The Environment of the Struggling Learner

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Who Are the Struggling Learners?

Academic success for public school students requires that educators be committed to and accountable for providing **all** students with a rigorous and relevant education, based on strong relationships, which meets prescribed state standards (learning outcomes) and federal mandates for inclusion. Reading proficiency and mathematical fluency have historically been valued as fundamental enabling competencies for achieving academic success. For a number of learners, however, achieving such competencies is a daily challenge — these are the struggling and disengaged learners.

Learning for learning-challenged and other students can be compromised by a variety of external and internal stressors. Stressors beyond the learner's control can include such factors as poverty, nutrition, health issues, unstable family structures, peer pressure, bullying, and/or substance abuse. Internal stressors can include organizational skills, oral and written comprehension, task complexity, socialization, and/or emotional immaturity.

An Optimum Physical Learning Environment

All students, but especially struggling and disengaged learners, need adaptations and accommodations for one or more of these stressors to maintain or increase the pace and effectiveness of their learning. A major adaptation/accommodation must include providing a supportive physical learning environment: research has shown repeatedly that the most immediate improvement in student achievement is in direct response to changes in the *physical learning environment*. The physical learning environment, defined by essential material and perceptual environmental qualities, reduces external and internal stressors, both physical and emotional, creating a positive and supportive learning environment that actively improves student performance.

To achieve an optimum learning environment, *design excellence* (the creative programming, planning, design, interior design and landscape architecture of the learning environment), based on proven research from a variety of areas (human factors, environmental psychology, ergonomics, learning theory, brain research, multiple intelligences, learning modalities, etc.), is employed to improve the effectiveness of the Rigor/Relevance Framework to encourage learning. To examine design excellence and a generalized architectural response, it is necessary to examine the needs of the respective struggling learners.

English Language Learners

For all learners, but especially for struggling learners who come from homes where English is a second language or is rarely spoken, it is critical to hear the language spoken in the classroom clearly. Hearing clearly, however, is complicated by a physical ear structure, which does not mature until the age of 15, evolving language comprehension skills (sorting signals from noise), and sometimes undiagnosed reduced hearing capacity. Having the ability to hear clearly is important, since most instruction in the classroom is aural. The ability to hear clearly (intelligibility) is further complicated by the lack of familiarity with the language of instruction and interaction.

Architectural Response

For English language learners and for many other students, the quality of the acoustical environment is the *most* important environmental quality that influences learning. Architectural noise controls to reduce the ambient sound level of noise generated in the room, to reduce echo, to reduce reverberation, and to prevent sound transmission into the room are essential to providing an environment with limited aural distraction. The ambient sound level in an unoccupied classroom is normally about 50 dBA. In order to be heard clearly, a teacher must speak at least 15 dBA above the ambient sound level for speech intelligibility; this is the *signal to noise ratio.*

The ambient sound level has been determined to be so important that the American National Standards Institute (ANSI) has prepared a non-binding standard (ANSI/ASA Standard S12.60-2002) for classroom acoustics, establishing 35 dBA as the ambient noise level. The standard is based on an unoccupied classroom and does not consider the critical signal to noise ratio, but it does provide a benchmark. Many states have adopted this standard into their Building Codes.

To establish an optimum acoustical environment, the architectural response of a *sound enhancement system* in the classroom ceiling has proved the most cost-effective method to achieve sound distribution of the teacher's voice, when compared to reconfiguring space to direct sound and installing reflective/absorptive panels to control reverberation (both of which still rely on the vocal strength of the teacher to project his/her voice 30 feet for six hours each day).

A sound enhancement system for a typical classroom consists of four ceiling mounted speakers, a ceiling mounted receiver, and a wall-mounted transmitter. Using infra-red technology not subject to interference, the receiver picks up the voice of the teacher from a lavaliere microphone and sends it to the transmitter, which distributes the teacher's voice to the four overhead speakers.

By immersing English language learners in the teacher's calm, non-directional voice at normal sound levels, anxiety and the exhaustive effort to listen carefully to a new language are minimized, increasing the energy available to learn. In addition, this system reduces distractibility from noise, maintains on-task performance, reduces the need for repetition, reduces test-taking time, improves spelling accuracy (increased intelligibility), and increases self-confidence (due to use of a hand-held student microphone). This system when combined with the teacher's computer station, desktop camera, overhead projector, and CD/DVD player ("high technology classroom") has proved to increase student achievement significantly by creating an auditory environment that makes real learning possible.

Students with Disabilities

Students with disabilities are struggling learners with a diversity of physical (neurological, musculoskeletal, congenital), emotional (psychologically disturbed, severely to moderately disturbed, mildly disturbed) and/or intellectual (low-level learners, trainable mentally handicapped) learning disorders that impair academic success (low-level learning may also have biomedical, social, motor and behavioral causative factors). Students with learning disabilities have a "disorder in one or more of the basic psychological processes involved in understanding and using language, manifested in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations" (IDEA 2004). Learning disabilities can include attention disorders, sensory integration dysfunction, and/or sensory processing disorder (sensory experiences are imperfectly organized or processed by the brain resulting in delayed motor skill development or behavior problems).

Students with disabilities learn in different ways, requiring specific instructional aids and a variety of learning strategies.

Architectural Response

The key to providing an optimum learning environment for learners with physical, emotional, cognitive, and other challenges lies in a rigorous analysis of the specific disorder(s) and accompanying behavior(s).

- The need for predictability or structure may require that regular visual patterns on floors or walls and simple circulation systems be used. Patterns enhance thinking, recalling, and remembering.
- The need for low student-teacher ratio or small group supplemental instruction areas may require additional resource spaces or divisible classrooms.
- The need for reduced distractibility may require acoustically separated circulation, remote window openings, rear entrance doors, and muffled ventilation grills.
- The need for emotional stability may require avoidance of large areas of primary colors, especially yellow, and the use of high frequency fluorescent ballasts to reduce non-visible flicker that stresses the central nervous system.

For learners who may feel more comfortable with younger classmates, classrooms that open to adjacent rooms to facilitate multi-class interaction might be considered. The environment should be generally softer (cushioned seating), dimmer (lower lighting levels), quieter (sound absorbent ceilings), and calmer (muted colors).

Variety in the visual environment is still preferred:

- Varying artificial lighting levels and task lighting supplemented by controlled daylighting is recommended.
- Varying floor levels, room shape, and degrees of transparency/opaqueness further promotes interest through exploration and motivation.

High efficiency filtered, room-controlled and conditioned air at higher than normal ventilation rates reduces air quality stressors such as particulates, odors, and lethargy inducing levels of carbon dioxide. Soft, round-edged mobile furniture that is easily reconfigured provides a safe, flexible work environment for varied learning configurations. Areas of cushioned flooring should be considered for children whose physical limitations or emotional reactions may cause loss of balance. Additional classroom area to provide adequate clearances for ease of movement for wheelchairs is essential.

The distribution of counseling, health, transitional, behavioral and social services throughout the school for ready assistance may be desirable, as well as ample space for storage and additional support personnel. Color-coding to identify classroom wings and ease way-finding is suggested.

Economically Disadvantaged Learners

The thrust of NCLB is to hold schools accountable for all learners' academic progress. Economically disadvantaged learners come to school with fewer skills and more risk factors than students in other subgroups. The lives of economically disadvantaged children outside the school are often in turmoil. Such children may endure personal, familial, and community hardships in addition to often desperate living conditions. School is and must remain for them a safe haven (from threats), a secure island (from criminality), and a nurturing, restorative environment.

Architectural Response

School is the physical manifestation of the value society places on its children. A bright, well equipped, properly maintained school demonstrates the continual care and concern these children deserve, in marked contrast to the depressing and dehumanized environments they negotiate every day. A school that is accessible to the family and community welcomes their participation and support. Perimeter fencing and entry control (observability, sequential entry) offer physical protection without a sense of confinement. The inclusion of community health, nutrition, and social services should be considered to provide immediate support. A variety of after-school programs for recreation, increasing learning skills, and parent drop-in are highly encouraged.

Disengaged Learners

Self-motivation lies at the heart of achievement. Perhaps the most overlooked group of struggling learners is the disengaged learners. These are the learners who succumb to the struggle in school by becoming disillusioned; growing increasingly disinterested, resentful, and disruptive; and ultimately, perhaps dropping out. Many of the disengaged learners do not see the relevance of the subjects they take to their lives outside the school and do not view higher education as a real or desirable option.

Disengaged learners may lack aspirations, feel no relationship to grades or adults, find the material too easy or too difficult, be unfamiliar with academic language, find the pace too fast or too slow, exhibit poor skill levels, have a limited vocabulary, be insufficiently prepared, be overwhelmed by conceptual complexity or density of ideas, or be frustrated with arbitrary testing and meaningless worksheets. These conditions contribute to deterioration in self-image. For many of these learners, failure replaces the quest for discovery of who they are and who they might become.

To bring these learners back to the classroom, engagement must be fostered through active learning (i.e., opportunities to demonstrate curiosity, enthusiasm, and interest; to interact in a connected manner with other students, teachers, and the learning environment; to persist in the face of difficulty; to expend effort to get the job done completely; to make independent connections; to continue to work after the assignment; and to take pride in accomplishment). Respect, trust, and relationships are the keys to student participation.

Architectural Response

The fundamental architectural response to disengaged learners must be to empower them by acknowledging that learning is the primary purpose for the school. Schools already communicate an "image" to these learners. Often, it is an "institutional" image of grand scale and durable materials that minimize the individual or a "factory" image that is cold and inhuman. To address these perceptions, schools should relate to the scale of their learners, using warm, but durable, natural materials.

School sites may appear apart from the community by being fenced in and/or set back from the street and surrounded by vehicular traffic. Inside the school, similar classrooms and long, unoccupied corridors heighten the feeling of alienation.

To counter this perception, schools should provide a variety of different classroom shapes and sizes to avoid regimentation. Hallways should offer opportunities for informal gathering and discussion. Large spaces, such as the media center, auditorium, or dining area could be visually and spatially open to general circulation, allowing these often underutilized spaces to invite alternative working locations for projects. Areas for student displays, theatrical or musical impromptu presentations, and multi-media news

and information stations would serve to encourage personal expression while keeping students regularly informed.

Conclusion

For learning-challenged students, and for many others, the design of an optimum physical learning environment is a necessary adjunct to an academic environment that supports rigorous and relevant learning. Through design excellence, the architect creates an optimum physical learning environment that provides positive support, appropriately stimulates the senses, and reduces stressors. Environmental qualities to enhance the learning concepts of attention, concept formation, habituation, imprinting, memory, perception, problem-solving and reasoning are addressed. Neglecting the struggling learners' physical needs will heighten their language and reading deficits, and, if consistently ignored, can result in increased dropout rates, delinquency, substance abuse, unemployment, or criminality. If the school is the manifestation of the community's concern for its children and their future, we can do nothing less than demonstrate that concern through creative and thoughtful design.