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DIALOGUE-LABS: CREATING DIALOGUE IN CO-DESIGN SESSIONS

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ABSTRACT
This paper introduces the *dialogue-labs* method, which allows researchers and designers to actively involve various people to test and generate ideas in the middle stages of the design process. The *dialogue-labs* provide a structured way of generating ideas by introducing different types of locations, materials and tasks that spark conversation and an exchange of ideas between participants in an inspiring and carefully crafted workshop environment. Participants engage in activities that rely on a variety of visual and tangible materials, providing different entry points to trigger their imagination, motivate and inspire them. We present a case study where *dialogue-labs* were used to create novel ways of 'augmenting mood boards' to illustrate the most important lessons learned from using this method. Our findings show that participants were positive about the outcome of the sessions in terms of the quantity and quality of the ideas created, and that some materials were more helpful than others. Our findings also provide insight into what aspects of the *dialogue-labs* provide the conditions to create a productive dialogue between the co-design participants and why.

Keywords: Formal methods in HCI, co-design, workshops

1 INTRODUCTION AND BACKGROUND
Practitioners from different fields of research and design have understood the importance of involving diverse groups of users in the generation phase of novel artifacts, and thus facilitating participation has become one of the cornerstones of designing [1]. Researchers have started to see everyday people not only as the recipients of the artifacts of the design process, but as active participants in the design and production process itself, capable of adapting products to better meet their own needs [2]. As a result, several authors have explored ways of actively involving users and other stakeholders in the design process by inviting them to shape future artifacts in different workshop settings, sometimes also called labs. Some studies have also emphasized envisioning future opportunities with potential users in real context (e.g. in an office) and on the move (e.g. going to visit a client) while users perform their everyday activities in order to see both *what is* and *what could be* [3].
There are a number of co-design labs that are set up in real context. The Design Collaboratorium [4] emerged as a way to overcome the limited notion of usability labs. They emphasize workshops as a vehicle for collaboration in which the real use context is addressed, the emergence of use is studied, and where different stakeholders work together in an integrated design setting. However, because its main goal is to bring together the development team, user involvement varies greatly across projects, and in some cases users are not involved at all. Design:lab [5] is a collaborative space of designerly exploration that takes advantage of a controlled environment and uses experimentation to go beyond observation in the real context towards prototyping possible changes. Design:lab takes place in real context (e.g. factory), combining the existing work environment (e.g. production room) with more controlled areas (e.g. factory cantina). In Design:lab authorship is shared meaning that lab partners have equal rights authoring the design work. The lab provides a setting for exploring the design space with the people involved, and thus its outcome is not the final design but rather the ground to start the actual design.
There is another group of co-design labs that are setup in artificial contexts. In the Design Lab [6] users and other stakeholders engage in a conversational design practice based on a series of design

events focusing on collaborative inquiry and participatory design. During the sessions, data from field studies (i.e. video ethnography and probing [5]) is fed in the form of design artifacts (i.e. ethnographic video-snippets in the form of cards) to bridge the gap between the lives and experiences of the different stakeholders. The sessions are driven by events, working with the design notions of "staging, evoking, and enacting." Johansson and Linde [7] take a similar approach in collaborative design sessions where designers and future users build future scenarios using data from probing and video snippets as sketching material. In the Co-Experience Environment [8] users were invited to co-design a physical environment for co-experience. A small group of users with shared expertise were recruited to allow the research to evolve as an activity of equitable collaboration. For the Co-Experience Environment participants previously worked on a probe package that later helped the designer to create two spaces. Users were invited to experience these spaces and give feedback on the overall experience. As such, in their case users were not actively involved in the design of the first two spaces but provided inspiration for the design of future co-experience environments.
While various articles discuss the benefits of using these methods, there is a lack of in-depth studies that concentrate on what is actually going on in the co-design situations. In this paper we provide a detailed description of how we set up, facilitated and participated in *dialogue-labs* [9], which consisted of co-design activities with practicing designers to develop future ways of creating mood boards with augmented reality. We introduce the *dialogue-labs* method, which provides a structured way of generating ideas, ensuring both quantity and quality of the results.

2 DIALOGUE-LABS

Dialogue-labs are primarily used in the middle stages of the design process to support researchers/designers in creating ideas and concepts for future designs together with relevant stakeholders and end-users. The scope of the *dialogue-labs* method is presented in Figure 1. The findings from user studies that take place in the *Problem-Analysis-Research-Specify* stages of the design process (e.g. cultural probes, contextual inquiries, interviews, etc.) provide the structure and content for the *dialogue-labs.*

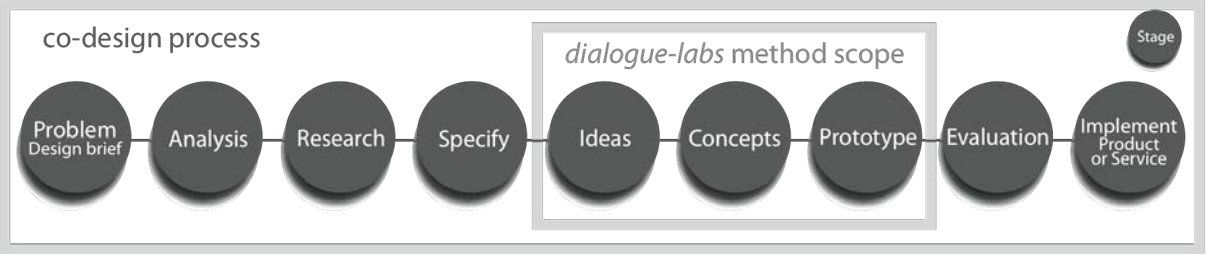


Figure 1. Stages in a co-design process. The scope of the dialogue-labs method covers the Ideas-Concepts-Prototype stages.

Dialogue-labs facilitate collaborative design activities among researchers/designers, stakeholders, experts and potential end users. In *dialogue-labs* different types of locations, tasks, and materials spark conversation and an exchange of ideas between the participants. By engaging in activities that rely on visual and tangible materials the complete design team is able to approach a given design problem from different entry points or perspectives and thus come up with novel design concepts. As an example, sketching is used by participants of the *dialogue-labs* to deal with the proposed design problem through the language of designing [10], combining verbal and non-verbal expressions while sketching, by drawing and talking in parallel.
Design tasks that can be dealt with in dialogue-labs can range from designing products or services, to creating novel interaction ideas or concepts for future (technological) designs. In the latter, participants are invited to think of technologies they can expect to be common in five-years time to avoid both having wide sci-fi ideas, or ideas that are limited to current technological possibilities.

2.1 Planning

When planning *dialogue-labs* sessions, there are four main aspects to consider: 1) session topic and specific design tasks, 2) creating an inspiring space, 3) the design materials, and 4) the participants.

Session topic and specific design tasks

As was previously mentioned, the basic structure for the *dialogue-labs* is given by the findings from user studies that are conducted in previous stages of the design process. Hence, activities and locations are aligned to set the space according to these findings, which can be the stages of a process (e.g. the mood-board making process), categories of a theoretical model, or other structures based on the available findings. Providing this basic structure encourages discussion around specific relevant topics for the research. These findings should create empathy with end-users, as they are the experts in the specific domain that is being studied, and should find the topics discussed in the sessions familiar. Each stage (Figure 5) has a corresponding location within the room, materials, and task that is formulated in an abstract-enough way so that participants feel inspired to think beyond the *status quo*. In each stage informative cards are available as reminders of the situation, the materials, and the task.

Creating an inspiring space

A considerable amount of work and resources is destined to creating an inspiring space (Figure 2). The room is carefully arranged in such a way that the general setting and the furniture chosen stimulate participants. Additionally, setting stages by an open window with a nice view helps participants transport themselves beyond the physical space of the *dialogue-labs.* The attention to detail and effort put in preparing this space is later rewarded by the participants' dedication to participate in the sessions.

Figure 2. Creating an inspiring space. Carefully arranging the room by choosing furniture and materials that stimulate people. The Finnish (left) and Dutch (right) dialogue-labs.

The space setting becomes an important aspect in *dialogue-labs.* A large room or office (5m x 6m x 3m) is used to allow housing different locations within the room. Having a combination of moving around the room, standing up and being comfortably seated at a couch in different parts of the session invites participants to keep the kind of dynamic and active attitude needed during the session.

Design materials

One of the key aspects of the *dialogue-labs* is to provide a wide variety of design material to enable participants to build a design language they feel comfortable to work with. Thus, the material should have varying abstraction levels, ranging from props to pen and paper. The aim of having these different entry points is to find something that will trigger participants and motivate them to begin the generation of ideas. Participants may feel inspired by the overall dialogue-labs setup, by the materials or tasks available at the different locations, or perhaps more importantly by the ongoing conversation with the design partner. Since the design dialogues may take forms of enacting or verbal discussion, the documentation of the session becomes fundamental. By documenting the ideas through sketches upfront at the end of each session prevents from having to go back to the video recordings later on.

Participants

Each *dialogue-labs* session involves four people: two researchers who act in a double role of facilitator/designer plus two end-users. The end-user participants are experts in the specific domain that is being studied and have ideally participated at previous stages of the research (e.g. as participants in cultural probes or contextual inquiries), thus providing the knowledge on the current situation and the future possibilities. Although *dialogue-labs* were initially conceived to involve end-users who were also designers, we have also explored expanding the method to involve everyday people and other stakeholders in the design process (i.e. research and industry partners).

2.2 Procedure

The sessions are planned for a total of two hours and consist of following six parts (Figure 3):

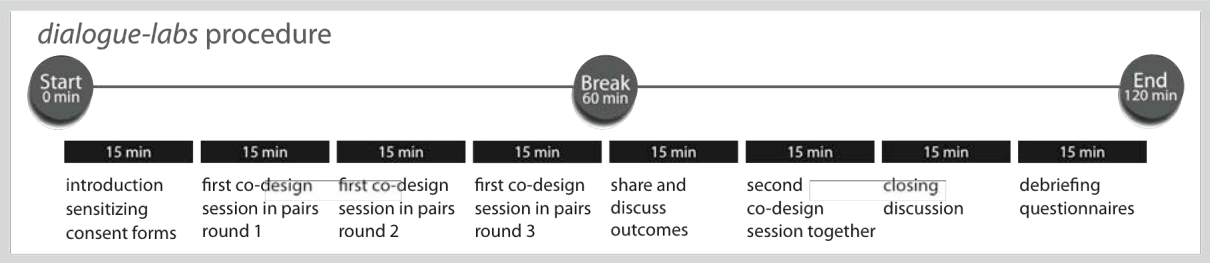


Figure 3. The dialogue-labs procedure. Sessions are structured in different rounds of 15-minute activities involving work in pairs as well as with the complete group.

Introduction – sensitizing – consent forms (15 min.)

To create a comfortable and relaxed atmosphere, participants are greeted and introduced to each other as they arrive as if they were coming to our home [8]. We begin by reading together a summary of the main findings from previous contextual studies (e.g. our definition of mood boards), followed by a short discussion to build a shared understanding [11] of the main theme of the session. The summary of the findings from previous studies may come in the shape of a definition or as a visual diagram. We then explain the main purpose of the session, which is for instance to create novel interaction ideas for future designs. Finally, all participants (including the researchers) must read together and sign a consent form to allow researchers to later use the ideas generated during the sessions.

First co-design session in pairs (45 min.)

The four participants form two pairs consisting of one researcher/designer and one end-user or stakeholder. Based on the previously defined structure of the session (e.g. stages of the mood-board making process), each pair is asked to think of new ideas, scenarios, or concepts in relation to the task and main purpose of the session (e.g. *think of novel ways of interacting with a tool that supports the creation of mood boards*). Participants can focus their exploration on aspects of functionality, context, technology, space, or whatever comes to mind. From the proposed structure of the session, some topics may be more relevant than others to the participants and thus we suggest starting from a topic that they are familiar with but that is not the most critical or relevant topic to them, or the one that requires more dedication or time. Each pair spends on average 15 minutes in each of the three locations they visit.

Share and discuss outcomes (15 min.)

Participants are called together as a group to share some of the ideas that emerge during the first round of discussion in pairs (Figure 4, left).

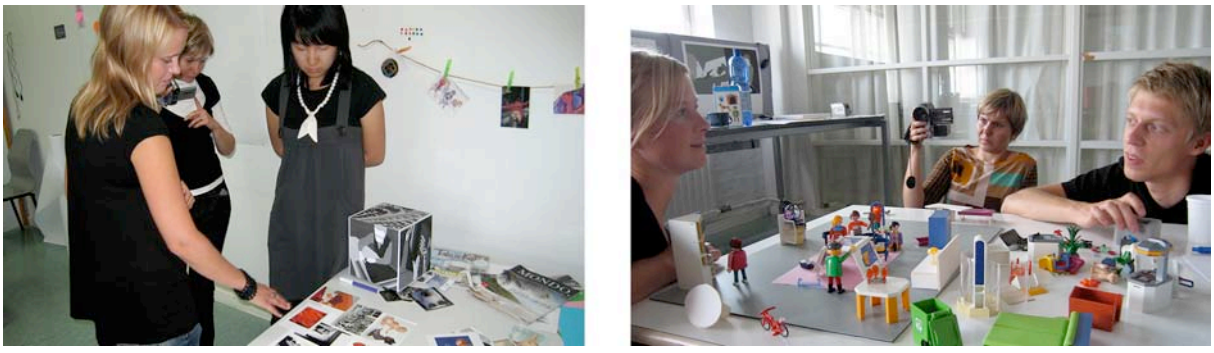


Figure 4. Different parts of dialogue-labs. Sharing and discussing ideas collectively (left) and the closing discussion (right).

Second co-design session together (15 min.)

The complete design team elaborates upon and evaluates some of the proposed ideas.

Closing discussion (15 min.)
To round up the discussion, the complete group sits together around a coffee table for a final activity on what would be an ideal solution that might summarize the best ideas that emerged during the session (e.g. how an ideal design studio could support the entire process of making mood boards). A Playmobil® scale model is laid on the coffee table to stimulate playfulness with physical elements (Figure 4, right). The Playmobil® can be arranged in a given way on the table to suit the purpose of the session (e.g. depict a design studio situation) or can be left in the box for participants to start exploring them.

Debriefing – questionnaires (15 min.)
Finally, all participants (including the researchers) are asked to fill-in two separate questionnaires. In the first one, participants are asked to assess the quality of the ideas that emerge from the session by rating each idea from every stage on a 7-point Likert scale (where -3 is very bad, 3 is very good, and 0 is neutral). Before rating the ideas, participants must collectively agree on the idea to be rated per stage by writing down the name of the idea on the questionnaire. In most cases, each pair goes through different locations as the other pair. The process of filling in the questionnaires provides researchers/ designers an indicator of what the participants felt were the best ideas and that may later provide a focus for the next design steps.
The second questionnaire consisted of assessing the helpfulness of the material by asking participants (including the researchers) to rate the different materials that were available for the team on a 7-point Likert scale (where -3 is not helpful, 3 is very helpful, and 0 is neutral). In this case, the team members must rate only the locations they worked in, including the closing discussion area. The purpose of this questionnaire was for us to study the effect that different materials have in the creation of ideas during the *dialogue-labs.* As such, this second questionnaire is not part of the method but served the purpose of allowing us to study the method.

3 AUGMENTING MOOD BOARDS CASE

We now introduce the Augmenting Mood Boards case. The project explored ways in which augmented reality could provide support for practicing designers who use mood boards as part of their work. Prior to the *dialogue-labs,* a series of contextual user studies had been conducted using a diversity of methods (i.e. cultural probes [12], contextual inquiries [13] and mood-board interviews). Based on the findings from the previous studies, we organized *dialogue-labs,* which consisted of co-design activities with practicing designers to develop future ways of creating mood boards with augmented reality. We have extensive experience in carrying out this type of sessions, both from this project [9] and others [14].

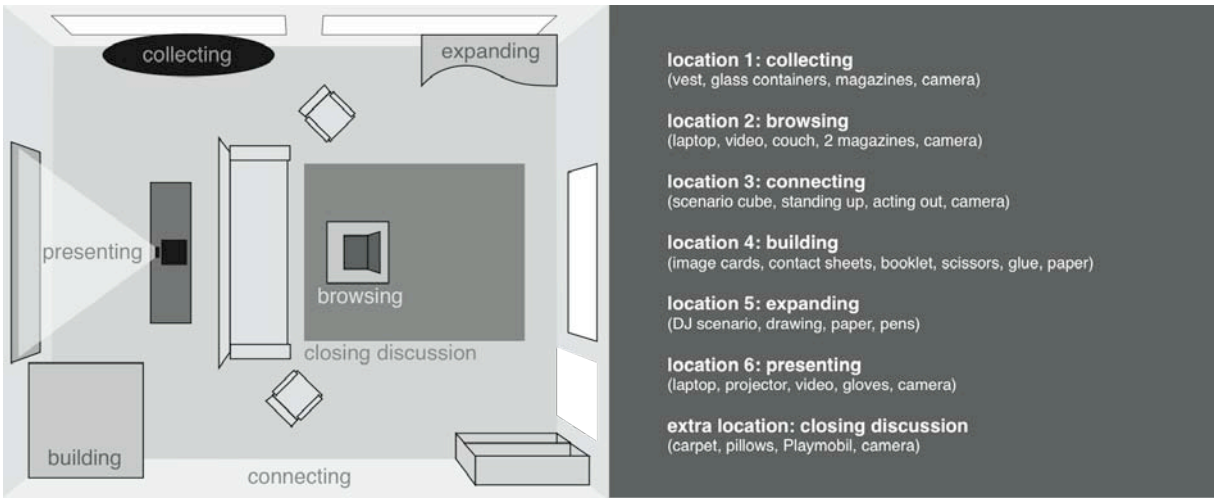


Figure 5. The space layout for the dialogue-labs sessions (in Finland). Different locations, materials and activities spark conversation and the exchange of ideas.

3.1 The *funky-design-spaces* hypothesis

The previous user studies with Dutch and Finnish mood-board makers have shown that the process of making mood boards takes place in different contexts both in and outside of the design studio. Based on the findings from these studies, the *funky-design-spaces* hypothesis has been defined. It is a vision for a new holistic design studio, a comfortable space that facilitates creative thinking in designers. Within this larger context, different *funky-design-spaces* or tools that are interconnected and stimulate designers to move around their design studios would support the process of making mood boards. We invited designers to test the *funky-design-spaces* hypothesis by co-designing these spaces further with us. We organized *dialogue-labs* with two objectives in mind. First we wanted to present space scenarios that are mapped to the different stages of the mood-board making process, obtain feedback, and develop them further. As such our first research question was *how could these funky-design-spaces support the creation of mood boards for designers?* The second objective was to study how different materials can support the dialogue between people when co-designing novel concepts. Therefore, our second research question was *how do different materials affect the dialogue and idea generation during co-design sessions?*

3.2 The Finnish and Dutch *dialogue-labs*

The seven *dialogue-labs* sessions were conducted between August and November 2007 in Finland (4 sessions) at the University of Art and Design Helsinki (TAIK) and in the Netherlands (3 sessions) at the Eindhoven University of Technology (TU/e). A total of 14 practicing designers and design researchers (8 in Finland and 6 in the Netherlands) took part in our *dialogue-labs.* We primarily contacted designers who were experienced mood-board makers and/or who were familiar with the ongoing research. Five participants worked either for TAIK (n=1) or the TU/e (n=4). The participants varied in their education (university/academy), age (between 28 and 46), and gender (7 female, 7 male). We followed the same six-stage procedure described in the previous section.

The setting for the *dialogue-labs* in Finland and the Netherlands were two large rooms, which were arranged to look and feel like a design studio including working tables, magazines, drawing materials, chairs and sofa. For the Finnish *dialogue-labs* (Figure 2, left), we used a meeting room (4m85 x 5m95 x 3m70) at TAIK, while for the Dutch sessions (Figure 2, right) we used a lab room (5m05 x 6m50 x 2m45) at the TU/e. We aligned activity and process by setting the space according to the six stages of the mood-board making process (Figure 5) that we previously identified: 1) *collecting,* 2) *browsing,* 3) *connecting,* 4) *building,* 5) *expanding,* and 6) *presenting.* These stages provided a basic structure to encourage discussion around the specific stages. The overall task was: *imagine new scenarios or future ways of creating and communicating mood boards.* We will now describe each of the stages:

Collecting

This stage was an open invitation to consider other contents (besides images from magazines) that could go in a mood board (e.g. sounds, video, smell, etc.). The stage itself was set by an open window with a view on the sea to help participants transport themselves beyond the physical space of the design lab. Magazines were lying on the table illustrating the current situation, while more ambiguous material was used to evoke future possibilities (Figure 7, left). Abstract physical materials aiming to stimulate the participants' thinking included an explorer-like vest with pockets, glass containers with a cork similar to those used in chemistry class to keep the captured sensations, and a set of Make Tools (i.e. Velcro modeling) that allow people to prototype and express their ideas [15]. The task given was *what types of new sensations could be collected for a mood board, and how could they be collected?*

Browsing

Designers typically browse through their magazines, looking for images for their mood boards at a table, in a coffee corner, or while seated on a couch. Two magazines were lying on a coffee table to allow reenacting how designers now browse magazines when searching for images. Additionally, we presented a video of a digital tool that allows browsing images on a coffee table. The video itself was shown in a coffee-corner context: the laptop on which the video was shown was set on a coffee table and participants were seated on a couch. The video was presented without sound to prompt reactions and inspire the teams to explore beyond the contents of the video. The task was *how could different types of contents or sensations for a mood board be browsed?*

Connecting

This stage referred to the process when designers select, group, pile, and make relations between in the contents for their mood boards. We created a scenario cube measuring 20 cm on each side and which represents the following situations where people connect things: 1) A DJ browsing different sounds, deciding which tracks make for a better mix, 2) a naturalist (e.g. Charles Darwin) adding a new specimen to his collection, 3) a cook with a rack full of different spices and flavors, 4) dancers and the set of movements that make a dance piece, 5) a tailor touching different fabrics for his latest design, and 6) a librarian visually keeping track of the available books. The purpose of the scenario cube was to trigger discussions based on the examples contained on its six sides. This stage was set on a wall that was covered with white paper and Post-it® notes that varied in color and shape (Figure 7, right). The task was *how would you keep track and make connections with the different contents you have for a mood board?*

Building

This stage reflected the different ways designers handle a collection of images. The stage (Figure 6, left) was set by a table on which we placed different ways to handle a collection of images: a set of A6 postcards, an A3 contact sheet with smaller pictures, and an image booklet that designers can browse by sliding images. Using the images and materials found on the table, the teams were asked to create a collage. The task was *how could designers put together new and types of contents in a mood board?*

Expanding

In this stage participants explored how designers might add other types of contents or sensations to their mood boards (e.g. video, smell, animation, etc.). We presented a real scenario from a designer who runs his own small company and creates mood boards as part of his daily work. At night, he works as a DJ and uses his hands now to select the best bits of music. He wonders how he could add some of his musical creations to his mood boards to help him better convey some of the feelings he has in mind. This scenario was presented as an A2 print on a table and we provide pens so participants can draw on top of the proposed scenario or create a new one. The task was *what other novel elements or contents could be added to a mood board to better convey a feeling or an atmosphere, and how could they be added?*

Figure 6. Stages of the Augmenting Mood Boards dialogue-labs. In building (left), participants were mainly involved in the creation of a collage, while in presenting they used a video that was projected on the wall. One participant is using the projector as an extra resource for creativity and design by casting shadows using parts of her body.

Presenting

For this stage, we wanted participants to think about how mood boards might be presented in situations where they cannot meet face-to-face. We presented a video that shows a designer (the first author) presenting a mood board. Once again, the video itself was shown in a similar context as the one portrayed in the video: the video was projected on a wall. Sound was also omitted to prevent the team from going directly towards the proposed solution. We provided a pair of gloves to invite the team to explore and act out different types of interaction using their hands and/or body. We asked participants to watch the video (with no sound) and try to assign (new) meaning to it. The task was *how could the story of a mood board be communicated differently?*

3.3 Interpretation

Immediately after each *dialogue-labs* session we conducted short interpretation rounds. The interpretation team consisted of the same two researchers. In this interpretation we summarized the main ideas that emerged during the sessions by means of sketches on A3 sheets of paper. Keywords were placed next to the sketches to describe the main ideas behind each concept. These sketches allowed us to have an initial overview on the quantity and quality of the ideas. Each A3 sheet and the ideas it contained were coded to identify the co-design session, and the number of the idea. Additionally, we discussed and wrote down some of the main discoveries we had made in relation to the process of conducting the *dialogue-labs* sessions.

4 FINDINGS

The analysis consisted of two main parts: the process and the ideas. First, we were interested in the process itself and how the way the *dialogue-labs* were prepared and conducted had affected the outcome. Therefore, we looked into the questionnaires by calculating the mean ratings and standard deviation for *quality of the ideas* and *helpfulness of the materials.* Second, we summarized the ideas that had a better potential as perceived by the participants by first looking at the highest mean ratings. We then did rounds of discussions within the analysis team to define the final concepts. We also did clustering whenever some ideas overlapped. The final concepts were summarized into sketches.

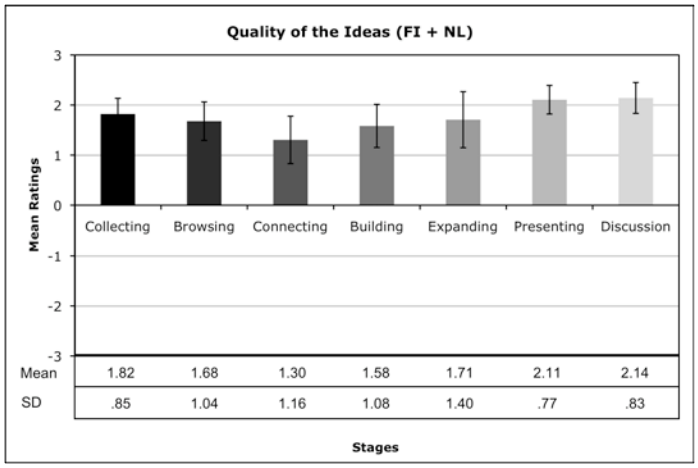
4.1 Funky-design-spaces hypothesis

In relation to our first research question, both our Finnish and Dutch participants generally agreed with the notion of funky-design-spaces that stimulate designers to move away from their desk to support the process of making mood boards. Both groups expressed in their own way the need to have easily convertible flexible spaces that support different activities both inside and out of their design studios. For example they mentioned the need to go outdoors to find inspiration (e.g. market, forest, or street).
Breaking down the process of making mood boards into six physically separate stages, forced participants to move about the room during the session. Participants thought these changes had been positive as they made the teams think of the whole process from different perspectives, without breaking the overall creative flow behind the session. Moreover, participants indicated that they needed these breaks to approach a new task with a fresh mind and that they would become tired if they had stayed in the same stage for 45 minutes. Thoughts that had previously come up in another stage were developed further while emphasizing on a different stage of the process.

4.2 Quality of the ideas

To answer our second research question on how do different materials affect the dialogue and idea generation during co-design sessions, we split our findings in two: quality of the ideas and perceived helpfulness of the materials. We looked into the data from the questionnaires, and jointly calculated the mean ratings and standard deviations on the quality of the ideas for our Finnish (n=16) and Dutch (n=12) participants to have a general impression of our findings (Table 1). Participants first collectively agreed on which idea they would individually rate per stage on a 7-point Likert scale where -3 is very bad, 3 is very good, and 0 is neutral. A series of paired two-tailed t-Tests was performed for the significance of the difference between the means of the ideas. We also looked at the different uses that participants made of the materials during the *dialogue-labs* through an analysis of the captured video to observe how different materials influence the co-design sessions.
Overall, participants were positive about the quality of the ideas that were created in the *dialogue-labs.* The high mean ratings (between 1.30 and 2.14) suggest that the *dialogue-labs* had a positive influence on the creation of ideas. Regarding the quantity of ideas, each of the seven sessions (i.e. 4 in Finland and 3 in the Netherlands) brought up something new obtaining on average 14 different ideas from each session. After the first two sessions, we did see some recurring topics starting to emerge (e.g. inspiration spaces, flexible work and presentation areas). However, until the very last session new topics were revealed. Participants were positive about the outcome generated during the sessions, both in terms of quality and quantity of the ideas.

Table 1. Finnish and Dutch participant mean ratings and standard deviations on the quality of the ideas for each stage. Error bars represent the 95% confidence interval of each mean.

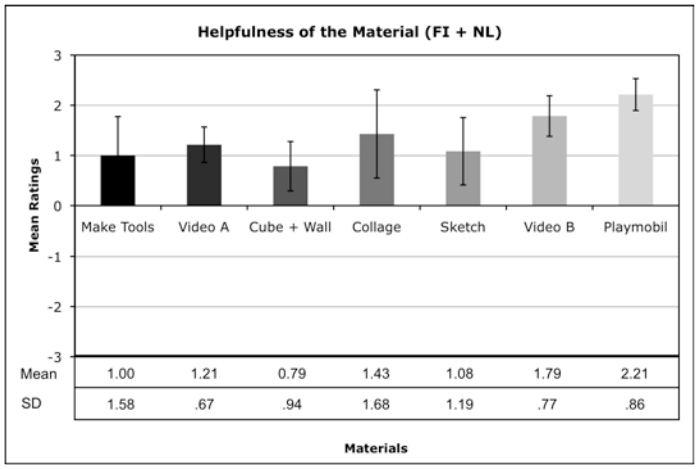


We observed three significant differences between the ideas that originated from the different stages, namely between *connecting* and *presenting* (paired $t(49) = 2.89$, $p < 0.01$), between *connecting* and the *closing discussion* (paired $t(49) = 2.94$, $p < 0.01$), and between *building* and the *closing discussion* (paired $t(50) = 2.06$, $p < 0.05$). We were expecting the ideas that emerged from the closing discussion to have the highest mean rating mainly for two reasons. First, all participants collectively worked on new ideas after having shared the ideas they had previously explored as pairs. As such we expected these ideas to be better developed. Second, the ideas from the closing discussion were fresher in the participants' mind when they were answering the questionnaire so it was easier for them to remember their details.

4.3 Helpfulness of the materials

Regarding the second part of our second research question, we also jointly calculated the mean ratings for our Finnish (n=16) and Dutch (n=12) participants with regards to the helpfulness of the materials (Table 2). Participants gave individual ratings to the materials they had used in each stage on a 7-point Likert scale where -3 is not helpful, 3 is very helpful, and 0 is neutral. A series of paired two-tailed t-Tests was performed for the significance of the difference between the means of the materials.

Table 2 Finnish and Dutch participant mean ratings and standard deviations on the helpfulness of the materials for each stage. Error bars represent the 95% confidence interval of each mean.



Generally speaking, participants were positive about the helpfulness of the materials. We found significant differences between the materials, especially for video B and the Playmobil® scale model. For video B, we observed a significant difference with the scenario cube with paper wall (paired $t(26) = 2.96$, $p < 0.01$). For the Playmobil® scale model, we observed significant differences with make tools (paired $t(42) = 3.22$, $p < 0.01$), video A (paired $t(40) = 3.71$, $p < 0.01$), the scenario cube with paper wall (paired $t(40) = 4.79$, $p < 0.01$), and sketching (paired $t(38) = 3.27$, $p < 0.01$).

Regarding the most helpful materials, although we had had positive previous experiences from using this material, we were unsure if participants would feel inspired to think of new scenarios using the Playmobil® scale model. We were happy to discover that people became actively involved in role-playing with the characters and the furniture. People would usually take a given puppet or piece of furniture to represent the situation they were trying to depict. In the end, as more ideas were discussed around the table, all participants became involved and shared their views.

Second, videos helped start the dialogue by providing a clear and simple starting point for discussion by mutually observing what happens in the video. The videos aimed at triggering thinking in participants, not restricting participants. For example, in one session the video shown in the presenting stage triggered participants to think beyond user interface aspects. The main difference between videos A (mean=1.21, SD=.67) and B (mean=1.79, SD=.77) is how abstract or concrete its contents are. The *presenting* video does not show a working tool or an interaction but instead shows a designer standing in front of a mood board while making a presentation, while video A which was related to browsing was more concrete and did not open so many new possibilities. This is in line with Brandt and Grunnet [16], who found that more generic and abstract representations open up the solution space.

Finally, regarding the use of collages, we discovered the need to begin the co-design sessions with a simple task to break the ice [17]. After pairing up, we observed it took some time for participants to become familiar with each other and the situation, and reach a comfortable creative mood. In this respect, collages were chosen by participants who initially were less willing to open up and start designing. They went for an activity that was familiar to them and which made them feel more at ease. When comparing the use of collages, we saw that Dutch participants used collages somewhat differently than their Finnish counterpart. While collages had been rated highly by Finnish participants (mean=2.13, SD=.93), Dutch participants gave it the lowest mean rating (mean=0.50, SD=1.98). We observed that Finnish participants were actively involved in creating a collage, whereas Dutch participants generally used the materials but never engaged in actually making a collage, which could explain the difference in mean ratings.

Regarding the other materials, participants had strong divergent opinions about the use of make tools. For some participants the make tools were used as props, gaining new meanings depending on the current status of the ongoing conversation. For example, in one session the vest was used as a vest, but also as a scarf. However, for some participants, the vest, glasses, and make tools were intimidating and they did not know what to do with them. Originally, all materials were laid on the table at the beginning of the session (Figure 7, left). As the sessions went by we discovered that some participants felt overwhelmed by the amount of options and materials that were given to them simultaneously. For the Dutch *dialogue-labs* sessions we placed all materials inside a box to prevent over stimulating and thus intimidating participants by having them gradually discover and remove the elements from the box instead. When analyzing both groups separately, we realized that this decision had a positive effect on participants as can be seen in the higher mean rating (mean=1.17, SD=1.07) when compared to the Finnish findings (mean=0.90, SD=1.81). We also observed that hiding things in the box sparked the curiosity of participants who gradually unveiled some of the materials they found in the box.

Figure 7. Materials used in the dialogue-labs. Make tools over stimulated some participants (left), while the scenario cube with paper wall created the opposite white page effect (right).

The least helpful material was the scenario cube with paper wall (mean=0.79, SD=.94). We discovered the paper-covered wall had created the opposite effect of the Make Tools. Instead of overwhelming participants by an excess of information, the wall had created a large-scale white page effect. For the

Dutch *dialogue-labs* sessions we decided to add abstract paper shapes or Post-it® notes to give participants a few alternatives to begin their exploration and thus reduce the white page effect (Figure 7, right). When analyzing both groups separately, we found that the higher mean ratings for the Dutch study (mean=1.00, SD=1.00) when compared to the Finnish study (mean=0.63, SD=0.86) show that this decision positively affected participants.

5 DISCUSSION

We have identified two possible sources of bias in the results of the *dialogue-labs:* 1) researchers' active participation in the co-design, and 2) having practicing designers as users instead of everyday people. We will now discuss the positive and negative influences that these had in the *dialogue-labs.*

5.1 Researchers' active participation

Our active role in the *dialogue-labs* was a consequence from considering the *dialogue-labs* as stages, in which different competencies and insights of the researchers and invited participants can meet. In addition, active interaction among researchers and designers was emphasized to attain communicative dialogue to create a wider overview of the phenomenon under study. As Bamberger [18] has claimed, the researcher's intervention can allow playing with the ideas that were the original motivation for the project since the researcher can pursue the aims of the study by stimulating the discussion during the dialogue. In all research "training, intention, and triangulation influence the type of material a researcher creates" [19]. Already when picking certain moments from the material for closer examination, a first selection occurs resulting from the particular way of seeing the material that comes from the researcher's background knowledge and personal interest. The challenge is to stay at the same level with the design partner and not push the situation or stand aside too much.

Another possible source of bias was the positive effect towards the researcher. We carefully crafted the *dialogue-labs* materials; we created a comfortable space and a relaxed atmosphere. We also facilitated and participated in the co-design sessions. The ratings given by the participants may have been biased by the cozy research context we designed. The fact that participants rated ideas (or materials) positively may not just be due to them thinking that the ideas were actually good, but also because they may have wanted to please us.

5.2 Co-designing with designers versus everyday people

In contrast to the co-design studies presented in the related work section, in our case the potential users were skilled designers, which partially reduced the need for facilitation and guidance during the dialogue. However, having designers as co-design partners challenged our work as researchers /designers. At first designers played along with us, listening attentively and roughly doing what was asked from them. However as the session progressed, they gradually started to analyze the sessions from different perspectives and reflect on some of our decisions: *"why did you formulate this task like this?," "why did you make this separation?," "I like this material."* The setting, tasks and materials presented to the designers triggered different thoughts.

Creating and maintaining a relaxed atmosphere and finding a common design language between two strangers during 45 minutes is hard regardless of their background. It is the researcher/designers' role to use their own creativity to amplify the creativity of others taking part in co-design [20]. Allowing participants to find and build a common design language becomes a fundamental aspect in the *dialogue-labs*. Participants were not told which material they were supposed to work with next but were instead provided with a diversity of media to choose from. This ability to freely choose the best-fitting medium for their dialogue resulted in that designing took divergent forms in the seven *dialogue-labs* sessions despite of the similar setting. Expressing ideas varied from sketching on paper, experimenting with props, to discussing with almost no visualizations. This notion suggests that providing a wide range of media for expression may help the participants find the appropriate dialogue style for them in that particular situation. In co-design this may help to reach a relaxed atmosphere since participants are not forced into activities they are not comfortable with.

6 CONCLUSIONS

This paper presents the *dialogue-labs* method, which allows researchers and designers to actively involve potential users in co-design activities in a workshop environment. The *dialogue-labs* provide a structured way of generating ideas, ensuring both quantity and quality of the results. We present a case

study where seven *dialogue-labs* were organized to create novel ways of augmenting mood boards and use its results to illustrate the most important findings from this project. Regarding the quality and quantity of the ideas, the results show that participants were generally positive about the outcome of the sessions, thus the *dialogue-labs* had a positive influence on the creation of ideas. Regarding the helpfulness of the materials, videos and creating future scenarios with the help of a Playmobil® scale model assisted participants mostly to discuss, present, and generate new ideas. We also discovered it was important to have diverse materials and strategies to motivate participants to get started and to keep them on a creative mood throughout the session. Moreover, the experiences our participants had during the sessions show that dividing the co-design activities in physically separate tasks helps participants approach the topic from different angles and maintain a fresh mind. In summary, our findings provide guidelines for researchers and designers aiming at amplifying the creativity of users and providing the conditions to support dialogue between participants in similar co-design workshops.

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