

What a new school teaches: Design affects learning

By Laura Wernick , Architecture | Wednesday, April 1, 2009

Is school open today? If it is, about one-fifth of Americans are inside a school building. Most of these people are young and impressionable, and the school building is an integral part of their learning experience.

Three key elements are important drivers in a school environment: acoustics, quality of light and indoor air quality.

Good acoustics are essential to comprehension. Adults can understand much of a conversation without hearing every word and can piece together the overall meaning of a presentation through experience, context and the understanding of verbal patterns.

Children have a much more limited capacity to make jumps in logic when they can't hear clearly. Children need to hear virtually every word in order to be able to learn. The physical school environment must support that acoustical clarity.

Natural light is also important, as there seems to be a direct correlation between good natural lighting and increased comprehension. The correlation diminishes with an increase in glare or uneven lighting.

While it is relatively easy to grasp why poor lighting can diminish learning, the difference between good natural lighting and good artificial lighting is a bit harder to explain. There appears to be some positive psychological and physiological effects from the use of natural light that aren't duplicated even when full spectrum artificial lighting is used.

Environmental factors such as thermal comfort and indoor air quality also make a difference in learning environments. Student concentration is diminished when a building is either too warm or too cold.

Poor ventilation can lead to higher-than-acceptable levels of carbon dioxide in the air and/or higher concentrations of volatile organic compounds (VOCs), and these higher concentrations can lead to a rise in absences due to illness and decreased student performance.

The impact of the appearance of a school on learning is harder to quantify. There has been research indicating a correlation between newly renovated schools and higher test scores. Just as the "broken windows" theory posits that disorderly conditions breed poor behavior, fixing these conditions can help stimulate good behavior. Schools that are clean and attractive appear to have a positive impact on learning.

The quality of interior design definitely matters in school settings. Most children are highly sensory learners. They count colors of wall tiles in their schools, invent skipping games to play on the floor tiles and discuss how painted steel trusses are holding up the roof of their building.

Family involvement strengthens learning. The best schools are places where parents feel connected and welcomed. This means assuring a clear organizational layout where both students and parents can quickly orient themselves. Moving through a school should be comfortable for everyone, not disorienting or intimidating.

Learning also requires motivated teachers. That means, in part, assuring a professional environment where equipment is easily accessible and conveniently stored and faculty can spend their time wisely. A well-conceived building allows effortless passive supervision of children.

There is always one message that comes back very clearly from even young children in response to a newly constructed school: "My parents and my community have built a very special place for me to learn. Learning must be very important."

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