

# A Case for Schoolhouse Aesthetics

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## ABSTRACT

*When new learning environments are built, numerous variables are taken into consideration. For example, school systems consider the instructional needs of the students they serve, enrollment, and whether to replace or remodel an old building. The concept of “going green” encourages school system planners to consider the natural surroundings and built environment that surrounds the school, thereby allowing the school’s architecture to match its surroundings. This notion has sparked an interest in sustainable design, which may best be explained as minimizing the harmful effects of the building on the environment. It further extends to the theory of biophilia or a natural attraction to living systems. Sustainability and the biophilia premise go far beyond just following new codes for construction and materials related to Leadership in Energy and Environmental Design certification. They link directly to aesthetics.*

*Aesthetics is the branch of philosophy concerned with art, beauty, and taste, with emphasis on sensory values, including an attraction to all that is alive and vital. Aesthetic spaces and places having ample natural light ensure a constructive influence on myriad human behaviors. Therefore, natural aesthetic surroundings having sustainability as a theme offers a context in which no textbook or technology-based learning environment can compete. A popular hypothesis generated by advocates of outdoor learning, for example, is that students learn at a more rapid rate when outside the typical classroom, they appreciate the learning more graciously, and they retain the information longer. Overall, built and natural aesthetic surroundings are invaluable!*

*Of all the numerous components traditionally included in the school’s physical environment, natural light is among the most important aesthetic variables. It influences a person’s wellbeing and performance positively. Given that other aspects of aesthetic surroundings are also significant, this article considers several variables that are vital to health, achievement, and good behavior. These include:*

- Classrooms having views overlooking green spaces and appealing gardens,
- Ample movement and circulation patterns,
- Commons places and spaces,
- Architecture with a welcoming entrance and a clear point of reference,
- Colors of various spaces,
- Scale designed to the physical size of students,
- Noise pollution and safety, and
- Biophilia, or bringing nature into the learning environments.

## A Case for Aesthetics

In the 1950s, Dr. Jonas Salk was working on a cure for the devastating disease polio in a dark and gloomy basement laboratory in Pittsburgh, Pennsylvania. Progress was slow and to clear his thoughts, Salk departed for Assisi, Italy, where he spent time in a 13th-century monastery, ambling amongst its pilasters and secluded courtyards. Unexpectedly, Salk found himself inundated with new perceptions, including the one that would lead to the discovery of his successful polio vaccine (Anthes, 2009). He strongly believed that his inspiration had come from the contemplative setting inspired by

architecture in Assisi. A few years later, architect Louis Kahn in designing the Salk Institute in La Jolla, California captured the reflective atmosphere found in the Assisi architecture. Jonas Salk developed a distinctive conceptualization for the creation of aesthetic surroundings. He envisioned an Institute with spacious, unobstructed laboratory spaces that could be adapted to the ever-changing needs of science. The building materials had to be simple, strong, durable, and as maintenance-free as possible. When the Institute was constructed in the 1960s, *going green* and sustainability were not yet widely used concepts, but were implicit in the functional architecture.

One needs only to examine the architecture of the Institute to see sustainability perceptions and vivid parallels with the concepts studied and advocated by many educational planners and architects (Alexander, Ishikawa, & Silverstein, 1977; Meek & Landfried, 1995). Assume that Inspiration for students in classrooms follows an analogous pathway as that taken by Dr. Salk and the architecture of the Institute. In K – 12 school settings, for example, classroom views overlooking green spaces and appealing gardens have been shown to influence reflective behavior and also correlate positively with progressive student attitudes and outcomes (Thomas & Thompson, 2004). Positive outcomes are inherently dependent on the good health of the student, the environment, and teaching and learning strategies.

Research shows that natural light in classrooms influences student achievement and health positively, especially when the influence of circadian rhythms is acknowledged as a fundamental constant by which the human body maintains its relationship to the environment (Tanner & Lackney, 2006). These are only two of the many aesthetic characteristics employed at the Institute and also emphasized by researchers at the School Design and Planning Laboratory (2012) for K – 12 projects. Christopher Alexander, Sara Ishikawa, and Murray Silverstein (1977) inspired many of these physiognomies.

The School Design and Planning Laboratory (SDPL) was among the first organizations to initiate research-based linkages connecting the performance of students to the physical design of school buildings. With these basic sources as points of reference, several other research-based examples on artistic surroundings and lighting in school buildings are presented in the following paragraphs.

Connecting to Salk's beliefs regarding spacious, unobstructed laboratory spaces that could be adapted to ever-changing needs, the physical environment and human performance are directly related. Human health and behavior are strongly affected by many factors including environmental and technological dynamics. Students need room to move about and not feel restrained by congested spaces. Ample movement and circulation patterns have direct positive effects on reading comprehension, language arts, mathematics, and science (Tanner, 2009). Wohlwill and Van Vliet (1985) discovered that the consequences of high-density conditions that involve too many children and too little space are excess levels of stimulation plus stress and excitement.

### **Linkages Among Aesthetic Environmental Design Variables and Behavior**

Ann Taylor and George Vlastos (1975) suggested that the learning environment is a practical art form and a place of beauty. The aesthetic school is a motivational center for learning. The artistic organization of places and spaces has a profound positive effect on student behavior and encourages a willingness to contribute to classroom interaction. Learning requires significant interface with the environment and widespread movement

and circulation configurations, with significant understanding and appreciation for territoriality of place. However, little exploration has been done regarding the many complex issues of social and personal space in educational settings and it is unclear exactly how much space is needed for learning when comparisons are made across cultures.

Common places and spaces add to the aesthetic appeal and overall organizational health of a school, going far beyond the traditional requirements of spaces such as a cafeteria where pupils and teachers may meet, greet, tweet, and eat. Public areas can create the perception among students that this is *our space*. Such spaces allow students to feel ownership of environments where they learn and engage in recreation and reflection. Commons areas can be designed for large and small group meetings and instruction, as well as a place for thinking, thereby developing a feeling of belonging to the school culture. Where appropriate social space is available, students perceive that *we are actually welcome here!*

Beyond the welcoming effect, educational spaces should challenge and stimulate students. Taylor and Vlastos suggested that educational architecture is a *three-dimensional textbook*; thus the educational setting is a real-world art form, a place of beauty, and a motivational and hospitable center for study and learning. Design of learning environments can stimulate or reduce learning capacity, inspire imagination, or lower intellectual awareness. A schoolhouse is a graphic entity; therefore it can be a motivational instrument.

Christopher Alexander, Sara Ishikawa, and Murray Silverstein contended that aesthetic architectural design should include an age appropriate and easy to find welcoming entrance that induces a comfortable feeling. Key structures should have a clear point of reference, a feature that heightens the awareness of belonging. The design concept of paths with goals translates to meaningful and easy to find focal points when moving among various locations, while variation of ceiling heights helps mix public and private places. Gradients induce the effect of inviting people into a space.

Natural light flowing into classrooms has received attention from several researchers and writers. An Investigation by Rikard Kuller and Carin Lindstern (1992) suggested that classrooms without windows should be shunned for prolonged usage. They point out the biological need for windows, especially noting that windows that students can actually see through, allow the eye to change focal lengths, providing essential relief for eyestrain. John Nash Ott's experiments in 1973 led him to conclude that only full spectrum natural light could promote full health in plants, animals, and humans. Critical to a student's health and growth, according to Ott, is full-spectrum light which is needed to stimulate the pineal gland's synthesis of melatonin, which in turn helps control the body's output of the neurotransmitter serotonin. Tanner and Lackney (2006) affirmed that inadequately lit and windowless classrooms evoke a daily form of gloom, doom, and *jet lag* among students, and toward the end of a school day, students in windowless classrooms with inadequate ventilation become exhausted and possibly dysfunctional.

Students, constantly exposed to dim light and windowless classrooms having inadequate air circulation (less than 15 cubic feet per minute per person), are expected to perform poorly on various standardized measures of success. Regardless of a school's

aesthetic attributes, the quality of indoor air, contaminated by such common occurrences as a poor rate of flow, leaking roofs and walls having mold and mildew, is a significant factor in a student's health and well-being. The Environmental Protection Agency (2012) has developed a tool to assist in improving 14 health-related categories, one of which is indoor air quality. The tool is used to periodically evaluate school facilities at a macro level to be sure that all of the essential elements of key prevention programs are being properly managed.

Color, a significant contributor to the aesthetics of spaces and places, ranks close to natural light in importance. Pyle (1997) has produced a definitive work on color in interior design. Our observations at SDPL have led us to hypothesize that interior coloring in classrooms has an effect on achievement, health, and behavior. Some students may be influenced negatively by extremely bright colors, becoming over stimulated by exceedingly bright color combinations. Color experts such as Pyle agree that reds, oranges and pinks are warm and stimulating colors, while most blues and greens are considered cool and relaxing. Most grays are thought of as neutral. Tints are fading and make a room look larger, while deep tones are impending and make a room look smaller. Overall, young children prefer red, blue, green, violet, orange, and yellow; although young children prefer bright colors, too many high contrasts should be avoided because they may produce fatigue and hyperactivity. As people age their color preferences change (Read & Upington, 2009). Obviously color cannot be considered without also including the effects of light.

Color in our society is used more shrewdly than we might think. For example, consider some *fast food* restaurants. Many of them are painted with varying degrees of deep red, orange, turquoise, and yellow. One philosophy is that children like these colors. However, there are such factors at play as the stimulation of movement - get in, eat hurriedly, and get out quickly so someone else can use the space. Too much red may increase blood pressure, but also increase appetite, while blue and green calm the nerves and induce relaxation. Color can improve interior spaces by making them more healthful (Marberry and Zagon, 1995). Given the increasing interest in color and color in nature such as explored some aspects of biophilic design, its impact on human behavior is one frontier in educational research that should be given more attention.

Adherence to scale is necessary to produce user friendly, safe schools. Scale as used here refers to the magnitude of a place as compared to the size of the student. Some design features may shock adults but be student friendly. For example, Ann Meek and Steven Landfried (1995) observed a lesson in scale at the front door of Crow Island School. They noticed that the door handle was too low - too low for adults, but just right for children. Other aspects of scale include windows low enough for children to *see out*, hand rails at three levels, and classrooms that resemble children's rooms at home. Carol Weinstein and Thomas David (1987) concurred that building to the scale of students promotes a sense of belonging and security. For children to feel competent in regard to their personal needs, the environment must be *child-scaled*. Water fountains, sinks, toilets, doorknobs, and light switches must be easily accessible and effortless for children to use.

When new learning environments are built, numerous variables are taken into consideration. For example, school systems consider the instructional needs of the students they serve, enrollment trends, and whether to replace or remodel an old building.

*Going green* encourages school system planners to consider the natural surroundings and built environment that surrounds the school, thereby allowing the school's architecture to match its surroundings. This notion has sparked an interest in sustainable design, which may best be explained as minimizing the harmful effects of the building on the environment. Noise pollution of the surrounding area is an important factor of concern to ensure less stress on students. Elevated levels of sound can significantly hinder students' overall performance and concentration.

Safety must be given the top priority when selecting a suitable place to locate a school building. The physical site for a school should be aesthetic, and properly located with respect to students' homes and surrounding business and industrial structures and agricultural operations. Sites should be free of air and water pollution and noxious gases and be far from sources of noise or danger such as high volume highways, airports, high-tension electric wires, chemical-based agricultural operations, and heavy industry (Earthman, 2000). Aesthetic and sustainability considerations should be stressed in the selection of a site. For example, trees, brooks, parks, or a natural environment near a school not only do much to beautify the area and enhance the study of biophilia, but also they serve as natural cooling areas in summer and allow sunshine to dominate the site in the winter. A suitable site's topography should be slightly higher than the area immediately surrounding it, giving the school structure a place of dominance in the community. Trees, shrubs, flowerbeds, and the arrangement of walks and drives contribute to the physical learning environment, a concept linking to *paths with goals and biophilia*. Both the design of the building and the arrangement and development of the site are important ingredients in the creation of an atmosphere that is educationally stimulating. The building should blend pleasingly into the terrain and be in harmony with nature and balance with its surroundings, bringing nature into the learning environments.

Well-planned instructional neighborhoods, a cluster of contiguous spaces accommodating about 100 elementary school students, includes large and small group areas, spaces and places for student and teacher planning, wet areas for art, a hearth area, and toilets for the students and teachers. The ideal instructional neighborhood includes windows for viewing outside the classroom and for bringing natural light inside. It contains open and closed spaces to maximize flexibility, and permit teachers and students to manage their own time and space. The instructional environment can affect non-achievement performances and attitudes and is directly associated with improved school attendance, participation, and attitudes toward the class, the school, the teacher, and peers. In aesthetic classrooms, desks are frequently being replaced with workstations and movable furniture suitable for problem-based learning styles. Adequacy of the instructional neighborhood depends on ample square footage and how the space is configured. For the instructional neighborhood concept to be effective, teachers should have special training where multitasking is a necessity. However, open spaces in instructional neighborhoods are threatening to teachers trained in traditional programs.

Other aesthetic and highly relevant aspects of instructional neighborhoods include workstations and research space for each student. Central gathering places and presentation arenas enhance problem-based learning activities, quiet semi-private areas, and spaces where students can think and work individually. Teachers should have offices located where they can perform individual work and advising, organize various study programs, or communicate with parents. Schools should be flexible enough to support a

variety of changing instructional strategies, taking into consideration the impact of technology on teaching and learning. Because curriculum and instructional methods are continually changing to meet the needs and demands of students, parents, and society, so the classroom space must also be designed for change. This underscores the need to design flexible buildings.

Early research efforts at SDPL led to the study of functional and aesthetic outdoor learning environments. The first issue was finding a definition for an outdoor learning environment, not to be confused with football, baseball, or soccer fields, and a swing set attached to a slide and monkey bars. What became clear was that outdoor teaching and learning was a curriculum innovation, seeking to involve students in the study of such important issues as science, mathematics, biology, anthropology, ecology and greener environments. Effective learning areas outside the school buildings demand the design and development of green spaces for birds, butterflies, and gardens, natural quiet areas, and play areas well beyond traditional fields for football and baseball.

“Environments that work” is the theme of Jim Greenman’s (1988) classic work on spaces and places. For example, outdoor education linked to the theory of biophilia is an excellent medium to teach aesthetic ideals, social and moral values, and respect for life of small animals and birds. Students must be taught not to destroy animals and plants just for fun. To this end it is important to permeate physical settings for students with the sense of being in nature for reasons other than just being outside the school building to get fresh air. Natural things have unending variety, people do not create them, and they offer a feeling of agelessness. Views from inside classrooms overlooking life and green areas provide quality to the school’s learning environment, while allowing spaces for small animals inside schools offers students the opportunity to *care for life*. Accordingly, caring for living things helps to teach a sense of responsibility and values.

Teaching in natural aesthetic surroundings that have sustainability as a theme offers a context in which no textbook or computer-based learning environment can compete. For example, if the learning goal is to understand the nature of a blue bird, why only ask students to read about blue birds, draw pictures of blue birds, or color sketches of blue birds in a classroom setting? Instead, why not perform these associated classroom activities and also observe the blue bird with all its shyness, at first, then as time goes by, its trusting nature with all of its graceful movements in nature? This is effective pedagogy because the process integrates abstract and face-to-face learning activities. At best, authors of textbooks and virtual learning packages only pass along second-hand information they obtained from observation, research, discovery and perhaps imagination. It is the student who sees, discovers, smells, and explores a situation who really gets the most out of it. A popular hypothesis generated by advocates of outdoor learning is that students learn at a more rapid rate when outside the typical classroom, they appreciate the learning more graciously, and they retain the information longer. Overall, built and natural aesthetic surroundings are invaluable!

Numerous aesthetic components included in the school’s physical environment influence a person’s wellbeing and performance positively. When learning environments are built, planners and architects should consider the natural surroundings and design structures accordingly. Of pronounced significance are aesthetic spaces and places having ample natural light. These ensure a constructive influence on human behaviors and attitudes. Built and natural aesthetic surroundings influence personal wellbeing more

positively than dull unimaginative places and spaces. While aesthetics is the branch of philosophy concerned with art, beauty, and taste with emphasis on sensory values, its value to us lies in our ability to reflect on structures we build, the culture linked to the environments we developed, and nature in which they are located (Kelley, 1998).

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