Empathic Modelling in Teaching Design for All

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Abstract

This paper describes the use of empathic modelling in teaching design for all and suggests the steps and 'props' that have been used successfully to carry out a simulation workshop with university students. This method has demonstrated that students in ergonomics and design can be effectively encouraged to think about how we take our senses and abilities for granted, as well as what coping strategies and adaptation techniques might be used by older and disabled people. It is suggested that the use of empathic modelling techniques can contribute to the development of core knowledge sets and skills that should be part of curricula in design for all, being promoted by the EU IDCnet project.

1 Introduction

The concept of design for all can, and should, be introduced as early as possible in a professional's career. However, training and competence in the use of appropriate user research methods and tools for inclusive design are needed, and this clearly emerged during discussions on obstacles and solutions for more inclusive design at the Include 2001 Conference in London (April 2001, see http://www.hhrc.rca.ac.uk/events/include/).

The Department of Human Sciences at Loughborough University offers a module called Ergonomics of Disability and Ageing, taught by ergonomists at ESRI (Ergonomics and Safety Research Institute at Loughborough University). This module is offered as a final year option for one semester to students in ergonomics, psychology, human biology, design and information technology, as well as to the MSc programme. The aims of this module are for the student to:

- Develop an awareness of ageing and disability and explore how ergonomists can play a part in the design of products, services and the built environment for elderly people and people with disabilities
- Explore the concepts of 'universal', 'inclusive' and 'barrier free' design, as applied to particular applications (low and high technology examples)
- Examine the role of ergonomists in the development and evaluation of adaptations, generic or individual solutions.

This paper describes the use of empathic modelling in teaching design for all and suggests the steps and 'props' that have been used successfully to carry out a simulation workshop with university students.

2 Empathic Modelling

Empathic modelling is the method whereby an individual, using various props and scenarios, is able to simulate the deterioration of physical and perceptual abilities in everyday scenarios, for example, by using spectacles that feign the effects of reduced visual acuity. In addition, the person is encouraged to attempt coping strategies and adaptation techniques that older and disabled people might use in specific situations (Poulson, Ashby & Richardson, 1996; also found on the INCLUDE project website at http://www.stakes.fi/include/1-7-7.htm). The aim is to encourage students to think about how we take our senses and abilities for granted and how the reduction or removal of a sense or ability can drastically change our perception of an environment or activity.

Pastalan (1982, as cited in Poulson, Ashby & Richardson, 1996) applied this technique using architects as participants in order to elicit the design requirements of people with visual impairments in different environments. He emphasised that it is difficult to know to what extent participants' experiences and adaptations to environmental situations will correspond to those of people with visual impairments as a whole. This is why we remind the students that this is only a simulation and does not enable them to understand the everyday experiences of someone with a disability—it is only meant to get them thinking about the issues. In addition, the person taking part in such a simulation will be able to take the device(s) off at the end of the session—an opportunity not offered to older and disabled people! It must be emphasised that the objectives are the same as any other area of ergonomics—that 'real' end users must be included when designing and evaluating products and services. Safety is also an important issue, and the students are reminded that they must take care not to hurt themselves or anyone else (e.g., when reducing their vision by wearing simulation glasses), as well as also ensuring that the technique is always applied in an ethical manner. We sought and received ethical clearance from the University's Ethical Advisory Committee before conducting such a workshop, and we would recommend that others planning such activities take similar precautions.

Designers can experience the effects of ageing and disability through fairly sophisticated design tools, such as the Third Age Suit, developed by ESRI at Loughborough University for the Ford Motor Company. The suit simulates reduced joint mobility through the use of restrictors for the hand, wrists, elbows, neck, upper and lower torso, knees and ankles. In addition, surgical style gloves are provided to mimic the reduction in tactile sensitivity, and yellow tinted glasses to demonstrate the reduced sensitivity of the eye to blue light as we age (Hitchcock et al., 2001; also see http://www.lboro.ac.uk/research/esri/hfdc/services.htm).

Other design tools can, however, be more easily acquired by lecturers and advocates of inclusive design. For example, in order to enable students to understand and appreciate more fully the difficulties that older and disabled people experience when carrying out activities of daily living, we begin our teaching module with empathic modelling, which is conducted in the form of a simulation, or experiential, workshop.

3 Empathic Modelling Workshop

The method that has been used to conduct an empathic modelling workshop with students, lasting for 1½ to 2 hours, is described below. Naturally, flexibility is the key, and with a bit of imagination further useful activities can also be developed.

3.1 Method

Before the students arrive in the room, move the tables at the back into two L shapes in the two back corners of the room. One L shape, furthest from the window, should be the 'Dexterity Station.' The other, with one section near the window, should be the 'Visual Station.' There will also be Hearing and Mobility Stations to be situated in the room where appropriate.

Set up the products/activities on tables along the sides of the room (see Materials below). There will be some overlap, e.g. coins need to be picked up and identified and these will form part of both visual and dexterity activities.

For each table, attach some instructions on the wall behind each activity, e.g. 'Read instructions for cooking on the back of the packet' and 'Open one of the packets on the table'.

Ensure there are sufficient tables remaining for all the students to sit down. Describe what has been set up around the room and how to affix buttons on the knuckles of each finger with tape. This will simulate the effect of older and arthritic fingers, causing discomfort or pain to carry out certain tasks. Emphasise that they should have a button on each of the two knuckles on each finger, and even on the underside if they wish. Affix a button onto each knuckle with surgical tape (more expensive!) or sellotape (painful to remove!). Cover hands with surgical gloves to hold it all together.

Try to divide the class into 2 groups:

3.1.1 Group 1 – blindfolded person + guide

Put the students into groups of two, and blindfold one of the two. Explain the need for care and safety, and also if possible to keep the blindfold on for the duration of this exercise. Tell them they have 15 minutes or so to walk around outside the classroom, and then they should come back to the room, at which time swap them over, so that the visually impaired person can become the guide.

3.1.2 Group 2 – visual, hearing, mobility and dexterity tasks

The students should explore the activities on the tables around the room (see Materials below). Emphasise that when they have finished at the tables there is still the opportunity to explore the room and maybe their own bags and everyday activities such as looking at the overhead projector or finding a plug socket. They should concentrate on the experience. It is not a competition to see who can perform the best or most—it is an experience that they should think about and consider its further implications.

3.2 Materials

Visual tasks, will require the following types of materials:
Newspapers, simulation spectacles, ordinary spectacles and sunglasses smeared with Vaseline, paper, pens (different colours and thicknesses), application forms, lamps (with different watt bulbs), blindfolds, and cotton wool pads.

The following types of activities can be undertaken:

- Reading various newspapers, using different intensity light sources
- Completing application forms and other documents
- Identifying the contents of different tins and packets of food
- Trying to read the instructions for preparing the packets and tins of food
- Writing on paper, with different coloured papers and different sizes and colour of pens
- Counting a pile of money

Hearing tasks will require a few audio cassette players, with tapes playing 'white noise'.

Mobility tasks will require the use of crutches, walking sticks, or wheelchairs (if enough space is available).

Once buttons have been taped onto the knuckles, as described above, the Dexterity tasks will require various packets, roll of plastic bags (e.g., from the vegetable counter at the supermarket), scissors, pens, paper, jars, biscuits, crisp packets, coins, etc.

The following types of activities can be undertaken:

- Opening packets of various kinds
- Opening the plastic bags, putting objects into them and tying them up
- Untying plastic bags and removing objects
- Putting objects into jars and closing them
- Opening jars and taking objects out
- Drawing on paper with different sized pens and cutting out the drawings with scissors.

3.3 Follow-up

Following the workshop it is necessary to leave at least ¼ hour for discussion about the students' experiences. Some actual comments from students in the past have been provided below in order to demonstrate not only the value of this exercise, but also suggestions for future improvements:

- With the blindfold on, other senses come to the fore.
- With the cotton wool pads under the blindfold, it was impossible to look around.
- The person guiding a blind person is a 'guide', not a 'carer'.
- When blindfolded, we were walking around an area that was already known by sight, which reduced the benefit of the simulation.
- When blindfolded, everywhere seemed larger.
- Going up or down stairs is an automated process.
- Handrail was bent at the top to tell you to stop stepping.
- Since multiple disabilities are so common, it is useful to combine the tasks, i.e. hearing + visual, visual + dexterity.

3.4 Conclusion and one of the ways forward

Our use of empathic modelling techniques have demonstrated that students in ergonomics and design can be effectively encouraged to think about how we take our senses and abilities for granted, as well as what coping strategies and adaptation techniques might be used by older and disabled people.

We hope that various initiatives will take up these ideas and consider them as core knowledge sets and skills that should be part of an inclusive design curriculum. The IDCnet thematic network project, part of the EU Information Society Technologies (IST) Programme, is focussing on such knowledge and skills in particular for information and communication products, systems and services (http://www.idcnet.info/idcnet/home.xhtml). The use of empathic modelling techniques can contribute to the development of curricula in design for all for any number of application areas, from product and system design to the design of the built environment. We would, therefore, like to encourage this sort of activity in the teaching of design for all, not just to students of design and ergonomics, but also to other disciplines such as engineering and computer studies. It may also become part of company training schemes for those already working in the professions.

A crucial next step, however, will be for students to be able to translate the results of empathic modelling into the design and development of products, systems and services that will be more usable by all. More work is needed, therefore, in promoting an overall understanding of the general principles of inclusive design, and more importantly, knowing how to put those principles into practice.

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5 References

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