

PROFESSIONAL PROBES: A PLEASURABLE LITTLE EXTRA FOR THE PARTICIPANT'S WORK

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ABSTRACT

Practitioners from different fields of design and research have started applying probing methods as means of getting a better understanding of their users and to inspire their designs. The probes have further been extended for deployment in different contexts and for different uses. However, applying the probes approach at work has unique characteristics that have not been formally addressed. In this paper we report a study with industrial designers as well as other studies in which probes have been introduced in professional environments. These studies revealed several problems and challenges researchers encounter while probing professional work. Based on the key findings from these studies we propose a set of considerations for designing professional probes.

KEY WORDS

Design methods, Cultural Probes, and Workplace

1. Introduction

Human computer interaction (HCI) and user centred design (UCD) practitioners have started applying new experimental methods such as probes as means of getting a better understanding of their users and to inspire their designs. Regarding its main characteristics, probes: 1) are based on user participation by means of self-documentation, 2) look at the user's personal context and perceptions, and 3) have an exploratory character [1].

Gaver, Dunne and Pacenti first introduced Cultural Probes [2] as a form of exploratory and design-oriented self-documentation method. Cultural probes are collections of evocative tasks meant to elicit inspirational responses from people – not comprehensive information about them, but fragmentary clues about their lives and thoughts [3]. An aesthetically well-designed probe kit is given to volunteers who complete the materials and send them back to researchers for analysis. The contents of the probe kit differ from one design or research project to another, but they are purposefully ambiguous, trying to stimulate the mind of the participants and capture their experiences.

Since the original probes, several researchers have extended probes for different contexts and uses, such as in Technology probes [4], Mobile probes [5], Empathy probes [6], Photograph probes [7] and Urban probes [8]. Most of these published probes studies have been carried out in domestic contexts. There are, however, cases in which the probes have also been experimented to study working context such as nurses [9] and clinical collaboration at hospitals [10], e-work (in which the domestic and the working context become blurred) [11], and ageing workers' well being [12]. Diary studies have also been conducted to explore environment information capture devices [13], and task switching and interruptions [14].

Our experience while applying probes both in domestic and professional environments indicates that applying the probes approach at work has special characteristics that have not been formally addressed. For example, introducing probes in the work place can have a negative effect due to interruptions to the work of the participants. Answering questions on a diary can be a significant distraction from the participant's main task. Participants are often reluctant to take part in these studies [15].

Based on these concerns, in this paper we propose a set of considerations for designing professional probes, that is, probing materials to be used to broaden the designer's and researcher's understanding of the topic that is being studied. To illustrate and provide a context for the discussion on the proposed considerations, we present how probes were applied in professional environments, including a study with industrial designers and other studies in which probes have been applied.

Our findings suggest that the main challenges researchers will face when designing professional probes include aspects related to 1) reducing the demands placed on participants, 2) encouraging a fluent and playful process for participants to avoid 'obligation', 3) being sensitive to the special nature of the work that is being studied, 4) supporting different strategies for using the materials, and 5) motivating the participants.

2. Case Study: Industrial Designers

The ID-MIX project investigates the relevance and impact of augmented reality systems in work practice. The project tries to assess whether professional users would change their current work practice favouring the use of an augmented reality system that supports their work. Probes were applied to open a dialog with professional users (i.e. industrial designers) and find opportunities for augmented reality interaction techniques to support their work.

2.1 Method

Seventeen practicing industrial designers were recruited for this study. They all initially agreed to participate in the study although ultimately only ten worked on the probes and sent them back. The participants varied in their education (university/academy), in age (between 24 and 50), and in gender (6 women, 4 men). We obtained a wide variety of contexts, ranging from an office in a large company, to freelance work performed at home. Participants worked with the probes for seven consecutive days in their design studios and were free to choose the day of the week in which they would start. To increase motivation, all participants were given the probe kit during a personal meeting. All participants signed a consent form in which their anonymity was guaranteed.

2.2 Procedure

The materials included in the kits probed different aspects of the life and design practice of an industrial designer. We describe our probe kit (Figure 1) using Mattelmäki's properties of probe objects [1]. First, the kit included a 'Design Studio' diary that allowed probing several different aspects. The diary included 1) a 'Timeline' to probe the daily thoughts and activities of our participants, 2) closed questions covering different aspects of routines, collaboration, and use of technology, 3) open questions to make people tell stories and express their opinions, 4) a map to allow self-expression, and 5) an 'Ideal Design Studio' drawing exercise to probe the dreams and aspirations of industrial designers. Second, the kit included a disposable camera to probe the environment and take pictures to visually support some of the experiences they had while working on the probes. Instead of suggesting pictures on the camera itself by re-packaging it, we decided to include a 'Picture Record Table' in the diary where participants kept track of their pictures. We made suggestions for shots as well as intentionally left half of the pictures unassigned so they could share different aspects of their environment or activities with us. In total, participants made over 200 pictures with the disposable cameras. Half of the participants personally returned the probe while the other half sent their probes by mail in the self-addressed and stamped envelopes we included in the kit.

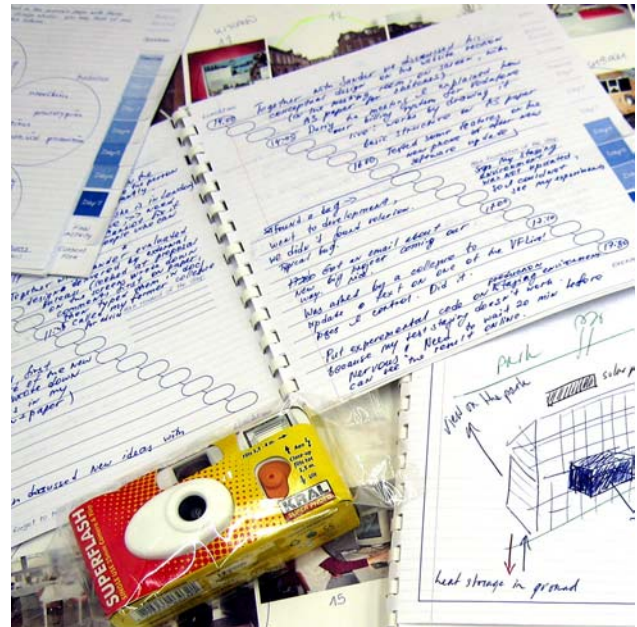


Figure 1: The industrial designers' probe kit.

3. Findings

The findings from the probe study concerning the designers' way of working are reported elsewhere [16]. We will now present the main findings in relation to the challenges of applying professional probes. To guide the discussion we use the previously described probes study with industrial designers. We also provide some illustrative examples from other projects, some of which the authors have directly been involved in.

3.1 High demands on the participants

Several participants dropped the study after they had initially agreed to participate. There were different reasons for not completing the study although lack of time was often mentioned. However, the energy and time demanded from participants to fill in the diaries proved to be a major problem. One participant summarizes the main difficulties participants encountered with the diaries: "I must say it is a BIG job, much more than I thought. Keeping your diary has a big impact on the way I work, so I wonder if this probe is actually useful." Participants indicated the diary should be less time-consuming and should involve less writing. High demands on participants' efforts to complete diaries in the work environment have also been reported [13, 14, 15].

Attempts to address the problem of filling-in diaries in a work context include a study about mobile work where participants used camera phones (i.e. mobile probes) as a way to report their experiences [5]. In this case the participants were sent SMSes during the study with tasks for messaging and taking pictures. In another study in which camera phones were used for probing at hospitals [10] the phones had a special probes application. In that

study the participants were asked to check daily the tasks from the probes application whenever it was best suited for them. This was thought to be less intrusive for their work than SMSes arriving at inappropriate moments. However, the feedback from the participants indicates that even opening the probes application for self-reporting required a lot of activeness and remembering. Some of the nurses would have preferred receiving tasks in messages instead. Hence, the balance of activating, interfering and remembering in midst of working is delicate.

Professional probes should aim at low time-consuming activities that reduce the demands on the participants. Alternatives to diaries should be considered. In the study with designers, participants reported taking pictures with the disposable cameras as easier than writing down text. Carter [15] proposes a hybrid between photo and audio capture for studies in which detail is important. Pictures are most appropriate for easy capture and later recognition, while audio is better suited for annotation.

3.2 Probing as an obligation

Several participants from the study with designers told us filling-in the diary at times felt like an obligation, something they ‘had’ to do. This created a negative effect making participants often forget about working on the diary. One participant told us, “I think I would be able to give a clearer impression (of my work) in a simpler way if I could use this study as a pleasurable extra, more like a break. The writing gave me the feeling of something that required extra attention.” When probes become an ‘obligation’ participants can lose motivation and perceive working with the probes as a cumbersome task [17].

Practical design of the probe kits and diaries can support motivation and reporting at work. The use of stickers and easy-to-access illustrations make diary-keeping more playful for users, and more enjoyable for researchers and designers [18]. The use of hints such as graphical elements, words and pictures to stimulate associations is recommended. A brief note made on the spot can later trigger deeper reflections in interviews.

Professional probes should encourage a fluent and playful process while documenting the participants’ work. The materials should be easily approachable and should avoid the feeling of being an ‘obligation’. One of the aims of probing is to sensitize and activate participants to reflect on everyday experiences with fresh perspectives. Thus, the probes should give motivational clues so participants can pay attention to their experiences, and have perhaps even a funny character, a pleasurable extra for work.

3.3 Understanding the specific work domain

When planning the probes the nature and context of the work should be considered. In the industrial design study, the placement of the probes was closely looked into.



Figure 2: The nurses’ diary (top) and cards (bottom).

To create less mess on the sometimes-cluttered desks of designers, most probe materials were concentrated into one booklet. In the study where nurses were involved [9] the diaries were designed to be small and plastic covered to fit the pockets (Figure 2). In the ageing workers’ study [12] the participants mostly worked at schools. Thus, the diaries were in form of school agendas folded into plastic pockets with clips to hold in their clothes or cleaning trolleys (Figure 3).

The planning of probe tasks for work contexts should consider organizational and management concerns as well. In the industrial designer study, a few participants were concerned about confidentiality issues in relation to their work. This problem was addressed by first reassuring designers, indicating them that the consent form included in the diaries explicitly considered this aspect. Participants were also free to choose the week in which they would work on the probes if they felt one project was more confidential than another. In the nurses study [5] the subjective character of the probes approach and its playfulness, openness and inspirational quality raised management concerns at one of the contacted hospitals. The hospital administrators were thoughtful if the patients’ ethical rights were respected and if the self-reporting at work time would risk the quality of the patient care. The grounds for these concerns were legitimate, because during the study we learned that nurses were not able to complete many words in diaries and for taking pictures they had had to make special arrangements such as covering the faces of the patients. However, the probes even when partly completed did spark reflections during work that were later documented or discussed in the interviews.

Another aspect is to carefully consider topics that may be sensible in certain work environments. To study clinical collaboration the participants considered the question “describe a panic situation at work” as highly unprofessional. Panic is not a word to be used in hospital context and in patient care. Thus a provocative wording can influence strong opinions, which are sometimes aimed at, but also negative attitudes to filling-in the probes.

Professional probes should be tuned in to the special nature of the work that is being studied. Aspects of the 1) placement of the probe, 2) management concerns, or 3) the use of provocative wording should be closely looked into to allow the probes to successfully enter the environment they were sent to study.

3.4 Different strategies to use the materials

Professional probes can be applied for various purposes. The probe kits, questions and the tasks often vary in each case. The reason why probes are used, the focus and the objective of the study affect how the participants should be supported in using the materials. If the aim is to focus on a specific experience, procedure or activity then we want the probes to be there reporting on the spot. If we are more interested in participants’ characteristics, feelings and considerations, and values then filling-in a diary is appropriate whenever it feels meaningful to the participant. In the study with designers, participants displayed a rich variety of strategies while working with the diary. Participants either filled-in the diary 1) as they worked, incorporating the diary as a new task in their normal work, 2) at the end of each task, 3) whenever they would remember, or 4) at the end of the day. Supporting these different strategies had not been initially considered.

Similar aspects have been reported in relation to participants using photos. To document experiences, photos should be taken when these experiences occur to represent the real situation. However, if they are taken later, they can have a hidden story about the lived experience. As an example, in the nurses’ study an anaesthesia nurse took a photo of an anaesthesia desk to describe ‘hurry at an operation’. The researcher was confused with the picture of a piece of furniture trying to interpret the hurry in it. Later it was revealed that it illustrated a dramatic story about a situation about the operation. The notes in the diary, in which this event was described, what had happened, and how the nurses felt after completed this story. The photo, when explained afterwards, included details that to a nurse represented hurry, which were not evident to a researcher.

Professional probes should be flexible enough to allow and encourage the use of different strategies for participants to work with them.



Figure 3: The ageing workers’ probe kit.

3.5 Participants’ motivation

In the study with designers, a considerable amount of work and resources was destined to create an inspiring probe kit. The booklet itself was designed in a way that designers would hopefully appreciate that it was handcrafted and especially made for them. Upon receiving the materials, designers had very positive comments and reactions. One participant said, “This is so nice. It really looks and feels like a diary.” The booklet was designed to visually stimulate writing. A handwriting-like font was used to communicate directly to our participants’ heart and to trigger an intimate sharing of their experiences while filling-in the diary. A blue color was used for the text to further elicit that it was handwritten with a ballpoint pen. We were successful in conveying this aspect to designers as two participants asked us, “Did you write this down manually?” The effort put in designing the probes was rewarded by the participants’ dedication to work on the probes. Similar positive comments about the aesthetics and personal touch of the material and their effect on the participants’ motivation have been reported also in other studies [17].

In the nurses’ study some participants enjoyed that they were asked to study their work from many perspectives. This holistic view was very different from the way company developers normally approach their work. Usually they are asked to evaluate the technology or usability and focus on specific tasks or practices. Some participants said the probe study was valuable because they felt they also learned something new themselves. It is worthwhile indicating however, that in probe studies some participants have been confused and uncertain of the value of the subjective focus, openness and exploring character of probes. This way of approaching research was contrasting with the natural science research methods they were familiar with. For this reason in a study considering clinical collaboration [10], tasks with professional content were added to motivate the participants from the operation theatres. Again, both positive and negative comments on the tasks were heard.

The nurses' probe tasks had visual elements in them and included collage-making assignments. Although there are individual differences how these kind of generative tasks are considered [19], some of the participants had clearly been motivated by them. One of the nurses commented that making the visual assignments made him think in a new, more visually oriented way, which he appreciated. Two nurses later said that they kept reflecting on the probes' tasks even when the study was completed.

The nurses' probe kits included a set of illustrated cards with open questions. One task from the cards was found surprisingly inspiring and successful. The illustration had five characters: Marilyn Monroe, Florence Nightingale, an athlete showing off his muscles, Doctor Ross from an American TV soap opera, and a Finnish male pig cartoon character with individual but creative personality. The nurses were asked, "Do these characters work at your work place?" All of the participants were able to identify their co-workers and created humorous answers describing the social atmosphere at work.

Professional probes should aim at motivating participants by providing inspiring probe materials that are made especially for the study that is being undertaken and by tailoring its contents to the specific work domain. Participants will pay more attention when they feel that the questions and messages included in the probe materials are tailored for them [20]. Using the professional jargon of the participants can support creating empathy both for participants and designers. Designing probe kit materials as handmade documents especially prepared for each study has an important effect in supporting the credibility of the material [6].

4. Considerations for Professional Probes

Previously we have illustrated the challenges of applying probes in professional context. To summarise we suggest the following considerations for professional probes:

- Professional probes should aim at low time-consuming activities that reduce the demands on the participants. Photo and audio capturing should be considered as alternatives to diaries.
- Professional probes should encourage a fluent and playful process for participants while documenting their work. The materials should be easily approachable perhaps even have a funny character to be perceived by participants as a pleasurable extra for their work.
- Professional probes should be tuned in to the special nature of the work that is being studied. Discussing the probe contents before deployment with management or potential participants will allow the probes to successfully enter the environment they were sent to study.

- Professional probes should be flexible enough to encourage the use of different strategies, allowing participants to work in ways that are meaningful to them.
- Professional probes should aim at motivating participants by providing inspiring, unique, handmade probe materials that are made especially for the study that is being undertaken. Materials should be tailored to create empathy both for the participants and designers.

5. Discussion

The probes approach is innovative and design oriented. It allows exploration to find ideas, to make sense of the topic of the study and the future users of the object of design. The participants of the probes studies are given tasks to explore and report their experiences with various means. Based on empirical data and literature Mattelmäki [19] has identified four reasons for using probes in product development and concept design context: 1) the probes data and the probing process can fuel design inspiration, 2) they provide useful information about users' context and needs, 3) they allow participants to express their needs and ideas, and to participate in design, and 4) they create and facilitate empathy and dialogues between participants and researchers/designer, and moreover within design teams.

When probes are applied to study professional context for inspiration they aim at triggering new views and opportunities. In this paper we have illustrated that despite the lack of motivation due to time pressure, participants are often willing to get inspired as well, to get a little pleasurable extra for their work. This would suggest that especially in professional context probes should be designed to have an inspirational and playful character to motivate the participants.

When probes are after information they focus on studying private contexts, they are able to enter intimate spaces. In professional context we have seen that this has created some challenges. The participants or their management have concerns on the ethics and confidentiality as well as time resources. Flexibility on reporting time and means should be provided to avoid these problems. The means of reporting should be open enough that the participants can frame their answers without risking their privacy. We have suggested that one solution is to allow quick and dirty filling-in strategies, i.e. to note meaningful insights or experiences during the work and to be able to deepen the information and reflections afterwards.

One of the aims with probes is to sensitize participants to the design topic and the experiences and practices that might be relevant for the design. In that way, participants are invited to participate in a co-design process. To facilitate this process, participants can be provided with clues, "things to think with" [21] to enable 'designerly'

change oriented thinking, to be able to express their needs and dreams with regards to future experiences.

For professional contexts, supporting dialogues to enable design empathy is important too. This can be facilitated with self-made, personal probes kits. When effort is put into the customized research material we expect to motivate the participants to go beyond the official professional roles and to express their personality and their subjective experiences in relation to their work.

6. Conclusion

We report on the use of probes in professional environments to discuss the unique characteristics of using this method in the workplace. We presented the results of a study with industrial designers (among other projects) to illustrate the problems and challenges researchers encounter while probing professional work. The results show that aspects related to 1) reducing the demands placed on participants, 2) encouraging a fluent and playful process for participants to avoid ‘obligation’, 3) being sensitive to the special nature of the work that is being studied, 4) supporting different strategies for using the materials, and 5) motivating the participants should be taken into account when applying professional probes. In summary, based on the key findings from these studies, we propose a set of considerations for designing professional probes which help emphasize the idea of designing probes as a “pleasurable little extra” for the participant’s work.

References

- [1] T. Mattelmäki, *Design probes*. Doctoral Dissertation. University of Art and Design Helsinki, Finland, 2006.
- [2] W. Gaver, T. Dunne & E. Pacenti, Cultural probes. *Interactions*, 6(1), January 1999, ACM, 21-29.
- [3] W. Gaver, A. Boucher, S. Pennington & B. Walker, Cultural probes and the value of uncertainty. *Interactions*, 11(5), September 2004, ACM, 53-56.
- [4] H. Hutchinson, W. Mackay, B. Westerlund, B. B. Bederson, A. Druin, C. Plaisant, M. Beaudouin-Lafon, S. Conversy, H. Evans, H. Hansen, N. Roussel, B. Eiderbäck, S. Lindquist & Y. Sundblad, Technology probes: inspiring design for and with families. *Proc. of the SIGCHI conference on Human factors in computing systems*, Ft. Lauderdale, FA, April 2003, ACM, 17-24.
- [5] S. Hulkko, T. Mattelmäki, K. Virtanen & T. Keinonen, Mobile probes. *Proc. of the 3rd Nordic conference on Human-computer interaction NordiCHI '04*, Tampere, Finland, October 2004, ACM, 43-51.
- [6] T. Mattelmäki & K. Battarbee, Empathy Probes. *Proc. of the Participatory Design Conference PDC 2002*, Malmö, Sweden, June 2002, CPSR, 266 –271.
- [7] M.P. Nieminen & P. Mannonen, Capturing the Mobile and Distributed Work for Concept Development using Photograph Probes. *Proc. of LASTED-HCI 2005*, Phoenix, AZ, November 2005, ACTA Press.
- [8] E. Paulos & T. Jenkins, Urban probes: encountering our emerging urban atmospheres. *Proc. of the SIGCHI conference on Human factors in computing systems*, Portland, OR, April 2005, ACM, 341-350.
- [9] V. Jääskö & T. Mattelmäki, Methods for empathic design: Observing and probing. *Proc. of the 2003 international conference on Designing pleasurable products and interfaces*, Pittsburgh, PA, June 2003, ACM, 126-131.
- [10] K. Battarbee, T. Mattelmäki, S. Ylirisku, H. Koskinen, M. Soosalu, M. Allén, & H. Salo, Looking beyond the product: design research in industrial and academic collaboration. *Proc. of Joining forces conference*, University of Art and Design Helsinki, Finland, 2005.
- [11] K. Virtanen, T. Mattelmäki & S. Heinonen, Visiting eWorkers’ Homes – Three Stories for Designing eWorkers Homes and Furniture. *eAdoption and the Knowledge Economy : Issues, Applications, Case Studies*, 2004, IOS Press.
- [12] T. Mattelmäki & K. Lehtonen, Designing alternative arrangements for ageing workers. *Proc. of the Participatory Design Conference*, PDC 2006, Trento, Italy, August 2006, CPSR, 101–104.
- [13] B. A. T. Brown, A. J. Sellen & K. P. O’Hara, A diary study of information capture in working life. *Proc. of the SIGCHI conference on Human factors in computing systems*, Den Haag, Holland, April 2000, ACM, 438-445.
- [14] M. Czerwinski, E. Horvitz & S. Wilhite, A diary study of task switching and interruptions. *Proc. of the SIGCHI conference on Human factors in computing systems*, Vienna, Austria, April 2004, ACM, 175-182.
- [15] S. Carter & J. Mankoff, When participants do the capturing: the role of media in diary studies. *Proc. of the SIGCHI conference on Human factors in computing systems*, Portland, OR, April 2005, ACM, 899-908.
- [16] A. Lucero & J.-B. Martens, Supporting the creation of mood boards: industrial design in mixed reality. *Proc. First IEEE International Workshop on Horizontal Interactive Human-Computer Systems*, TableTop 2006, Adelaide, Australia, January 2006, IEEE.
- [17] A. Lucero, T. Lashina, & E. M. A. Diederiks, From Imagination to Experience: The Role of Feasibility Studies in Gathering Requirements for Ambient Intelligent Products. *Proc. of the 2nd European Symposium of Ambient Intelligence EUSAI 2004*, Eindhoven, Holland, Springer Berlin / Heidelberg, 92-99.
- [18] T. Mattelmäki, Probes – Studying experiences for design empathy. *Empathic design - User experience in product design*, 2003, ITpress, 119 –130.
- [19] T. Mattelmäki, Applying probes – from inspirational notes to collaborative insights. *CoDesign: International journal of CoCreation in Design and the Arts*, 1(2), 2005, Taylor & Francis, London, 83–102.

- [20] B.J. Fogg, *Persuasive technology: using computers to change what we think and do* (Morgan Kaufmann, 2003).
- [21] S. Papert, *Mindstorms – children, computers and powerful ideas* (Basic Books, New York. 1980).