

Use of Activity-probing Tools for Enhancement in Co-experience for Scenario Based Design

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Abstract: In this paper, we illustrate a participatory workshop process and propose three Activity Probe Tools for user self-reporting that help workshop practitioners to gather co-experience through observation and to form a communication space. By developing new technology for working with users, we seek a convenient and effective method to explore users' problems in the context or actual use, and attempt to gather new concepts and ideas by making various viewpoints available.

Key words: *Scenario, Participatory Design, Photo Diary, Mobile AP II.*

1. Introduction

In the information society, gathering and transmitting the most relevant and complete information can be difficult. At the present state of the art, information technology design emphasizes not only communication involving an artifact and a human but also the design of systems and services etc. This requires a thorough understanding of the context of the human activity under study, making user-centered design and participatory design important in the understanding of users' experiences, activities, and the co-realization of the goals of the stakeholders. In addition, to achieve globalization of design, it is important to design a product to meet the needs of overseas users. Therefore, it is necessary to understand user life experiences and needs in overseas markets. However, in order to reduce survey costs, tools to provide insight into the understanding of foreign users are needed. The reduction of communication costs by Internet technology facilitates this with lower costs by shrinking the limits imposed by space and time on communications between stakeholders. Any tool that supports such collaborative design is worthwhile.

2. Objectives

In design to meet user needs, the users' life information and experiences that have been discovered often serve as a springboard for future designs.

To understand the users, the following steps are essential:

- Discover the user's problems and experiences.
- Generate empathy between stakeholders.

- Support communication to express their problems and requirements and opinions about the design.

Unfortunately, people are not good at becoming aware of problems related to familiar situations and events that they expect as part of their routine; it is difficult for them to bring these problems to conscious awareness. Therefore, we have designed tools that facilitate observation and self-report by enabling participants to record problems as they are encountered, including the context of the event and their momentary impressions. In this study, we implemented a participatory design using a scenario workshop with students from Japan and Taiwan, and used activity-probing tools in the workshop to evaluate the effectiveness of the methods and the tools.

3. Methods and Tools

In several current investigations, certain sociological methods are applied to design research, including observation, interviews, etc. However, technological progress now allows us to improve these methods. We plan to utilize probe technologies to help participants gather firsthand information from the field, increase their co-realization and communication with participants, and obtain more useful information to help develop design ideas. In this study, we required participants to use participatory design and to use probe tools to report a series of experiences and problems in field work. By using these methods and tools, participants could share their experiences and viewpoints, understand the context at a deeper level, and generate new viewpoints and ideas.

3.1 Participatory Development Methods

In this workshop, we have been studying information gathering techniques that combine the benefits of keeping a photo diary using scenario based design, and participatory design. The components of this combined method included:

- **Photo Diary**

A photo diary uses photographs and texts to help record a specific instant of time, as well as any relevant personal observations, and thus captures the information most important to that life experience and the event context. It provides a chance to consider other participants' action and intentions, or even one's own. Observation of a user's activity and responses as recorded in a photo diary makes those user's problems and needs accessible.

- **Scenario Based Design**

A scenario is a story [1]. A benefit of scenario based design is that it allows users to easily re-create situations with stories as the user experienced them, describe current problems. The design also enables extrapolation of future situations based on these problems. It can facilitate forming a common consensus among stakeholders to promote their constructive collaboration.

- **Participatory Design**

Participatory design is a collaboration method that encourages cooperation among participants of different backgrounds to share their knowledge and the experiences. This method can eliminate certain sources of conflict, such as those due to differing viewpoints, and offers the possibility of producing new designs. Using the method can promote interaction, create co-realization, and create empathy between participants.

3.2 Activity Probe Tools

In this study, we used three Activity Probe Tools (Figure 1) in field work. An Activity Probe Tool is a kind of

self-reporting tool, and connects observation with design. Self-reporting is a good way to record a user's activity and thoughts and make them available to the designer [2]. It is also a tool that can benefit from the photo diary method, and promote the participation of the user. The recorded information serves as a resource for analysis, and assists participants in perceiving the issues and seeking new concepts in the design process.

- **Mobile AP II and Camera Phone**

We have developed the Mobile AP II system, a user self-reporting platform, to collect and share a participant's impressions of his/her experiences. In this workshop, participants utilizing camera phones take photographs in the field, and upload the photographs plus text via email from the camera phones or a computer.

- **Instant Camera and Workbook**

In using this tool, a participant uses an instant camera to take photographs of objects of his/her concern at any instant, and notes the 6 relevant factors in his/her workbook: people/object, place, time, situation, cause, result. This provides the event with context in field work.

- **Digital Camera and Memo-pad**

The participant uses a digital camera to take photographs or sketch the problem situation, and writes a memo on the memo-pad while in the field. After completing the field work, participants can print the photographs to assist in explaining the problems.



Figure.1 Activity Probe Tools: Mobile AP II and Camera Phone (left), Instant Camera and Workbook (middle), Digital Camera and Memo-pad (right)

4. SEP2008_Hakodate Workshop

The Scenario Exchange Project (SEP) workshop, which began in 2005, is a participatory design model workshop that uses scenario-based design and involves Japanese and Taiwanese students [3]. The SEP2008_Hakodate workshop was continued with the Scenario Exchange Project, held in December 2008, and used scenario-based design etc. to develop design ideas based on participants' experience in the field.

- **Participants**

This workshop involves participants from different cultures: Japanese and Taiwanese university students from different backgrounds including computer science, information design, industrial design, and visual design. We coordinate these students' stay so that the students from Japan and Taiwan could be both the tourists on a field trip and the participants in a design process. The participants play a role not only as observers but also as designers.

- **Approach**

In this section, we outline the approach that we used in the workshop. The five-day workshop took place in

Hakodate, Japan. One of the objectives of the approach was to design new interaction systems or devices to support interaction between residents and tourists in ubiquitous environment. We planned five steps for this process (Figure 2).

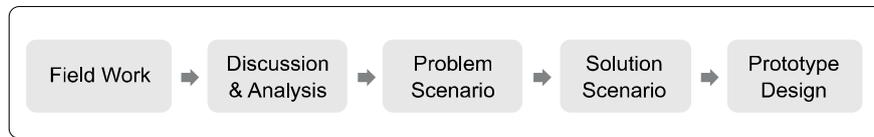


Figure.2 The process of the SEP2008_Hakodate Workshop

For the field work (Figure 3), we divided the students into five groups, each of which included six to seven students from Japan and Taiwan. Each group used different Activity Probe Tools (Mobile AP II and camera phone, instant camera and workbook, digital camera and memo-pad) to record the problems and experiences they encountered in the field and to complete their photo diary. After completion of the field work, the students shared each other's views and experiences to produce co-experience. Furthermore, students analyzed the collected information as a resource for concept and scenario building, and this analysis assisted students in perceiving the issues and visualizing the context from different viewpoints (Figure 4).



Figure.3 The step of field work



Figure.4 The step of discussion and analysis

In the third step, the students used problem scenario [1] to describe the issues arising from their findings and the problems uncovered in their discussion. Scenarios use story-telling to unify the co-experiences and enhance the participants' empathic understanding (The left of Figure 5). In the fourth step, the students considered solution scenarios [1] to deal with the issues set out in problem scenarios. In solution scenarios (The right of Figure 5), students presented new concepts and ideas on interactive design to improve the interactions between residents and tourists. In the final step, students were asked to build a simple prototype to express the concepts and ideas of their solution scenario (Figure 6).



Figure.5 An example of a problem scenario (left) and a solution scenario (right) from a workshop group



Figure.6 The prototypes from workshop groups

5. Discussion

Participants' questionnaire responses indicated that the data gathered by the tools supported communication between them. These Activity Probe Tools play a co-experience role in analysis of problematic context, and support the process of scenario writing. We have summarized the advantages and limitations of these tools in Table 1. While each tool has its advantages and limitations, the optimum combination seems to be workbook and memo-pad, which will be used for the improvement of Mobile AP II in future work.

Table 1. Advantages and Limitations of the Activity Probe Tools

	Mobile AP II Camera Phone	Instant Camera Workbook	Digital Camera Memo-pad
Advantages	<ol style="list-style-type: none"> 1. When analyzing, it is easy to recall the situation in which a photograph was taken because the memo and the photograph can be saved together in a file. 2. It is convenient to review the data for similar research even separate places via network. 3. Ideas can be collected from the comments of other members in Mobile AP II. 	<ol style="list-style-type: none"> 1. It is suitable for communication in the same field work. 2. Using the tool features specified in the workbook to note down the context of the problem, it is easy to clarify the problem. 3. It immediately reacts to shared information of problems, concerns and exchanged opinions in field. 	<ol style="list-style-type: none"> 1. Participants do not need to learn the tool that is accustomed to be used in daily life. 2. When dealing with photographs after field work, participants could find new discovery in photograph.
Limitations	<ol style="list-style-type: none"> 1. Communication for collaboration in the same workplace is not easy. 2. There are many photographs, and it is difficult to narrow down to a focus theme. 3. The quality of the photographs taken by the camera phone was poor. 	<ol style="list-style-type: none"> 1. When using an instant camera, the photofinishing is so slow that few pictures are taken. 2. Photo size and quality are insufficient for good detail. 3. Sticking a photo in a workbook makes it very difficult to categorize the photos in similar problem areas. 	<ol style="list-style-type: none"> 1. Use of a digital camera makes it impossible to immediately match the photos & text, leading to memory lapse about some details in photographs. 2. Use of digital cameras produces so many photographs that it is difficult to deal with them all in the analysis step.

6. Conclusions

In this study, participants in this workshop used certain tools to gather their collective experiences to form a communication space, and performed collaborative learning and idea creation. Furthermore, participants could express the issues that arose, easily using information gathered with probe tools to build scenarios to achieve empathy and good communication. However, we found that the participants' awareness and understanding of the problems depended on their different cultural viewpoints. This was actually advantageous, as they could discover new problem areas and inspire more concepts and ideas through the co-realization of their differences. In future work we would like to improve Mobile AP II to make it a tool to accumulate and represent user experiences effectively, and to form a communication field that promotes co-experience.

7. Acknowledgement

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8. References

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