Mobility and Learning: Engaging People in Design of their Everyday Environments

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Abstract

"Mobility and Learning Environments" is a three-year project in which we have collaborated with people with cognitive difficulties at a day activity centre in Lund, Sweden and college students at Arts and Communication (K3), Malmö University, Sweden. The project is based on the participants themselves being engaged in the design of their everyday environments. For people with considerable difficulties in communicating, a new means of expressing their dreams was required. This paper describes how we used cultural probes to inspire, inform and surprise those of us who took part in the design process.

Keywords: cultural probes, inspiration, cognitive abilities, engaging users

Introduction

In recent years we have seen a change in attitude from considering people with disabilities and older people as special cases requiring special design solutions, to involving them in their everyday life routines through a more inclusive
approach to the design of artefacts, services and buildings (Coleman 2005). Particularly important for this inclusive approach is understanding the needs and wishes of people adversely affected by decisions made throughout the specification and design process.

An important reason for this change in attitude is the growing percentage of older people in the population. People change mentally and physically when aging. For many, these changes include several minor impairments in vision, hearing, mobility, communication and memory abilities. Sometimes, these changes have a serious impact on older people’s independence because of the unnecessary mismatch between the design that surrounds them and their altered capabilities (Jönsson 2003).

In this paper, we look at inclusive design for mobile learning and communication in two different groups of people: one with very limited verbal language abilities with a need to convey their experiences and language non-verbally, and another – students – with a need for access to communicating in different media in an open, flexible university environment.

An important challenge has been to establish a design process that allows us to reveal and understand the needs and wishes of both groups.

The Mobility and Learning Environments Project

The Mobility and Learning Environments Project is a three-year collaboration between Lund University and Malmö University that was initiated in 2002. The project has a strong focus on methodological problems of how to engage users in design of their everyday environments. Important issues, aims and activities in the project are:

How can we establish a design process that engages people in creating their mobile and digitally augmented environments?
Studies of how to combine ethnographic approaches with the idea of cultural probes to support engagement in design processes.
Developing a more general methodological framework for engaging people in designing digitally augmented daily life environments.

A successful analysis of learning situations must involve at least four perspectives: content, structuring of the content, pedagogical method, and learning environment. Through the years, fruitful although far too limited efforts have been made to adapt content, structure and methods to each other and to the needs, wishes, and dreams of the learning individual. The learning
environments, however, have remained stereotypic and fixed, with minor possibilities for flexible interplay with the other three perspectives. Empirical studies have documented that people with autism who are unable to learn in a conventional educational environment, are able to learn in ones adapted to their specific needs (Mandre 1999). This requires that we engage people – professionals as well as other groups – in designing flexible learning situations that fit their needs. Mobility and mobile technology are key factors in creating such adaptable environments. Another requirement is access to a variety of sources for learning – digital as well as material.

New mobile technologies are emerging on the market for a wide selection of applications and devices such as digital pens, handheld computers, and telephones. The possibilities for the range of applications are much wider, especially within the area of embedded technology.

To enhance the opportunities of these wireless and mobile technologies, the individual, organizations and society as a whole must engage in different use situations that might be characterized as trial and error processes. Within such a process both technology and human practices have to change in order to explore and benefit from the technological opportunities.

To develop knowledge related to emerging use possibilities and technical obstacles in a wireless and mobile environment, we need to design for and study applications in real environments. This is where humans can engage in different situations working with wireless and mobile technologies and thereby become aware, reflective, and competent users who are able to specify technological as well as social and organizational needs.

In this project we have created a platform where users and designers of augmented mobile learning environments can participate in a mutual process expressing needs, wishes and possibilities.

Participants from two learning environments have been involved. One is a university context, K3, at Malmö University, Sweden, www.k3.mah.se. This context is characterized by the need for, access to and exchange of a wide range of sources for learning. The second learning environment is a day activity centre for people with reduced cognitive abilities, Tryckolera, in Lund, Sweden, www.tryckolera.certec.lth.se. The potential of this polarization is implied in the description of the project (Jönsson et al. 2002) and illustrates the challenges of inclusive design processes.

During the first two years of the project, a number of cultural probe processes were undertaken in the two learning environments (see following section on cultural probes). These have revealed many surprising observations and important ideas for future design decisions by giving us access to our own and
our co-designers’ thoughts, which would have been difficult to explore through more traditional enquiry processes.

Methods for engaging people in design of their everyday lives

Since the idea of using cultural probes was proposed (Gaver et al. 1999), it has received substantial attention from the research community of interaction designers oriented towards conceptual design of interactive digital devices. To transcend well-established practices and habits based on many years of experience, it is necessary to establish and use methods and means that allow the viewing of well-known situations and environments in a new way. Metaphorical design (Madsen 1994) and future workshops (Kensing and Madsen 1991) are early attempts in this approach. Cultural probes can be considered as another method based on the idea of transcending practice. Whereas the first two methods have their roots in the Scandinavian systems development tradition based on a socio-technical approach, the cultural probes method has its roots in an artistic, design-oriented approach.

Talking about cultural probes as a means for provoking users in order to gain inspiration for design usually is referring to the designers’ inspiration. But we believe that the “friction” contained in the probe’s design can also work as a way of inspiring users to create new use situations and to look at their environment in a new way – with new glasses. In an interactive process of inclusive design involving people with very limited verbal language abilities, questionnaires and interviews are extremely blunt instruments for capturing people’s dreams or aversions. Different kinds of cultural probes in this context are many times preferable because they do not require specific prerequisite knowledge or language skills. In the Mobility and Learning Environments Project, we introduced a number of hi-, lo- and no-tech probes at the two sites described.

In what follows, we describe how the use of these probes has inspired and surprised those of us who have participated in the process. We focus primarily on design processes involving people from the day activity centre in this paper.

Cultural probes in inclusive design

We saw our primary task as project managers to create, as far as possible, the required conditions that would enable people with significant cognitive and communicative difficulties to direct the design process and thus become co-designers from the very beginning to the end. Experiences from previous similar
projects indicated that the reason the co-designers were not given the opportunity to control the process was primarily due to the great difficulties they had in verbalizing their wishes and needs. By making use of cultural probes, that obstacle no longer existed. Instead, through their actions they could inspire others to take part in the design process.

Action goes for both the designer and the participants. The question that faces such a research project is, “What do we have to do in order to find out?” rather than “What is the situation?” By acting, we capture at an early point many of the practical problems and conditions that would otherwise have been missed (Suchman 1987). The technology itself can serve as a catalyst and can provoke reflection, answer existing questions while at the same time raising new ones (Jönsson 1997).

**Cultural probes and people with cognitive limitations**

Since this was the first trial, we had no assumptions about how the cultural probes would be appreciated or applied after we had introduced them. There was an unspoken hope among us as designers that at least some of the probes would be so tempting and fun to approach and use, that they would initiate processes that directly or indirectly would give us clues about issues that had a distinctive importance for our co-designers with cognitive limitations.

**Co-designers’ familiarity with the probes**

We deliberately used probes from the beginning of the project which in appearance and use strongly resembled artefacts our co-designers had been familiar with for several years. This could include videos, digital cameras, image management software, sound and image based e-mail, barcode readers and ordinary telephones. The advantage of starting with these probes, which fit into old patterns, was that it made it possible to interpret and relate the inspiration, the answers and the reactions to the new applications of well-known artefacts.
instead of discussing whether the effect in reality emanated from the novelty of the artefact as a physical device.

**Trust and empathy of the designers**

Since we as researchers wanted to let ourselves be exposed, inspired and, if possible, surprised, we chose to start with just a few probes. We were prepared to take all the time needed to let our co-designers’ become acquainted with them before we introduced others. Our co-designers, however, very quickly found innovative ways of using the probes that forced us to come up with responses in the form of different kinds of tangible or intangible artefacts. Each step, each interaction, each response required a tremendous amount of sensitivity, understanding and empathy from the supervisor of the day activity centre who was our confident during the months when the first probes were introduced.

Although several of us had had more that ten year’s on-going co-operation with many of the people who participated in the Mobility and Learning Environments Project at the centre, it would never have been possible to introduce the probes and their usage without having a person on location whom all participants in the project trusted and relied on completely (Plato and Jönsson 2001).

This became obvious when a new member (not involved in the project) started at the day activity centre. During this person’s two-month orientation period, one of the researchers was unable to visit the centre in person to avoid unnecessary disruptions. This meant, however, that he was unable to keep in regular contact with the co-designers in the project. Out of necessity, he and the centre supervisor introduced a web camera in order to re-establish ongoing communication, albeit at a distance. The web cam was also to work as a cultural probe. When technical problems arose, the unexpected solution resulted in an entirely new kind of communicative encounter between the researcher and co-designers, which the following example shows. It inspired all of us who were participating.

**Example:** During one of the initial connections after introducing the web cam, the sound was not working, so the researcher and co-designers were only able to see one another on the screen, moving their lips. The researcher than telephoned the centre and one of the two the co-designers answered. On the screen he and the researcher could see one another holding the telephone receivers to their ears. From the facial expression of the co-designer, it was obvious that this was a true “Aha!” experience. It took a while for the researcher to realize that the surprise was because this was most likely the first time the person in question had had the opportunity to actually see what it was like for the person who was calling, something he lacked the abstract thinking capabilities to imagine on his own. Since that day, the supervisor saw to it that the co-designers often used the phone when communicating with the researcher using the web cam, even when the sound worked, because the feedback the co-designers
received from the telephone signal and connection provided even more clues to the mystery of telephoning (Jönsson et al. 2004).

**Concluding remarks**

An exciting part of many design processes is the challenge of trying to transcend well-established practices and habits based on many years of experience. To do so, it is often necessary to establish and use methods and means that allow you to view very familiar situations and environments in a new way. In this project, we have attempted to take this a step further by consciously creating conditions for people with considerable cognitive and communicative problems to force us as researchers and designers to question established concepts of whom is capable of initiating and contributing to a design process. It is already quite obvious that the use of cultural probes helped to elucidate exactly whom it was who actually owned the questions, issues and problems.

Through the years, several of us have participated in many design processes that aimed to make everyday life easier for people with cognitive difficulties. It was always implicitly understood who was leading the process since many of our partners did not have the ability to verbalize their thoughts (Svensk 2001). In the Mobility and Learning Project, the roles have been considerably more ambiguous and, with the exception of the first few months, the initiative has passed back and forth. In this project we chose to utilize cultural probes to let ourselves be informed and inspired in the design process along with several people with severe difficulties in communicating. In our opinion, this way of posing questions and the co-operation that resulted from it proved to be an unexpected success. There is every reason to further develop this method in similar research efforts.

**References**


Illustration: Henrik Enquist