Recent Findings on Communication Productivity and Facility Design

Research Question: How do three recent laboratory project perform in terms of supporting informal interaction among scientists?

Design Goal: To develop science building design guidelines based on objective, measurable criteria.

Background

Forty years of studies on the behavior of scientist, including studies that consider the role of the physical layout on communication patterns have established that:

- Informal communication is the single most important indicator of research productivity.*
- Highest performing scientists in groups spend more time communicating than lower performing scientists.*
- In research facilities, most informal communication occurs in offices.*
- Frequency and location of informal interactions are affected by distance, building layout and visibility. *

* Please contact mserrato@lasarchitect.com for references.

Methods

Three laboratory buildings designed by our firm were selected as research sites. Eighteen to twenty people were selected at each site to respond to interviews and questionnaires about their informal communication habits. A space syntax analysis was completed for each site and the responses were correlated to integration values and distance. The figures below show the most integrated lines (red) and the location of most frequent talkers (medium & dark purple) at each site.

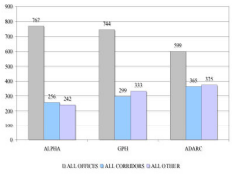
ALPHA

GPH

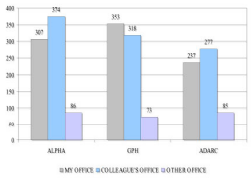
ADARC

Results

Talking Location



Talking in Offices



- Location and frequency of informal interaction was related to local and global integration and average distance between scientist.
- The greater the distance, the more important integration measures became in terms of predicting interaction.
- Highest levels of integration and informal interaction occurred in grid plans (those with frequent and equally important cross corridors).
- Race-track plans were not related to significant levels of informal interaction.

Talking (my office) versus Distance

Significant negative correlation for all sites.

r = -.34, p=.002 average (GPH highest)

Talking (all) versus Distance

Significant negative correlation for all sites.

r = -.39, p<.001 average (GPH highest)

Talking versus Integration of Offices

Significant positive correlation for ALPHA and GPH.

r = .58, p=.002 ALPHA

r = .36, p=.04 GPH

But, negative correlation for ADARC

r = -.45

Design Ideas

- Avoid cul-de-sac office suite arrangements.
- Locate offices and primary workstations on a main corridor.
- Circulation should be grid like, simple and obvious.
- Distance is ok as long visibility and integration is high.
- Vertical distance between scientists is almost impossible to overcome.
- Locate groups who would benefit from cross talk on the same floor. An atrium, or remote “interaction space” is not going to help.
- Maintain visibility down corridors – avoid angles and visual obstacles.
- Avoid the sliver window phenomenon. When researchers have a sliver window they tend to put paper over it.
- Providing a larger glazed area with patterned or slightly diffused glass gives privacy, but allows people to see if somebody is “home”.
- At least use blinds and encourage researchers to leave them open except when absolutely necessary for security.
- The notion of openness and collaboration must be part of the organizational culture for a collaborative floor plan to succeed.

LORD · AECK · SARGENT
ARCHITECTURE

Margaret Gilchrist Serrato, PhD. AIA
Lord, Aeck & Sargent, Architects
1201 Peachtree Street, NE Suite 300
Atlanta, GA 30361
mserrato@lasarchitect.com

4th International Space Syntax Symposium London, 17-19 June 2003