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The physical environment factors in preschools in terms of environmental psychology: a review

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Abstract

This paper sets out an explanation about the importance of the environmental psychology in preschools. The field of environmental psychology has emphasized how the physical environment affects feelings and behaviors. Preschools are systems in which the environment is just one of many interacting pedagogical, socio-cultural, curricular, motivational and socio-economic factors. Effective learning setting is a combination of several different factors; adequate usable space, noise, air conditions, color and lighting. This study considers implications from recent researches about physical environment in preschools and their reflections to the literature in the light of environmental psychology.

1. Introduction

An environment is a living, changing system. More than the physical space, it includes the way time is structured and the roles we are expected to play. It conditions how we feel, think, and behave; and it dramatically affects the quality of our lives. The environment either works for us or against us as we conduct our lives (Greenman, 1988). Physical environments play an important role in the behaviors or cultural practices that take place within them. The quality of the environment, the presence and condition of its features, the decay that it suffers, and the level at which it is maintained, are all factors in the quality of the activities that take place in it (Durán-Narucki, 2008).

Environment and behaviour specialists have noted particular concerns with design features of these settings that impact the very youngest children—children whose age means they have very short attention spans and are easily distracted by visual movement and by noise (Bell et. al., 2001). Until the preschool age, children are presumed to view environments egocentrically, relating them only to themselves. Gradually, this mode is replaced by a fixed frame of reference in which the child orients in the environment in relation to some fixed landmarks (Bechtel & Churchman, 2002).

What places afford we argue is not just important for the child's here-and-now but also for their long-term personal cognitive and emotional development. There is now growing body of literature that evidences what children gain from their experiences of places: ranging from those 'special places' which allow for the imagination, and a sense of personal control and freedom, to those social venues where one can learn about one's community, and be recognized by others for one's part in it. Designing and supporting places which maximize the chances for a child's cognitive and social development are therefore another campaigning issue where environmental psychology can offer convincing evidence, in support of those arguing for the rights of the child (Spencer & Blades, 2005).

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The physical environment is a critical part of any child care program and has an important role in children's behavior and development. The many children cared for outside the home will spend most of their waking hours in such a setting. It is therefore critical that such places support all the developing child's needs. Physical attributes contribute to the meaning of place by supporting or inhibiting the individual's ability to control, personalize, and have meaningful relationships in the space (Maxwell & Evans, 2002).

2. Method

The literature of environmental psychology was reviewed carefully in the light of pioneer studies and leading theories of certain disciplines such as educational sciences especially early childhood education and psychology. Exclusively on-line literature search within the Educational Resources Information Center (ERIC) and PsycInfo etc, were conducted. As one may find many contradicting theories of, this descriptive study particularly focused on centering the whole discussion of the article around the fundamental principles of environmental psychology are accepted as universal by different disciplines. It is also that the interested people reach the synthesis information, related scientific research, contemporary developments in the boundaries of the article.

3.The Factors In Physical Environments

Many aspects of the school children's attitudes and mood such as their concentration, interest, attention, stress, fatigue and arousal probably affect their scholastic performance. These qualities may in turn, be affected by the psychosocial factors, work organization, educational methods as well as the physical environment as climate, light and noise (Lundquist, Kjellberg & Holmberg, 2002). Environments can be defined based on their objective, hard and quantifiable physical properties, Specific aspects of the physical environment include: lighting, noise, color, and air quality (Spivack, Askay & Rogelberg, 2009).

3.1. Space

Indoor and outdoor environments are arranged to encourage different types of play which are interesting, safe, appropriate and challenging for children. Appropriate space should be set aside for play. It should be big enough to allow for the free-ranging activities of a child in relation to her age and developmental progress. Play space should be safe and should also lend itself to exploration and investigation by the child.

Creating public and private zones in child care spaces is complex and should be paid great attention to activity area in classrooms. Center-wide gross motor or group activity areas could locate away from rooms where infants sleep. Unsuitable environment can create excessively noisy spaces (Maxwell & Evans, 2000).

Children need space where they can play with others but also smaller, quiet spaces for their own solitary activity, providing opportunities for autonomy and independence but also a secure base to which they can return or retreat, as and when necessary. Indoor and outdoor places are both important. Children seek adventure and challenge in their play outdoors; they explore places and enjoy transforming spaces to create imaginary worlds (Tovey, 2007). The indoor space should be large enough to accommodate a desirable number of children. The centre's capacity is determined by space for indoor activities. It is computed based on the minimum space requirement per child, that is 3m² of usable floor space, excluding service areas. Any single activity area for children must be able to accommodate no less than 4 children at 3m² per child after deduction of the passageway. As for infant care, the minimum space requirement per infant is 5m². Similarly, the minimum space requirement does not include the space for service areas, entrance areas, hallways, passage ways and diapering areas. the child care centre must have access to outdoor play space. If this is not possible, there shall be an additional indoor gross motor activity area. The space provided, both indoors and outdoors, shall be at least 30 m² or one-fifth of the centre's capacity at 5 m² per child, whichever is more. The gross motor activity area shall exclude service and children's activity areas (Child Care Division Ministry of Community Development, 2011).

3.2. Noise

Noise is, of course, only one of many factors that affect the classroom climate and the children's mood (Lundquist, Kjellberg & Holmberg, 2002). Although extremely limited, the research on school noise can be *divided* into two categories--studies that have looked at the impact of external noise, generated by airplanes and surface traffic, and studies of internal noise, generated by the daily activities of teachers and students (Rivlin & Weinstein, 1984).

High background noise level is certainly a common and significant problem at many daycare centers and schools. A number of measures were taken to decrease the noise levels, including decreasing group sizes. The optimal number of children was found to be 3 or 4 to 6 or 7 children per preschool teacher in order to achieve low noise levels and also good cooperation between the children. A number of steps were taken to improve the acoustics so that space and rooms became more efficient for the pedagogical aims (Södersten, Granqvist & Hammarberg, 2004). Maxwell & Evans (2000) demonstrated that there is a link between interior chronic noise levels and pre-reading skills in pre-school children. Children's use of, and understanding of, language is poorer in loud classrooms.

The center should not be located near noise sources such as major highways, street intersections, railroad lines, or airport flight paths without mitigation. Maximum acceptable noise levels at the center's exterior are as follows: Outdoor play yards: continuous: 70 dBA (decibels), intermittent: 80 dBA; centers with sleeping and quiet areas placed next to outside wall continuous: 60 dBA, intermittent: 65 dBA; centers with sleeping and quiet areas protected and not located along outside walls: continuous: 65 dBA, intermittent: 70 dBA (U.S. General Services Administration Public Building Services, 2003). In Truchon-Gagnon & Hétu's (1988) research, noise exposure levels exceeding 75 dB were found in four settings from the seven daycare centers. The noise level in preschool settings is not ideal.

Most efforts to reduce noise are directed at the classroom and at appropriate selection of room adjacencies and scheduling of classroom activities within the building. Careful school planning and design of new buildings and thoughtful modification of existing sites can alleviate noisy conditions in the school. Appropriate noise studies (including reverberation time, signal/noise ratio, and ambient noise level) in classrooms, corridors, cafeterias, music spaces, and other important areas should be obtained to guide interventions (Geller et. al., 2007).

3.3. Air Conditions

Earthman (2004) rates temperature, heating and air quality as the most important individual elements for student achievement. Furthermore, it is notable that air conditioning, ventilation and heating systems are found to contribute quite distinctly to the level of classroom noise (Dockrell & Shield, 2004).

The lung is not well formed at birth, and development of full functionality does not occur until approximately 6 years of age. During early childhood, the bronchial tree is still developing (Schwartz, 2004).

Outside play time is important for children to get exercise and to learn motor skills. However, when children are playing outside, they take in more air than adults, and can be exposed to a lot of pollution. Children should be kept inside when air quality is poor, or should at least be discouraged from intense outdoor activity. Educators and parents should be aware that nearby construction and traffic can increase pollution (Arizona Department of Environmental Quality, 2006).

Schools are one of the important indoor locations in which children spend the most time and children most spend their time in indoors more than outdoors. Thus, indoor air quality is as important as outdoor air quality (Anderson and Bogdan, 2007).

Schools can be prone to poor air quaility. Schools typically have more people in closer spaces than other buildings. Children, because of their size, may be more susceptible to pollution and contaminents than adults. The materials used—art and science supplies and eqıipment in industrial or vocational classes—can generate pollution. Poor air conditions can harm the quality of education, according to the EPA (Environmental Protection Agency). It can create an uncomfortable environment that makes it more difficult for students to learn, cause more health problems and absenteeism among students and staff; spread airborne infectious diseaese; contribute to the deterioration of the school building and equipment (Kennedy, 2001).

3.4. Color and Lighting

Both color and texture have a great impact on children. The sense of touch is directly related to cognitive development, and color has far-reaching effects which influence behavior. While cool colors tend to have a calming effect, and warm colors tend to create warmth and excitement, a consistent extreme of either in a center is not desirable. The overuse of a strong color scheme should be avoided, as this may result in over-stimulated, excited behavior. Color variety can come from toys and the children's artwork, Color is used to designate areas for specific activities such as art or reading. Tactile experiences are provided with water tables, plants, and a variety of furniture coverings (U.S. General Services Administration Public Building Services, 2003; Maxwell and Evans, 2002).

In Boyatzis and Varghese's (1994) research, children had positive reactions to bright colors (e.g., pink, blue, red) and negative emotions for dark colors (e.g., brown, black, gray). Read, Sugawara and Brant (1999) found when subjects were in physical environments with either differentiated space; differentiated ceiling height or wall color, the preschool children's cooperative behavior scores are effected. Hamid and Newport (1989) found pre-school children's strength to be affected by room color. The children's strength was greater when the children were in a pink room. When the children moved to the grey room, their measured strength decreased if they had been in the pink room, but increased after being in the blue room. The children's strength was also lower when they were in the blue room. Additionally, the pre-schoolers were more likely to paint positive paintings in the pink room and negative paintings in the blue room (Stone and English, 1998).

The relationship between environmental color and mood is unclear. In some instances, though, red and yellow colors (primary colors) appear to be stimulating in a child's environment as children respond to strong colors in their early stages of development and blue and green colors tend to be calming (Stone, 2001; Poore, 1994). A school should be a fun place that encourages learning. The use of full-spectrum color creates an energy that is uplifting and positive. Children love color and respond it well—but does not mean the only approach is to use primary colors. Use of high-reflectance colors in corridors and stairways, and sharp accent colors on railings and doors, can define points of orientation. In the classrooms, the color palette should not a distraction; rather, it should promote concentration through use of a neutral palette with accent brights (Marberry and Zagon, 1995).

Classroom lighting plays a crucial factor in student performance. The importance of an appropriate visual environment for learning tasks deserves careful consideration. The visual environment affects mental attitude, and performance. Lighting of a school should be thought an efficient component of the educational settings and good lighting contributes significantly to the aesthetics and psychological character of the learning space (Phillips,1997).

Conclusion

During the few years, a new perspective has been developed which place an emphasis on the relation between architectural organization and knowledge of the habits and practices, typical of the various social spheres to which the inhabitants belong. This paper summarizes evidence of environmental psychology in early childhood settings and the quality of early childhood environments. In this study environmental psychology literature is reviewed as it focuses on children's needs, experiences and development in preschool classrooms. We have outlined several factors from the environmental psychology perspective. Many factors must come together to support the school environment. All these factors have an impact on children's learning and behaviour. We draw out the factors; space, noise, air conditions, lighting and color, which effect the preschool environment.

For indoor and outdoor areas, it's necessary for children to have enough space to act and move easily. Children should have enough space but too large areas are not suitable for them.

In preschools noise level is away from to be ideal. There is an important link between learning and noise. Noise control is very important in preschools. Too noisy areas effect the children's development and skills in a bad way. The schools are supposed to be away from the noisy areas and should be in quiet areas. Number of children is important to reach low noise level.

Air quality in preschool is one of the most important factors. Children are sensitive to diseases caused by bad air conditions. So many materials (soaps, cleaning materials, toys, building materials, art supplies etc.) cause gases. Gases effect the children by breathing. These materials should be used carefully in preschools and they should have

high quality. When the air quality is not good enough in outdoor environment, the children should be kept away from the open air.

Colors and lighting effect the children's mood, learning and behaviour. There should be several colors in preschools but should be avoided to use very bright and strong colors. In classrooms, it's important to use colors which provide concentration. It's recommended to use neutral and bright colors together. Lighting plays very important role in learning. Architectural design is important in lighting. Windows and doors should be designed to receive the daylight.

A good environment supports the children to feel safe, free and secure. Feelings play an important role in learning. Design and architecture has an impact on children's physical, social, cognitive and emotional development. Good design is necessary for a positive child development. Many researches show us the development between 0-6 years is very important in human life. If we support children with good preschool designs, they will have key abilities for their lifes.

In this study, we point out that many researches in which the environmental psychology factors have drawn upon ideas similar to ideal preschool physical settings. We need a systematic, cross-disciplinary studies to develop an integrated knowledge base for the design school settings environments. Educators, environmental psychologists, educational psychologists, program planners, architects and especially policy makers need to work together in providing suitable environment of preschools. Future work should also observe appropriate environment affects on children as well as between children and their teachers and/or parents in the light of the cultural differences.

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