

## Chapter 20

# Collaborating with Elderly End-users in the Design Process

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### 20.1 Introduction

The fact that end-users can participate and contribute to the design process, was pointed out in previous studies on user participation to the design process conducted by Cavanagh (1996), Ciccantelli and Magidson (1993), Mitchell (1995), Morini and Pomposini (1996), and Reich *et al.* (1996). For Howes, *et al.* (1998), participatory design is a design methodology, European in origin, giving an important contributory role to the end-user in the development of products they would eventually use. This paper presents a study (Demirbilek, 1999) in which elderly end-users were involved in the design process by means of participatory design sessions. In these sessions, the expertise of designers and the comments and ideas of elderly end-users were applied to how doors and door handles for domestic use should be designed. Two different design sessions were run for each group of elderly end-users.

### 20.2 Participatory Design Sessions

#### 20.2.1 Characteristics of the Sample of Elderly End-users

The participatory design sessions were held with potential end-users, each consisting of 3-6 elderly people, mostly widowed, male and female over 65, from the city of Ankara. Random sampling was used among a group of volunteers. A pilot session was conducted with 4 elderly participants (one male and three females between 68 and 75 years old), at the end of which the participatory design session was revised. A sample of 13 potential elderly end-users forming 3 different groups (see Figure 20.1) took part, each completing both participatory design sessions.



**Figure 20.1.** Views from the first participatory sessions for each group

The sample of volunteers, consisting of 10 females and 3 males, had a mean age of 75. Nine of the elderly participants were living in a residential home, with two of them having their own homes but preferring to stay in this sheltered accommodation where they have a one-room studio with a bathroom and a small kitchenette. The other four participants were living in their own homes, two as a couple, and two with their children. None of them had any severe disability limiting their physical activities. Four of the women used canes and three of them had problems when sitting down and standing up. Only one of the women had difficulty walking due to her age (93) and weight.

## 20.2.2 General Conditions of Participatory Design Sessions

Small groups consisting of 6 people are said to successfully produce up to 150 ideas in half an hour at their first attempt (Jones, 1992). Therefore, this study, on participation in design by the elderly users was conducted in small groups of 3-6 elderly people each. The participants were not prepared before the participatory design session.

### 20.2.2.1 *The First Participatory Design Session*

In the first participatory design sessions, the participants were asked contribute to in the ‘design’ of doors and door handles for the house that they want to age in, considering all their own possible requirements, needs, particular wishes and ideas. In other words, the end-users were asked to talk about, and to ‘design’ the doors and door handles according to their own requirements, an in their own words. The setting was a room, with chairs around a table. The designer and the participants sat around the table, having papers and pens available for everybody.

This session involved a combination of unstructured interviews, scenario building, and brain storming facilitated by the designer. To start the session, a group of questions prepared in advance was used to stimulate conversation and set out the problem areas. When the participants started to respond directly to the questions, the designer introduced scenario building in order to help the participants to express themselves more independently, without being limited by the questions. Once the participants started to create various scenarios, the designer encouraged them to start brain storming in order to propose any kind of solutions to the problems they have depicted while building their scenarios.

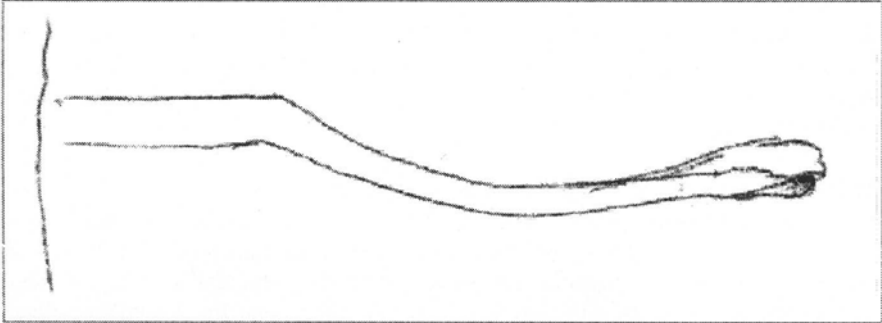
The first participatory design sessions for each group of participants began with a blank page. A pre-existent solution was not proposed because the aim was that the elderly participants should propose their own solutions. The outputs of these design sessions were not intended to deliver finished products or designs, but to be a point of departure for the remainder of the design process.

Different scenarios in which the elderly could imagine themselves were used during these sessions. Examples of scenarios were:

- You are coming back from shopping, hands full. Nobody is at home and you have to open the door. The keys are somewhere deep in your bag (or pocket). What happens?
- You are in the kitchen, the door is closed, and your hands are all greasy and dirty because of preparing a meal. The telephone is ringing in the other room. How do you open the kitchen door? What do you do?
- You are alone at home. Somebody rings at the door. You look through the ‘eyehole’ but you cannot see the visitor well. What do you do?

The designer asked the participants to share their ideas, whether positive, negative, or neutral regarding these scenarios. From the negative reactions put forward by the participants, the designer asked them to describe how things could have been better, and how the relevant parts could have been designed. The sessions were conducted with blank papers in front of the participants for them to

draw and write when necessary, and they were highly encouraged to do so. This was believed to give them control over the situation, and the feeling that they are really designing (see Figure 20.2).



**Figure 20.2.** Proposition of an elbow operated door handle (drawn by a 74 years old participant)

The session facilitator collected the outputs of the sessions (in written, oral, sketch and gesture format). This information, which was recorded on video for later evaluation (to recall all the details), provided a basis and starting point for the author to prepare the preliminary design proposals for the products. This technique is similar to the video ethnography technique (Mannoy, 1995). The analysis of those videotapes allowed a full range of behavioral traits to be observed; and a sequence of events to be analysed.

After the completion of the first participatory design sessions, the outputs (responses to the questions, drawings and additional comments) were grouped under the topic they were related to (such as: physical aspect of a door; door operation; accidents related to doors, *etc.*). They were then listed in matrixes to assess their existing correlation with technical design considerations.

#### ***20.2.2.2 Results of the First Participatory Design Sessions***

As none of the participants have experienced a participatory design session in their lives, almost all were very shy at the beginning. The designer had to make them imagine themselves in some related scenarios to be able to really start the session. The elderly users participated in their own ways and in their own words. At some stages, where they could not adequately explain something in words, they mimed the scenes that they wanted to describe (see Figures 20.3, 20.4, and 20.5), using hand gestures and body language.

**20.2.2.2.1 Questions and Answers of the First Participatory Design Sessions**



**Figure 20.3.** A participant showing door-handle operation at the door



**Figure 20.4.** A participant drawing a sketch for the handle design in his mind



**Figure 20.5.** Two participants explaining their ideas with hand gestures

The elderly were presented with eight groups of questions relating to the sub-

tasks of domestic door use, starting with the entrance door. The questions were grouped under the following headings: problems faced with main entrance door; problems with keys while opening or closing doors; door safety while opening and closing doors; reasons for closing interior doors; problems and recommendations related to door handles and knobs; problems and recommendations related to the glazed parts on doors, and the materials chosen; and different kinds of doors available.

After having grouped the answers, the most important points identified by the elderly users were carried into matrixes to see whether there was any relationships between the elderly users' requirements, design limitations and technical design requirements. The matrixes were prepared using the answers and comments elicited by the pre-set questions and the product type specifications from the literature survey. Both the elderly user's requirements and the design specifications were rated according to their importance levels. The importance of elder users' requirements was rated according to the number of participants having (or approving of) the same opinion. The importance of design specifications relating to the design of a door was rated according to the professional judgement of the designer.

While designing the main entrance door the most important features for consideration were ranked in order of importance as follows: the visibility range of eyehole; the placement of keyhole on the door; the lighting level outside the door; the mode of operation of the key; the lighting direction outside the door; and the placement of door handle on the door.

While designing the main entrance door the most important features for consideration were ranked in order of importance as follows: shape of the grip part of the handle / knob; the door material(s); the level of transparency of the glazed parts; the surface finish of the handle/knob; the handle/knob material; the way of opening of the door; the placement of the door handle; the colour of the door; the dimensions of the door handle/knob; and the appearance of the door handle.

#### *20.2.2.2.2 Conceptual Designs*

Three design concepts were generated after having completed the first participatory design sessions. Among them, an elbow operated door handle concept and a conceptual design for a door screen that will allow elderly users to see a visitor without having to go near the door were proposed. Another conceptual design created was a structure to be erected outside, near the main entrance door, serving as a shelf for shopping bags and a seating unit while searching for keys.

### **20.2.3 The Second Design Participatory Design Session**

In the second participatory sessions the designer presented the concepts reached as the outputs of the first session to the same groups of elderly participants (see Figure 20.6). The presentations were in the form of free-hand and computer drawings, not too perfectly drawn, in order that the participants should not feel that every thing was already decided, and that nothing was left for them. Each participant received A4 copies of the drawings on which he/she could draw as well.

This time, the participants were asked to criticize the presented drawings. Every comment, and the copies of the design concepts which were 'corrected' by the participants, were collected at the end of the session.

### 20.2.3.1 Results of Second Participatory Design Sessions

During the second participatory design sessions, the elderly participants seemed more comfortable, probably because they were familiar with the process. They have listened to the presentations of the design concepts carefully and made their comments. Some of them did draw corrections on their copies of the drawings.

Among the three conceptual designs presented to the elderly, the lever handle received the most correction. The second conceptual design, the foldable shelf/stool to be hung on the wall of the main entrance door also underwent some modification. The third conceptual design, the door screen was accepted as it was, and the idea was very much appreciated by all of the participants. No corrections were made on the drawings of the door screen.

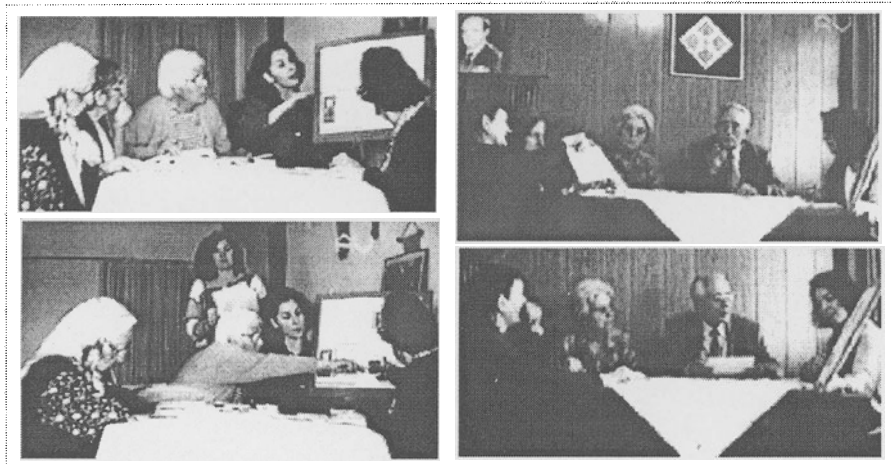


Figure 20.6. Views from the second participatory design sessions

## 20.3 Conclusion

All three concepts were generated entirely with the help of the responses given and proposals made by the elderly participants during the first participatory design sessions. This result reinforces the statements of Howes, *et al.* (1998) who claim that design knowledge is present in all the people potentially affected by a design, and that these people can contribute to improve that design. Druin (1997) adds that in this way, researchers can directly identify new product possibilities that they might not have been able to think of on their own. This latter issue is reinforced in the following statement by Haigh: 'Design for the young and you exclude the old; design for the old and you include the young' (1993:p14). This point becomes

more valid as the number of elderly people increases. Furthermore, Coleman (1997) says that older people are, to a greater and greater extent, commanding substantial wealth and are prepared to spend it on things that will really improve their lives. This means that they are an important potential consumer market which needs to be explored more deeply. This study has tried to illustrate a concrete example of the involvement of elderly end-users early in the design process. Prototypes of the three design concepts that have been developed will be produced in order to be tested in use, again by elderly users.

## 20.4 References

- Cavanagh S (1996) *The Space we Need: Principles of Housing Design for Older Women, Women with Children, and Parents with Disabilities*. In E. Komut (Ed.) *Housing Questions of the Others*. Ankara: Chamber of Architects of Turkey, 67-76
- Ciccantelli S, Magidson J (1993) *Consumer Idealized Design: Involving Consumers in the Product Development Process*. *Journal of Product Innovation Management*. 10:341-347
- Coleman R. (1997) *Breaking the Age Barrier*. Speech at the Royal Society of Arts, June '97 as part of the Design Council - Design in Education Week, London: DesignAge, Royal College of Art, March,  
<http://valley.interact.nl/DAN/NEWSLETTER/NEWS97/home.html>, 6, 6, 1998
- Demirebilek O (1999) *Involving the Elderly in the Design Process: a Participatory Design Model for Usability, Safety and Attractiveness*. Unpublished PhD Thesis. Ankara: Bilkent University
- Druin A (1997) *Participatory Design: Children Participation in Computer Design*". [http://mtsnmc.unm.edu/intel97/html/participatory\\_design.htm](http://mtsnmc.unm.edu/intel97/html/participatory_design.htm), 10, 3, 1998
- Haigh R (1993) *The Ageing Process: A Challenge for Design*. *Applied Ergonomics*. 24. 1:9-14
- Howes G, Gordon P, and Masellis B (1998) *Perspectives on the Role of Participatory Design in Computer Mediated Communication*. CMNS 353.  
<http://oscar.cprost.sfu.ca/~cmns353/Projects/GroupJ/index.htm>, 10(3)
- Jones CJ (1992) *Design Methods: Seeds of Human Future*, Second Ed. Van Nostrand Reinhold, New York
- Mannoy R (1995) *The Scholarly Practitioner. Co-Design*, Milton Keynes
- Mitchell CT (1995) *Action, Perception, and the Realization of Design*. *Design Studies*. 16:4-28
- Morini A, Pomposini R (1996) *New Designs for Aged People Housing*. In Ural O, Altinbilek D, Birgönül T (Eds.) *XXIVth IAHS World Housing Congress*. Middle East Technical University, pp791-800
- Reich Y, Konda SL, Monarch IA, Levy SN, Subrahmanian E (1996) *Varieties and Issues of Participation*