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Integrating participant research with product design education

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Abstract

For significant consumer groups like the over 50's and disabled people, usability is especially important besides lifestyle aspirations, and products have to address a greater variety of functional issues to include their needs.

Leading design companies now emphasise their competence in delivering user-centred design solutions. Consequently, research skills such as those used in ergonomic or sociological research are becoming more important in design practice.

The paper discusses the integration of participant research with product design education to enable graduates to deal with changing demands on professional practice. The authors have previously investigated older people's needs for bathing environments. Arising from that research, a human factors teaching module was designed in which a group of students and a group of retirees worked together to define needs and to answer them. In the six week module, qualitative research techniques and full size test rigs were used by the students. The outcomes indicate that the work was of benefit to both the students and the participating user group.

The benefits of integrating participant research with product design education are highlighted and discussed in the paper, with a particular view to how they prepare students for new demands placed upon the profession.

1 Introduction

The paper discusses the integration of participant research with product design education. In the past year, the authors have investigated older people's needs for bathing environments ('The Wellbathing study'). This paper first gives a brief overview of relevant aspects of the Wellbathing study, and then reports from 'action research' (Gibbs, 1992) on importing qualitative research elements into a teaching module. This paper lists the observations made during the module and evaluates the approach on the benefits it brought for the students and the participating University of the 3rd Age (U3A) group.

1.1 Changes affecting design practice and education

Consumer groups like the over 50's and disabled people are now a significant market (Coleman, 1993). Older people themselves have begun to criticise that many products are not adaptable to their needs (DesignAge, 1995).

Researchers have looked at the relationship of older people with their environment (Csikszentmihalyi, 1995; Mollenkopf, 1993; Saup, 1986), and have emphasised the need for more research in this area (Baltes and Mayer, 1996; Chaney, 1996; Bowling, 1995).

For more than two decades, socio-medical research has focused on 'quality of life', which has been described as 'in its widest concept [...] identifiable with that of happiness. The entire personality concurs in the subjective perception of a good or poor quality of life' (Tamburini, 1997). The concept takes the patient's view as central in the evaluation of a health outcome.

Researchers are contributing to design methodology that places the user at the centre of the design process (Fozard, 1993; Jordan, 1998; Poulson et al, 1996; Rosenblad, 1997). The inclusion of participant research of the quality developed in sociological and psychological research is increasing in design practice.

User involvement has become a feature of some design courses, for example the Technical University of Delft, Netherlands, and the Royal College of Art, UK (Coleman, 1997). The RCA's DesignAge programme runs regular user forums in which groups of older people give critiques on student designs.

Researchers in higher education have described the benefits of a 'deep' rather than a 'surface' approach to learning (Entwistle et al, 1992; Gibbs, 1992; Kolb, 1984), which focuses on the *process* through co-operative learning in groups. Research on design students' thinking has shown that their information processing has an influence on their design output (Christiaans, 1992).

2 The 'wellbathing' study

The Wellbathing study is briefly described here to introduce the research methodology that was transported into a teaching module. The aim of the study was to contribute to a theory of 'quality of life in product use' by identifying environmental factors that promote well-being and do not disable people from being independent in their daily life. A number of older people were interviewed about their 'ideal bathroom' and about their interaction with their bathing environment.

During a four month period, two researchers conducted interviews with 36 people aged over 60 years living in sheltered accommodation. In three focus group interviews, visual elements (similar to mood boards) were used by participants to describe ideas and wishes (Lebbon and Boess, 1997). The use of visual material was prompted by the reported difficulty of interviewees 'in making choices when the products that would be right do not exist or are not available [to them]' (Willcocks, 1984). Subsequently, fifteen one-hour long interviews were conducted with individuals in their own dwellings. All interviews were followed by a peer debriefing and later, member checks. To gain insights on the nature of person-environment relationships, a grounded theory approach (Strauss and Corbin, 1990) was adopted in analysis. Data were categorised and coded (Polit and Hungler, 1997). Two types

of interview and photographic documentation allowed for data triangulation.

2.1 Results
The data, for example, showed instances of:
- acceptance of generally provided equipment (not aimed at individual disability)
- rejection of some assistive equipment because of a desire to 'keep going'
- adapted use of products, e.g. draping shirts over rails.

A discussion of the preliminary results is given in Boess and Lebbon (1998).

2.2 Conclusions
It emerged that the acceptance of equipment is influenced by how it reflects on identity, besides practical concerns, and that people adapted their environment to their daily routines. The study concluded that visual and open question-based communication with users yielded data pertinent to design. The methods used in the Wellbathing study served as a resource in developing a learning opportunity for product design students.

3 The teaching module

Examples of user involvement in design education have been given in the introduction. To assess the benefits of integrating participant research methodology, the authors designed a six week human factors module at Staffordshire University. Its aim was to convey skills and appreciation of research to students. During the module, the students discussed their progress with a group of retirees. Outcomes were negotiated between them. The evaluation of the module was concerned with the following questions: What factors promoted or hindered participants' communication on design? What did it contribute to learning outcomes?

The group meetings were led by one of the authors. Participation and initiative were encouraged. Written summaries (on overheads) provided analysis material. Individual discussions between students and users were observed by the authors. Students' written records helped to recapture their

content. Feedback from students, the user group, and the two other lecturers was collected by the authors throughout the module. For assessment, students presented their research on boards and demonstrated its application in a full-size test rig. They submitted a research report, which was assessed by a lecturer external to the project. The assessor's comments were also drawn on for evaluation.

3.1 Module design

The authors asked a University of the Third Age (U3A) group to collaborate on the module. There were seven students and seven U3A members. They worked together in varying small groups at the meetings. The U3A members were three couples and one woman, age range 60 to 73 years, mean 67 years. The design students were all male, aged on average 20 years. All were given a framework within which to work and provided with prepared – but unregulated – time together. Design students want to learn by seeing the whole picture (Durling et al, 1996). Qualitative research skills are suitable for achieving this. The students were given a basic training in those skills at the start of the module.

3.1.2 The brief : a useful bathroom

The students collected and compared the ergonomic guidance available (e.g. Goldsmith, 1976; Juul-Andersen and Jensen, 1997; Kira, 1976), and translated the information into a 1:1 test bathroom. In the space, the students built test rigs. Three student teams each worked on one of the following topics:
- grooming at the washbasin;
- storing, reaching for; and using toiletries;
- manoeuvring within the space.

3.1.3 Structure

Week 1
Research methods day:
Introductory activities on user research, e.g..:
- video on older consumers,
- definition of human factors in discussion,
- doing observation (of people using a train station) and information structuring
- talk on 'the art of open questioning' (Krueger, 1994, p. 57)
- doing interviews with people and

structuring of the information according to relevance for design.

Overview of bathroom products, collection of guidelines on accessible bathrooms. Preparation of information boards for the U3A members.

Week 2
Meeting 1: Brainstorming by all on 'the ideal bathroom'. Interviews in groups of two and two.

Week 3
Visit to a manufacturer to discuss relevant design issues.
Students complete the test bathroom, organising it in the most accessible and usable way.

Week 4
Meeting 2: Presentation (by the lecturer) on 'ideal' bathrooms (on U3A group request). Students present research results. Discussion of test rigs.

Week 5
Meeting 3: Video on product design for older people. The U3A group criticises emphasis on 'older people' in it. Discussion of progress.

Week 6
Presentation to the manufacturer and to the module managers.
Recap session on research methods, transferred to another topic.
(Presentation to U3A members to follow.)

4 Observations

- Initially, the students were reluctant to extract information from guidelines. They seemed overpowered by the task: "There are three different guidelines here, how do I know which is right?"
- The students were asked to present their research findings in summarised form to their 'lay' audience. It was a learning process for them to present information clearly.
- The interview and observation skills taught were applied repeatedly by the students in discussion with the users. Throughout the

module, the students refined their question-asking and became more relaxed about it.

- The group discussions showed differences in interpersonal skills between individual students. Their strategies ranged from easy chat to almost completely non-verbal communication in the case of one student, who preferred to set up measurable test situations instead.

- Uniting the demands of the brief and users' comments like "I want a bath like this", obliged students to rationalise, prioritise and defend their decisions to users and lecturers. The recurrent meetings helped to focus the interpretation of information, which was a main difficulty.

- The use of full-size test rigs enhanced in-depth discussion of functional issues. Some students developed design ideas directly out of observing users' actions and getting their comments.

- The students were apprehensive about the module beforehand, saying they would not have chosen it. Though they enjoyed working with the users and acknowledged the value of background data for design, this attitude did not change. In a follow-up module (designing washbasins), only one of the students elected to take a user-led approach.

- The U3A group insisted on 'design for all' rather than 'special' products. They did not want to be targeted specifically on account of age or disability. Students and users found common ground in their dislike of equipment with a 'rehabilitation look'.

- The older people showed less discomfort than the students in discussing bathroom activities. Some even invited students to their home. Some students found it more difficult to be open.

- There were insecurities on both sides that hindered communication. For example, when it came to actually moving around 'as if' in the bathroom, the students were embarrassed to ask, and the U3A members to do so unasked.

- Most of the students said – before and after the module – that they didn't like designing bathrooms, and that they didn't like designing for older people.

5 Discussion

The aim of the module was to convey to students skills and appreciation of research through 'learning as understanding reality' (Gibbs, 1992). It was observed that the amount of guideline data which the students were confronted with, and their lack of experience in actively handling it, caused overload and initially diminished their ability to learn and to understand. More time could have been given to discussion of the data. Further into the project, their confidence in selecting relevant information grew and they worked constructively in doing so in their self-selected teams.

Purposeful interaction with outsiders, who had no power relationship with them, promoted students' 'transferable skills': e.g. communication skills, interactive skills and analytical and synthesising skills (Entwistle, 1992 quoting Hitchcock, 1990). The students commented, after each meeting, that they enjoyed this interaction. For some students, though, the basic research training given was insufficient to help them counterbalance their shyness.

Triangulation of data sources (user group discussions, background data, full-size models, and manufacturer's comments) emerged as beneficial for learning outcomes. The full-size test rigs enabled students to verify abstract data with the user group. The knowledge gained was in turn enhanced by returning to the literature. Some succeeded in challenging guidelines by comparison with user preferences. The students commented that they came to feel more secure about their knowledge. Input from the client company demonstrated to them the relevance of the knowledge in professional practice. The finding that triangulation is an effective approach corresponds to Entwistle's (1992) recommendation for promoting effective learning: a combination of experiential learning and collaborative work. Coleman (1997) has noted:

"I know of no better way of challenging students' preconceptions than putting them face to face with a group of older people."

The relevance of user research in bringing realism to design was recognised by the students. However, they found it difficult to interpret the information obtained from open questions like: "What do you want/ need it to be like?". This requires practice and experience, as is emphasised in guidance literature for social disciplines (e.g. Krueger, 1994). It could be addressed by offering more opportunities for acquiring research skills in design education. Students would be helped in understanding the outcomes of their design work as 'product environments involving the conditions of getting, using and keeping' (Margolin, 1995).

Studies have highlighted the role of information processing in creativity (Christiaans, 1992). This module did not allow enough time for the students to gain routine in using information. They felt that working with the user group blocked them in their ideas, commenting that developing designs based on older users' requirements can neither be creative nor innovative. The authors recognise that this bore negatively on their motivation. Gibbs (1992) has shown how motivation influences effective learning. Most of the students did, however, transfer some of the knowledge gained into their next module (designing washbasins), in which they were explicitly invited to innovate.

The U3A group rated positively the insights they gained on improving one's environment. They confirmed Laslett's (1989) vision of an active and fulfilled Third Age. Although some experienced disability due to arthritis, as a group they preferred not to focus on disability. They sought information on what an 'ideal bathroom' for them would be in their present situation. Some advice was given by one of the authors. Ideally an independent expert would have done this. The U3A members were helpful and open towards the students. They commented that they had enjoyed the collaboration and the insight into design education.

The stimulus materials (videos, slides and literature) available to students and users didn't promote quick digestion of information. Both might benefit from newer media like CD-ROMs, which can be explored collaboratively and at one's own pace. It might facilitate co-discovery (Jordan, 1998), rather than one group trying to solve another's problems. It may also be advantageous to use a topic where older people can take more of an expert role rather than a research subject role.

7 Conclusion

It has been shown elsewhere that user involvement has benefits in design education. The approach taken here facilitated communication between students and users, introduced students to a new set of methods, encouraged new approaches and conveyed the value of working with users. The project work familiarised both groups with relevant design issues.

- The prolonged collaboration contributed to 'deep' learning.
- The students profited from being able to apply knowledge gained directly.
- The approach enhanced students' transferable skills and use of triangulated resources.
- Lack of motivation and difficulties in handling information hindered students' learning.
- The U3A group benefited by gaining an insight into how one's environment can be influenced.
- Better use of stimulus materials could enhance collaborative approaches.

When the graduates start their professional lives, they will be better prepared for developing new approaches in designing for tomorrow's smart consumers. Some professional designers do this very well. These design students have been given an insight into how it can be achieved.

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