



2027 COHORT

The Missing Input in Education: Clean Air

The biggest unmeasured input in education is the air. While schools test water, inspect kitchens, regulate building materials, and track nearly every dimension of student performance, most have never monitored the air their students breathe. Increasingly, the evidence is showing that this is holding children back from achieving their fullest potential:

- **Clean air improves attendance.** In a randomized trial involving more than 2,000 children, [classroom air cleaning reduced absences by 12.5%](#), with the largest benefits among students who had been missing the most school.
- **Clean air improves learning.** Even low levels of air pollution below federal standards have been found to [reduce learning and student performance gains by nearly 20%](#). Another study found student math and English scores [rose by 0.1–0.2 standard deviations after introducing air purifiers](#), an unusually large gain for an intervention costing roughly \$1,000 per classroom.
- **Clean air improves long-term health.** Fine particulate pollution penetrates deep into the lungs and enters the bloodstream. A growing literature links it to asthma, cardiovascular disease, cognitive development, and other outcomes we spend billions trying to improve downstream.
- **Poor air quality is even connected to poor behavior.** Air pollution has been associated across multiple studies with [increased school discipline incidents](#), including fighting, defiance, and interpersonal conflict.
- **Pollution outside the school follows students into class.** Students at a school downwind of a major highway have [lower test scores, more absences, and more behavioral incidents](#) than at comparable upwind schools. Wildfire smoke during the school year has [lowered test scores across thousands of U.S. school districts](#), and low-income communities lose the most.
- **“Go inside” isn’t enough on bad air days.** When pollution or smoke spikes, the standard advice is to stay indoors, but indoor air comes from outside. In one study, [71% of campus buildings went over the daily air quality limit during a smoke event](#), including buildings with upgraded HVAC filters. In-room filtration closes that gap.
- **Kids spend most of their day indoors.** People spend about 90% of their time indoors, and children spend roughly half their waking hours in classrooms. In-room filters have [cut classroom particle levels by 77%](#), so a few dollars per student per year buys a large drop in what kids actually breathe, starting the day the filters go in.

This is not a ten-year facilities program. HVAC settings changes and filter upgrades can make a difference inexpensively overnight. To improve air quality further, modern in-room filtration can dramatically reduce airborne particles with no construction, no HVAC replacement, no new staff, and nothing asked of teachers. An excellent filtration system can cost as little as \$5–10 per student per year.

That combination is rare in education: a solution to a large problem that’s inexpensive, imposes little administrative burden, and directly benefits students, parents, *and* teachers. A superintendent can begin deploying cleaner air this school year, and see effects on exposure, attendance, and learning within months.