Collaboration and Communication in Design Games

In this paper we explore what can be learnt about design organisations by designing and playing design games. We describe one particular design game in detail. We look at how the players of this design game collaborate and communicate on a specific design task, and investigate collaborative and communicative skills they develop. We conclude with an evaluation of the potential 'design games' have as a tool to enhance collaboration and communication in multidisciplinary design teams and suggest further steps to improve and expand this tool.

Willem Horst
Vicki Sørensen
Department of IT Product Design
University of Southern Denmark
Grundtvigsallé 150
DK-6400 Sønderborg
w.horst@student.tue.nl
vsoerensen@mail.com

INTRODUCTION

As an introduction to participatory design 26 first year graduate students engaged in an 8-day design project called 'Design is a Game' [2]. 16 design students from the Mads Clausen Institute in Sønderborg, Denmark, worked together on this project with 10 design students from the University of Umeå, Sweden. The goal of this project was to develop design games, taking a situation observed in company visits as a starting point.

In teams of 3-4 people the students developed 8 different design games with different focal areas. After describing our approach and process, we show one game example that focussed on collaboration, and show how the players of this game collaborate and communicate while performing the task.

Previous studies in the area of design games have explored their use as research tools to help understand designing [1] and their use to develop design competence [2]. In this paper we focus on the elements of *communication* and *collaboration* in the design process of the 'organisation of players' in the design games, which can be seen as an element of design competence.

DESIGN GAMES AND ORGANISATIONS

Our sense of design organisations is broader than design *companies*. When a group of people (usually with different backgrounds) collaborate on a design task and communicate ideas, we consider it to be a design organisation. This means that design students working together on a task are an organisation and that players in a game working together on a task are one too.

Games can model particular situations in the design process [1], where different players collaborate on a design task in a certain setting and have to communicate their ideas. The relative simplicity in the 'design brief' (goal of the game, e.g. 'build a dog') allows to dive deeper into the actual process. Because of the relatively short time a game round takes, compared to an actual design process, the players can have many iteration loops. They can experiment with different strategies and take risks, because they know it's 'only' a game.

To explore design organisations we actually visited different design companies in Denmark and Sweden. The interesting situations we extracted from our visits became starting points for our design games. We deliberately use 'interesting situation' rather than the word 'problem', as this would suggest there is also a solution. The games aren't meant to solve problems; their intent is to serve as tools to deepen our insight into the design process in an organisation.

In the games we create a setting, a context in which players perform a design task. We mainly focus on what can be learnt about collaboration and communication in multidisciplinary teams by playing games. We are interested in seeing parallels between people in the games playing them and "real life" design organisations. What can we learn about collaboration and communication by playing games? What do the games tell us about ourselves as an organisation?

GAME EXAMPLE

In this section we describe in more detail how one specific design games was developed, what the intention was, what players of this game reflected on and what we learned from analysing people playing this game using qualitative video data analysis [3].

In the development of the games we worked together with people from many different backgrounds – 26 people from 13 countries with various previous educations. The main question we were continuously struggling with was: 'How can we develop a design game that has *collaboration* and *communication* as a theme, whilst collaborating and communicating with these different people and utilising the different skills available?' It was a long and frustrating process at times, but after the 8-day project we learned a lot about collaboration and communication; especially about how hard it can be to integrate different backgrounds collaboratively and how you can have different levels of communication between people from different backgrounds – sketching may be a rich way of communication between designers, whilst technical drawings or written descriptions are more appropriate when communicating with different people.

The game we describe is 'Up Lay Modify' (see Figure 1), which focuses on collaboration between people from different disciplines, an 'interesting situation' observed at a Danish graphic design company. Since it is a silent game, players communicate with each other through their actions.

UP LAY MODIFY

The intention of the game Up Lay Modify is to create a stage where players can collaboratively explore multidisciplinary teamwork from various perspectives and with different skills. The purpose of the game is to construct an object (seen on card) in collaboration with the other players, using building blocks. The game is played in silence.

Rules and Roles

In the game three players are put into three different roles to simulate the collaboration in a design organisation between different people or different departments. Every player can try out each role to understand the opportunities of the given role. The three roles are: 'uprighter', 'flatter' and 'modifier'. The uprighter can only place blocks in an upright position, the flatter can only place the bricks in a horizontal position and the modifier can only modify the blocks already placed on the table. We consciously created simple roles, to minimise the elements of skills and expertise required to play the game.

The different roles are not based on differences in knowledge, but on a variety of action possibilities; each role is unique. Their limitation in action possibilities is not just a restriction; it is their specialisation as well.

The game starts by picking a card that describes something concrete they have to build together, e.g. 'Birthday cake'. The uprighter is the one that adds blocks first, then the flatter and finally the modifier. The game round ends when the modifier is satisfied with the result. We encourage players to play multiple rounds and try out different roles.

Because some sort of communication is necessary to collaborate effectively and players are not allowed to speak, they will need to develop strategies to communicate on a different level, i.e. through actions. Because the roles are very clear and different, players can also anticipate others' moves to a certain degree, as is the case in a 'real' design organisation.

The game allows players to think about strategies for collaboration, and to get a feeling for players in different roles, with different skills, and how to collaborate in a way that utilises all skills.

VIDEO ANALYSIS

During the game-playing session that concluded our 8-day design game project, three groups of three players played two rounds of the game. Four of these rounds and a group evaluation were captured on tape and available for us to analyse. From this hour of video material, we extracted a lot about what the players of the game had learned. Moreover we observed and learned more about how this game works ourselves. In a sense the video camera took the role of a silent observer, with the disadvantage that it could not participate in the discussions after each round, but with the advantage of limitless playback that made the analysis easier for us. In our analysis we focussed on how the players of Up Lay Modify dealt with the situation of having to adapt to different roles in the setting of a 'design organisation' – the organisation of the different players – and how their approach changed as they played the game multiple times.

Figure 1: The 'Up Lay Modify' game – Game design by Willem Horst, Sevýlay Sezer and Lisa Hultgren

The video material enabled us to observe what exactly happens in each round and see how the approach of the players changes over time. The reflections in which the players vocalise how the game worked for them and what they learned help us to get a deeper understanding of how the game works.

Firstly we describe what we observed in the different rounds and what this tells us about the game. Then we describe reflections of the players themselves on the game. In the conclusion we give our own reflection consisting of a synthesis of the previous two elements.

Observations

After watching the video clips several times we found some characteristics of the players. One player was very careful, in the sense that he read the rules again and again to ensure he understood his role correctly. He thoughtfully picked out the bricks he wanted to use and thought carefully about his moves, and even corrected another player's move. We did notice that he seemed more confident in the second game even though he was still very careful. We can say that even though we created simple roles, the way this role is played still depends on the personality of the player.

However, turn-taking ensured that personality could not impact the game in a negative way. We saw that two players got along very well; they were laughing and joking. We wondered if the third player felt left outside, because he was not taking part in their jokes. Normally this situation would probably make it more difficult for him to get his ideas through to the others, but we saw that the turn-taking of the game made sure that he had a voice, and that the others had no choice but to consider his suggestions since they were part of the game.

Figure 2: One round where three players construct a dog in nine moves

One player showed some signs of frustration in the first game she played, because she had a hard time figuring out what the other players were trying to build. Due to this frustration we came to think about that some objects are more difficult to build than others, because we do not all have the same clear picture of any given object. In other words, come objects are more archetypical than others. For example, most people would be able to agree on the fact that a house consists of four walls, a roof and some windows. But what makes a monster? We saw in both groups that they took a longer time building less archetypical objects than very archetypical objects. The first group built a monster in 9 minutes and a dog in 5 minutes. The second group built a birthday cake in 12 minutes and a boat in 3 minutes.

Players' reflections

In the reflections both after each round and in a group reflection, players could express what happened in the game, how they experienced it and reflect on the game.

One of the players explained how she felt frustrated in the first game because she wanted candles in a round shape in the birthday cake, but did not feel that she got through to the others. Because she was the modifier she could make changes to push through her ideas of what she wanted the birthday cake to look like. In the feedback the flatter of this round explains how she experienced the round slower and more frustrating than the second one. We can see it was definitively slower as the first round took 12 minutes compared to 3 minutes of the second. Also the uprighter of the round mentions that *"the first game was a little bit more frustrating."*

Because the game is silent the frustration can become extra frustrating. One player mentioned that the game affects emotions because at times you feel frustrated over the fact of not being able to speak. Do the others understand what you are trying to say? And what are the other players trying to say? She said this forces you to find different approaches to communicate with your co-players.

Right after building the dog in their second round of playing, one of the players starts reflecting on what they have just done: *"But that was interesting, because that was the first time I thought of a strategy to do it. [...] Because I can't add pieces. Before I could just mess it up, because I needed pieces. So by you putting those up there... I mean, before I had to exchange one of those for its head, even though I thought yours was fine* (see transition from Figure 2e to Figure 2f)*. But it was within my limitations of what I could do. Because I was just thinking; if you just laid those two pieces up before me* (see Figure 2h)*, I could build him; you made them available for me. [...] Yeah, you have to wait until somebody else moves, to make those resources available for you."*

This reflection shows that players start thinking about strategies for collaboration and start to understand the roles that each player can play in this collaborative process. As a result collaboration improves, because the understanding of everybody's role allows you to anticipate players' moves.

Also other players talk about strategies in the feedback. One mentioned that she was thinking about how she needed to consider what she did as a modifier. She could not just put all the long blocks as candles in a round shape, because then the uprighter had nothing to work with. Another player commented that in her group the flatter and the uprighter applied the strategy of just adding blocks to leave it up to the modifier to place them. She felt that she was doing her job as 'flatter', and

took part in the collaboration of building together. She says that the second game went better because they saw the possibilities of their role, and understood each other's roles, this shows that they learned something about each other's roles, which they applied in the second round of the game.

However, one player mentioned that he *"would need more time to work with my role and get into my role, instead of switching every time."* This underlines that understanding of your role comes with time, and due to the relatively short time players had to accustom to their roles this was far from perfect.

CONCLUSION

After having watched people play the game we argue that there is a tendency of players developing different strategies and understandings of other people's roles.

In Up Lay Modify, taking turns gave all players a voice, an opportunity to communicate their ideas; not only loudest ones got their ideas across. Players also commented on how they thought about finding a strategy that made it easier to collaborate with the other players and to understand what they wanted. This could be very helpful and relevant in the design process; instead of just focusing on what *I* want, try to open your eyes and ears to what other people have to say. The different roles of the game show that even though we, as designers or engineers, do not have the same way of designing new products, one idea might be just as good and relevant as the other. Hopefully it could also help people realize that even though the design process is not normally a game, we still work on a common goal, to design a 'good' product.

Players noticed that the game went smoother the second time they played it. This we take as evidence that they learned strategies relevant to playing the game. It was also important that almost all players had a feedback session after playing the games to put words on what kind of strategies they applied and why. How did they experience the moves of the other players, and was this really what the other players were trying to "say". They all mentioned that they learned something from trying out different roles. All players had a lot of fun while playing and thought the game was engaging and helpful in order to communicate ideas to people from different backgrounds to get a satisfying result.

As mentioned, we realise the importance of reflection by the players after each round of playing. This reflection now emerged naturally, but could also be stimulated or guided by several reflective questions. Example questions for this particular game could include: How did the limitations work for you? How did you try to communicate your ideas and how did this work? Who did you feel was in charge? Were you comfortable in your role? Did you feel you were collaborating? Did you anticipate moves of the other players?

The roles in the game are very simple; therefore it allows the players to quickly understand the three roles of the game and try out different strategies to find the most efficient way of collaborating with the other players. We believe that this very simple training can be helpful for designers in 'normal' design organisations. The game could be a tool to better understand the people you work with. This shows in the data, because already in the second round the game runs smoother; they start to understand each other's roles. Almost all players we watched had comments on how they applied strategies to make the collaboration run freer. There was a general agreement that the game helped understand other roles than your own.

In its current form the game is very simple, because it focuses on beginning players. To avoid boredom, the game could be adjusted to fit more or less experienced players. We have seen that the object to be built impacts the complexity of the game – a dog is easier to build than a monster. This could be used to keep the game interesting for more experienced players. Beginners should start with very concrete, archetypical objects (e.g. dog, boat or house) whereas more advanced players could build concrete but ambiguous objects (e.g. monster, forest or birthday cake). Expert players could try to build abstract 'objects' (e.g. excitement, fear or hunger) that challenges them to develop more advanced collaborative and communicative strategies.

As a player in this game you learn that collaboration can be hard, you really need to keep your eyes and ears open to understand the people you are working with. Strategy is another keyword, and this game provides a setting where you can explore different strategies and see how they work out. It is a fun way of trying to learn understanding other people and appreciate their ideas. We believe that design games can serve as a tool to learn to understand the people you are working with – including yourself. You can see what your and other peoples' strengths and weaknesses are and see the potential each member of the team has to contribute to the design. We believe that a better understanding of the team as a whole leads to better collaboration.

REFERENCES

1. Harbraken, N.J. & Gross, M.D. (1987): A report submitted to the National Science Foundation Engineering Directorate, Design Methodology Program, Dept. of Architecture, MIT, Cambridge, Massachusetts

2. Iversen, O.S. & Buur, J. (2002): Design is a Game: Developing Design Competence in a Game Setting. Paper presented at the PDC 2002, Malmö

3. Jordan, B. & Henderson, A. (1995): Interaction analysis: foundations and practice. The Journal of the Learning Sciences 4(1): 39-103.