

***A Design Note:***

***UNIVERSAL DESIGN FOR THE ELDERLY***

Roberta L. Null

**Abstract**

A program is described which made full use of adaptable, universal design in a rehabilitation training facility for teaching basic life skills to visually impaired elderly. This program evolved from a class project in kitchen design and illustrates how universal design concepts can be implemented through team activity.

**Universal Design for the Elderly**

Until recently, the design needs of the elderly have been given little attention by physicians, professional care-givers, architects, or designers. The elderly population has been expected to be confined to a nursing home or to "make do" in their own homes or a family member's home. However, as research on the aging process has increased and as population growth has moved toward the later end of the life cycle, more and more designers, social service personnel, and manufacturers are learning about and designing programs and products for the special needs of the elderly.

Traditionally, there have been few housing options for the elderly. Frequently they have been advised to simply resign themselves to the physical and psychological changes and limitations which come with the aging process. If they cannot adapt themselves to their existing surroundings, they often find themselves confined to an institution that will "take care of them." Many elderly persons want and need to take care of themselves and to maintain the independence they have established over a lifetime (Vaughn, 1981). Unfortunately, the physical problems they face as they grow older often threaten their independence, and they find themselves no longer in control of either their bodies or their surroundings. May (1984) states:

The body has a vital importance for a human being. It is viewed as an instrument for controlling the world: hands for working, feet for walking, tongue for talking. We dominate and control our world through our bodies. Illness and aging threaten us with a loss of control (p. 8).

Of the various programs and ideas developed to meet the changing needs of elderly individuals, perhaps none is more important than the concept of universal design. This concept is modeled around the idea that design can meet the needs of all people, allowing them to function independently despite changes in their bodies or when faced with major disabilities. "Universal design is the embodiment of the health, safety, and welfare issue, as we provide design which serves and supports the public at large" (May, 1984).

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The traditional methodology for dealing with problems of the aging has shifted from the individual adapting to fit the environment to adapting the environment to fit the changing needs of the individual. Odette Lueck (1987), Public Service Chair for the American Society for Interior Designers, states this is happening for two reasons:

Demographic changes in the United States will have a profound effect on the way we live, work, and spend our money and our leisure time. Two specific trends will affect the interior design we see in the years ahead: the "greying" of America, and the rising number of disabled individuals in the country. These groups are creating a market for specialized housing. Builders, developers, and the design profession will have to work in concert to produce modes of housing tailored to meet the needs of all people ( p. 8).

The sheer numbers of the elderly who need our assistance will make more traditional methods of care (such as institutionalization) virtually impossible. By 2025 the percentage of elderly individuals is projected to rise from the present 15.7 percent to 23.6 percent, with 42 retired persons for every 100 working-age persons (Wall, 1986). The importance of this shift in focus from individual to environmental adaptation is seen in Lorraine Hiatt's (1985) observation:

The environment is omnipresent. Unlike the most caring family member, the environment is present 24 hours a day, 7 days a week. Specially designed environments for older people can function as a nonstop support system. While spaces are no substitute for family, income, and health, they can be designed to facilitate independent living (p. 15).

#### Visual Impairment and Universal Design

The loss or impairment of vision is one of the first signs of the body's aging. The lens of the eye begins to yellow at about age 45, colors fade, objects become harder to distinguish, edges become less defined, focusing at various distances is harder, and depth perception becomes difficult (Mousseau, 1987). These changes occur gradually, but the difficulties are compounded by other visual problems brought on by cataracts, diabetes, glaucoma, and macular degeneration. By the time individuals reach age 65, they will probably be among the 65 percent of the 6.4 million Americans who suffer from visual impairment.

Adaptation to this first experience of aging will deeply affect how subsequent changes are faced (Marsh, 1980). The loss or impairment of one's vision is a stressor which can actually cause other disabilities--both physical and psychological (Gillman, Simmel, & Simon, 1986). Many individuals will fail to react adequately to this challenge. They believe that since they still have most of their capabilities, they will not benefit from nor be qualified for the information and services available for the "blind" --even though statistically there are relatively few totally blind individuals.

In the past, an individual had little recourse in dealing with loss of vision. Recently, research and product development has begun to provide the option of altering our environment so as to remain functional. However, as Hiatt (1982, et. al.) states, there are several barriers to implementing the necessary change:

1. Most people think that nothing can be done about impairments in old age.
2. There are few role models or examples illustrating the potential for maximizing capabilities; for using the environment more effectively.
3. The environment has long been devalued in comparison to more highly valued resources (group activities, for example).

4. Control over the environment is thought to be the domain of "experts" (architects, designers, carpenters) or especially craft-oriented individuals.

5. Some people want to maintain the status quo of their homes, to preserve their memories; they resist change.

6. Professionals have not stressed the environment as part of a system of support in assessing or responding to an individual's needs. They don't ask about the home layout or recommend that changes be made there.

What is necessary, therefore, is the dissemination of pertinent design information to architects, designers, social-service personnel, care givers, and the public at large; and the establishment of programs which can serve as models for all those concerned. What is needed is "adaptable" design. Just as car seats are designed so that the car may be driven by either a short- or long-legged person, so too should other environments be adaptable to accommodate all individuals.

In an interview in a recent issue of ASID Report, Walter Park (1987), Executive Director of the Independent Housing Services in San Francisco, discusses the differences between "accessible" and "adaptable" housing:

"Accessible" housing was a term developed by HUD in the late 1960s and early 1970s. It demanded full 5' turnarounds at every dead end, wide hallways, and grab bars. It's an "institutional" look and it's not very easy to market to the public at large. Also, it only serves a portion of the disabled population.

"Adaptable" housing provides accessibility of entry and circulation to wheelchairs, plus people using walkers and crutches. It works equally well for the able-bodied or the physically disabled. It makes provisions for adaptability later on as they may be needed (p. 11).

What follows is a description of a program which made full use of adaptable, universal design. This project, involving the redesign of training kitchens for the teaching of basic life skills to the visually impaired elderly, was both rehabilitation-oriented and design-based. The program had as its goal the training of the low-vision elderly so that they could live independently and competently. It sought to offer models of therapeutic design features which could be adapted for use in a client's own home. Arnold Gross (1979) points out in his report on the Virginia Commission's Project on Aging that a full 73 percent of the low-vision elderly indicate that their dominant need is help with household chores and cooking. To be able to "navigate" in the kitchen and to operate there effectively and efficiently is tantamount to proving that one can still "handle" one's autonomy.

#### Universal Design at Work

The San Diego Service Center for the Blind (SDSCB) is an independent rehabilitation facility with a staff of 15, half of whom are themselves visually impaired. The Center is located in a building which was once used to house a gymnasium. In 1985 it became obvious that the training kitchen they were using was inadequate. It had been constructed haphazardly, with little or no attention paid to the "normal" kitchen layouts in most homes and apartments. Few of the special features which can make a kitchen more user-friendly to the visually impaired (braille overlays, large-print controls, etc.) were present.

Also in 1985, several students from a class in kitchen design at San Diego State University were serving as volunteers at SDSCB. They approached the class professor with an idea for redesigning the kitchen training facility as a term project. The professor agreed and assigned the redesign to the class as-a-whole. After numerous field trips to the Center, a great deal of class discussion, and research into the design of kitchens for the disabled, each student submitted their redesigns as semester projects.

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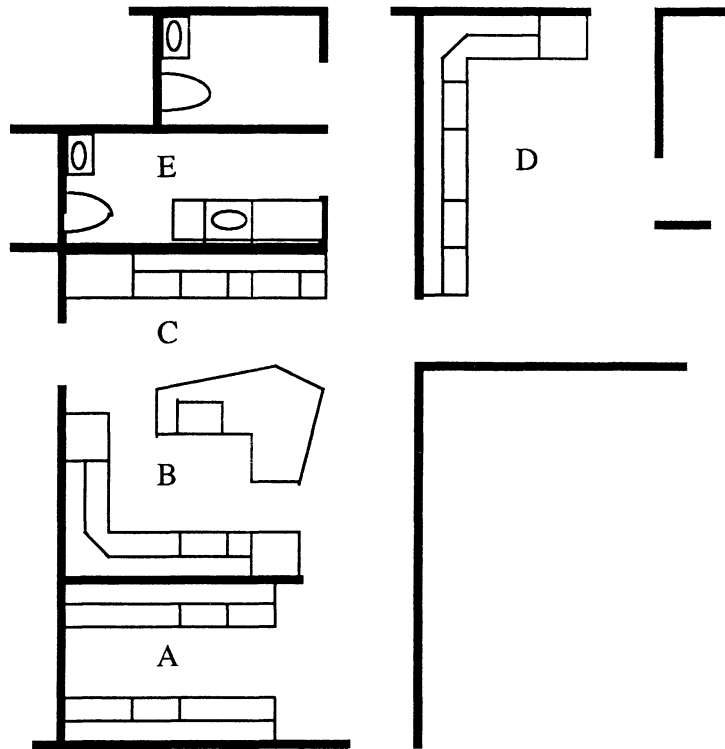


Figure 1.

**Remodeled Facilities:**

- A. Corridor Kitchen -  
32 inch high counter top with no base cabinets
- B. Main demonstration kitchen
- C. One wall kitchen

**Proposed Facilities:**

- Apartment kitchen and laundry
- Bathroom grooming area

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During the summer, SDSCB presented a further proposal - to turn the class assignment into a working reality. Their proposal requested a complete redesign and reconstruction of the Center's kitchen training facilities.

The first step of the project was to acquire the necessary materials such as cabinets, cupboards, flooring, and appliances. Various manufacturers were contacted and members of the local National Kitchen and Bath Association were asked to solicit donations from their clients whenever a new large purchase was made. For almost a year, donations trickled in slowly. A turning point in the project came when a local dealer donated a complete showroom kitchen.

The project advanced to the next step. This necessitated forming a design team. The first to volunteer for the team was Michael DeLuca, Certified Kitchen Designer and co-owner of the dealership which had donated the showroom kitchen. The author began to work with Michael on the students' plans, adapting them to include the donated kitchen. Others to join the project during this phase included several social-service personnel, two other kitchen and interior designers, a low-vision lighting specialist, the home economist from the local utility company, and an instructor from SDSU who had implemented an experimental class in teaching home management skills to the elderly.

The team decided there was adequate space at the Center to include four complete, separate, and different kitchens. They would include "one-wall", "corridor", and "U-shaped" kitchens. The fourth, an "L-shaped" apartment kitchen, would be placed in the Center's model apartment adjacent to their main facility. (See figure 1.) These four kitchens would represent the basic types found in most homes. The three constructed in the facility would serve as models for adapting existing kitchens to better meet the needs of the visually impaired. The L-shaped kitchen would be designed and outfitted with state-of-the-art equipment, allowing it to serve as a prototype for builders, architects, designers, and other interested professionals.

#### Adaptable Design

All of the appliances and cupboards in the training kitchens are of standard design. However, the team has worked to make modifications that will not only serve the needs of the low-vision elderly, but will also neither lower the resale value of a client's home, nor make the kitchen uncomfortable for the non-impaired user.

Lighting is an especially important concern. The elderly need as much as three times the overall lighting as a person who is twenty. It is important that work areas be glare-free, as glare can decrease the attention and make close-work tasks more difficult and tiring. Shiny surfaces such as countertops and floors can be dulled by the use of placemats and no-shine floor wax. The team has installed rheostatic controls for all overhead lights and has used under-cabinet task lighting in all the kitchens.

Color Contrast is also important to the elderly. This is one of the easiest and least-expensive adaptations to create. In the training kitchens dark-colored wall-switch plates have been installed to contrast with lighter walls. Non-skid rugs to mark pathways and work areas and colored placemats to provide sharp contrast with countertops make any kitchen far less frustrating for the low-vision user.

Existing countertops and cabinets are also easily adapted for better use by the visually impaired. At least one countertop and sink in the kitchen should be lowered from the standard 36" height to a more comfortable 28" to 32" height. It should be open underneath, allowing the elderly or wheelchair-bound to sit while preparing food or cleaning up. In the training kitchens lowered countertops have been installed in kitchen A. (See figure 1.) The most effective sink design is one with a shallow, rear-draining basin. Pipes should be insulated. Kitchen C (see figure 1) incorporated a large, easily manipulated sink faucet with lever controls, including a retractable spray hose for ease in filling and cooling containers.

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Cabinet doors should either be removed so the cabinets are open-faced, or equipped with large U-shaped handles for easy gripping. Pull-out inserts and lazy-susans provide access to otherwise hard to reach items and are used extensively in the training kitchens.

The most daunting features of any kitchen for the low-vision user are the appliances. Rear-mounted controls keep a range safe from children, but they are difficult and even dangerous for the elderly, who may have to reach over hot burners to adjust the dials. Fortunately, the existing range in the Center's original kitchen has front-mounted controls and a side-opening, eye-level oven. This oven design is ideal for the low-vision elderly. The oven control panel has been adapted for use by low-vision clients through the addition of "High-lites" - fluorescent colored resin markings. All of the donated appliances are equipped with special features such as braille overlays, large, easy-grip controls, oversized print controls and operating instructions. Microwave ovens have also been installed in each kitchen. They heat the contents of a container, not the container itself, thus reducing the chance of burns.

A special donation to the DeLuca showroom kitchen is a down-draft range. This cooktop is actually a module interchangeable with the newer magnetic induction cooking surfaces. The cooktop is cool to the touch, heating the cooking utensil but not burner. It has no flame, brightening electric coil, or discernible heat, and is designed to chime when a pot or pan is lifted from its surface.

The model L-shaped apartment kitchen is outfitted with donations from several manufacturers. One large manufacturer has supplied the project with a washer and dryer equipped with large-print controls and directions, a microwave oven with braille overlays and audiotape directions, and a side-by-side refrigerator-freezer with external ice and ice-water dispensers and an accessible reach-in compartment for often-used items.

The model kitchen includes an under-the-counter food and utensil storage cabinet (approximately 40 cubic feet) with four standard utensil and three "file-cabinet" type drawers. Each large drawer has a lowered side to allow a seated person to reach its contents with ease, and each of these drawers can be fitted with racks for storing pots and dishes.

Other countertops are adaptable, allowing their heights to be adjusted for use while sitting or standing. Outlets are raised for easy access, and pull-out shelves, for food preparation at a variety of levels, were installed.

#### Redesign Results

The SDSCB's board chairman is a retired contractor who joined the team to coordinate the actual remodeling of the training facility. He sought and received volunteer help from carpenters, electricians, and plumbers who moved, removed, and installed load-bearing walls, fixtures, and appliances.

The final step in the process, the remodeling, began in September, 1985. By Thanksgiving Day the Center was able to serve a turkey dinner prepared completely in the newly installed showroom kitchen to nearly 100 clients. Training classes are conducted in all three training kitchens, serving nearly 200 people yearly in 18-week courses. In 1986, the American Society of Interior Designers' Educational Foundation awarded San Diego State University its prestigious Environmental Design Award for the students' role in the Center's redesign.

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Nearly \$60,000 in materials, equipment, and services has been donated by 60 companies, manufacturers, and individuals during the course of the remodeling. The work is basically complete. SDSCB is now able to produce functional, competent, and independent graduates from its rehabilitation programs. Graduates are now able to live safely, despite their age and visual handicaps. The project encourages design professionals in other communities to lend their expertise in meeting the needs of a rapidly expanding population of disabled and elderly individuals.

#### Conclusion

The SDSCB project demonstrates that there is a viable alternative to the institutionalization of the elderly, visually impaired. Universal design includes the culmination of many years of concern, thought, and research involving problems in dealing with the elderly and the disabled.

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