Environmental Design Evaluations

Habib Chaudhury, Ph.D.
Benyamin Schwarz, Ph.D.
Ruth Brent, Ph.D.
Department of Environmental Design
University of Missouri-Columbia

[Add here an introduction to the whole environmental design evaluation process.]

Professional Environmental Assessment Protocol (PEAP)

Professional Environmental Assessment Protocol\(^1\) was used to conduct focused evaluation of the Kingswood facility before and after environmental modifications. This instrument is based on eight attributes of environmental experience that includes

- awareness and orientation,
- safety and security,
- privacy,
- regulation and quality of stimulation,
- functional abilities,
- opportunities of personal control,
- continuity of self, and
- facilitation of social contact.

The primary advantage of PEAP is its documentation of both discrete and global aspects of the environment that supports the eight attributes. Scores across the eight dimensions serve a baseline assessment of the environment before and after renovation at Kingswood. Using this instrument, assessment of the facility was conducted by four members of the research team to ensure reliability.

The newly constructed cluster scored higher in all eight dimensions of the instrument compared with the scores of the facility before renovation. The dimensions of maximize awareness and orientation, provision of privacy, and facilitation of social contact had the highest variation in the pre- and post-renovation PEAP scores. Score difference in the privacy dimension can be explained by the fact that majority of the residents' rooms in the new cluster were single-occupancy, whereas the majority of the residents' rooms in the pre-renovation facility were double occupancy. The score difference in facilitation of social contact can be attributed to the cluster floor layout that allowed direct visual and physical access to the activity area from the residents' rooms. This centrality of the living
area and adjacent dining area also impacted the two-point variation in the PEAP dimension of maximize awareness and orientation. Residents' rooms surround the new common living/activity space in each cluster. This arrangement increases the potential of utilization by the residents compared with the location of the activity space before the renovation, which was far from the residents' rooms. Pre and post-renovation PEAP scores were as follows:

<table>
<thead>
<tr>
<th>Environmental Attribute</th>
<th>Pre-Renovation Score</th>
<th>Post-Renovation Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximize Awareness and Orientation</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Maximize Safety and Security</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Provision of Privacy</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Regulation of Stimulation:</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Quality of Stimulation</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Support Functional Abilities</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Opportunities of Personal Control</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Continuity of Self</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Facilitation of Social Contact</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

**Behavioral Mapping**

One of the central questions to be answered in this research was how were the various spaces utilized, how many people used them, and who were these users. The different spaces included the nurses' station area, activity room, dining room, kitchen, and hallways. User groups included residents, staff, and administrators. The behavioral mapping study, which involved direct observations of spaces in a systematic way, was the primary method to gather data to answer the research questions that pertained to the physical environment of the facility. More specifically, results of behavioral mapping indicated:

- How often various spaces in the facility were used
- Who were the primary users of those spaces
- What were the patterns of activities in those spaces
These results explain the impact of environmental changes on residents, staff and families. In this study we used place-centered behavioral mapping for observation of activity patterns of residents, staff and visitors in different public spaces. The place-centered approach showed how people placed themselves within particular rooms and the activities in which they engaged. This method is different from the person-centered behavioral mapping, which involves recording actions of particular persons wherever they are located and move around.

Although person-centered observations do not provide any indication of how many people use a room for a particular activity, the data may provide information on the areas that compose each person's home territory. The initial research design for this study included both place-centered and person-centered behavioral mapping; however, the latter was not conducted due to the uncertainty of which residents will move to the new cluster. It was decided that place-centered mapping would be conducted to find aggregate data pre and post-renovation of the facility. Observational instrument consisted of floor plans of the two levels of the facility and a checklist of possible types of activities. The checklist is based upon previous behavioral mapping in long-term care facilities.

Data were gathered for randomly assigned half-hour periods from 9:00 am to 6:00 p.m. on various days of the week including weekends. The procedure involved documenting the group, number of users, and activity pattern in a given space for a particular period of time. The specific identity of a user was not observed. Therefore, data evolved in terms of aggregate numbers of residents, staff or visitors without reference to the specific identity of the individuals. Behavioral mapping was conducted in three phases: a) prior to the environmental modifications, b) immediately after relocation in the renovated setting, and c) three months after relocation. The following are the behavioral mapping timeframes:

- Pre-Renovation: 20 hours
- Post Renovation (immediately after renovation): 22 hours
- Post Renovation (three months after renovation): 20 hours

Observations were conducted in the shared or common spaces, i.e., dining/activity space, lounge areas and hallways. Private areas, e.g., residents' rooms, rest rooms and tub-rooms, were excluded for behavioral observations. Frequency counts were calculated for number of residents or staff using the different spaces, as well as the types of behavior they were engaged in. The...
frequencies were converted to percentages and are represented in the charts in Appendix B. The inter-reliability of the observation was assured by the fact that two researchers completed the same data gathering route for two hours in each observation session and compared their results.

Results

The most utilized spaces in the facility were the main activity lounge on the first floor and the nurses' stations on both first and second floors (see floor plans in Appendix A). The majority of the programmed activities for the residents were held on the first floor activity space. This posed certain challenges of access for some residents on the second floor. Residents on the second floor had to take the elevator to go down and find their way to the activity space. For this indirect route of access, some residents on the second floor sought assistance from the staff in order to get to the activity room. Pre-renovation behavioral mapping indicated that activities in the main lounge on the first floor had on average twenty to thirty residents.

Overall, the majority of the residents seemed to be actively engaged in the activities. Only few residents were dozing or set with no engagement. Post renovation data indicated that the number of residents who were using the first floor activity space declined, as they were spending more time in the new common living/activity spaces within the new clusters on both floors. Post-renovation activities were offered in the large activity room as well as the activity spaces in the clusters. Active engagement was slightly increased in the new cluster activity spaces. This can be explained by the smaller group size in the new clusters, i.e., ten to twelve residents, versus twenty to thirty residents in the first floor activity lounge pre-renovation.

However, post-renovation data indicated that during the programmed activities for all the residents, in the main activity room on the first floor, there were some residents who preferred to spend time in the common living/activity areas and not to join the group in the main activity space. This option of easily accessible living areas in the clusters allowed them to choose between staying in their own households and going to the main lounge. Although residents in the new clusters could informally interact with fewer fellow residents in a smaller, residential-scale living area, they could not benefit from programmed activities in these spaces because they were not offered.

This finding demonstrates the importance of organizational decisions regarding staffing and staff training, which need to follow the environmental design in order to take full advantage of an innovative architectural
setting. De-centralized activity spaces require additional activity staff to conduct the range of activities that are suitable for the newly designed common living/activity areas. At the time of data collection for this study, the administration considered hiring additional staff and offer more meaningful activities for residents with dementia. However, the study was completed before the new programs were instigated.

The two aviaries were popular locations for residents on both floors. Although the characteristics of the aviary locations were very different in post-renovation time compared with the nurses' station in the pre-renovation, the nature of the activities had some minor changes. Residents seemed to be congregating around the aviaries passive spectators. The difference in usage of the aviary instead of the nurses' stations, but they continue to be area resulted from the family visitations. Family members tended to use the aviary space more often. In the post-renovation phase, families set with their loved ones in the aviary area in contrast to the pre-renovation phase in which the space was dominated by the nurses' station. Renovation of this area reduced the institutional appearance that is frequently associated with the dominant nurses' station.

The nurses' station was reduced in size and was relocated to the side of the general service area. This design allows opportunities for easy visual and physical interaction among staff members and residents. Staff members can engage in various tasks at the new nurses' station, and at the same time they can maintain natural supervision over the residents that are situated around the aviary. However, the popularity of the aviary could be attributed, in part, to the lack of adequate programmed activities in the other common areas. This, of course, was due to organizational aspects in the facility rather than the impact of the physical environment on the residents.

The three dining rooms on each floor that were created during the renovation are smaller in size and less institutional in ambiance, compared to the single large dining space that served the facility before the renovation. Mapping data indicated that there were fewer incidents of disruptive and agitated behaviors in the new dining areas than in the larger dining space that served the residents prior to the renovation. The number of residents that were served in the new dining spaces was 8-10 compared with the 25-30 residents who had their meals in the large dining area before the renovation. Staff seemed to have more sustained conversations with the residents in the new dining spaces than they were having in the old dining space. These positive aspects of the new dining areas could be attributed to the significantly smaller number of residents in one space. Staff members have more time
and control in interacting with fewer residents. Also, in the large dining area, it was observed that one resident's disruptive behavior may have triggered other residents' similar behaviors. The reduction of group size in the new dining areas reduced the possibility of this chain effect of disruptive behaviors.

The overall conclusion of the behavioral mapping study is that the multiple activity spaces on both floors are utilized much more by the residents due to their ease of access compared to the large activity space on the first floor. Although active engagement in planned activities in the new cluster common spaces have slightly increased, the residents spend a significant amount of time in null behavior in these spaces due to lack of adequate planned programs specifically designed for these areas. The aviaries are popular areas for engagement among residents and have provided an option for interactions during family visitations. Decentralized dining areas have fewer disruptive behaviors from the residents and at the same time the spaces seem to encourage greater social interaction among staff and residents.

References


