

### **Chapter 3 Program Development and Methodology**

This chapter addresses the design problem, the design concept and the method used to solve the design problem step-by-step with the design concept -- workplace neighborhood. Also, it specifies the content of the final product of this project.

#### Design Problem

The Educational Technology office area of the Advanced Communication & Information Technology Center (ACITC) will be on the second floor of the ACITC building. The potential of this office area to represent the present workplace had been explained in chapter one. It included about 22 workstations or offices and covered 5,120 square feet according to the project architects' programming record (Esocoff Associates, 1997). In this study, part of the space requirements had been revised with the workplace neighborhood as a conceptual guide for the design.

#### Design Concept

The concept of workplace neighborhood was applied in the space design of the ACITC Educational Technology office area so as to promote human interactions in the workplace, and hence to shape a work environment to meet the requirements of the work patterns there. The features of the new workplace space summarized from the research review of the workplace patterns were listed in Table 1. Those features highly related to certain neighborhood concepts were highlighted. These neighborhood concepts are the basis of the workplace neighborhood concept. They would be a help to realize those new workplace space features, and hence shape the workplace neighborhood space prototype.

TABLE 1. Relationship between Workplace Space and Neighborhood Concept

<b>WORKPLACE SPACE</b>	<b>NEIGHBORHOOD CONCEPT</b>
Task based, work process focused	
<b>Various kinds, including places for informal activities</b>	Diversity, activity node
<b>Considering both individual high-concentration and group interactive</b>	Balance of privacy and interation
<b>May be shared</b>	Balance of private and public
Multiple use, flexible for changes	
<b>Considering user’s self-control, self expression and personalized work style</b>	Identity, personality
<b>Integrated into a workplace system with gathering places as interaction generators.</b>	Balance between diversity and order, activity node
<b>Identifiable, but also can form a common image reflecting the common goal</b>	Orientation, sense of place, sense of community

Design Steps

The design process began with a user needs assessment by questionnaire survey and behavioral mapping. Next, the design programming was conducted. Then, a workplace neighborhood space prototype was designed for the ACITC Educational Technology office area. Afterwards, three-dimensional computer models were prepared for three different neighborhood units in the prototype. Finally, the floor plan of the workplace neighborhood space prototype and the color printouts of the neighborhood units’ models were evaluated by the present Educational Technology Center employees to get some feedback of these designs. Based on the design evaluation, revisions were made on the

space prototype designed and a computer model was prepared for the revised space prototype.

**Step 1: Complete a user needs assessment by a questionnaire survey and behavior mapping observation.**

The questionnaire (see Appendix B) was developed from the users needs check list for a workplace neighborhood (see p. 30). It consisted of three parts. The first part of the questionnaire tried to find out the needs of appropriate activity settings, physical comfort, psychological comfort, functional efficiency, aesthetic appeal, and symbolic ownership. The questions related mainly to the users’ opinion of an ideal workplace space from the above aspects. The second part of the questionnaire tried to find out the needs of appropriate human interaction, appropriate activity settings and functional efficiency. The questions mainly related to the users’ present work pattern and work settings. The third part of the questionnaire was to obtain demographic information of the users. As the future users, all the present Educational Technology Center employees were selected to answer the questionnaire. The total number of the sample was 12. The questionnaires were delivered in person so as to get a high response rate.

Then, a behavioral mapping method (see Appendix C) was used to observe users' behavior in the existing office spaces. A floor plan was obtained from the present Educational Technology Center. Types of activities to be observed included talking on the phone, chatting, discussing, computer operating, copying, eating, drinking, meeting, faxing, writing and reading. A recording system was developed as follows:

<b>Activity</b>	<b>Key</b>	<b>Activity</b>	<b>Key</b>	<b>Users</b>	<b>Key</b>
talking on phone	----- t	copying	----- y	Director	----- D
chatting	----- a	eating	----- e	Programmer	----- P
discussing	----- d	drinking	----- r	Faculty	----- F
				Developer	
computer operating	----- c	meeting	----- m	Graduate	----- A
				Assistant	
writing/reading	----- w	faxing	----- f	Secretary	----- S
				Other	----- T

According to the pre-observation, the employees might leave office for lunch during 11 a.m. to 2 p.m. and might leave early after 4 p.m.. Thus, the observations were scheduled during 9 a.m. to 11 a.m. and 2 p.m. to 4 p.m.. Total of four observations were conducted with two times in mornings and two times in afternoons. Each observation lasted two hours with 15 minutes intervals.

A behavioral mapping work sheet was prepared which included the floor plan, the keys for recording and an area to indicate the time of the observation (see Appendix C). The observer used the work sheet to record the activities occurring there at each of the 15 minutes intervals. The records were then overlapped on top of each other, and two composite maps of activities were prepared for analysis (see figure 6 & 7).

**Step 2: Develop a space design program based on the data collected.**

The information gathered was analyzed to decide the requirement of each work space and their relationships in the workplace neighborhood of the ACITC Educational Technology office area. A decision matrix analyzed the relationship between the frequency of the activity and the employees with different positions. Another matrix analyzed the frequency of informal interactions among the employees with different positions.

**Step 3: Develop a workplace neighborhood space prototype for the ACITC Educational Technology office area.**

The design phase started with developing a conceptual plan for the ACITC Educational Technology office area according to the basic functional relationship synthesized in the design program step and Alexander's (1977) neighborhood development theory. Then, based on the information obtained from the questionnaire survey, the behavioral mapping and the review of the new workplace space patterns, a series of space patterns were developed in detail. Finally, these workplace space patterns were incorporated into the conceptual plan to develop the floor plan for the workplace neighborhood space prototype of the ACITC Educational Technology office area.

**Step 4: Prepare three dimensional models for the neighborhood units.**

Three neighborhood units of the workplace neighborhood prototype were rendered with 3-D Studio software (Autodesk Inc.) respectively. The three computer models tried to reflect different spatial relationships among the workstations within each neighborhood unit. Another purpose of the computer models was to provide a tool for visually expressing the work space configuration three-dimensionally.

**Step 5: Obtain user evaluation of the space prototype.**

As the future users, the employees of the present Educational Technology Center were asked to evaluate the proposed workplace neighborhood space prototype by reviewing the floor plan of the whole space prototype and the color printouts of the three neighborhood units' computer models. A brief design evaluation form (see Appendix E) was used to collect the user's opinion on how much the space prototype would be conducive to their individual work, to their formal/informal team work, to the whole work process in this office area, and to the formation of a pleasant work environment.

**Step 6: Revise the space prototype.**

After the user evaluation of the workplace neighborhood space prototype designed for the ACITC Educational Office area, some limitations of the design were found. In order to alleviate these limitations, to make the design more closely meet the users' requirements and to more clearly reflect the workplace neighborhood design concept, a revised floor plan and a computer model for the revised design were made accordingly.