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Engage me, do!

Engagement Catalysers to ignite a (design) conversation

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ABSTRACT

This paper reflects on the possibilities of embodiment and skilful coping to connect people and to catalyse a constructive (design) "conversation" among people with different backgrounds, during transformative collaboration. We do this by illustrating the process and results of a two-weeks design class with Master students at the Department of Industrial Design at the Eindhoven University of Technology. The resulting *Engagement Catalyser* is a creative tool to engaging people in a (design) discussion more concrete and effective than a discussion or brainstorm session held around a table. The six developed *Engagement Catalysers* have been used and evaluated in two workshops, in which participants from very different cultural and professional background have used them as a means to engage quickly and ignite the design process. The results show that the Catalysers stimulate engagement, help people to get familiar and connected in a short period of time, and seem to inspire and boost the design process.

Author Keywords

skills; catalysers; creative tools; engagement; skilful coping; transformative collaboration; design; social innovation.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Human Factors; Design; Measurement.

CONTEXTUAL LANDSCAPE

Our times face us with numerous societal challenges, such as pollution, safety and health issues, which are leading to a growing discomfort and quest for balance. People are looking for systems, products and services able to help moving towards a sustainable world. The call to open up to 'radical' new skills to enable societal transformation and realise behavioural change on a personal as well as on a societal level is getting stronger every day [6].

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In line with this quest towards societal transformation, Brand and Rocchi [1] foresee a transformation economy as the next paradigm following our current knowledge economy. The transformation economy refers to a society where stakeholders work together on local solutions for local issues that stem from greater global issues.

Figure 1 - The transformation economy

The need for transformative collaboration among all the cross-disciplinary stakeholders is becoming paramount, since the complexity of designing systems, products and services has increased rapidly during the last decade. These stakeholders may come from academia, governmental bodies, (non-)profit organisations and societal bodies, as well as from industrial partners. Moreover, the close involvement during the design process of citizens (clients, users or consumers) is necessary to move towards behaviour change on a personal and on a societal level.

The collaboration within the transformation economy is based on a horizontal collaboration in which all stakeholders are equal, but not identical, and valuable in their own way. To obtain such a kind of collaboration requires a specific attitude and approach: transformative collaboration is based on engagement, empathy and respect. It asks people to put themselves - their point of view, their value system, their experience and their skills - into the shared design space [13, 6]. It requires new ways of organising and working together. The more so to bridge the many languages spoken at the table of transformative collaboration. Therefore, we see a need for new methods, processes, techniques and tools that allow the different

participants to build a constructive dialogue and design for transformation. Why not, for instance, abandon the Cartesian glorification of our cognitive capacities and praise Poetry instead? Poetry contemplates a margin of open-endedness, of individual interpretation, it appeals and touches deep cords of our sensitivity, those that give meaning to our life, make it rich and worth, way beyond how mere efficiency and ease of use can be satisfying.

We have been and are developing several of such methods, processes and tools over the last years such as *Experiential Design Landscapes* [9] *Rights through Making* [13], the *Reflective Transformative Design* process [5]. We are now working on synthesising them within a design framework called *Designing in Skills (DiS)* [12]. In this paper we focus on one of the creative techniques called *Engagement Catalysts*, which was developed within the *DiS* framework. This technique serves as a means to connect people and enhance engagement, empathy and respect during a transformative collaborative design process.

In this paper we will first sketch the theoretical embedding of this technique and more specifically the role of embodiment and skilful coping. Thereupon, we show, through the process and results of a two-week design class, how embodiment and skilful coping can be incorporated in transformative collaboration. We do this by illustrating how creative tools, more specifically *Engagement Catalysts*, can catalyse a constructive design conversation among stakeholders that speak different languages and act in different worlds. We present how *Engagement Catalysts* can be designed, starting from the designers' skills. Finally, we briefly discuss the results of two workshops in which participants with a large variety of backgrounds used our *Engagement Catalysts* to ignite their design process.

EMBODIMENT AND SKILFUL COPING

Designing is very well suited to play an active role in a shift towards societal transformation, since designing faces localising (making a matter concrete), questioning (reflection on its quality) and opening up (expanding its sense) [11]. Especially the latter is essential to make the step towards transformation. Designers open up by using their skills to connect the abstract to the sensorial. They connect the intuitive to the analytical, and making (synthesise and concretise) to thinking (analyse and abstract). The importance of senses, intuition and making forms the core of philosophies like phenomenology [e.g. 10] and theories like embodied cognition [e.g. 2]. Essential to these theories is 'embodiment' and 'skilful coping'. Dreyfus, articulating on Merleau-Ponty [3] considers these concepts to be unique characteristics of man; that is, we are able to engage with the world and develop skills, while acting in the world that allow us to continuously change the way we transform it and to relate with it. There is no divide between subject and object: "*The meaning of things ... exist[s] neither 'inside' our minds nor in the world itself, but in the space between us and the world, in the*

interaction" [8]. We perceive the world in terms of *what we can do with it*, and by physically interacting with it we access and express this meaning. Meaning is created in interaction.

By starting from skilful coping and embodiment, we have developed techniques supporting a transformative collaborative design process that focuses on "making sense" in interaction, on being meaningful, on engaging the participants through their skills and trigger empathy and respect. Consequently, our *Engagement Catalysts* are based on what people can actually do, instead of what people think (or think they think).

DESIGN CLASS: THROUGH SKILFUL COPING, FOR TRANSFORMATIVE COLLABORATION

Our *Engagement Catalysts* were developed during a design class, which has been carried out by the authors in September 2012. Eighteen Master students of the Department of Industrial Design of the Eindhoven University of Technology participated. The aim of this design class was to design creative tools for transformative collaboration, realised through embodiment and skilful coping. These tools aimed at catalysing a multidisciplinary design process, based on respect and empathy, where people are engaged in a (design) discussion more concrete and effective than a discussion held around a table [13]. The students worked in teams and produced six tools, which we named *Engagement Catalysts*, and which were evaluated during two design workshops. We describe the process of creating an *Engagement Catalyst* through the results of one student: Chris Gruijters. Moreover, we present the final results of all other student teams.

Step 1: Reflecting on your own skills

All students were asked to choose a personal skill to focus on (e.g. free-climbing or playing a musical instrument) and make a short video documentary on the relevant elements such as: What is the skill about? Why do you do it? What does it mean for you? Why is it important or meaningful? What do you experience and feel when performing the activity? The goal of this first video (video A) was for each student (person 1) to directly reflect on these questions, explore one's own point of view and skill, and prepare himself for transferring the findings to another student.

Figure 2 - Chris Gruijters riding his fixed gear bike

Chris Gruijters' focused his skill of riding fixed gear bike. In his video he described how he moves through traffic, and he pointed out how it is based on constant anticipation and trusting instinct, next to timing [14]. The film was realised with a voice over on shots of him riding the bike and reinforcing the concepts that he was expressing.

Step 2: Documenting person 1's skill by person 2

A fellow student (person 2) was asked to make a short video documentary (video B) about person 1's skill, based on a demonstration and explanation of it in the context, documented with an interview by person 2 and, if feasible, by letting person 2 try out the activity. Every video B was then presented to person 1, in order to show him a new perspective on his own skill. In this way, person 1 would be able to reflect on the point of view of person 2. What did person 2 consider to be meaningful for person 1, what was person 2's own point of view? By showing such a "mirror", person 1 can scrutinize their meaningfulness and point of view again, thus adding an extra layer of self-awareness.

Figure 3 - Zhiyuan Zeng riding Chris' fixed gear bike

Zhiyuan Zeng created a video of Chris Gruijters' skill. [15] Zhiyuan tried fixed gear biking and he compared his performance with Chris' ride as well as with his own normal bike. The video enhances the elegance of flow that a skilled person can achieve by mastering a skill, in this case the skills of biking and fixed gear riding.

Step 3: The design of an enabling tool by person 1 and 3 to let somebody else experience their skills

The students then extrapolates one key-aspect of their skill. They teamed up with another student (person 1 and 3 forming a team) and they used both of their skills as the starting point for designing an enabling tool: a tool to enable any other student duo (person 4 and 5) to experience the key aspect of the skills of persons 1 and 3. Since these unskilled persons 4 and 5 could never experience person 1's skill in the same way, participants were encouraged to explore all senses and to design their enabling tool beyond the boundaries and context of the original skill.

Chris Gruijters teamed up with Robert Noome. Robert's skill was hockey. He focused on the issue of control: how can you control a ball through a bat and acquire a sensitivity that makes of the bat, an extension of your limbs. As a combination of hockey and fixed gear riding, they designed an enabling tool *Balancing Stick* formed by a soft

mono-glove base and a stick that is connected to the centre of the glove, but not rigidly. One can put his hands in the glove, facing the palms to the sky, and try to balance the stick on it [16].

Figure 4 - The enabling tool Balancing Stick was designed by Chris Gruijters and Robert Noome to make somebody else experience the combination of their skills

Step 4: Trying out the enabling tool by person 4 and 5

The enabling tool was thereupon given to another team for validation: to reflect on how the tool was able to transmit the skills' qualities that person 1 and 3 designed into it. In this case Marjolein Wintermans and Sergej Lojko were given the enabling tool from Gruijters and Noome without instructions. The validation showed that the tool engaged well, but the students that tried it did not understand how to use it. They tried dozens of ways, were engaged for a fairly long time while, but did not experience it as the designers intended to, as the video shows [17].

Figure 5 - Sergej and Marjolein experience the enabling tool designed by Chris and Robert

This step of the process was the first one in which the students faced the concept of engagement and irresistibility: how to design a tool that other people are intrigued to use and explore for a long time, and that engages them?

Step 5: Movement analysis and the design of a sketchy enabling tool by person 1 and 6

After having evaluated the 9 enabling tools during the previous step, we saw the necessity for deeper reflection on the sensory / perceptual-motor qualities of each person's skills. To design for embodiment and skilful coping requires a close connection to and awareness of the body. If one truly likes to design for embodiment and skilful coping, one has to be or become an expert in movement, not just theoretically, by imagination or on paper, but by doing, moving and experiencing while designing [4].

Design choreographer Sietske Klooster led the movement exploration and reflection. She guided the students into a deeper understanding of their skills, by making them move and reflect on their movements. And also the merging of the qualities of teams' components skills, (of person 1 and 6) happened by means of movement. This time Chris Gruijters teamed up with Hanneke Hooft van Huisduinen, and they explored the cross-section between fixed gear biking and making pasta, as the video shows [18]. After these movement explorations, the students worked briefly on translating these movements into an enabling tool (made by person 1 and 6). Chris and Hanneke created a small space with a large soft disk to emphasise the transition between increasing and releasing tension. The main purpose of this small 'creative body' assignment was to emphasise the importance of using one's own body during the design process, which appeared very useful during the remaining part of this two-week design class.

Figure 6 - Chris and Hanneke exploring movements to combine fixed gear biking and making pasta (top) and using their enabling tool (bottom)

Step 6: The design of the Engagement Probe for catalysing the transformative design processes

The last step of the design class, for which the students had one week, was the realization of an Engagement Catalyser as we described it in the introduction: a tool able to connect and engage people in order to catalyse a constructive (design) "conversation" among people with different backgrounds during transformative collaboration. Students capitalised on the previous steps to face this last challenge. They worked in trios on it in several steps. They built prototypes and tried them 'in the wild': in public spaces of various natures, with people unaware of the aim of design

class. The evaluation aimed at assessing the elements of engagement and irresistibility of the *Engagement Catalysers*. These evaluations fed the design with new insights, which was then refined. The students did several iterations of this kind, before they realised their final Engagement Catalyser that was used during two design workshop with participants from various backgrounds.

Figure 7 - Engagement Catalyser "We feel like talking" developed by Chris, Jeanne and Kevin

Chris Gruijters teamed up with Janne van Kollenburg and Kevin Andersen, and they designed an Engagement Catalyser named "We feel like talking". This tool is constituted of an aluminium sheet and two sets of five magnetic finger-tops. The sheet is positioned perpendicularly to a table and separates people sitting in front of each other, preventing them to look at each other. On the fingertips of their hand(s), these two people wear little caps. At the far extremity of these cap is a magnet. People can place their "extended" hand on the sheet and feel the presence and the movement of the person on the other side of the sheet, as their video shows [19].

The various explorations of this *Engagement Catalyser* in the wild showed that the interaction with the Catalyser and the other person is careful and the feedback one receives is subtle. The two persons at both sides of the sheet carefully explore each other and are fully emerged in this exploration. At some point, most participants extended their exploration towards the visual, by peeking over or next to the sheet. Moreover, these explorations made the designers decide to have a table version and a hanging version from the ceiling.

As we had hoped, the students' skills are clearly visible in the design. For instance, one can notice the subtlety of control that Chris Gruijters exercises with his fixed gear bike: very small, precise and unconscious movements permit to keep a sensual dialogue with the bike and lead it where desired, with fluency and elegance. These elements are traceable in the design of *We feel like talking*: a sensual dialogue is constituted between two people and by means of seduction, through very small and careful movements, one can lead the other, fluently and swiftly. And also the piano playing skills of Kevin, with its subtlety, light articulated touch, harmonising quality and attempt to let the piano

breath, can be felt in their *Engagement Catalyser*; as are Janne's fine motor skills fully based on touch instead of sight, when typing text messages blindly on her phone.

Figure 8 - Kevin's initial skill was playing the piano and Janne's skill was blind typing on a phone

MORE RESULTS

The other five *Engagement Catalysers* that were designed during the design class are now described. The description is done in terms of functional, formal and interactive characteristics.

LeMiMi

LeMiMi's main components are a disc of flexible fabric and levers. A rigid rim constitutes the disc, and around the rim two elastic sheets of fabric are tensed; the one below is light blue, the one above is black. The top one has a pattern of cuts that let the piece of fabric beneath appear. Below the rim, a set of levers (40-50 mm wide) juts out about 60-80 mm. These levers are flat at the end, i.e. the part that juts out, and they have protrusions of different shapes at the other end, hidden underneath the fabric. These extremities of the levers are connected with elastic: By pushing down the outer extremities of the levers, the other extremities push on the fabric and make it bulge out (see Figure 9).

Figure 9 - "LeMiMi has been designed by Leonie Tenthof van Noorden, Michiel Wolters and Mitchell Jacobs

Diskill

This Catalyser is a vertical object that spans from ceiling to floor. It is constituted by three white elastic bands, attached in the same point on the ceiling and fixed to a weight on the floor. At about hip-height and neck height, there are two cylindrical (400 mm diameter, 150 mm height) grey

pillows. Moving the pillows, generates audio-feedback. Based on an electronic music sample, one can partly manipulate pitch and pace, by agitating the pillows in different directions (see Figure 10).

Figure 10- 'Diskill' has been designed by Enitia Karijodinomo, Sergej Lojko and Robert Noome

The unpredictable stick

This Catalyser is formed by two main components: a wooden stick, around 1100 mm high, and a semi-sphere on which the stick is fixed. The semi-sphere contains a weight and a servomotor that shifts the weight according to an irregular pattern. One can push the stick, but the feedback is unpredictable, since it can happen that the weight is shifted, while the tool is rolling on its base (see Figure 11). The stick is a wooden branch, scraped from its bark and which has an irregular shape. At its top, a sharp change of direction of the branch makes it look as if it had a sort of a handle.

Figure 11 - 'The unpredictable stick' has been designed by Marieke de Rooy, Wisse Trooster and Bert Bogaerts

Fantastic Elastic

Figure 12 - 'Fantastic elastic' has been designed by Robin van Kampen, Marjolein Wittemans and Hanneke Hooft van Huijsdijnen

This Catalyser is a simple orange lycra rectangular piece of fabric, hanging from the ceiling with several white elastic bands (see Figure 12). In its neutral position it takes about 1000mm x 1200mm. It can be extended by at least half of its size. It can be crunched to a 150mm ball of fabric. It is positioned at chest-height. One or several balls can be placed on the cloth. One of the goals during interaction with this Catalyser could be to keep the ball on the fabric.

Don't move!

This Catalyser is constituted by six stools, placed in two rows of three, facing each other (see Figure 13). Five of the six stools are connected: one is connected to another and the remaining three are connected too. The connection is made with a belt, placed under a wooden floor. One does not realize this connection, until one sits down and is moved by the movement of another person, although it is not immediately clear who is connected to whom.

Figure 13 - 'Don't move!' has been designed by Mathijs Jansen, Zhiyuan Zheng and Sina Kazemi

USING AND EVALUATING IN CONTEXT

The weeks and months after these six *Engagement Catalysers* were designed, a soft evaluation in context took place. Several copies of these *Engagement Catalysers* were built and used in two workshops. The first workshop (WS1) was called *Hephaestus and the senses* and coincided with the inaugural speech of Caroline Hummels (September 28, 2012). Eighty persons participated, who had very different cultural and professional backgrounds, and affiliations e.g. from industry, government, local institutions, university and freelance positions. Approximately half of them had a 'creative and synthesising' profession, such as designer, architect or dancer, and the others not. The participants were divided in 15 teams of 4-6 persons, with a mixed background. For example, one team existed of a dance teacher, a manager from a housing cooperation, the head of monuments of the city of Amsterdam, a technical workshop assistant, a designer-researcher and a design student. The assignment that they had to tackle was to design a tool for citizens to socially connect through their senses. Moreover, every team had to select a situation or group of citizens based on (one of) the team members' personal or professional experience.

The second workshop (WS2) was called *Re:vision on city councils*. This workshop was conducted in cooperation with Necker van Naem and the Dutch Ministry of Interior and Kingdom Relations and held March 19, 2013 at the Ministry in The Hague. Thirty persons participated who were related to city governance one way or another, e.g. as a city councillor, a clerk or a consultant. The participants were divided in 6 teams of 4-6 persons, with a mixed background. Since none of the participants had a design background, one Master student from the department of Industrial Design, TU/e joined every team to support the design process. The assignment that they had to tackle was to design the city council of the future, including its way and place of working.

The set-up of both workshops was fairly similar. The workshops lasted 5 hours including a lunch (WS1) and 4,5 hours including a short tea break (WS2). In the end, all teams had to deliver a prototype of their design. In WS1, they had to capture their designed prototype in a 1-minute movie including, if possible, a "user test" of their design "in the wild". The movies were presented to a broad audience after the inaugural lecture at the end of the afternoon. In WS2, every team acted out and explained their design to the other participants, which was followed by a short discussion and reflection by the entire group.

Every team started to meet each other and getting to know each other by using one of the *Engagement Catalysers* that we just described. They used them to connect to their teammates, using their bodies in a playful way. In WS1, all participants were standing, during WS2, most participants were sitting around a table with the *Catalysers* placed on top. During WS1 all *Engagement Catalysers* were used, in total 15 copies of the various tools. During WS2, we had to limit our set due to travel conditions and space arrangements. Consequently, we used 'We feel like talking', LeMiMi and The unpredictable stick. Moreover, we used the enabling tools that Chris Gruijters and Robert Noome made, shown in Figure 4, and a variation of Fantastic Elastic. They received no further instructions of how to use the *Engagement Catalysers*.

At the end of this exploration (after ± 15 minutes), every participant had to describe the people of their team in keywords, based on the way these people interacted through the *Engagement Catalysers*, with each other. Thereupon, every team started with their design challenge. In WS1, the participants first needed to agree upon their specific challenge before they could start to design. In WS2, participants first got an assignment to determine the values of current and future city councils, and design a small gift that would evoke the values of the future city council when unpacked by the receiver (so with a focus on interaction and less on appearance). This way we hoped to support people that never designed before, to get acquainted with designing. And more importantly, we stimulated them to design with a focus on embodiment and skilful coping.

The teams, both in WS1 and WS2, did not have their own table with chairs to work on with paper and post-its as is often the case in brainstorm sessions. To emphasise and support embodiment, skilful coping and making, we had placed tinker material in the space. The teams were free to work where they liked and in their preferred way.

As said before, the evaluation of the final outcomes of these workshops will be the subject of another paper (the results of WS1 can be seen at the website [6]). What we want to reflect upon in this paper is how *Engagement Catalysers* have worked as irresistible creative tools and catalysers for a constructive (design) conversation. In order to do this we observed how the *Engagement Catalysers* were used, we collected people's impressions, we took pictures, made movies and we reflected on all this input afterwards. From all this material, we were able to produce the reflections presented in the last part of this paper. We first address every Catalyser individually and thereupon reflect on the technique of *Engagement Catalysers*, for connecting people and catalysing a constructive (design) "conversation" among people with different backgrounds during transformative collaboration.

How We feel like talking engaged

Catalyser: A wall, on which on both sides, people interact through magnetic fingertip-caps.

A limitation of the design of this creative tool in team settings is that it stimulates one to one interaction. Nevertheless, the two teams in WS1 that worked with this tool also explored a one-to-many kind of interaction. During exploration in context in the design class and in WS1, it showed that people soon got out of the boundaries of the sheet and started to explore haptics with a direct contact between two hands wearing the magnetic fingertips. Since all participants were seated rather closely in WS2, they did not have the space to explore other ways of interaction, but it still was one of the most engaging tools. The beauty of this catalyser (WS1 & WS2) consisted in the subtlety of the haptic discourse it elicited. Looking at two people using it, really felt like looking at a conversation. Because of its focus and subtle movements, it felt very intimate and dense both for spectators and participants. Experiencing it felt rather intriguing: one touches another person in a very sensitive area (fingertips) but without a direct contact; one gets "attracted" to somebody else and can play how to resist and give in to this attraction; one can be led or lead, escape or follow, and hide or show up. People explored for a long time and in very creative ways. The participants really seemed to engage through this tool in both workshops. During the remaining part of WS1: both teams had a strong emphasise on tactility and touch during their prototyping explorations and in their final designs.

How LeMiMi engaged

Catalyser: The membranes of a disk get tensed by interacting with surrounding levers.

The platform students designed triggered curiosity which was clear from the all-day usage in WS2 by many participants and visitors (it stayed there also during the evening party). Students faced two important steps during the design process in the design class. They first found out that having a goal (i.e. putting a ball in the middle of the membrane) was not reinforcing or catalysing conversation. Students had the courage of stripping their design of the function. That was a valuable step, because it made them realise that the beauty of the interaction that they created did not rely exclusively in the levers, but also in the haptic characteristics of the membrane. The final tool is characterized by a high formal quality, achieved through a careful design and building process. The movement that one can induce to the membranes reinforces the visual subtlety (graphical pattern), which inspires playing with the surface. The students have been experimenting a lot with the levers. The feedback of the levers is not a on-off switch, thanks to elastic feedback in the middle, but elicits the possibility of gradient changes. Although almost everybody was attracted to *LeMiMi* at first sight, not many people explored it for a long time. It appeared irresistible, especially when people were standing around it in WS1, but the engagement was not sustained in time. Moreover, in WS2, when people were sitting around it, and the participants did not have a design background, *LeMiMi* seemed to evoke less engagement. Both outcomes can be partly explained by the limited richness in levers and the separation between the input and output: it was harder to get a haptic (inter)play between persons. Another aspect limiting its interest in time and public seem to be its finished look: it seemed a closed object where users could not invent (new) ways of interacting with it. Augmented feedback (e.g. audio effects coupled to the levers) or more direct contact between input and output could be solutions to increase engagement.

How Diskill engaged

Catalyser: Vertical elastic bands with two pillows fixed at different heights that produce sound when moved.

The irresistibility to play with it, the length of interaction and the openness to find new ways to interact with it appeared very strong. Even though the sound feedback could have been designed better, the audio component enriched the design and attributed to a very interesting margin of open-endedness. Since the ways of moving the Catalyser are myriad, participants easily started exploring with the (unconscious) aim of producing differences sound and inviting each other to make interesting moves and sounds. The creative tool worked very well as icebreaker, because of its social playfulness. WS2 showed that *Diskill* was used by different people at the same time because it bounces back. When solicited, it affords bold, strong movements. Even after just one minute, we saw participants punching the pillow at full strength in the direction of a complete stranger and having fun with him. After a few

minutes we saw people completely entangled with their teammates. Diskill affords an incredible variety of engagements, which span from the movement of two fingers to the complete involvement of the body, around, within or through this *Engagement Catalyser*. Moreover, the margin of uncontrollability in its behaviour strengthens its open-endedness. Because of it being bouncy, and having weights distributed unevenly, it is difficult to forecast the response one will get (both direction-wise and force-wise), once it is solicited. We saw more shy people engage, maybe because one can actually “blame” Diskill for intruding one’s privacy. Finally, we saw patterns arising during use, concerning the qualities of interactions and the collaboration the Catalyser elicited. Because it emphasises responses to touch, due to its elasticity, participants tended to accompany and increase the bouncing. When it got too wide and out of control, people started to bring it back to a calmer movement, thus enhancing engagement.

How Unpredictable stick engaged

Catalyser: A wooden stick, placed on a semi-spherical base in which a weight moves randomly.

We used two versions: one with a motor and one without, making the movements of this latter a bit more predictable. However, for both versions it turned out that it is interesting because it has a life of its own and it elicits curiosity in people. Participants tried to recognize patterns in its behaviour and anticipate during interaction, often with no success and to the great amusement of the team members. Also the formal qualities made the Catalyser interesting. It is made of different materials, with different sensorial and physical properties: An irregular shape and texture of the stick (a branch), and a geometrical, artificial semi-sphere with filleting elements cut along an arch. If one looks at different spots of the creative tool, without looking at it in its whole, the creative tool seems to respond in different ways: rolling at the bottom, and jerkily oscillating at the top. All these aspects make it an interesting ice-breaker. Where the design did not completely fulfil its aim, is its limitation with respect to group use. People can “talk” to each other through it, but not with it. The communication is not both ways, but unilateral. Maybe the use of two sticks or more handles could have afforded a two-way conversation. During WS1 one group solved this issue by using two Catalysers at the same time. Another disadvantage was its fragility. People tried to use foot-control (see Figure 12), but the Catalyser felt too fragile to really explore it this way and feel engagement. During WS2 it turned out that this was one of the more engaging tools, maybe also because people needed to stand around it, giving them more freedom to act, explore and talk.

How Fantastic Elastic engaged

Catalyser: A piece of elastic cloth suspended by a set of elastic bands, on which a ball can be placed.

This Catalyser is extremely simple and “loose”. Not just in

terms of physical properties, but also in terms of boundaries and action possibilities. Being an elastic piece of fabric and being anchored to the ceiling with elastic bands, it can be stretched and pulled on all sides. The boundaries of the Catalyser appeared very open: people scrunched it up into a small ball and stretched it into a large sheet. Playing with the ball that was placed on it, was a starting point to use it, but most teams got rid of the ball soon after and started playing with the cloth alone. Simplicity and “looseness” made “Fantastic Elastic” a creative tool that did not intimidate creative people. On the contrary, it engaged them in all sorts of “wrapping each-other” and fun games. Because of its looseness, it engaged creative people very easily, whereas less creative people were more hesitant and trying to stick to the original goal of keeping the ball on the sheet. Especially, in those cases where there was enough space around the creative tool, it was used in all extensions and pulled in all sorts of directions. The kind of “bodily” conversation through which people engaged were very expressive. The Catalyser allowed for a lot of variation possibilities. Aspects that could be further developed are its rectangular shape, which influences the way people standing around it, and its openness for less creative people.

How Don’t move! engaged

Catalyser: A set of stools, whose rotation is connected.

To understand what this Catalyser is about, you have to sit on it. You cannot understand it by looking at it, or by moving yourself. You only realise how it works when other people move you. More than others, this Catalyser forces people to move, even without them willing to. It is intruding the personal possibility of making choices, although it does not interfere with sensitive areas of one’s privacy (e.g. it does not involve direct contact with other people). While with most of the other Catalysers participants could choose to be involved or not, with this one, once you sit you cannot choose, except the possibility to resist this intrusion or strengthen it: by exercising force with legs and feet they could maintain their position or move along. This could mean, imposing the decision not to move, to somebody that did want to move. It resulted in an interesting play between people. Unfortunately, there was a functional problem with this Catalyser. One pair of connected stools was working very well: once one person rotated this stool, the connected stool would be rotated, and the person sitting on it as well. The trio of connected stools had a big dispersion of force: once one person rotated his stool, the connected stool would only slightly rotate. The induced rotation was often not strong enough to give a meaningful experience to the persons sitting on the rotated stools. Consequently, this element prejudiced the evaluation of the Catalyser. The engagement created by it was less strong than some of the other Catalysers. Moreover, the Catalyser seemed rather constraining and there was less open-endedness in it. The way people tried to keep it interesting, after the first minutes of exploration, was to

connect themselves beyond the connection imposed by the stools. They were, for instance, putting their legs in the lap of another person or connecting their arms. There was not a big variety of action possibilities that the Catalyser afforded and it seemed that it was very difficult to refine the types of interaction, to obtain intermeeting subtle results. Finally, *Don't Move* influenced the idea generation process afterwards: the ideas were less physically oriented.

How *Balancing Stick* engaged

Catalyser: a soft mono-glove base with a stick connected non-rigidly to the centre of the glove.

Although this tool wasn't originally developed as an Engagement Catalyser, we did see potential for triggering engagement, and offered two sets of these Sticks to one of the teams in WS2. Since it was a one-person interaction device, triggering engagement went differently than the other tools. These tools required rather a lot of space, which was not present, and consequently, we could discern distinct roles of interaction: balancing the stick, and supporting and taking care that nothing would happen to other participants. Due to its unpredictability, this tool was very playful and a true ice-breaker, making it a pleasurable connection, and that open and playful attitude stayed during the rest of the workshop. The participants focused on the tool and not so much on each other, making the conversation less scary, but also less intense and personal as some of the other tools.

SKILFUL COPING IN TRANSFORMATIVE COLLABORATION

If we observe the reflections on the single *Engagement Catalysers*, we see that three main points of evaluation:

- level of engagement;
- how it helped people to get to know each other;
- how it supported/inspired the design process.

Level of engagement

The first fundamental characteristic of the *Engagement Catalysers* is their ability to engage a variety of people from different backgrounds. The Catalyser has to be irresistible and seduce people to start playing with it, and it has to be interesting enough to engage people for a while, so they can actually start to know and explore each other through it. By observing how the Catalysers have been used, it is possible to define elements that caused engagement.

The first element is the 'mystery effect': when the reaction to a specific action is not (only) predictable, people are tempted to explore longer the possibilities of interaction that the tool allows. This happens for instance with *Diskill*, where a movement of the pillows generates an audio feedback. A second element was the open-endedness of the tool. If the tool does not have rigid (spatial, functional, formal) boundaries, it elicits more creative explorations. Two examples on the extremes are *LeMiMi* and *Fantastic Elastic*. While the first is a "closed" object, the latter is very

open and undefined. The first object engaged people for a much shorter time than the latter. In a way, open-endedness allows people to "enter" the object, hack it and explore for meaning in/through the Catalyser. A third element, which is a corollary of the second, concerns the positioning of the tool. In those cases that the tool was positioned at a good height and with a lot of space around it, it was easier for people to use it in different ways. We notice this by the use of the tools in the narrow space of WS2, as well as of two versions of *Fantastic Elastic* positioned in different areas: one was a restricted area and the other afforded wider mobility around it. The explorations that were done through the tool in the second case were way more interesting and articulated than in the first case. A fourth element that affects engagement is the degree of functionality of a tool or, in other words, the presence of a clear aim. Having a clear aim turns the tool into a toy rather than a tool, and it subtracts attention from the possibilities of interaction and its effects. A fifth and very important element refers to how much involvement of the body it affords. If we take *Diskill* as an example, the involvement of the body was very ample. Participants got completely entangled with other people after few minutes of exploration, whereas *Don't Move* was rather limited in this respect. *We feel like talking* used mostly only the fingertips, but even though the size of involvement was limited, it elicited (most importantly) perceptual crossing. The kind of involvement was dense and powerful because of its subtlety, element six, and unavoidability and directness, element seven. The sixth element concerns the subtlety of contact, in the sense of the kind of variety in possible interpersonal interactions, as *We feel like talking* showed. Finally, the seventh element relates to unavoidability, directness and similarity of input and output. We feel like talking stimulates direct contact at the spot, similar at both sides of the sheet and unavoidable in way (without the other magnet nothing happens).

How it helped people to get to know each other

The second track of evaluation concerns transformative collaboration: how did the object empower people that did not know each other, to know more about each other by means of movement, mediated by the Catalyser. While using the *Engagement Catalyser*, participants were instructed to write keywords on other participants' badge, to describe how they related to the object. Keywords such as "playful, reflective, delicate, bold, explorative" were used. Participants got to know each other on the base of how they related to the world, and not through categories (titles, job description, family situation, income, origin, ...). It was amazing to observe how most of the participants started to relate to each other, completely ignoring (or overtaking) etiquette boundaries. After less than half an hour, people were laughing and playing with each other like only children can do. And as soon as they started to design, they were trying out things, low-fidelity prototypes, and acts in which the taboo of physical contact was almost completely ignored, also with people not trained in design

or other creative professions. The variety in background and "language" did not play a role on the embodiment level.

How it supported/inspired the design process

The third track of evaluation concerns the way in which the *Engagement Catalyser* supported and inspired the design process. As said, the WS2 results, which can be seen in our movies [6, 7], will not be discussed here. What is relevant for the present discussion is noticing that the Catalysers had mainly two effects in the design process:

- The Catalysers were designed to elicit specific qualities of interaction. These qualities were partly traceable in the final design of WS2, as we for example explained in the reflections of *We feel like talking* and *Don't move*;
- The design process of WS2 was amazingly fast. Almost all prototypes were made between 0.5 and 1.5 hour. The *Engagement Catalysers* helped in sustaining a good pace.

Both these aspects will be further explored in the future, but it makes us optimistic about the potential outcomes. Even though the characteristics of the tools and the process to design them can be further elaborated, the results show that these *Engagement Catalysers*, based on embodiment and skilful coping, are able to connect people and to catalyse a constructive (design) "conversation" among people with different backgrounds. So we have good faith that they can play a role to support all stakeholders work together on local solutions for local issues that stem from our greater global issues, as explained in the beginning of this paper. We are currently designing a set of *Engagement Catalysers* for workshops with a variety of stakeholders like WS1 and WS2, as well as a set for use in smaller settings with only two or three persons present.

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