SPACE DESIGN FOR THE ACITC EDUCATIONAL TECHNOLOGY OFFICE AREA USING A WORKPLACE NEIGHBORHOOD CONCEPT

Ping Zhu

Master’s Thesis submitted to the Faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

in

Housing, Interior Design, & Resource Management

Joan McLain-Kark, Chair
Lennie Scott-Webber
Eric Wiedegreen

April 25, 1997
Blacksburg, Virginia

Keywords: Space, Design, Workplace, Neighborhood.
Copyright 1997. Ping Zhu
SPACE DESIGN FOR THE ACITC EDUCATIONAL TECHNOLOGY OFFICE AREA USING A WORKPLACE NEIGHBORHOOD CONCEPT

Ping Zhu

(ABSTRACT)

Today, the workplace is undergoing dramatic changes, featuring increased team activities and informal interactions. The “workplace neighborhood” is a design concept derived from a city planning theory that may solve the workplace design problems arising from these changes, and provided a focus for this project.

The Educational Technology office area of the Advanced Communication and Information Technology Center (ACITC) possesses the features representing the general workplace tendency today. The purpose of this project was to develop a workplace neighborhood space prototype for this office area. This prototype will provide a work environment conducive to team efforts and informal interactions and a “workplace neighborhood” space model for future reference.

The project had three design phases: design programming, design development, and design evaluation and revision. During the design programming, a survey questionnaire was distributed to all of the 12 Educational Technology employees and behavioral mapping observations were conducted. Then, a conceptual plan, a series of workplace space patterns and a floor plan were developed for the workplace neighborhood space prototype. Finally, computer models were prepared for three neighborhood units for design evaluation.

The result of the design evaluation indicated that the concerns between individual and group work spaces were not solved. The space prototype was revised, and a computer model of the revised space prototype was prepared. The revised space
prototype met the work patterns of the employees more closely and reflected the design concept of workplace neighborhood more clearly.
ACKNOWLEDGMENTS

This moment is exciting for me to be able to thank all the people who contributed to this master’s thesis. First, I would like to thank my major advisor, Dr. Joan McLain-Kark for her time and effort devoted to this thesis. Without her timely guidance, enlightenment, and support, it would be impossible for me to have made such smooth progress. I would like to thank my committee members, Dr. Lennie Scott-Webber and Mr. Eric Wiedegreen for their precious time and advice. I also would like to take this opportunity to thank Dr. Jeanette Bowker for providing me the opportunity to study at Virginia Tech.

Sincere gratitude is due to Mr. Tom Head and his staff in the Educational Technology Center, Virginia Tech. They supported me tremendously in the data collection and design evaluation phase. Without their help, this thesis would not have been finished.

I would also like to thank all my friends in the HIDM department for their constant support and encouragement. Special thanks should be to Shari Park-Gates, Rebecca Wood and Elizabeth Demerchant who helped in the questionnaire development.

Finally, I deeply appreciate my parents and brother for their blessings, support, encouragement, and most importantly, their belief in me that I will make them proud.
1. **Introduction** 1

2. **Conceptual Basis of Design** 4
   - Historical Review and Workplace Design Concepts 4
   - Pressures for Change 7
   - New Workplace Pattern 9
   - Workplace Design Projects Using a Neighborhood Concept 13
   - Neighborhood and Workplace Neighborhood 17
     - Use of Neighborhood Space 17
     - Human Interactions in Neighborhood Space 18
     - Neighborhood Development 19
     - Comparison of Neighborhood and Workplace Neighborhood 21
   - User Needs Check List for “Workplace Neighborhood” 22
   - Research on Workplace Human Interaction 22
     - Communication 22
     - Gathering Place 23

3. **Program Development and Methodology** 24
   - Design Problem 24
   - Design Concept 24
   - Design Steps 25
4. Data Analysis and Design Program 29
   Summary of Questionnaire Survey 29
   Summary of Behavior Mapping 34
   Design Program 38
     Functional Relationship 38
     Space Standard 40

5. Design Development 42
   Spatial Relationship and Conceptual Plan 42
   Workplace Space Patterns 46

6. Design Evaluation, Revision and Summary 52
   Design Evaluation 52
   Design Revision 54
   Summary 57

Reference 63

Appendix

A  Cover Letter and Consent Form for Questionnaire 65
B  Questionnaire 67
C  Behavioral Mapping Work Sheet 74
D  Cover Letter and Consent Form for Design Evaluation 76
E  Design Evaluation Form 78

VITA 80
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Relationship between Workplace Space and Neighborhood Concept</td>
<td>25</td>
</tr>
<tr>
<td>2.</td>
<td>Mean Score of Importance of Work Space Characteristics</td>
<td>30</td>
</tr>
<tr>
<td>3.</td>
<td>Mean Score of Preference of Workplace Space Images</td>
<td>31</td>
</tr>
<tr>
<td>4.</td>
<td>Percentage of Attendance for Scheduled meetings and Unscheduled Group Work with Different Types of People and Different Frequencies</td>
<td>32</td>
</tr>
<tr>
<td>5.</td>
<td>Mean Frequency of Informal Interactions in Different Spaces</td>
<td>33</td>
</tr>
<tr>
<td>6.</td>
<td>ACITC Educational Technology Office Area Space Standard Developed by Architects</td>
<td>41</td>
</tr>
<tr>
<td>7.</td>
<td>Result of Design Evaluation</td>
<td>53</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Example Bullpen Office Plan</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Example Executive Core Office Plan</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Office Using the Bureaulandschaft Design Concept</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Generalized Neighborhood Space Use</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>Neighborhood Activity Nodes</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>Composite Behavioral Map (9 a.m.~ 11 a.m.)</td>
<td>35</td>
</tr>
<tr>
<td>7</td>
<td>Composite Behavioral Map (2 p.m.~ 4 p.m.)</td>
<td>36</td>
</tr>
<tr>
<td>8</td>
<td>Matrix of Activity Versus Position</td>
<td>39</td>
</tr>
<tr>
<td>9</td>
<td>Matrix of Informal Interaction</td>
<td>39</td>
</tr>
<tr>
<td>10</td>
<td>Conceptual Plan of the ACITC Educational Technology Office Area</td>
<td>43</td>
</tr>
<tr>
<td>11</td>
<td>Floor Plan of the ACITC Educational Technology Office Area</td>
<td>44</td>
</tr>
<tr>
<td>12</td>
<td>Neighborhood Unit A</td>
<td>48</td>
</tr>
<tr>
<td>13</td>
<td>Neighborhood Unit B</td>
<td>49</td>
</tr>
<tr>
<td>14</td>
<td>Neighborhood Unit C</td>
<td>50</td>
</tr>
<tr>
<td>15</td>
<td>Revised Floor Plan of the ACITC Educational Technology Office Area</td>
<td>56</td>
</tr>
<tr>
<td>16</td>
<td>Computer Model of the Revised Space Prototype, View A</td>
<td>58</td>
</tr>
<tr>
<td>17</td>
<td>Computer Model of the Revised Space Prototype, View B</td>
<td>59</td>
</tr>
<tr>
<td>18</td>
<td>Computer Model of the Revised Space Prototype, View C</td>
<td>60</td>
</tr>
</tbody>
</table>