

Bright Futures:

Harnessing Daylight to Enhance Student Performance and School Environments

Did you know that throughout their high school years, students spend a staggering 15,600 hours inside school buildings? It's no surprise then that the design of classrooms has a profound impact on effective learning, as well as the health and well-being of children. Among various design options available, access to daylight has emerged as the most influential factor in improving student performance and overall health.

Why daylight?

It's Science ... Natural daylight plays a significant role in fostering a conducive environment for teaching and learning, primarily due to its effects on vitamin D production, circadian regulation and the generation of neural transmitters like serotonin.

Vitamin D is crucial for the body's internal system as it aids in the absorption of calcium, an essential component for the bone health of growing children. By exposing oneself to natural daylight, the body can generate an adequate amount of vitamin D, supporting the overall well-being of individuals. Circadian rhythms, which are influenced by daylight, govern various physiological processes such as sleep-wake cycles, hormone release, eating patterns, digestion, body temperature regulation and other vital bodily functions. Daylight exposure helps in regulating these rhythms, promoting a healthy balance in our daily routines. Furthermore, daylight contributes to the production of serotonin, often referred to as the "happy chemical." Increased levels of serotonin can result in heightened energy, improved mood, better restfulness, and a reduction in stress, anxiety, depression and seasonal affective disorder (SAD).

Additionally, a recent [study](#) published in the journal Microbiome has demonstrated that rooms exposed to daylight exhibit similar effects as UV light in reducing the number of germs present. In fact, the study revealed that daylit rooms had around half as many viable bacteria, compared to dark rooms. In addition, daylit rooms were found to contain fewer types of bacteria that result from human skin shedding (including some that can cause respiratory disease), and more closely resembled outdoor bacterial communities. This led to the conclusion that while daylighting was previously believed to be only beneficial for visual comfort and broad health, it also influences air quality and functions as a disinfectant as well.

It's psychology too ... The benefits of natural light on the way we feel don't just apply to our physical wellbeing, but also to our psychological health and mood. As living beings, we feel the benefits of being exposed to daylight, and when we don't have it, we crave daylight and views. Research has found that students actually feel better, safer and have less anxiety when they have access to daylight because it creates a sense of physical and mental comfort.

What does all this mean?

Students exposed to daylight will not only have the energy to play in the schoolyard but also have improved concentration in the classroom.

One [study](#) even found that students in classrooms with high levels of daylight exhibited faster and more effective learning rates than those with low levels of daylight.

Specifically, classrooms with daylight resulted in students having improved math scores of (20%) and reading (26%) – as compared with students under little to no daylight.

So how do you design with daylight?

Introducing sufficient daylight into new school designs or renovations can present challenges. Facility planning teams need to seek flexible and energy-efficient solutions to establish these nurturing and pleasant learning environments.

Solatube Tubular Daylighting Devices (TDDs) offer an innovative approach to address this challenge as they enable the penetration of daylight into areas that were previously difficult to reach, surpassing the limitations associated with windows and conventional skylights in both new construction and retrofit projects. TDDs provide a practical and efficient solution to bring natural daylight into various spaces within educational facilities, enhancing the overall learning experience.

The process begins with specially designed domes positioned on the building's roof, strategically engineered to capture

sunlight from various angles. These domes serve as a gateway for harnessing natural daylight. The captured sunlight is then channeled into the building through highly reflective tubes, ensuring maximum efficiency. Within the building space, the light is diffused by fixtures, resulting in a beautiful and evenly spread illumination of natural daylight.

The best part is that this technology nearly eliminates infrared wavelengths from 950-2500nm, allowing the system to deliver a full spectrum of visible light without bringing in the heat, making TDDs perfect for hot climates where traditional skylights may be a problem.



Moreover, Solatube TDDs can also be fitted with built-in features that enhance the versatility and adaptability of the Solatube system, catering to various classroom needs and ensuring an optimal learning environment. Integrated LED Light Kits can be added for a cleaner ceiling appearance and nighttime illumination, and Solatube Daylight Dimmers can be added to allow classrooms to be darkened when needed, much like electrical lights.

In conclusion, access to daylight is an important element in the learning environment. Using tubular daylighting devices provides a solution for improving an educational environment and does more than simply brighten up a space.

To learn more about Solatube Tubular Daylighting Devices, visit www.solatube.com or call 888.SOLATUBE to set up a free consultation.

