Designing a Child Participated Building Evaluation Tool: A Review of Literature (Naghmeh Pak and Andrea Wheeler)

Andrea S Wheeler, Iowa State University
Naghmeh Pak, Iowa State University
Designing a Child Participated Building Evaluation Tool
A Review of Literature

Background
Because the foundation of an individual’s health and well-being is laid in their childhood, evaluating health and comfort factors in the environment in which children live their daily lives has a different perspective on design quality and define comfort differently from that of adults, but schools are generally designed without consultation with children. School is a designed setting that a child resides in on a daily basis, and the United Nations Convention on the Rights of the Child argues that it is simply a matter of a child’s right to be consulted about his or her day-to-day environment, “the child’s views must be considered and taken into account by those exercising authority on behalf of children” [1]. However, for children, comfort is not stand-alone, for instance in the evaluation of buildings include a trend toward the standardization of methods in order to collect comparable data for building types; but also a persistent prejudice against the value of children’s experiences, deeming children unreliable research participants [2]. It can simply be the difficulty in developing methods appropriate for children. Architectural engineering has yet to respond to the rights of the child. Comfort: comfort is through human senses: sight, hearing, taste, touch, and smell. Each sense can lead to a greater or lesser degree of comfort. However, children experience comfort differently from adults [3]. They experience spaces differently and have knowledge about the performance of a building that is different from adult users; they can also have a perspective on design quality that is different from that of the architect. Designing a tool that includes children’s perspectives has value not only in terms of improving building performance, and thereby energy performance, but also in delivering the educational objectives of schooling and in enhancing the learning and wellbeing of architectural and developmental levels, providing healthy human beings for the future.

Indoor Air Quality (IAQ)
Indoor allergens, such as dust mites, molds, and pollens, can lead to allergic reactions in some people. In addition, pollutants from building materials, such as formaldehyde, can cause respiratory problems. Children are more susceptible to these problems than adults because their immune systems are still developing.

Daylighting
Daylighting has been proved to be equally important. Daylighting effects have been studied in a number of different geographical locations and climates. Daylighting has a significant impact on the potential correlation between daylighting and student performance [9].

Acoustics
Acoustics play a significant role in the design of buildings. Poor acoustics can lead to decreased learning outcomes and increased stress levels. Children are more sensitive to noise levels than adults and can be particularly affected by noise in industrial environments.

Temperature and humidity (thermal comfort)
Thermal comfort is a subjective experience, and comfort levels vary between individuals. Additionally, many factors can influence an individual’s comfort level. These factors can include, but are not limited to, the building’s design, the building’s location, and the building’s orientation.

Methodology
This background and this stage of the research, the question is how to align a theoretical position and an associated appropriate methodology for building performance evaluation. This paper reviews the literature describing the many methods adopted to evaluate school buildings, with a particular interest and emphasis on the value of child participation in that evaluation and the potential to design ways to accommodate the specific environmental experience of children. The researcher develops a child-focused building performance assessment tool for schools: first, to evaluate the performance of new schools in Iowa in terms of environmental quality, design quality, and energy performance—the immediate value of which is in remedying design flaws or building management issues (and may encourage sustainable behavior) and second, to collect an evidence base for designing child-centered learning spaces and school buildings: the value of which suggests improved educational performance, psychosocial development, and wellbeing [7].

Table 1: Pilot Building Assessment Tool schedule

<table>
<thead>
<tr>
<th>Month</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>House survey, visit school, identify classrooms, interview ergonomic experts, parent consent, visit dates.</td>
</tr>
<tr>
<td>April</td>
<td>Conduct pilot survey questions on Comfort and IAQ.</td>
</tr>
<tr>
<td>May</td>
<td>Simple survey for child comfort.</td>
</tr>
<tr>
<td>August</td>
<td>Conduct pilot survey questions on Comfort and IAQ.</td>
</tr>
<tr>
<td>September</td>
<td>Conduct pilot survey questions on Comfort and IAQ.</td>
</tr>
</tbody>
</table>

Conclusion
Designing green schools cannot only address energy conservation, but must address health and well-being. Comfort issues cannot be neglected in the design of new and sustainable schools. Comfort understood through the perceptions of children offers a new approach. Hence, the objective of the building performance assessment tool is to be a means of collecting evidence for designers to create learning spaces not only of the highest possible environmental quality, but also of educational and psychological features—organization of tables and chairs for example in relation to outdoor spaces—but at the level of less obvious comfort experience of the different users: lighting levels, temperature, CO2 levels, sound quality, and pollutants. The position taken in this research is one of determining an appropriate approach, which places children’s experience of comfort in relation to their learning environments at the center of the conversation on green schools.