

— ISSUETRAK —

A CEFPI Brief on Educational Facility Issues

Topic: Learning to Learn, Pre-kindergarten — Kindergarten Design Implications

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As the current K-12 generation approaches societal maturity they will encounter issues that are changing almost as fast as they are identified. Fast on the heels of the elementary population are the pre-kindergarten children who will be facing an ever-changing global society. Business and educational leaders have called for universal preschool education that will meet the developmental needs of pre-k children. These developmental needs are identified through research that supports the advantages of early childhood education and intervention. The primary goal is to close achievement gaps as they invest in the future. As world competitors in the global marketplace make investments in early education, and domestic social and economical conditions dictate the need for childcare, the call for implementing pre-k universal programs is being heard. State funded preschool programs have expanded over the last decade. By the 2001-02 school year 40 states had preschool programs including Oklahoma, Georgia, New York, West Virginia and Florida.

Recognizing the knowledge-based global economy, the increasing number of English language learning children, federal initiatives, and other issues effecting education, the National Association of Elementary Principals state, "Early education ensures that we leave no child behind."ⁱ The social benefits of high-quality early learning programs and the long-term effects of early intervention on achievement are continually supported by research. Preschool has been shown to increase early reading and math skills in kindergarten and studies found that children who attended quality preschools demonstrated lower incidents of social problems.ⁱⁱ While others have analyzed the cost benefits of intervention and show a return of four to seven dollars for every dollar invested in early education.ⁱⁱⁱ

A national survey of American families revealed 82% of three and four year olds with employed mothers are in non-parental care, and 43% use child care centers for this care.^{iv} With so many children already enrolled in environments outside of home, attention must be given to the merits of pre-k education. It is important to note that the research explaining the benefits of early education, qualifies the findings with the descriptive phrase "high quality." As states come on-line with pre-k programs they are requiring certified, degreed teachers and standard approved curriculums. These requirements are elevating the importance and professionalism of the early childhood learning environment.

DESIGN BASED ON DEVELOPMENTAL NEEDS

High quality early childhood programs must be supported by the facilities housing them. The built environment needs to complement the level of professional expertise required as it allows for the creation and implementation of a high value program. Pre-K facilities need to be planned and built based on the research available as it relates to early childhood curriculum delivery methods and developmental attributes of children. Designs based on nursery school models, typical elementary schools, corporate franchised daycare or most home care environments are not adequate models to follow. Elementary school archetype, especially classroom layout, is a commonly applied model guide used for the design of a preschool. This practice ignores the needs of the preschooler and limits the early childhood educator's ability in delivering the curriculum.

The early childhood environment is a unique educational setting. Each preschooler's developmental needs must be met by the facility in order to achieve the full benefit of early intervention. Preschooler's needs are distinctive to their age, size, abilities and how they learn. Environmental support is essential to their learning process. Children fully experience the moment, responding immediately to the situations around them. As they maneuver in their space, interactions with their surroundings create responses and consequences. These responses become learning experiences, thus qualifying the environment as part of the curriculum.^v

DESIGN BEGINNINGS

The logical starting point for designing an early childhood center is to understand how children develop. Comprehending how they learn is essential before any size, shape or space requirements are discussed. It is imperative to see the entire preschool experience through the eyes of a three or four year old, which provides a base for design decisions. The organization of space in an early childhood facility can either advance or discourage secure feelings through personalization, friendliness, predictability, familiarity, safety, all of which are essential in an early childhood atmosphere and surroundings. Creating these positive impressions should supersede any architectural design statements.

Children develop by interacting with the social and physical world around them, by observing consequences created by their own operations with the materials that make up the environment they explore.^{vi} To facilitate these interactions, the built environment must allow for discovery. Upon discovery, assimilation to the environment occurs. Once the child has assimilated to a social or physical encounter an accommodation to the situation develops. After accommodation there is an adaptation to the experience. When the environment allows, assimilation, accommodation and adaptation to occur in a safe comfortable space, the bases for expanding knowledge is created.

Two educational models that are based on developmental needs of the child can be used as guidelines and inspiration in facility planning.

The Montessori curriculum focuses on learning through experiencing hands-on activities. The striking feature of the facility's space is a home like quality. Dr. Maria Montessori referred to her classrooms as the "Child House." There is an emphasis on natural materials that enhance sensory stimulation. Rooms are warm in hue and filled with plants. Design elements of scale, shape, color, texture and light play significant roles in the learning process as the children discover and appreciate the details of their surroundings.^{vii}

The Reggio Emilia (named for a city-run early childhood environmental program in Reggio Emilia, Italy) is considered to be the "third teacher." The space is arranged to adapt and change depending on the direction of study. Classrooms and public areas are adorned with plants, collections of the children's mementos from nature outings and/or their projects. Adjacencies to the center piazza and surrounding support spaces by means of windows, passageways, courtyards and doorways are important. Clearly designated spaces for large and small group activities along with a studio (atelier) are specified to encourage social encounters and individual discoveries. Natural, soft, warm colors reflecting nature bring the outdoors in and do not compete with the display of collections or artwork.^{viii}

DESIGN ELEMENTS

There are four basic elements that must be addressed in the design of the early learning environment; MOVEMENT, COMFORT, COMPETENCE and CONTROL.^{ix} With the incorporation of these elements, the facility provides the child with the opportunity to participate in the learning process. The built environment is actually working, enabling the staff to facilitate the optimum learning experience for the child.

MOVEMENT – A child's most effective learning occurs when total physical participation is allowed to take place. Adequate square footage is necessary for activity and physical action; a variety of activity; and, change in stimulus to occur.^x Movement allows children to access varied environment areas, investigate their abilities, create their own limitations and exhibit skill, all of which encourage discovery through their surroundings. Movement is the foundation of intellectual development.

COMFORT – Comfortable feelings establish a willingness to investigate the environment. The teachers must be able to manipulate the classroom setting freely to create exciting but secure settings. Moderate levels of stimulation create a comfort zone. Too much stimulation can lead to heightened arousal, while too little leads to boredom. Significant changes in stimulation can be worrisome or perplexing, while anticipated change aids in maintaining a high level of awareness and alertness. This is referred to as "difference-within-sameness."^{xi}

COMPETENCE – Being able to traverse the surroundings develops skills and adeptness. The facility should support practices that teach independence, responsibility and decision-making. Dr. Anita Rui Olds, respected educator, designer and children's advocate explains, "A variety of things to do, a variety of places in which to do them, along with well organized and accessible loose parts and objects, enhance children's ability to work competently."

CONTROL – Supervision and complete access to children is paramount. Yet, at times, children need to be able to remove themselves from the group or interact with just one or two classmates. The environment must be responsive to this need. Secluded corners, private areas, and odd shaped enclosures arranged with adult sight lines, allow opportunities to break away while maintaining individuality and ability to avoid over stimulation. Climbing for a bird's eye view from atop a loft or ducking into a cubicle and observing the actions of others are one means of exercising control (Olds, 2001).

Fixtures and furniture scaled for children allow easy manipulation create a sense of controlling the surroundings. A door at child-height is a design element worth incorporating as an entry into a building or classroom. This element provides opportunity for a child to experience movement, comfort, competency and control. It is an invitation to enter. Visually saying, "This place is for you."

SIZE AND SHAPE

Licensing in most states requires a minimum of 35 sq. ft. of activity space per child in each classroom. Reasoning supporting 35 sq. ft. minimum requirements is hard to find. The possible source might be from a health department study stating that school children need a minimum of 35 sq. ft. to prevent the spread of communicable diseases in the classroom. The study does not refer to curriculum or developmental needs.

Usable activity classroom space does not include bathrooms, cubbies, storage areas, or any part of the room with built-in furniture or equipment. Research conducted for the U.S. Corps of Engineers developing standards for Army child development centers, recommends

42 sq. ft. of activity area per child and 50 sq. ft. as optimum. While the U.S. Dept. of Defense uses 45 sq. ft. standard in their *United Facilities Criteria for the Design of Child Development Centers*. The Head Start Technical Assistance Center recommends 50 sq. ft. The *National Health and Safety Performance Standards*, jointly published by the U.S. Dept of Health and Human Services, American Pediatrics and the Public Health Association also specify 50 sq. ft.^{xii}

Density plays an important role in children's social behavior. Research shows that 40-45 sq. ft. provides the optimal requirement for positive social interaction.^{xiii} With more than one child per 30 sq. ft. aggression and less relevant involvement was exhibited. While densities lower than one child per 50-55 sq. ft. could possibly cause lower levels of social interaction.^{xiv}

The shape of a classroom needs to be proportionately balanced. Rectangular rooms of at least 20-25 ft. wide will accommodate activity centers on either side of the room. This allows for a 3-5 ft. circulation pattern through the center. Large square rooms create dead space in the center, which can encourage wandering. Rooms with deep L-shape may be difficult to monitor. Angular rooms are especially difficult because corner space, which is valuable for the layout of activity boundaries, is compromised.

Nooks and alcoves can create interesting spaces for learning. Fixed fixtures, door swings, columns or wall partitions must not impair sight lines. Storage closets, cubbies, built-in cabinets and sinks need to be located strategically so as not to obscure supervision or encumber the usable activity space. Design the footprint of the room to keep as many corners open as possible.

Additional design elements that will impact the shape and size of the classroom need consideration as well. Universal Design, Daylighting, Zoning and Acoustical issues all play important roles in the daily learning process.

UNIVERSAL DESIGN – Attention must be paid to the special needs of all occupants. These design principles as suggested from the Center for Universal Design, will be helpful: equitable usage, flexibility in use, simple and intuitive, perceptible information, tolerance for error, low physical effort, and size and space for approach and use.^{xv}

DAYLIGHTING – Windows for views and natural light are without a doubt beneficial. Keep in mind three crucial principles:

1. Daylight, not sunlight, is desirable. Energy efficient means of controlling the daylight will pay off educationally and financially.
2. Safe, operable ways to control the amount of light for nap times and/or strong sunlight hours must be considered.
3. Preschool children need to benefit from the view outdoors. Place windows with accessible sight lines to keep the outdoors in view.

ZONING – Wet and dry areas need to be identified within the footprint of each classroom. Raising plumbing issues during the schematic phase of design will allow consideration of strategic placement as supervision concerns are explored.

Within the wet and dry areas of a room are activity zones or sections.

1. The entry section provides a familiar space as the child transitions for their time in school. Here, the greeting and day ending activities take place. Social interactions occur and independence and a sense of belonging are developed. This zone should provide a traffic pattern that directs the children into the classroom. With this structure children are less likely to roam after entering the classroom.
2. The messy section accommodates cooking, science, art, woodworking, water, sand and clay projects. Easy washable resilient flooring and access to a sink are necessary. Storage for supplies and tables for eating, drinking and projects are required.
3. The active section houses the dramatic play, doll and block play, puppets, music and movement centers. This area works best located adjacent to the messy zone.
4. The quiet section includes centers for reading, math, computer, manipulatives, writing, gathering and listening, private spaces and resting. These activities do well in protected corners. Conceptual usage of technology for data port placement is essential. Also, consider the floor as a work surface requiring an area rug or carpeting.

ACOUSTICS – Clarity of verbal communication as young learners are formulating speech patterns is essential. Their ability to fill in an unheard word is obviously underdeveloped. Research is providing evidence that strict attention to the clarity of speech by controlling the sound to noise ratio within the space improves achievement gaps on standardized testing.^{xvi} Chronic noise has a negative effect on developing reading skills.^{xvii} Attention to material finishes, adjacencies, and sound enhancement equipment are crucial components for high quality acoustics.

ENVISION THE FUTURE

Early education has profoundly affected many people who have themselves envisioned the future. Albert Einstein liked to tell about a “wonder” he saw when he was four years old. It was a magnetic compass. The swing of the compass needle northward by some invisible force convinced him that there had to be “something behind things, deeply hidden.” Frank Lloyd Wright himself describes his play with Froebel's kindergarten blocks as “a basis for design and the elementary geometry behind all natural birth of

Form”... the smooth shapely maple blocks with which to build, the sense of which never afterwards leaves the fingers: so form became feeling.”^{xviii}

The creation of a child's space is an exceptional experience. When those who design the space view it through the eyes and thoughts of a child, the importance of visual impact and function in space become particularly significant. By basing planning and design guiding principles on research expressively compiled for early childhood environments, along with a conscious thought of what the environment teaches and how it supports the developmental needs of children the results will be a premium learning environment. Incorporating elements that encourage perceptual awareness in a multi-sensory learning space will assist a high quality program in teaching how to learn, there-in improving the development of successful higher achieving life long learners.

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