

Implications

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Design for Development: The Importance of Children's Environments

The Child in Us All

I'd like you to close your eyes and take a little journey back in time. Think back to when you were a child and recall a favorite place where you loved to spend time. Remember the colors, textures, and feeling of that space and think for a moment why you felt happy there. I would venture to guess that, like many people, you were able to quickly identify vivid details of your favorite place. When I ask college students to describe their favorite childhood place they consistently recall places that were child-friendly, inviting, stimulating, and that they were able to control in some way. Places like a tree fort in the backyard, a bedroom or basement play space, or their grandparent's small storefront. Elizabeth Prescott, a researcher in child-care environments, contends that our ability to effortlessly return to these favorite places in our minds, so many years later, speaks to their importance in our lives.

Unfortunately, a world designed for and by adults can result in a "super-sized" mismatch between the needs of children and their everyday environments. From

the table and chairs or drinking fountain that are too high to reach, to the large, unhealthy dose of indoor air contaminants to which they may be exposed, children's home, neighborhood, education, medical, and outdoor spaces are often designed with little regard for developmental needs.

A Developing Perspective

Children as users of the environment deserve special attention for many reasons. Because children are in the process of developing physical, cognitive, social, and emotional skills, their interactions with the physical environment can have long-lasting effects. An important example of the significant influence the designed environment can have on development is in the area of play. Play is said to be the work of the child and is a universal need for children of all ages, across all settings. The physical environment can directly affect the quality and quantity of play, which in turn affects development.

Understanding the stages of child development and how they relate to the environment of the child is essential in creating spaces that meet the needs of children. Much rapid and important development occurs within the first 10 years of life and children of different ages vary



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Where Research Informs Design

widely in their abilities. Consequently, a “one size fits all” approach to children’s environments will not work. For example, the organization and furnishings in an elementary school classroom are not appropriate for a childcare center, as the developmental abilities of the two age groups are worlds apart.

Gathering very specific information about the developmental abilities of children who will potentially use the space can improve programming. What are children capable of doing at a particular age? How do they play--together or alone? How do they understand the world? What fine motor skills have they mastered? What are their needs in terms of outdoor play? How far from home can they safely travel? How tall are they? What can they reach? How much time can they comfortably spend apart from their parents? What do they consider comforting or threatening in the environment? These and many other questions need to be answered to improve the child-environment fit.

Places and Spaces

For most children, the home and neighborhood are the principal settings in which crucial social, physical, and cognitive development occurs. The near-environment is especially important for very young children as they can do little to control their surroundings and spend proportionately more of their time engaged in interactions with the physical environment as compared to adults. Issues of parental supervision, appropriate play materials and spaces, and safety in the home are of particular concern to the parents of young children. Home environments for infants and toddlers that encourage movement and stimulate the senses can positively influence development. As children grow, their needs in the home environment change. The environmental range of older children increases beyond the home to the surrounding neighborhood and safe outdoor play spaces and streets become increasingly important.

Children entering adolescence experience an increased need for independence and privacy, creating new demands on the home environment.

Children spend a significant proportion of their day in educational settings. Learning environments range from daycare centers to high school classrooms and must also respond to the wide-ranging developmental abilities of the children who use them.

In addition to meeting these important needs, designers of such spaces must also program for issues of cultural/ethnic and economic diversity,



special-education requirements, disabilities, general safety and security, and pinched facilities budgets--the challenge can seem insurmountable.

Unfortunately, for some children who are seriously or chronically ill, the hospital environment can become the setting in which early development takes place. Hospitalization during childhood can have long-term effects on children's cognitive, emotional, and social development. In response to the problems created by parent-child separation during extended stays, many hospitals have implemented family-centered care policies, involving parents in their child’s care. Changes in the way care is delivered have been accompanied by a whole new set of space requirements. The needs of the sick child, the parent, and staff must all be addressed, in a balanced way.

Health and Safety Concerns

The physical environment has a significant effect on children's health and safety. Exposure to toxic substances such as lead and indoor air contaminants have been shown to have direct pathological effects on children's health and development. In addition, children are more vulnerable than adults to the effects of toxins by virtue of their size, incomplete development, and behavior. Lead poisoning, for example, can cause irreversible deficits in cognitive functioning. Because young children frequently put objects in their mouths as a way of exploring the world and because they spend much of their time crawling around on the floor, they can be exposed to more lead than adults through household dust, soil, and chipping paint.

Dramatic increases in the incidence of asthma among children serve to further illustrate the link between the physical environment and children's health. According to the Centers for Disease Control and Prevention, asthma affects nearly 5 million people under 18 years of age, rising nearly 75% between 1980 and 1994. Asthma is a significant factor in school absenteeism and is a leading cause of hospitalization among children under 15 years of age. Many indoor air quality factors such as mold, dust, and smoke in the environments where children live, play, and learn can trigger asthma attacks. Specifying construction methods; building systems, materials, and finishes; and furnishings materials, and finishes that promote good indoor air quality can help children suffering from asthma.

Safety is a major concern for all those engaged in the design of the built environment. Children have limited experience in responding to the environment and potential hazards that may exist. It is disturbing to learn that unintentional injuries are the leading cause of death among children. Injuries related to motor vehicles, fires/burns, drowning, falls, and poi-

soning account for the majority of these deaths. Younger children are susceptible to injuries in the home environment, while older children and adolescents tend to venture farther from home and so are more at risk for injury in their neighborhoods and at school. Special attention should be paid to the safety needs of children in the environment throughout the planning, programming, specification, and installation phases of the project process.

In the End

If good design can foster healthy development, what are the developmental consequences of less than optimal home, neighborhood, school, and medical environments? The effects of residential crowding, noise, lack of green space, poor housing, and other inappropriate environmental conditions have been documented by authors whose work has been summarized by Informedesign. For instance, children living and attending school in disadvantaged environments may have trouble learning, or may be at increased risk for health problems and injuries. As novelist Barbara Kingsolver writes: "We can see, if we care to look, that the way we treat children, all of them, not just our own, and especially those in great need--defines the world we'll wake up in tomorrow."

--Lou Bunker-Hellmich, Ph.D., Research Associate

Everything I Needed to Know About Design, I Learned in Kindergarten!

When you were in kindergarten, did you take naps on a rug on the floor? When you were in fifth grade, did taller students (at this age, it was usually the girls) sit at the back of the classroom so shorter students (those unruly boys) could see the board? And, how many times in your high school classrooms did you have to "move the chairs around so you can discuss this issue in small groups...?" What do these early life experiences tell students about human behavior and the designed environment?

The first thing they say is that humans adapt to their environments. We make some floors soft and cozy; we still put taller people in the rear of photos instead of using a more creative pose; and everyone, no matter their ages, “moves the chairs so we can talk.”

Secondly, these experiences set patterns of behavior that stay with us a very long time. Do you still like to curl up on the floor, maybe on a rug or blanket, and fall asleep while watching television (I'm sure that's where my husband learned this behavior).

Finally, these experiences may say to us as designers, we need to teach children more about design and human behavior so they learn they have choices about how supportive their environments can be. Children can find out about how design influences their behaviors; how design can be used to manipulate behavior; how design can encourage or discourage conversation, establish status, put people in power positions, increase or decrease anxiety...and the list goes on. We do research on children's behavior in designed environments; we need to do more teaching to children about design.

Bringing Design Education to the K-12 Classroom

There are several people and groups who are doing something to change this. They have developed some projects and programs that teach young students about design. There are two outcomes of these programs, first to encourage children and teens how to make informed decisions about their designed environments and to encourage students to consider one of the design professions as a career.

Stephanie Clemons, Ph.D., IDEC, associate professor at Colorado State University completed a qualitative study in 2002 that examined how and what students in K-12 classrooms should be learning about interior design. Her research reminds us all how many careers are introduced into our consciousness

during the primary school grades such as teaching, law enforcement, and firefighting, but interior design is seldom a career that is directly introduced or described.

Based on focus groups and personal interviews of interior design practitioners and educators, K-12 principals, curriculum specialists, and teachers from June 2001 through April 2002, Dr. Clemons determined that the time to introduce information about



the profession was as early as pre-kindergarten. However, she also concluded that it is critical that interior design education is collaborative, and integrates with and supports national education standards. The K-12 teachers and administrators who participated in her study also identified the necessity

for the interior design profession to provide the K-12 educators with the tools necessary to deliver this curriculum: developed lesson plans, resource materials, visuals, textbooks, and involvement from design professionals. As Dr. Clemons reminds us, “Our future clients, educators and practitioners are among the children in our communities.” For more information about this study, see ISdesignNET, “IDEC Report: Interior Design in K-12: Let's Ask the Experts!” at www.isdesignnet.com/Magazine/J_AO2/idec.shtml or contact the IIDA Foundation at (888) 799-IIDA.

The American Architectural Foundation (AAF) of the American Institute of Architects (AIA) is working to enhance the public's--and especially children's understanding of design and the built environment

and the contributions they can make. *Messages of the Built Environment*, a collaboration between the Learning and Leadership in Families and the AAF is a program that has just completed its pilot year of integration into Title One and Head Start classrooms around the Washington, D.C. area. The goal of the program is to provide tools to preschool and elementary teachers that integrate learning about design and the built environment into the curriculum.

Teacher resources and art are available to provide student activities that range from a series of exploratory exercises about the design of windows



(*Why Window?*), basics of construction and structures in nature and our environment (*Why Do Buildings Stand Up?*), and an historical review (*Living in Style: A Guide to American Architecture*), among others. For more information about how

you can tap into this exciting program and bring design education into the classrooms in your community, contact the AAF through the Web at www.archfoundation.org/about/index.htm or call (202) 626-7318.

The American Society for Engineering Education (ASEE) is working to address the increasing technological needs of the United States by working with K-12 teachers and administrators to bring science, math, engineering, and technology education into the classroom in a manner that is engaging and comprehensive within mandated standards-based curriculum. ASEE's corporate and academic member institutions are working collaboratively on this outreach effort designed to enhance K-12 achievement in these areas of learning as part of their Best

Practices Initiative. K-12 educators are encouraged to take advantage of ASEE's EngineeringK12 Center offerings that include classroom assistance, demonstration programs, curriculum design, and an array of educational support.

Their mission is driven by statistics such as those reported by the National Science Foundation in *Science & Engineering Indicators 2000*, "While the Department of Labor projects six million new tech jobs by 2008, the total number of math, engineering, and physical science majors has been shrinking since the mid-1980s." For more information on ASEE's K-12 Center or how you can engage their members' support in your area, go to their Web site at www.engineeringk12.org.

The Future

Supporting collaborative projects that are working to get K-12 schools in your area engaged in curriculum regarding design and the built environment could mean that in the next generation, designers could see a more informed public. Educators could see a more informed student population. And, the world could see more informed design. But, we don't ever need to stop curling up on a rug on the floor and falling asleep while watching television.

--Denise Guerin, Ph.D., Coordinator

The Aerodynamics of the Frisbee ...Another View

In last month's issue of *Implications*, we made fun of the applicability of some research projects we'd read about over the years. Now, to defend our accusation of "the most ridiculous funded project," we give you the results of a couple of these ludicrous projects. The government did fund a research project some years ago on the "Aerodynamics of the Frisbee." Sounds like a waste of good money? But, from these findings the stealth bomber was developed. Of

course, you may still think that was a waste of good money.

Another research project lauded for its inane application was “The Mating Habits of the Tsetse Fly.” What possible good comes from this one? It was found that for tsetse flies, mating and eating go together (not unlike humans!). Scientists were able to develop a spray that when put on tsetse fly foods such as fruits, the male would eat the food and spray, which would cause sterility, therefore controlling the tsetse fly population. Ever wonder why your mother insisted that you wash your fruit before eating?

So, the next time we hear the title of some nefarious research project, let’s use our design thinking for a moment and come up with all the different applications the findings could have. For example, they use aerodynamics in design, hmmm...what are you sitting on?

--Denise Guerin, Ph.D., Coordinator

Children's Environments: Where Children Live, Learn, and Play

If your current work is in the area of children’s environments or if you have children of your own, be sure to search the Informedesign database (use the “Search Research Summaries” box to enter a term of interest). There you will discover that Informedesign

has posted well over 50 Research Summaries that address children’s issues. Here are just a few:

Home and Neighborhood Environments:

“Inner City Children Benefit From Green Spaces”
--*Environment and Behavior*

“Residential Crowding Impacts Children’s Well-Being”--*Child Development*

Education Environments:

“School Furniture Design Affects Children’s Behavior”--*Ergonomics*

“Private Spaces in Preschool Classrooms”
--*Journal of Interior Design*

Medical Environments:

“Health Benefits of Including Nature Within Hospitals”--*Journal of Environmental Psychology*

“Lighting Can Improve Growth and Development in Premature Infants”--*Infant Behavior and Development*

Health and Safety:

“Indoor Allergens Affect Children With Asthma”
--*Archives of Pediatric and Adolescent Medicine*

“Playground Hazards Increase the Risk of Injury”
--*Journal of Environmental Health*

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The Mission

The Mission of Informedesign is to facilitate interior designers’ use of current, research-based information as a decision-making tool in the design process, thereby integrating research and practice.

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