

# DESIGNERS AND STAKEHOLDERS DEFINING DESIGN OPPORTUNITIES “IN SITU” THROUGH CO-REFLECTION

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## ABSTRACT

This article proposes co-reflection as a workshop to situate design practice in its context of application and presents a case study done at the eLearn Center of the Open University of Catalonia. Co-reflection is a reflective practice. In the half-a-day workshop developed, co-reflection was specifically tailored for group dynamics in situ. The workshop was the kick-off meeting of a design research project and involved both designers and stakeholders. The project focused on how to communicate and disseminate relevant information between members of the eLearn Center. The aim of the kick-off meeting was to define design opportunities by framing both collaboration and a design space. This double aim has been achieved by: a) exploring and framing a design space by reflecting on short design activities in situ, and b) motivating stakeholders to collaborate in the design research project by making them reflect on the expertise and interests they can share and gain. Participants' evaluations have been used as feedback and treated as insightful considerations for further action research.

## INTRODUCTION

Generative design research allows designers and everyday people to generate, experience and reflect on design opportunities in order to transform current situations. Generative design research is driven by design action and has a participatory approach based on the use of generative tools (Sanders 2006). Generative design tools have been widely developed over the past years. Experience prototyping allowed Buchenau & Fulton Suri (2000) to understand existing experiences, explore

design ideas and communicate design concepts. Make tools were developed by Sanders (2000) and empowered everyday people to express their ideas and feelings. Drama and props were used by Brandt & Grunnet (2000) to evoke the future. Cardboard mock-ups were used by Såde (2001) in multidisciplinary design projects to provide a common language and facilitate conversations.

In recent years, research on generative design tools has focused on situating generative design tools in real life

contexts. Iacucci & Kutti (2002) developed SPES (situated and participative enactment of scenarios) for trying out emerging ideas, discerning important contextual information, collecting creative contributions from participants and communicating realistic and authentic scenarios. Howard et al. (2002) used endowed props to increase stakeholders' sense of immersion during participatory design sessions by making real the possible interrelationships between the prop and the physical, social or technical context. Anderson & McGonigal (2004) developed place storming in order to allow engineers, designers and strategic marketers exploring new directions and applications for consumer electronics performing new technologies in context. The in-situ play provided a common language and experiential reference. Vaajakallio & Mattelmäki (2007) explored the situated used of make tools for setting the stage for co-design in collaborative design explorations. They carried out exercises to think about future opportunities with end users in their everyday work context.

This article builds upon previous research in order to integrate generative design practices in real life settings. It proposes a repertoire of generative design techniques that can be used in a workshop setting to define design opportunities through framing both collaboration and a design space: exploring and framing a design space by

reflecting on short design activities in situ; and motivating stakeholders to collaborate in the design research project by reflecting on the expertise and interests they can share and gain. A workshop done during a kick-off meeting at the eLearn Center of the Universitat Oberta de Catalunya (UOC) is used throughout the article to exemplify the workshop activities, to point out the implications of situating the process of defining the design opportunities; and to reflect on its additional pedagogical, exploratory and user research aims. The following sections introduce reflection and co-reflection in design practice as the theoretical framework that provided the structure to the workshop, describe in detail the workshop phases, analyses the feedback obtained from the participants and discusses about the implications of running the workshop in situ.

### REFLECTION IN DESIGN PRACTICE

Reflective practice has now been widely accepted and used in the field of design. Schön (1983) defined designing as reflective conversation with the materials of a design situation. Dorst & Dijkwis (1995) compared design as a rational problem solving process with design as a process of reflection-in-action. Valkenburg & Dorst (1998) analyzed reflective practice in team design and identified that reflection occurs related to a choice to make for the next activity or to the design task itself and the team's progress. In the reflective transformative design process of Hummels & Frens (2008), reflection occurs in the transitions between envisioning a new reality, validating in society, analyzing, making prototypes and tinkering with technology, and integrating the knowledge created.

Reflective research can be of four types: frame analysis, repertoire building research, research on fundamental methods of inquiry, and research on the process of reflection-in-action (Schön 1983). Frame analysis puts emphasis on the process of perceiving and making sense of social reality. Frame analysis in the design field is of special importance. Considering design as a situated and constructive making of meaning (Ylirisku et al. 2009), makes framing activities key to deal with the complexity of design action and define

design opportunities. Ylirisku et al. (2009) define three framing actions: exploratory, anticipatory and social framing.

This paper proposes reflective techniques to be used at an early stage of the design process to support explorative and social framing of design opportunities. Explorative framing functions as a guidance to support collaborative experimentation, ideation and exploration. Social framing focuses on understanding a number of aspects regarding how people act together, relate to others in relation to their interests. The authors developed and applied a co-reflection workshop to support designers and stakeholders in defining design opportunities by framing a collaboration space (social framing) and a design space (explorative framing). Framing a collaboration space is about making explicit what possible projects could be done between stakeholders and designers, and making them aware of value that they will bring. It stands for clarifying the motivations and defining boundaries. Framing a design space means exploring what possible directions the project can take based on interests and expertise of stakeholders and designers, and managing expectations and discussing about them.

### CO-REFLECTION

Yukawa (2006) defines co-reflection as a collaborative critical thinking process involving cognitive and affective interactions between individuals who explore their experiences to reach new inter-subjective understandings. According to Yukawa (2006), co-reflection exhibits three interactional characteristics: it supports sharing experience, information, and feelings; the achievement of inter-subjective understanding through collaborative meaning making; and synergy between co-reflection and relationship building. These three interactional characteristics (sharing, inter-subjective understanding and relationship building) make co-reflection especially interesting for the involvement of stakeholders during the design process as it fosters co-operation (Boujut & Laureillard 2002) and reflective practices (Schön 1983).

Co-reflection has been previously ap-

plied during the design process as a user involvement session in order to constructively confront designer's rationale with society (Tomico et al. 2009). In a design context, co-reflection can be defined as an inductive process, a dialogical inquiry between designers and users used to build upon their transformative visions (designer's vision or societal vision based on users needs, desires and fantasies) (Tomico et al. 2009). Co-reflection sessions in design practice use both tacit and active co-reflection views defined by Yukawa (2006). During tacit co-reflection, participants engage in inquiry without directly seeking feedback during the process. During the active co-reflection participants engage in inquiry through explicitly seeking feedback in an interactional and discursive manner. Co-reflection sessions start by getting users acquainted of the societal context in order to envision a new reality (tacit co-reflection stage). This new reality comprises the motivational aspects of the users' vision of the now, making them able to reflect on designers' vision (active co-reflection stage). Co-reflection sessions can be developed in three parts: exploration of the current situation, ideation through a discovery process and confrontation between users and designers. Each part builds upon the next. The exploration of the current situation is used as the basis for an ideation process. At the same time, this ideation part is used as an empathy tool (Koskinen et al. 2003) to make users more aware of their own motivations and desires in order to confront them with the ideas that the designers have. This article presents how co-reflection was applied as a methodological approach in a workshop intended to design in situ with multiple stakeholders.

### CO-REFLECTION WORKSHOP ON SITUATED BOOKMARKING

The present co-reflection workshop took place at the eLearn Center. The eLC is the center for research, innovation and training on e-learning at the Universitat Oberta de Catalunya. The eLC community constitutes a network of experts both from within and outside the UOC, who are organised in teams and get involved in projects whose aim is the improvement of the

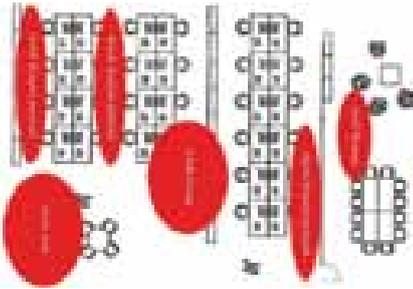


Figure 1: Working, library, open and meeting spaces in the center.

quality of virtual education and training. The eLC was currently starting a project on the improvement of the flow of information between members of the eLC community with the support of ICT. The goal of the project was finding new ways to connect people through their interests, the projects they are taking part of, the resources they are using, the outputs they produce, etc.

Situated bookmarking has been used in this project as a strategy to articulate the processes of information sharing, searching and knowledge building. Situated bookmarking is about re-contextualizing digital tagging of information in the same place where meaningful actions occur (physical and social domains). One of the first tasks of the project was to identify the kind of activities that could support the eLC needs in terms of information sharing and dissemination in different working situations and specific physical spaces. Starting from there, our purpose was to determine the right method and media to create, search and retrieve this information. In this sense, the activities of the workshop were meant to support designers and stakeholders in the definition of design opportunities during the kick off meeting of the situated bookmarking project. More precisely, the workshop lasted about three hours and it was realized in the real life context. It used one of the meeting rooms, personal working spaces, an open space and the library space of the eLearn Center. Figure 1 shows the distribution of the spaces used.

In total it counted with 14 participants: 3 designers (an assistant professor and 2 design students) from the Eindhoven University of Technology and 11 stakeholders (employees of UOC). The 11 stakeholders were all related to the eLearn Center (homogenizing char-

acteristic) but with different expertise valuable to the project like psychology, education, sociology, innovation, engineering (heterogeneous characteristics). Moreover, there were members of the center that were not familiar with the topic but worked in the space (users) and other members that were the clients or tutors of the research project. Four groups were made combining profiles with different expertise. Results from the first group (researchers on instructional design, digital libraries, and learning technologies) will be presented throughout the article. The core guidelines and structure of co-reflection sessions allowed developing specific techniques for the exploration, ideation and confrontation phases for a workshop setting in situ. Autoethnography, group intervention, paper-prototype safari and wall of fame where the techniques developed for the kick of workshop on situated bookmarking.

#### AUTOETHNOGRAPHY

##### AS EXPLORATION

Autoethnography (Reed-Danahay 1997) focuses on researchers experiences, feelings and reflections. Autoethnography is a reflexive account of one's own experiences situated in culture (Hayano 1979). It focuses on the researcher's subjectivity rather than trying to prevent it (Ellis & Bochner 2000). In the field of design, sensitizing packages by Sleeswijk-Visser et al. (2005) or empathy probes from Mattelmäki (2005) are small playful exercises done by means of disposable cameras, workbooks, diaries or postcards. These packages trigger participants involved in the design process to reflect on their experiences and provide a visual inspiration source for designers.

In the exploration phase of the co-reflection workshop, sensitizing packages were filled, analysed and applied directly by the stakeholders as in autoethnography. Stakeholders were challenged to do in depth observations on a specific topic by constraining their explorative actions through specific techniques. They grew their understanding on their surroundings by reflecting on their personal experiences and analysing them. Autoethnography through diary-tables was the technique developed with this specific aim. Diary-tables focused on one specific situation and were meant to be filled



Figure 2: Photo from the library at the eLearn Center.

out in groups in situ. They helped to describe what, where, when, why, with whom and how each situation happened. In order to get the participants into the mood, role-playing techniques were used to re-enact the situation to analyse in a similar way it is done in place storming (Anderson & McGonigal 2004). Diary-tables described each situation by activities, context and observations. They made a specific separation between the physical, digital and social domains. Other fields could be added in relation to the purpose of the workshop.

During the exploration phase of the current workshop, stakeholders focused on what, where, when, why, with whom and how they bookmark resources. In groups, participants had to make a short introduction (who you are, what you do in relation to research, documentation and resources). Later on, they had to choose one situation common for all them that happened at the eLearn Center (e.g. wandering around, project meetings, working in their personal space, looking for resources in the library space) and analyse it based on the diary-table. In this case the fields to describe for each situation were actions that happened, context where it happens, content shared and observations of critical aspects. Special attention was given to analyse physical, digital or social domains separately. Designers used the exploration phase to present themselves to each group, explain what kind of work they do and, more specifically, about the project they are collaborating on (the reason of the workshop). During the exploration session designers acted as facilitators, they gave support and guided the autoethnography process done by the stakeholders. At the same time, they used their process and results to reflect on their own process and analyze their own ideas (tacit co-reflection).

	Actions	Context	Content	Obs.
<b>Physical</b>	Observation (topics, distribution) Classification	Table with ordered & unordered books.	Books & journals	Books are complex to organize
<b>Social</b>	Discuss about interest or quality	Sounds of conversations	Book subjects, classifications.	Help for classifying. Share knowledge
<b>Digital</b>	Take pictures	Mobile phones		

Table 1: Diary-table resulting from group 1's autoethnography.

Table 1 shows the diary-table from group 1. In order to fill this table, they had to agree upon a situation first. The situation they finally chose was reading in the small library at the eLearn Center (see figure 2), which consists of an array of 5 bookshelves and 5 empty tables. Tables were currently used to pile, classify and read books. Shelves were used to store the books and journals in order. Because group 1 described a situation in a different room from where they were located, it was difficult for them to frame the situation. They planned and remembered how they would use it based on their past experiences but they did not explore, nor re-enact the situation first. Observing and re-enacting their everyday activities in situ afterwards made them change part of their findings (e.g. they thought that all the books were laying on an array of tables and not in the shelves). Their main observations were: books are complex to organize, they would like to meet people that help them identifying interesting books, and have support to share knowledge with others. These observations were taken to the next phase of the co-reflection workshop, the ideation phase.

#### GROUP INTERVENTION AS IDEATION

Group interventions in a real life context were used as the ideation phase of the co-reflection process. Group intervention, like other generative techniques applied in the design field, was used to catalyze, capture and collect dreams and aspirations (Sanders 2000). It situated the use of projection in the real life context of the eLearn Center to let ideas arise, tapping into the social imaginary (Howard et al. 2002, Vaajakallio & Mattelmäki 2007). Group intervention was an application of exemplary design research developed by Binder & Redström (2006): research

through design driven by program, experiment and intervention. In the current workshop, a design program acted as a frame for various design experiments. Experiments were conceptual design proposals. Examples served as alternatives to frame the design space and at the same time provided suggestions for design practice (Gaver & Martin 2000). In group intervention, design action was done in groups and in the context where the outcome was meant to be used. It changed existing situations into preferred ones (Schön 1983) by using role-playing and paper prototyping techniques.

The aim of group intervention was to: set the expectations between stakeholders and designers, define the boundaries of the design research project on situated bookmarking and define the design space. Group intervention used a framing program based on the research done on situated media (Güven & Feiner 2006). Situated media refers to multimedia and hypermedia that are embedded in the environment (Güven & Feiner 2006). The framing program on situated media defined how the consumption and creation of digital media would be transformed by the inclusion of the social and physical domains as part of the content. These specific directions for the transformation were based on constructivist learning tasks for computer mediated learning environments: discussing,



Figure 3: Material used during the group intervention.

seeking, organizing, generating and manipulating (Gros 2002). The situated bookmarking design research project was a specific case study under the situated media framing program.

During the ideation phase of the current workshop, stakeholders had to choose one activity to support (discussing, seeking, organizing, generating and manipulating), discuss what it meant for the group, how it related to the situation chosen and actions described in the autoethnography. Then, they had to re-enact these actions and relate them to the critical observations defined in the autoethnography table. Later, they had to envision how the ideal experience should be and transform the space to support this desired behaviour. They used paper prototyping as a tool to physicalize the required transformation (see figure 3 for the materials used). In this phase designers acted as facilitators. They supported and guided the stakeholders' group intervention by explaining how the design process works. At the same time, designers carefully observed stakeholders' process and outcome. They reflected on their own design process and how to support decisions taken (tacit co-reflection).

The concepts developed by each group were related to social reading, supporting pre and post meeting activities, enhancing inspiration behind the computer, and posting informal questions during free time. Group 1's concept was about social reading. Its value was that it supported discovering new books and new interesting topics. The starting point (based on the exploration phase and the observations they made) was to classify books and journals in a certain way useful to each of them. They chose organizing actions from the situated media framing program as their personal take on how the situation should be transformed (fig-



Figure 4: Photo taken during group intervention done by group 1.

ure 4 presents the group intervention done by group 1). They wanted to first organize and classify: organize books by tagging them in terms of their interests, classify them in a way that is common to all of them making them easy to retrieve and use. In the desired situation, when they find a book that it is interesting they tag it with their name and explain why it is interesting for them. They use a colour code to do it and an exclamation mark to set priority (that was necessary for them for a specific task for a week). Then, every member of the team put his or her opinions and priority to use it. Opinions will become a code that will evolve and adapt based on their needs. During group intervention, questions arose like: how could the use of a book be arranged when two persons are interested, and how could the code be enhanced to show priorities to use it. Their main comments revolved around the usefulness of their concept. They described how they could go to the table and see who is interested in specific books and why. The designers pushed group 1 to move beyond discussing how things should be in general by asking them to focus on specific things related to the group. The designers also encouraged them to get inspired and constrained by the context, and use the material provided (e.g. paper of different sizes and colors, post-its, transparent tape, scissors) to tinker, experiment and communicate. In this way the designers shared their way of working with the stakeholders, who also experienced it to show its value, its advantages. Afterwards the designers asked for the reasoning behind stakeholders' actions. The designers also helped the stakeholders to broaden up their situation by adding new users, new functionalities to their concept (e.g. asking how the information will be presented to someone that passes by, asking for the role of the physical context for their concept) in order to prepare them to the next phase of the co-reflection workshop: the confrontation phase.

#### PAPER PROTOTYPE SAFARI AS CONFRONTATION

The design field has a tradition of design critique that serves as a form of reflection, evaluation, reuse of knowledge and accountability (Wolf et al.



Figure 5: Photo from two members of group 1 role-playing.

2006). Design critique allowed designers to stay open and recognize multiple and conflicting interpretations (Sengers & Gaver 2006). During the confrontation phase of the co-reflection workshop, design critique was transformed into a safari by presenting paper prototype concepts in their natural habitat. Like informances (Burns et al. 1994), scenarios were rendered as plays and interactive environments by role-playing with simple paper prototypes.

The paper prototype safari was a presentation technique that allowed designers and stakeholders to compare, discuss and comment on the design outcomes in the context of application (Buchenau & Fulton Suri 2000, Iacucci & Kutti 2002, Howard et al. 2002). Stakeholders had explained the existing situation to improve, role-played the new desired situation with their prototypes and described how their concept would help to bookmark research activities, documentation and resources (based on activities, time, people and purpose). Each group had a two-minute presentation and a two-minute session of comments and constructive critique. During the latter session, designers actively asked questions, proposed directions and explained their proposals in relation with their personal vision on the subject (active co-reflection).

Figure 5 presents the role-play and presentation from group 1 in the library space. During their presentation group 1 first explained the process to get to their concept. Then, they explained the concept by re-enacting the new situation they envisioned. Afterwards, they proposed possible uses for other members of the center. During the presentation, a designer built upon the stakeholders' ideas and confronted their proposals (based on possible imple-

mentations of their ideas). A designer commented that the coding scheme could grow with time. New codes, functionalities and other communication streams would be added if needed. Moreover, stakeholders were confronted with a scenario where books were classified in a bottom up approach in order to create an emerging taxonomy and where other people could use their private search information.

#### WALL OF FAME AS RESULTS

The resulting paper prototypes and transformations of the space were shown as trophies in a wall of fame setting. The wall of fame used paper and cardboard prototypes to promote comments and discussion (Säde 2001) during the following weeks after the workshop. Photos and prototypes were arranged in an exhibition setting at the eLearn Center. Situating the exhibition in the real life context helped to broaden the scope of the workshop and to create conversations between members of the center that did not participate in the workshop. The wall of fame stayed in the space for a few weeks. It gave continuity and physical presence to the design research project on situated bookmarking. It acted as a reminder of what the design space would be, the set expectations, and the defined opportunities.

Figure 6 shows the four concepts developed based on the four situations chosen by the groups: social reading (first on the left), meeting history (second on the left), inspiration behind the computer (second on the right), and informal questions while wandering around (first on the right). In the wall of fame, a photo of books with tags on Post-Its represented the social reading concept. In other cases, concepts were displayed by 2D or 3D paper prototypes created during the group intervention.



Figure 6: Framed paper prototypes and transformations of the space.



Figure 7: Situated bookmarking webpage.

A digital version of the wall of fame was created to disseminate the outcome of the workshop and expand the possibilities for feedback outside the eLearn Center. Visitors could watch the safari presentations from the four groups, read through the concepts that were generated during the workshop, leave comments about what they liked from the concepts, envision what they would like to have in the future, and read the comments from other visitors and participants. Figure 7 shows the tab developed for the reading situation. Each situation had a tab with a picture taken from the wall of fame, a description of the concept taken from the safari presentation and a space to comment.

## FEEDBACK

The current workshop presented one of the first attempts to situate the process of defining design opportunities in a real life context like the eLearn Center. Improvement areas like group dynamics with real co-workers, detachment from everyday reality, and managing creativity and expectations emerged from framing the design and collaboration spaces in situ. Group dynamics with real co-workers related to what roles group dynamics played in the session and on the results. Detachment from everyday reality related to how the generative design tools (materials and the processes of making) supported stakeholders during the workshop. Managing creativity and expectations related to the confronting situation of designing for unlikely futures. The following paragraphs comprise some of the comments the stakeholders gave to the designers during a feedback session after the workshop in order to exemplify the areas of potential improvement.

## GROUP DYNAMICS WITH REAL CO-WORKERS

The group sample was one of the topics commented by the stakeholders: *“choosing the group sample is very important: the amount of people, the background, the gender. A bigger group would have been more useful, four people in each group instead of 3. It might have changed the dynamics inside each group. A triad is a very specific kind of group.”*

Although it is an important consideration, for the current workshop it was relevant to come with more than one solution. Participants saw their concept as just one of many. It was important to communicate that there was not just one solution to the same situation. Each proposal enriched each other's ideas instead of getting into a discussion on which concept was better. With less groups competition becomes harder. It was important to avoid having winners and losers inside the same working environment. Future research will explore how stakeholders can best be divided into groups and be motivated to work together considering preference (what one wants) and competence (what one can bring in).

## DETACHMENT FROM THE EVERYDAY REALITY

Autoethnography was an important topic that the stakeholders mentioned: *“By using autoethnography we are asked to detach from the situation, to objectivize their own work and this is the kind of task that is really hard to get done. It is not something you can do without training. We were forced to observe, analyze, objective and desire. Sometimes it is not easy to split the different activities. People are not trained on doing that. Sometimes is better an external observer who may contribute to make things easier.”*

This comment emerged because not all the stakeholders did the autoethnography during the exploration of the space and role-playing (already commented in the autoethnography as exploration subsection). Done before the exploration, the filling the diary-table is based on how they will plan the actions. Done after the exploration, the filling the diary-table is done by reflecting on the actions done. As a reflection, it

would have been better to give diary-tables afterwards they had observed the space and re-enacted the experience in situ. Then it truly would have become a reflection on a personal experience. It will be taken into account in future workshops.

## MANAGING MOTIVATION AND EXPECTATIONS

Frustration was another topic that stakeholders commented on: *“If you are fostering subjective creativity you are putting the objective limits aside. This might create frustration. If you are pushing people to be creative and there are objective limits then the reaction is frustration. And frustration is the worst friction.”*

This is a really critical point for designing in situ. The current workshop created confrontations in a personal level. Forcing stakeholders to be creative during the exploration and ideation phases made them to directly push management rules, privacy policies and hierarchical structures that hardly could be changed. However, defining design opportunities through role-playing and paper prototyping had a gaming component. It helped to find interesting topics, find critical aspects, and create relations between concepts in a playful way. Research on playfulness and generative design tools will be taken into account in future workshops.

## DISCUSSION

This workshop was set up with the aim of defining design opportunities by applying co-reflection practices in a workshop setting in situ. Its results had been used to define a 3-stage implementation program towards an open knowledge culture at the eLearn Center. It showed the importance of the workshop to support the work of designers into the real context and closely together with the community that will potentially become the user of the designed objects and processes. Moreover, the interactional characteristics of co-reflection (sharing, intersubjective understanding and relationship building) broadened the scope of the workshop. The current workshop presented was used with a pedagogical aim (to let participants experience the work of a designer), an exploratory aim (work together with multiple

stakeholders through group activities in situ), a design aim (physicalize the desired scenarios through concepts) and a user research aim (to understand critical issues encountered by people in their ordinary work).

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