

The Impact of Biophilic Design on Student Success

Biophilia is the theory that human beings are innately connected to nature and living organisms. It is a universally human reaction to feel relaxed and more sensory aware in natural spaces. Through evolutionary adaptation we now find beauty and calmness in the natural elements that once nourished and protected our remote ancestors.

Biophilic design applies cues from nature to built space to achieve an enhanced sense of well-being and improved performance. Decades of research studies have proven biophilic design has produced significant user benefits; for example, shorter hospital stays for patients (Ulrich study, 1984), improved cognition in children (Dadvand, et al, 2015) and restored attention (Lee, Williams, Sargent study, 2015). Biophilic design has never been assessed in learning space, until now.

Craig Gauden Davis Architects assembled a multi-disciplinary team of scientists, educators and designers in an AIA-funded study to determine the contribution of biophilic design to student stress reduction and academic performance in a 6th grade Math class at a Baltimore City charter school. We employed three enhancements in the biophilic classroom:



- *View to nature- a garden was planted outside the classroom window. Trees retain leaves through winter and bloom in the spring attracting birds and insects will also attract the temporary gaze of students, providing a short break from concentration, restoring attention and lowering heart rate.*
- *Dynamic and diffuse light – opaque blinds are replaced with perforated motorized roller shades operated by a solar cell. Diffuse sunlight is ever present, and when the sunlight diminishes shades automatically rise revealing more light and view to nature, restoring circadian system functioning.*
- *Biomorphic forms and images – The teacher was asked to refrain from posting visual learning material on the walls. Shades were printed with the shadow of trees: nature inspired patterns printed on vinyl wallcovering is applied to the walls above the white board; carpet with a “prairie grass” pattern covers the floor; and a 3-dimensional wave pattern ceiling tile replaces one row of standard ceiling tile.*

Findings

- *Stress – Biometric measurements indicated students in the biophilic classroom were significantly less stressed over a 5 month period when compared to a control classroom.*
- *Learning – The average test score gain between September and March were 3 times better in the biophilic classroom when compared to the same class last year (without the enhancements)*
- *Surveys indicated students were more positive about learning in the biophilic classroom*
- *Student Interviews indicated they were “more relaxed”, “calmer”, “better able to concentrate” and “easier to focus” in the biophilic room when compared to their other classrooms.*

Significance

With modest upgrades to classrooms, biophilic design yields enhanced student and faculty wellness as well as improved academic success. The ripple effect of this early success can change the education trajectory of generations of young people.

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