



How Does Indoor Air Quality Impact Student Health and Academic Performance?

Building the Case for Comprehensive IAQ Management in Schools



What is Indoor Air Quality (IAQ)?

- Characteristics of the air in indoor environments that impact the occupants' health, comfort and ability to perform.
- IAQ is one component of a school's physical environment and is often the most easily overlooked.



Examples of IAQ Issues

- Presence of moisture and molds.
- Low ventilation rates.
- Radon.
- Asthma triggers.
- Outdoor pollutants or vehicle exhaust.

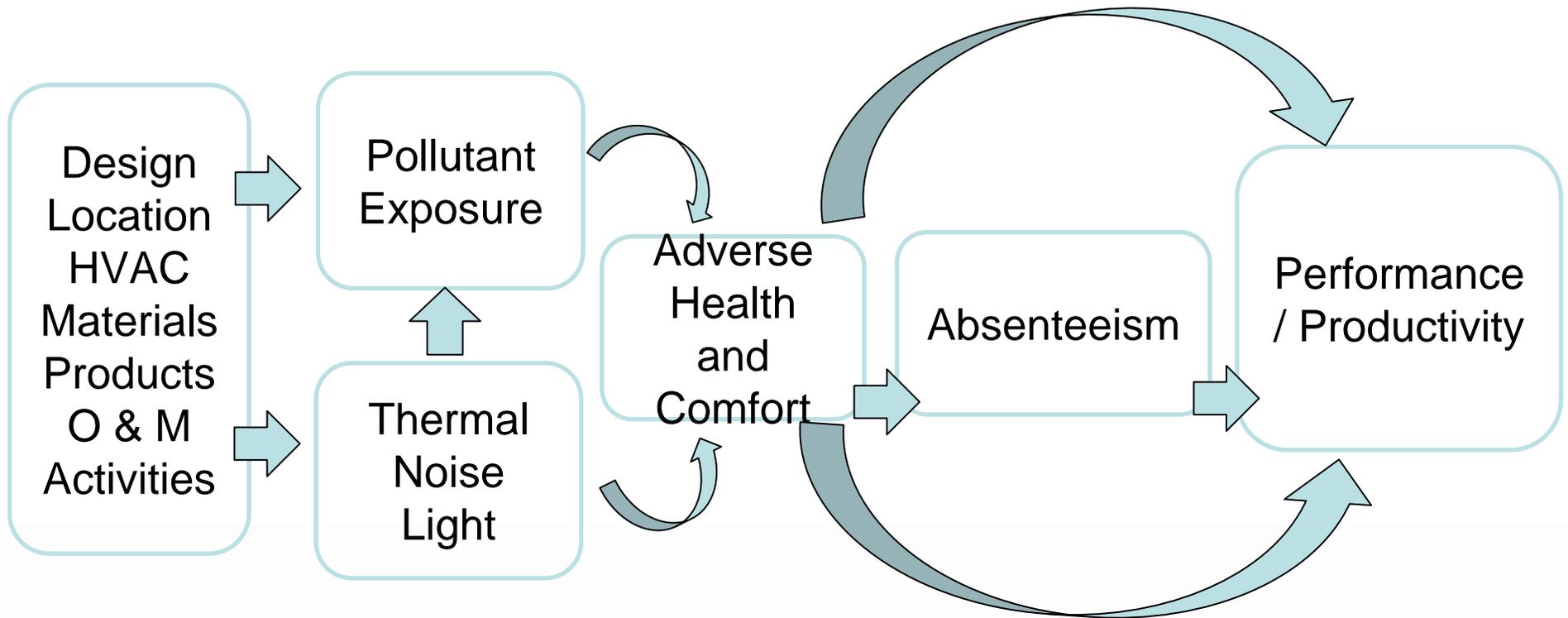


Laying the Foundation: Why do we care about IAQ in schools?

- Children's bodies more vulnerable to environmental hazards.
 - For their size, children breathe more air than adults.
 - Children's immune systems are still developing.
 - Children depend on adults for their health and safety.
- Well-implemented IAQ solutions WILL result in cost savings.



Laying the Foundation: How Does IAQ Affect Performance?



Building the Case: What Evidence Currently Exists?

- There is an association between poor IAQ and respiratory health effects, including asthma.
- Maintenance issues have been associated with asthma symptoms and allergies.
- Children's overall performance decreases with absences from school.



Building the Case: Does the Evidence Paint a Broad Picture?

- Yes! Scientific evidence demonstrating the relationship between IAQ and human performance and productivity is becoming more robust.
- Example: Improved IAQ increases productivity and improves the performance of mental tasks, such as improved concentration and recall.



Supporting Evidence from Scientific Literature



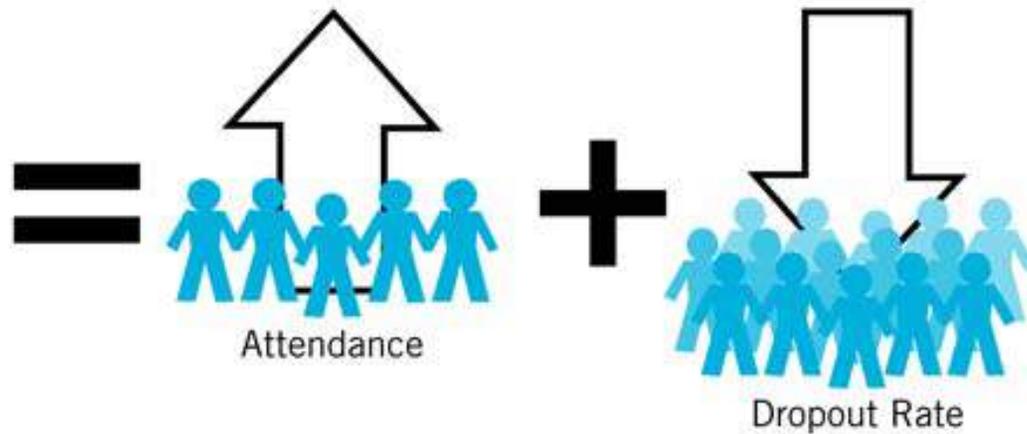
Manage the School Environment

- Health, attendance and academic performance have been shown to improve with increased maintenance.
- Schools with better physical conditions show improved academic performance.
- Schools with fewer janitorial staff personnel and higher maintenance backlogs show poorer academic performance.





Proactive Maintenance
in Schools



Schools without a **major maintenance backlog** have a higher average daily attendance (ADA) by an average of 4 to 5 students per 1,000 and a lower annual dropout rate by 10 to 13 students per 1,000.



Adequate Outdoor Air Ventilation

Benefits:

- Improved student and teacher performance;
- Increased test scores; and
- Reduced airborne transmission of infection.

In one study, students in classrooms with higher outdoor air ventilation rates scored 14 to 15 percent higher on standardized test scores than children in classrooms with lower outdoor air ventilation rates.¹

¹Shaughnessy, R.J., et al. 2006. A preliminary study on the association between ventilation rates in classrooms and student performance. *Indoor Air* 16(6): 465-468.



Control Dampness and Mold

- Dampness and mold in buildings are associated with significant increases in several respiratory and asthma-related health outcomes.
- Symptoms of mold-exposure include:
 - Coughing
 - Throat irritation
 - Tiredness
 - Headache
 - Increased wheezing



Establishing a Comprehensive and Effective IAQ Management Program



Coordinate an IAQ Program with Other School Strategies to Improve Health and Attendance

- Integrate related health programs (e.g., physical education, nutrition and counseling services) into a coordinated and comprehensive IAQ management program to:
 - ✓ Achieve improved results for learning;
 - ✓ Be more resource efficient; and
 - ✓ Involve students in their own health outcomes.



Follow a Structured Process

- *IAQ Tools for Schools*
Framework for Effective School
IAQ Management
 - ✓ Defines strategies to establish and sustain a successful IAQ management plan.
 - ✓ Provides a flexible and adaptable structure.



EPA's *IAQ Tools for Schools* Resources

Provides us with everything we need to know about IAQ in schools!

- Action Kit
- E-mails and Updates
- Schools IAQ Connector Listserv
- Webinars
- Awards Program
- *IAQ Tools for Schools* National Symposium



EPA's *IAQ Tools for Schools* Program

A National Movement

- In the mid-1990's, nearly 50% of K-12 schools had IAQ-related problems.
- *IAQ Tools for Schools* Program launched in the mid-1990's.
- Today, schools nationwide are implementing IAQ management programs!
 - Over 51% of schools in U.S. have an IAQ management plan (60,000 schools).
 - 85% of those schools base their plan on *IAQ Tools for Schools* model.



What About Our School?

- **Our Role** – Provide a healthy learning environment for the students, teachers and staff.
- **The Science** – Evidence demonstrates that inadequate building maintenance and poor indoor air quality can result in the following:
 - Decreased academic performance;
 - Increased absenteeism; and
 - Increased dropout rates.
- **An Opportunity** – Improve the IAQ of our school, bettering student health and academic performance.
- **The Resources** – EPA's *IAQ Tools for Schools* Program provides us with a comprehensive management plan to follow.



Take action today to ensure every child has a school that is a safe and healthy place to learn!

