The ReflecTable:
A digital reflective practicum

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ABSTRACT

The ReflecTable is a novel approach to teaching design that combines a long tradition of playing games in participatory design with Donald Schön's concept of the reflective practicum. This is done by using a design game to teach students design by aiding reflection on the process of their own design projects. Based on design artefacts from a design project that the students are engaged in, the first part of the game takes them through a condensed design process. In the second part of the game, the players formulate a question about their process in the first part and use video clips from the first part to answer it. Judging from the nine experiments conducted so far, the ReflecTable could be a valuable supplement to traditional design teaching by helping students to get the most out of their design projects. Using learning-by-doing in the framework of a game, it succeeds in teaching important schönian points, e.g. the value of conversing with the materials of the design situation. Eventually, the ReflecTable will be an augmented table for supporting reflection individually and in student design teams.

Keywords

Design education, reflective practicum, explorative design games, concept design games, research through design, interaction design

1. INTRODUCTION

Design is, according to Donald Schön [8], a reflective practice, where the practitioner's constant reflection-in-action is crucial to success. It is therefore best taught in practice and Schön envisions a *reflective practicum* as a way of bridging the gap between design practice and design theory. The reflective practicum is a *virtual world*, where design students can experiment with chosen aspects of real design practice. The ReflecTable powers Schön's vision up by using a design game to engage students in reflection on their own practice. The core game consists of taking groups of students through a condensed design process, recording it on video and letting the students work with the video afterwards. This supports *off-loop-reflection*, reflection on the direction of one's design practice [7], and helps the players generate insights on their own practice and get the most out of their design projects. Accordingly, the ReflecTable could be a valuable supplement to traditional design teaching and we envision the ReflecTable as a place where design students can come when they need to reflect upon and further their design process.

The ReflecTable consist of an augmented table and a design game that's played on the table. We've created a mock-up and tested the game several times, while the actual table has yet to be built.

2. RELATED WORK

The project builds on a long tradition of playing games in participatory design. For example Ehn & Sjögren [1] use design games to bridge the gap between designers and workers in some of the very first participatory design projects, Brandt & Messerter [3] use games to facilitate cooperation between different stakeholders – users, suppliers, designers – in design projects and Brandt [4] argues for exploratory design games as a powerful framework for organising collaboration between stakeholders. The examples demonstrate how design games can frame complex situations and make them less abstract. And by making design situations make sense for the participants, design games make participation possible. As Ehn & Sjögreen [1] notes, design is a *language game* – in Ludwig Wittgenstein's sense of the word – that changes the rules of other language games. Hence, design games are a way of opening the language game of design up for other participants – e.g. design students – by employing the familiar resemblance with ordinary games.

Another important inspiration for the game is the concept design games of Habraken et.al. [4], which has earlier been proposed as a supplement to traditional design teaching by Iversen & Buur [6]. Habraken et.al. use very abstract games as a way of pointing at important parts of design practice. The ReflecTable takes much of the abstraction out of the game play, but shares the goal of teaching the tacit dimension of practice.

A similar study of supporting design team training in the light of Schön's reflective practicum has been conducted by Iversen & Buur [7]. They, however, use video recordings from previous design projects to initiate reflections among design students.

I've previously contributed to an article [5] about the aesthetic qualities of using real artefacts as opposed to relying solely on digital representation. This is also a theme in the ReflecTable project as the ReflecTable use artefacts from the players' design projects.

The development of the ReflecTable design game is an example of research through design (see Zimmerman, Forlizzi & Evenson [9]), where the design process itself produces new insights.

Below, I will describe the design game that is the core of the ReflecTable setup.

3. THE REFLECTABLE DESIGN GAME
3.1 RULES AND ROUNDS

The players – a group of 3-4 design students – are asked to bring five things each from a design process they are currently engaged in. The things can be anything, as long as they are manageable on a table. In the experiments, however, people have brought pictures from field studies, vision statements, scenario descriptions and other design artefacts. Besides these objects, the game is played using post-its and pens (with a different colour for each player) on a writeable surface. The game is filmed using a camera mounted in the ceiling. The players are asked to push a button whenever

they feel something important or noteworthy has happened. This is marked in the video. A game facilitator takes the group through the rounds and helps the players if they get stuck.
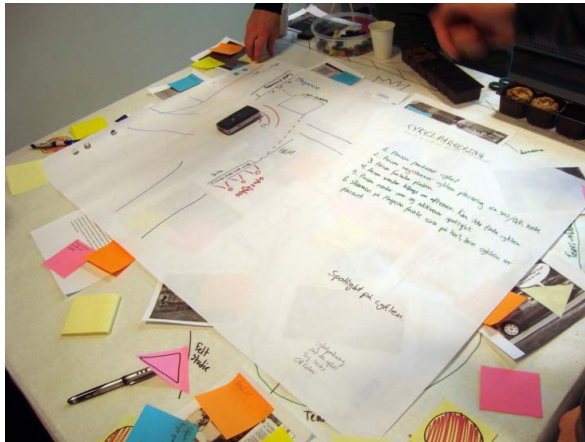

Figure 1: Concept developed in the last round of part A. The pictures and post-its under the poster are from the first two rounds. The yellow post-it with a red circle is a button.
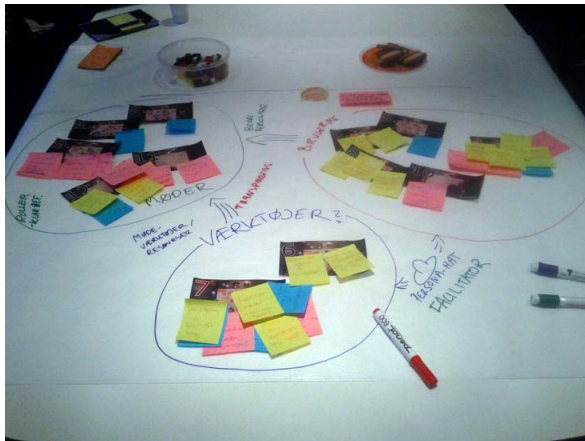

Figure 2: Video clips, represented by still pictures, annotated, grouped and related to answer the group's question in part B of the game.

The actual game consists of two parts. Part A consists of three rounds and takes the players through a condensed design process. In the first two rounds they explore the materials they've brought with them; in the last round they transcend their understanding of the domain by creating a new design. In part B, the players are asked to formulate and answer a question about their design process in part A. The answer is done by annotation, grouping and relating video clips from part A.

While part A is similar in the mock-up and on the actual table, part B differs quite a lot. In the final version, the players will use tablets for watching and manipulating video. I the mock-up, the players have used laptops for watching video and worked with printed still pictures from the video clips.

3.2 PLAYING THE GAME
We've played the game with six groups of players. The video from part A had to be manually edited for part B, which meant that the two parts of the game had to be played separately, a week

or two apart. Half of the groups played both parts; the other half only played part A. After part B, we asked the groups to write post-its with what they felt the group had learned from the game, and conducted five minute individual semi-structured interviews.

Table 1: Overview of the games

No.	Players	Parts played	Part A time	Button pushes	Part B time
1	4 researchers	A	1:13 h	-	-
2	4 students	A+B	1:36 h	6	0:59 h
3	4 students	A+B	1:14 h	8	0:56 h
4	4 students	A	1:04 h	1	-
5	3 students	A	0:56 h	2	-
6	3 practitioners/ students	A+B	1:30 h	2	1:26 h

The first game, played with a group of design researchers, was a very early test of the concept. The researchers were asked to bring things and ideas they found important for a design practice and help us design a ReflecTable. We didn't get much of a concept out of the game, but it confirmed that we were on to something useful.

Games 2-5 were played with groups of 1st semester interaction design students from Aarhus University. They were doing an obligatory design project and brought material from that project to part A.

The last game was played with a group with a "real life" project. One of the group members was a fulltime project leader with a background in computer science and comparative literature; the other two were interns, one from a multimedia design school, the other an interaction design student. This group was nearer the end of the project compared to the design students and used the game more as a way of evaluating their process. The game worked well in this capacity too, though the concept development in part A felt quite artificial since they were beyond that point in their project.

3.3 RESULTS
In evaluating the potential of the ReflecTable design game and assessing the learning gains for the participants in the games so far, we rely on our observations and the subjective responses from the players, expressed during the game and in five minute semi-structured interviews.

Even though it was never the intention, the game turned out to be a good team-building exercise. One of the players explicitly commented on the "teambuilding-effect" and all the groups who played part B reported things relating to their teamwork, e.g. "found out that our team works well under stress", "found common values". This effect is probably due to the fact that the game forced the players to make choices and prompted discussions about subjects that might otherwise have remained tacit.

In analysing the interviews, three schönian terms pop up most often: Repertoire, conversation with the material and learning by doing. On the most concrete level, the digital design students felt that playing the game expanded their design repertoire by showing them ways of conducting a workshop and generating ideas. One player put it like this:

Facilitator: "What did you, on a personal level, gain by participating in this design game?"

Player (S): "I think it's clearer to me how a design process happens in practice, because we've been given a lot of theory on it, but not experienced other peoples' design process as we've seen yours now. At the same time it has obviously given us new tools and I think about things in a new way; maybe I push myself a little harder because I can see that it's beneficial for the process."

Three of the players noted that they realised that working creatively with post-its – having a conversation with the material - in the design game produced better ideas than sitting around a table or in front of a computer. For one player, this insight helped her on a personal level, giving her more confidence as a designer:

Facilitator: "What did you, on a personal level, gain by participating in this design game?"

Player (A): "Well, I guess I discovered that I'm better at thinking creatively when I'm doing something. I find a game like this, where you have post-its and some pens to draw lines, much better than just sitting and thinking about it. Sometimes I've been thinking 'am I even thinking creatively enough?' when I've been sitting by my computer to write a design proposal. And then you try something like this [game] and then you feel, that yes, you can do it."

Lastly, four of the design students noted that the design game facilitated learning by doing and made the design theory more concrete.

It's important to note that the outcome of the game depends very much on the players. Some groups are better at working together in the way the game facilitates; some people are better at reflecting and articulating their reflections. The ReflecTable can't guarantee what the players gain from the game, but it can help the students to get the most out of their practice projects.

4. CONCLUSION AND FUTURE WORK

Before we began working on the ReflecTable, we knew that design is best learned in practice. We also knew that discussing video of practice supported off-loop reflection for designers, and that playing abstract design games could teach designers aspects of design. This knowledge comes together in the ReflecTable design game which takes the "sandbox" practice of the student design project, puts it into a game structure and uses video to provoke reflection on practice.

The preliminary results show that the ReflecTable design game succeeds in teaching aspects of reflective design practice to 1st semester interaction design students. It also works as a tool for strengthening the cooperation in the individual design groups. As such, we feel that the ReflecTable has some potential as a tool in design education.

The next step in the design process is prototyping ReflecTable design game on actual hardware. We imagine the final Reflec-Table to be an augmented table with four buttons, a camera mounted in the ceiling and four tablet computers for watching and manipulating video (see figure 3). Additionally, we would like to make the technology accessible on low cost commodity hardware to enable a more widespread adoption in universities and schools.
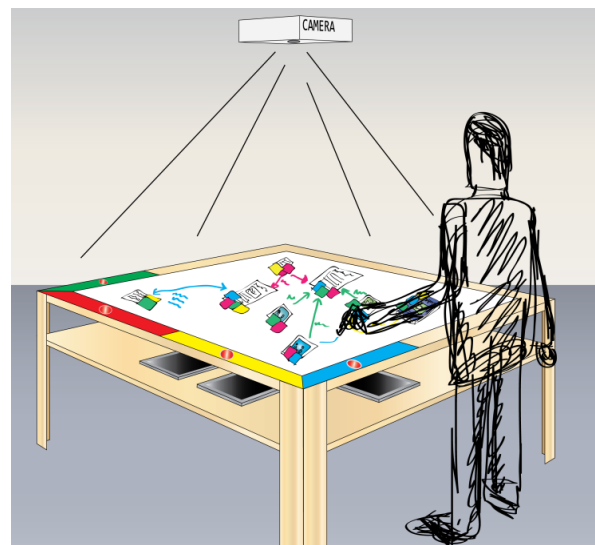
5. ACKNOWLEDGMENTS

Figure 3: A sketch of the final ReflecTable setup.

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