University Common Spaces and Corridors that Foster Communication among Researchers

—A Case Study on the Use of the Engineering and Science Building at Nagoya University—

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ABSTRACT

When conducting research, researchers have to communicate with each other not only during meetings but also outside them. The purpose of our study is to clarify the actual use of the Engineering and Science Building at Nagoya University on the basis of our observation of the communication behavior therein—this building was designed to encourage informal communication among researchers. We attempt to clarify the characteristic features that foster informal communication in corridors and common spaces.

Keywords: informal communication, circulation spaces, environment and behavior, university, building commissioning

1. Background and Purpose

1-1. The Importance of Communication in Research

When conducting research, researchers have to communicate with each other not only during meetings but also outside them. For instance, at first-rate research institutes such as Princeton University, there is a respected “Tea Time” culture at which researchers gather at a set time to freely exchange opinions over coffee and sweets. The 2009 Nobel Prize for Physics winner, Dr. Toshihide Masukawa, calls this organizing of thoughts through the exchanging of opinions among researchers a “thought-stirring mechanism”[1),2)], pointing out the importance of communication.

1-2. University Facilities in Japan

However, buildings in Japanese university campuses were traditionally designed as standardized facilities that met only size requirements but did not encourage communication. The common practice was to have rows of closed cubicles lining both sides of a dark, narrow corridor. Recently, however, some examples of advanced architecture designed to encourage informal communication among researchers have emerged. For example, the University of Tokyo’s Kavli Institute for the Physics and Mathematics of the Universe has research labs spiraling around an open-ceilinged hall. The subject of this study, the ES

Building at Nagoya University, may also be considered an example.

1-3. Past Research

When reviewing past research, we discovered that there have been many studies about the relationship between worker communication and space in corporate offices. For instance, the research conducted by Eric and Mary Sundstrom[3)] was compiled systematically. One-on-one conversation is the preferred means of informal communication, and physical proximity increases the possibility of it occurring. Moreover, Mori et al.[4)] studied the relationship between communication in Japanese offices and the layout and work style of the office.

1-4. Purpose

The purpose of our study is to clarify the actual use of the Engineering and Science Building (hereafter, the ES Building) at Nagoya University on the basis of our observation of the communication behavior therein—this building was designed to encourage informal communication among researchers. We attempt to clarify the characteristic features that foster informal communication in corridors and common spaces.

Furthermore, in our study, we examined whether the building was indeed utilized for the stated purpose. Therefore, from the vantage point of environmental and behavioral studies, the establishment of building commissioning methods must also be considered.

2. Research Object and Method

2-1. The Design Concept of the ES Building

The occupants of the building stated, “It is important to have active discussions to obtain cutting-edge research results.” Therefore, the building was designed with the concept of “an environment where researchers from different fields can hold discussions instead of holding them at only certain places or with only certain people.” The plans were drawn up by the authors at the Campus Planning and Management Office in Nagoya University and outside design office.

2-2 The Spatial Construction of the Sixth and Seventh Floors

The sixth and seventh floors were the object of our study. There, we found 104 physics researchers. One-third was professor and staff, and two-thirds were students, including graduate students. The space on the sixth and seventh floors shows distinctive characteristics in the corridor and the colloquium rooms. The 3-meter wide corridor is air-conditioned and is wider than most corridors. Some sofas are arranged in the center, and a whiteboard is affixed to the wall (see Fig.1 and 2). In addition, there are glass walls facing the corridor in the students’ room and in the colloquium rooms (Fig.2). In addition, in the center of the floors is an open-ceilinged hall and stairwell connecting the two floors (Fig.1). The colloquium rooms include not only a seminar room with a kitchen, where seminars and discussions may be held, but also have a lounge area, so the room may be used as a place of relaxation (Fig.3).

2-3. Method of Observation

Using these two floors with the same floor plan as our object of study, we performed observations in regard to movement and lingering from 10 a.m. to 8 p.m. at 30-minute intervals over eight days in October and November 2011. From a point where we could obtain a good view of the corridor for stationary observation, we recorded the location, behavior, and time when we observed communication or lingering. The area observed is shaded in the figure 1.

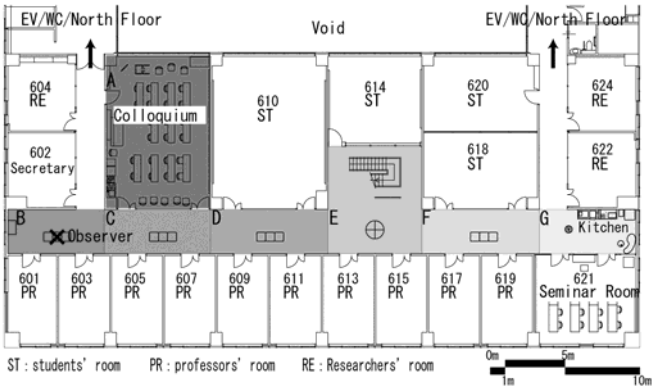

Figure 1. 6th floors plan

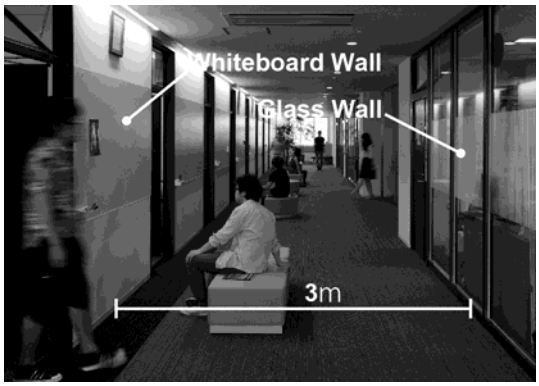

Figure 2. Corridor

3. Quantitative Analysis Focusing on Researchers' Behavior

3-1. The Relationship between Lingering and Time or Location

There were a total of 731 incidents of informal lingering, excluding seminars. We saw a great tendency for lingering to peak at around 4 p.m. on the sixth floor and at mealtimes on the seventh floor (Fig.4). This suggests that the quality of exchange activity changes from floor to floor. Moreover, about half of the lingering cases included conversation.

The area observed was divided into seven parts A–G (Fig.1), and the number of activities in each area was examined (Fig.5). Area A, the colloquium room on each floor, had the most activity, along with Area G, the kitchen area of the sixth floor. This shows that the kitchen attracts many people. Furthermore, on the seventh floor, there was a shelf on which to place a printer and other work equipment, which was not available on the sixth floor. In other words, providing equipment for common use was a factor that attracted people and increased the incidents of lingering. A space that provides equipment for common use is said to be a "gathering place" by Eric and Mary Sundstrom[4]. The colloquium room in our study fits this description.

On the other hand, Area A on the seventh floor hosted a large number of conversations, but there was not much

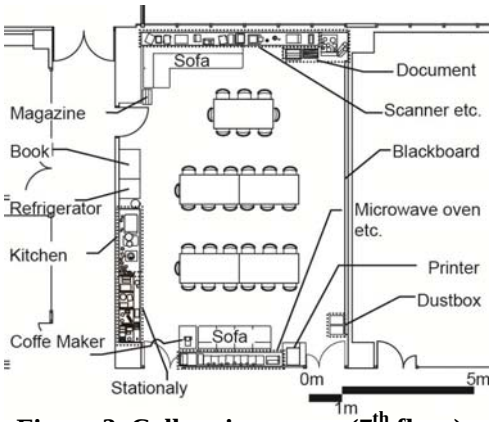

Figure 3. Colloquium room (7th floor)

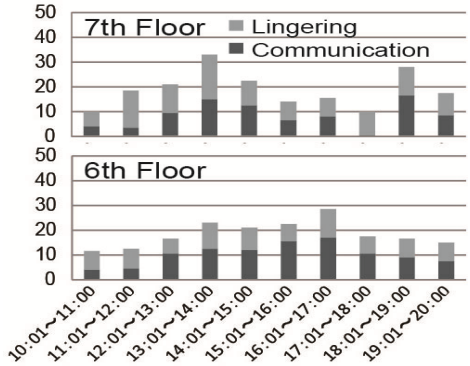

Figure 4. Relationship between lingering and time

3-2. Analysis Regarding Movement

Movement behavior was recorded a total of 1,637 times on both floors. On the sixth floor, the number of times people went back and forth from the room they were in to the colloquium room or the kitchen was about 15%, and on the seventh floor, it was 30% (Fig.6). Thus, it may be thought that movement is promoted by having colloquium rooms or kitchens. Also, of the movement observed, nearly 20% was either conversation held while moving or upon encountering someone.

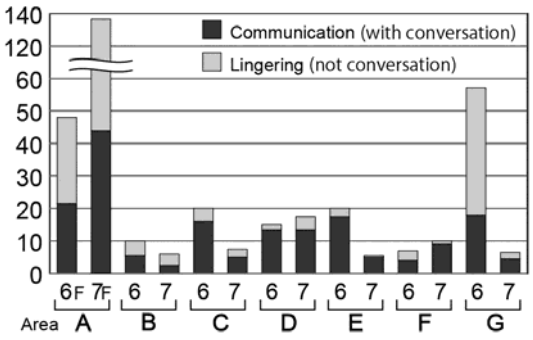

Figure 5. Number of activities in each area

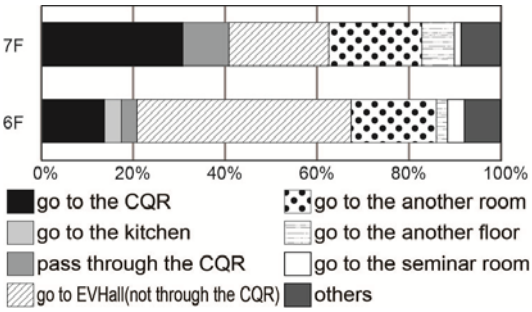

Figure 6. Ratio of each movement

Table 1. Ratio of each type

Type	1	2	3	4	5	6	7	other	total
Ratio(%)	4	5	5	5	37	32	8	4	100

Furthermore, movement passing through the colloquium room to the elevator hall and back was noted (Fig.6), making it clear that there are circulation spaces in the colloquium rooms. The reason for this may be due to the fact that the colloquium rooms are positioned in such a way as to provide a shortcut to get to the elevators and the restrooms (Fig.1) and that it is easy to enter a room that has a glass wall and an open door. It can be thought that this type of room placement and the characteristics of the space give birth to impromptu communication during movement. According to Robert Bechtel[5], the places where people's traffic patterns cross paths during daily activities may be called "activity nodes." The colloquium rooms are quite simply "activity nodes" or "gathering places" and may be referred to as hubs of informal communication.

4. Qualitative Analysis Focusing on Environment and Behavior

4-1. Classification of the Relationship between Communication and Environmental Factors

We classified a total of 670 incidents related to communication, focusing on scenes related to environmental factors. These were categorized into the following seven types. Table 1 shows the ratio of each type.

Type 1: Communication among groups at the center of the corridor (Figure 6-2,3)----Groups gathered in the center of the corridors, where conversations started. There were spaces to move on both sides of the corridors, with the sofas often serving as the refuge.

Type 2: Communication among groups positioned at one side of the corridor----When a group starts a conversation on one side of the corridor, it creates a situation in which there is space to move on the other side.

Sofas limit the size of the group and create a space for taking refuge. At the same time, we can see that the corridor is wide enough that gathering does not bother people passing by, allowing for traffic spaces where lingering is possible.

Type 3: Synchronic communication using a white/blackboard (Fig.6-4,5)----This is behavior in which people write on a white- or blackboard at the location where the conversation starts.

Type 4: Diachronic communication using a white /blackboard----This refers to passersby who become aware of what has been written and printouts or posters. This leads to behavior that confirms that knowledge or to a conversation started from that vantage point.

White- or blackboard show that not only is it possible to have spontaneous conversations, but we can see that any topic of conversation that lingers long time has the effect of creating new communication among the passersby who come later.

Type 5: Behavior in which facilities other than one's room is preferred (Fig.7-1,2)----This is behavior using equipment and facilities not available in one's own room. For instance, this would include making coffee, printing, filing, reading books, and other such behavior.

We can see that such as "a kitchen, a printer, work equipment, and bookshelves." have the effect of attracting researchers. Moreover, because this environment is outside one's room, it may be thought to cause active movement behaviors, as noted in chapter 3. In addition, these environmental factors promote communication and imply that there would be negative results if all of this equipment were to be in one's own room.

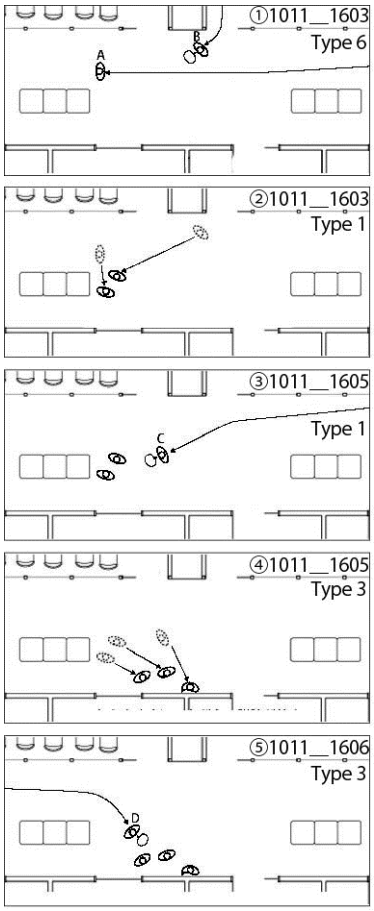

Figure 6. Some scenes in corridors

Type 6: Behavior indicating the situation when looking into a room from the corridors or when looking into the corridors from inside a room (Fig.6-1, Fig.7-2,3)----These are behaviors that confirm each other's situation between the room and the corridor through the glass wall or through an open door. This is primarily visual communication, but it leads to actual conversation later.

Type 7: Communication from the corridors towards the inside of a room or vice versa----This is behavior in which people talk to each other through an open door.

Glass walls and open doors make confirming each other's situation possible. Moreover, it may be thought that opening one's door is a sign that it is considered okay to talk through the door or come inside the room. We can say that seeing or feeling the presence of others leads to impromptu communication.

4-2. The Increase in the Number of People Talking

In our investigation, there were 352 scenes of conversation. Of these, 147 involved the number of people increasing, for instance, from one to two or from two to three, and so on. We saw a number of patterns. One was that the number of people talking increased when they met by chance in the corridors (Fig.6). Another was that people met when using the equipment in the colloquium rooms; however, the number increased even more due to others passing through the colloquium rooms (Fig.7).

5. General Considerations

We determined that an environment with special characteristics such as chapter 4 encourages communication. Additionally, by attributing such characteristics to “circulation spaces,” communication receives a stimulus, thus leading to either continuous or impromptu conversation. Corridors are like streets in that they are spaces where people may meet someone in an impromptu manner. As this study has made clear, it is very important to promote informal communication by providing the right quality of environment in the corridor areas.

ES Building was designed from the beginning with the purpose of creating communication. Through our present study, we can say that it has been successful. Furthermore, communication behaviors that were not expected at the time of the design were also seen, and we were able to divide them into types. Through this type of inspection (Building Commissioning) after the building has been used, we can say that we are able to gain knowledge as to how the design may be put to use in the future.

We can easily imagine that the relationship between the environment and behavior, as we have seen, will lead not only to results in cutting-edge research but also to good educational outcomes. On the other hand, we were not able to closely observe the difference in social positions between graduate students and professors and how this environment affects behavior, which leaves room for further analysis that includes social position.

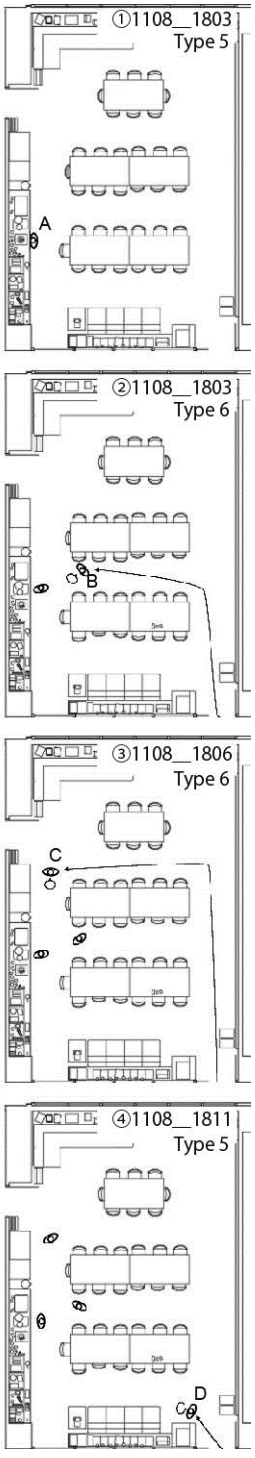

Figure 7.Some scenes in colloquium room

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