature boosts learning through a "dual engine" consisting of **passive exposure** and **active pedagogy** (Kuo, Barnes & Jordan, 2019):

- **The Power of Passive Exposure:** Simple exposure to nature—such as schoolyard greenery (Kuo, Browning & Sachdeva, 2018), views of trees from classroom windows (Li & Sullivan, 2016), or green walls indoors (van den Berg et al., 2017)—supports academic performance. This passive contact rejuvenates cognitive processing, restores depleted attention span, decreases stress and optimizes the social and emotional functions necessary for effective learning (Kuo, Barnes & Jordan, 2019).
- **The Impact of Nature-Based Pedagogy:** Moving lessons outside naturally encourages high-impact, active teaching methodologies. NBL thrives on hands-on investigations, phenomena- and inquiry-based learning, collaborative activities, and physically active lessons. For early learners, NBL is deeply grounded in outdoor play, recognizing that play *is* learning during early childhood. This dynamic pedagogy directly amplifies student motivation, curiosity, and engagement (James & Williams, 2017).

The Collective Benefit: A Classroom Conducive to Learning

NBL's impact extends beyond individual students. When children spend time learning or playing in nature, they exhibit improved self-discipline (Kuo, Browning and Penner, 2018) and stress reduction (Dettweiler et al., 2017). When most individual students are calm and regulated, a calmer, more cooperative atmosphere–highly conducive to everyone's collective learning–is created (Kuo, Barnes & Jordan, 2019).

Green schoolyards are one setting or approach supporting NBL, as well as health and well-being. Green schoolyards are nature-filled, climate resilient school grounds designed by and for the entire community (Children & Nature Network: C&NN, 2018). By encouraging nature play and nature-based learning through their rich biodiversity and design features, green schoolyards support learning and academic success; mental health, well-being and social-emotional functioning; physical activity and health; environmental literacy; and environmental health (such as decreased heat, air pollution and flooding) (C&NN, 2017). One study on the economic value of green schoolyards commissioned by C&NN found solid circumstantial evidence that green schoolyards provide a $3 return on investment (ROI) for every $1 invested. The ROI is driven by improved educational outcomes, better mental and physical health, property value increases, and climate resilience (Grunewald, 2024).

Fostering Equity and Inclusion

Nature acts as an educational equalizer by:

- **Supporting Special Needs:** Greening school environments and integrating nature-based instruction provide critical, multi-sensory support for students with unique learning requirements. Regular time in nature significantly restores attention skills and mitigates symptoms in children with ADHD (Sakhvidi, Knobel, & Bauwelinck, 2022), while emerging data reveals promising, but nuanced applications for children on the autism spectrum (Li, Larsen, Yang, Y. et al. 2018).
- For youth from disadvantaged communities, NBL and green schoolyards are uniquely impactful. This phenomenon, known as the ***equigenic effect***, describes how nature is relatively more impactful for more socio-economically disadvantaged students compared to their more advantaged peers. For example, research shows that school greenness significantly predicts better performance on standardized math and reading tests in high-poverty urban schools (Kuo, Browning & Sachdeva, 2018); the strongest academic improvements may occur among students in public schools rather than affluent private ones (Jimenez, Bozigar, & Janulewicz, 2023). Integrating green spaces into school grounds or utilizing nature-based pedagogy could serve as a cost-effective intervention to narrow persistent achievement gaps and promote health equity.
- Given the inequitable distribution of quality community greenspace based on family income and race/ethnicity, greening school grounds ensures that children have access to nature at school, the setting where they are required to spend a significant portion of their daily lives. The same is true of the adults working in schools. (Stevenson, Moore, Cosco et. al., 2020)

Future directions

NBL Research agenda: The NSF-supported *Science of Nature-Based Learning Collaborative Research Network* developed a research agenda offering recommendations for research questions and methodological improvements to increase the relevance and rigor of research in this field. Questions include how learning in nature affects what children learn, how they learn, and how it varies based on demographics. Outcomes of interest cover academic performance, practical skills, personal development, and environmental stewardship. Other questions focus on causal explanations for observed outcomes. To create optimal conditions for NBL, the agenda includes practical questions about how to prepare teachers to work successfully in nature and how to support their adoption of this approach. The agenda asks whether learning in nature can address major societal issues by moderating the effect of socioeconomic disadvantage on children's academic achievement, personal development and wellbeing, and how these benefits might be attained at reasonable costs (Jordan & Chawla, 2019).

Green Schoolyards Research Agenda: C&NN facilitated a process to develop a research agenda for generating, accelerating, and coordinating the research around green schoolyards, for studies on the impacts on:

- student, teacher, and community health and wellbeing
- academic achievement
- teacher retention and satisfaction; and
- community cohesion

Additional comprehensive cost-benefit analyses of designing and building green schoolyards is also called for (Stevenson, Moore, & Cosco, et al., 2020, pg. 3).

Green Schoolyards Action agenda: C&NN also facilitated the development of an action-focused agenda co-developed by hundreds of experts and movement leaders. The 2026 "refresh," led by the C&NN in partnership with **Trust for Public Land** and **KABOOM!,** updates the original 2017 Action Agenda. The goals set in the Action Agenda advance through the ongoing work of visionary and dedicated leaders across the field. One of the three primary goals set forth in the agenda is: **"A robust evidence base demonstrates the many benefits of green schoolyards."**

References

- Children & Nature Network. (2017). Green Schoolyards Evaluation Framework: Considerations or measuring the many benefits. Available at https://www.theintertwine.org/sites/default/files/CNN-Green-Schoolyards-Evaluation-Framework.pdf
- Children & Nature Network. (2018). Green Schoolyards Action Agenda. Available at: https://www.childrenandnature.org/green-schoolyards-action-agenda/
- *Dettweiler, U., Becker, C., Auestad, B.H., et al., (2017). Stress in school. Some empirical hints on the circadian cortisol rhythm of children in outdoor and indoor classes. International Journal of Environmental Research and Public Health, 14(5).* https://dx.doi.org/10.3390/ijerph14050475
- *Grunewald, R. (2024). How green schoolyards create economic value. Available at:* https://www.childrenandnature.org/resources/how-green-schoolyards-create-economic-value-toolkit/
- James, J.K. and Williams, T., (2017). School-based experiential outdoor education - A neglected necessity. Journal of Experiential Education, 40(1), 58-71. http://dx.doi.org/10.1177/1053825916676190
- Jimenez, R. B., Bozigar, M., Janulewicz, P., et al. (2023). School greenness and student-level academic performance: Evidence from the global south. *GeoHealth*, *7*(8). https://doi.org/10.1029/2023GH000830
- Jordan, C. & Chawla, L. (2019). A coordinated research agenda for nature-based learning. Frontiers in Psychology, https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2019.00766/full
- Kuo, M., Barnes, M., & Jordan, C. (2019). Do experiences with nature promote learning? Converging evidence of a cause-and-effect relationship. *Frontiers in Psychology*, *10*, 305. https://doi.org/10.3389/fpsyg.2019.00305
- *Kuo, M., Browning, M.H.E.M., Penner, M.L., (2018). Do lessons in nature boost subsequent classroom engagement: Refueling students in flight. Frontiers in Psychology.* https://doi.org/10.3389/fpsyg.2017.02253

- Kuo, M., Browning, M. H. E. M., Sachdeva, S. (2018). Might School Performance Grow on Trees? Examining the Link Between "Greenness" and Academic Achievement in Urban, High-Poverty Schools. *Frontiers in Psychology*, *9*. https://doi.org/10.338

- Li, D., Larsen, L., Yang, Y., Wang, L., et al. (2018). Exposure to nature for children with autism spectrum disorder: Benefits, caveats, and barriers. Health and Place. http://dx.doi.org/10.1016/j.healthplace.2018.11.005

- Li, D. and Sullivan, W.C., (2016). Impact of views to school landscapes on recovery from stress and mental fatigue. Landscape and Urban Planning, 148, 149-158. http://dx.doi.org/10.1016/

j.landurbplan.2015.12.015

- Sakhvidi, M. J. Z., Knobel, P., Bauwelinck, M., et al., (2022). Greenspace exposure and children behavior: A systematic review. Science of the Total Environment, 824. http://dx.doi.org/10.1016/j.scitotenv.2022.153608

- Stevenson, K.T., Moore, R., Cosco, N. et al., (2020) A national research agenda supporting green schoolyard development and equitable access to nature. Elementa: Science of the Anthropocene (2020) 8 (1): 406. https://doi.org/10.1525/elementa.406

- van den Berg, A.E., Wesselius, J.E., Maas, J., et al. (2017). Green walls for a restorative classroom environment: A controlled evaluation study. Environment and Behavior, 49(7), 791-813. http://dx.doi.org/10.1177/0013916516667976

Thanks to Cathy Jordan PhD
University of Minnesota
Professor of Pediatrics, Medical School
Principal Scientist, Masonic Institute for the Developing Brain
Consulting Research Director, Children & Nature Network

Green Schoolyards

Green schoolyards are known by many names across a broad and diverse field: *living schoolyards, community schoolyards, blue-green schoolyards* and others. Green schoolyards are nature-filled, climate-resilient school grounds designed by and for the community and ensuring vibrant places for children to thrive. They include features such as:

- Outdoor classrooms
- Native and pollinator gardens
- Nature play and exploration areas
- Edible gardens, farms, and livestock corrals
- Trails and walking paths
- Forests, groves, trees, and shrubs
- Resilient infrastructure to manage stormwater, provide shade, and cool surfaces

Cincinnati Schools and Community Development

In Cincinnati, green schoolyards are more than physical infrastructure. They are spaces where students learn, play, grow food, connect with their communities, and experience the benefits of nature every day. Beginning **in 2018, Cincinnati Public Schools** launched a collaboration with the school board and park board to bring outdoor learning opportunities to every school across the district. **Today, 60 of 66 CPS campuses have green space**, with a goal of reaching all schools by 2028. This progress has been driven by the *Green Schoolyards Action Network (GSAN)*, convened by Greater Cincinnati's Green Umbrella Regional Climate Collaborative, which brings together more than 30 organizations—including the city, CPS, non-profits, community members—to coordinate programming, share resources, and advance systemic change.

This citywide commitment reflects a broader understanding that **school environments play an important role in supporting student wellbeing**. In Cincinnati, green schoolyards are formally embedded in district wellness policies, **connecting outdoor learning with mental wellness, physical health, and prevention-focused approaches.** These spaces also extend learning beyond the classroom, giving students opportunities for **hands-on exploration, movement, collaboration, and connection through the K–12 curriculum**.

One example of this approach can be found at **Rockdale Academy** in the Avondale neighborhood. What was once a traditional schoolyard has become a vibrant urban learning garden where students explore plants, pollinators, food systems, and environmental stewardship. The **Rockdale Urban Learning Garden** was created through a **partnership between the Cincinnati Zoo & Botanical Garden, Cincinnati Public Schools, and community partners**.

The space encompasses:

- gardens,
- native plants,
- trees,
- outdoor learning areas, and
- spaces designed to encourage curiosity and discovery

The impact of these spaces extends far beyond a single garden. Across Cincinnati Public Schools, **agriculture and environmental learning** opportunities are creating new pathways for student engagement and career exploration, with agriculture now one of the fastest-growing workforce programs in the district. At Aiken High School, the school farm provides fresh produce to a neighborhood experiencing food access challenges, supporting nutrition equity while building student pride and ownership. **CPS Dining Services also sources 20–24% of its food from campus farms and gardens,** connecting school-grown food directly to student meals.

At Rockdale, the garden has also become a community asset—strengthening connections between the school and surrounding neighborhood while supporting greening efforts throughout Avondale. Cincinnati's experience demonstrates how green schoolyards can become powerful platforms for student wellbeing, creating environments where young people feel connected to nature, engaged in learning, and **invested in the health of their communities.**

Thanks to Priya Cook

Chief Program Officer at Children & Nature Network

(Until August 2026, Priya was Director, Green Schoolyards & Communities for C&NN)

(Also see the previous Research Note of highly related research points in *"Nature-based Learning (NBL)"* by Priya's C&NN colleague, Cathy Jordan.)