Enhanced Capabilities through Design-Based Approaches

VAN DER MAREL Floris\textsuperscript{a}\textsuperscript{*} and JOORE Peter\textsuperscript{ab}

\textsuperscript{a} NHL University of Applied Sciences, Leeuwarden, Netherlands
\textsuperscript{b} Delft University of Technology, Delft, Netherlands
* Corresponding author: floris.marel@nhl.nl

Design Thinking is often referred to as a valuable addition for educational models to promote a way of learning that encourages collaborations with people who work, think and act differently. Despite being used in multiple situations and described by numerous lists with characteristics, little is known about how it could affect people’s lives beyond the professional environment. The Capability Approach was used as an inspiration to explore with designers how it has influenced their lives through an interactive installation and in-depth interviews. Respondents reported better imagination, reasoning, thinking, using of skills and talents, freedom of expression, and ability to imagine another’s situation as a result of their designerly attitude. It is argued that integrating design thinking in educational models potentially transforms how people interact in society.

keywords: Capability Approach; Design Thinking; Education

1. Introduction. Design Thinking for Education

Educational models do not solely prepare for professional careers. They target transformations of students beyond knowledge, skills or attitudes, to shape ways we subconsciously are, think, do and interact in our daily lives. The classroom should thus be a safe place where students practice various ways of thinking and become familiar with different perspectives and reflect on what they feel they have reason to value to be able to be and do (Holley & Steiner, 2005). The in traditional educational model’s encouraged desire to possess the right answer silencing conversation partners translates to numerous aspects in people’s lives, for example when discussing the best way to take your business forward with your partners, when suggesting a vegan menu to your family for Christmas.
dinner, when arguing more money needs to be made available to welcome migrants in a political debate, or when asking your neighbour to not watch movies after 10pm because the walls are thin and you want to rest. It affects interactions in personal, professional and social environments, underscoring the need for educational methods to consider human development in terms of personal, professional and societal challenges.

Taking societal challenges into account in educational models is not new. Industrialisation has pushed educational institutes to focus more on efficiency, compartmentalization and measurable outcomes leading to social stratification (Treiman, 1970). Freire mentioned his 'practice of freedom' already in 1967 (Freire, 1967). In the words of Jane Thompson:

\[ \textit{Education either functions as an instrument which is used to facilitate the integration of generations into the logic of the present system and bring about conformity to it, or it becomes the 'practice of freedom', the means by which men and women deal critically with reality and discover how to participate in the transformation of their world. (as cited in Mayo, 1999, p. 5).} \]

More recently, also Razzouk and Shute (2012) stated: "if we are serious about preparing students to succeed in the world, we should not require that they memorize facts and repeat them on demand; rather, we should provide them with opportunities to interact with content, think critically about it, and use it to create new information" (Razzouk & Shute, 2012, p. 345). Design Thinking claims to help both developing new products or services and "opening up the fixed mindset that the day-to-day operation of jobs creates in people’s functioning" (Efeoglu, Møller, Sérié & Boer, 2013, p. 254). Both for professional environments and educational models Design Thinking is thus often mentioned to be a valuable addition.

**2. Critiques, Characteristics and Potential of Design-based Approaches**

**2.1. An Introduction to Design Thinking**

To understand the potential of Design Thinking for educational models, some core qualities of design-based approaches need to be agreed on. The term Design Thinking was coined by David Kelley, founder of the Stanford d.school—the Hasso Plattner Institute of Design at Stanford University, and founder and chairman of IDEO, the renowned global design company, to describe the general outlines of creative processes that have been around for centuries (Glen, Suciu, Baughn & Anson, 2015). It describes a team-based, multidisciplinary approach to problem solving derived from the field of industrial design to support people to push for innovation in their field (Camacho and Kelly, 2016; Glen et al., 2015). Applications can be found in various fields to address messy, ill-structured problems incorporating thought processes and methods underlying design practice (Glen et al., 2015). Purposefully not specifying methods or tools, it is best understood as a way of seeing and consequently interpreting the world in all its complexity (Liu, 1996). Through iterations and inviting multiple perspectives to the conversation various representations of concepts and ideas are always considered to solve issues, which then through identification of patterns and relations combined with critical reflection inform further design efforts (Do & Gross, 2001; Lloyd & Scott, 1995).
2.2. Critiques on Design Thinking

Design Thinking has since its conception - the term, not the process - received a lot of backlash and is even said to already be on its return (Badke-Schaub, Roozenburg & Cardoso, 2010). This happened partly because over time many different practices have been labelled Design Thinking, and described as "1. an iterative process, 2. a ‘special’ way of understanding and creatively solving so-called wicked problems, 3. user empathy, 4. a tool for collaboration, 5. a mindset, 6. a toolbox for user research and group creativity, 7. prototyping, or 8. a culture" (Plattner, Meinel & Leifer, 2015, p.168). To better capture the essence of Design Thinking many have avoided labelling, and instead attempted to list phases or characteristics related to Design Thinking (e.g. Bootcamp Bootleg, 2010; Brown, 2008; 2009; Lawson, 2006; Liedtka & Ogilvie, 2011; Efeoglu et al., 2013; Brown, 2008; Dunne & Martin, 2006; Meinel, Leifer & Plattner, 2011; d.school, 2010; Waloszek, 2012; Cigaina, 2013; Vetterli, Brenner, Uebenickel & Berger, 2012). The popularity of Design Thinking made many design agencies decide to develop toolkits, sharing their way of designing, presenting creative approaches as something easily adoptable and usable following a few steps and techniques. These ways of describing tend to be quite arbitrary, as they are "always incomplete", "non-exclusive" and "at different levels of granularity" (Badke-Schaub et al., 2010, p. 44). The issue with either labelling the concept or listing phases or characteristics of either processes or participants, is that these oversimplifications are never able to incorporate the unique identities of participants influencing those truly creative, chaotic exercises (Wendt, 2015). The simplistic understanding has caused people to see Design Thinking as a quick fix, resulting initially in disappointing results. Like any other approach, it takes time to become familiar with methods, tools and techniques, to make them your own and to be able to intuitively adapt them to specific contexts and present skillsets and preferences.

2.3. Design Thinking to Develop Personality

We consider design-based approaches not just to be activities intended to push for innovation. Instead they are journeys of creativity incorporating conscious reflective practices in which everything is done with intention (Camacho & Kelly, 2016). To allow free reflection, the initial problem is revisited many times, and reframed whenever insights from literature, experience or new perspectives are uncovered, allowing for unusual, big, innovative ideas (Camacho and Kelly, 2016). Inviting alternative perspectives is essential here, since people with similar backgrounds tend to tunnel as a result of automatic thinking (Kulkarni, Cambre, Kotturi, Bernstein & Klemmer, 2016; Gurin, Dey, Hurtado & Gurin, 2002), whereas increasing the team's diversity adds more divergent perspectives and confronting questions resulting in a discontinuity pushing people out of the comfort zone. The tensions resulting from an exchange of critiques over assumptions, beliefs and values can lead to conflict if people are unable to move out of the comfort zone, yet, if harnessed constructively, can be turned into creative opportunities "yielding more active, effortful and conscious thought" (Kulkarni et al., 2016, p. 1117). Tools or methods to empathize with stakeholders that are missing can be used to intentionally create a discontinuity and reveal potential tensions. It is never about finding a middle ground where parties give in, but about finding innovative solutions, new ways of thinking or other ways of working that benefit all stakeholders, in Buddhism referred to as the Middle Way (Grenny, McMillan, Patterson, & Switzler, 2002; Smith, 2016). Harnessing and
dealing constructively with tensions rising from diverse perspectives thus is a core element of design-based approaches. Intrinsic motivation and embracing discontinuities supports participants to move "away from the comfort zone to re-invent and develop their personality" (Efeoglu et al., 2013, p. 254).

2.4. Design-based Approaches as an Educational Model
Part of the beauty of using design-based approaches as inspiration for educational purposes is that it is clear enough to guide novice designers yet open enough to make room for a master: “It is innately human because it mirrors the process of the stories we tell, the transitions we make and the development we experience” (Drake, 2016). It therefore has great potential for students, faculty, companies, politicians, locals and others, since they collectively possess both new naivety and knowledge of industry and regulations. Considering different angles in respectful and equal learning environments supports creating inclusive opportunities for innovation, without winning, compromising or losing (Grenny et al., 2002). Design-based approaches thus claim that professional and personal environments can be transformed, enhanced by generating genuine empathy between people with diverse backgrounds and various roles (Kulkarni et al., 2016).

2.5. Studies on Design Thinking
Several studies targeting creative arts saw an increase in mutual understanding and awareness of individual differences strengthening relationships (Leckey, 2011; McNiff, 1992; Ulrich 1992) and in an educational setting Pearce (2016) found that participants developed stronger relationships after engaging in creative exercises. Grenny et al (2002) also concluded that when people produce something with another person that is truly creative, it’s one of the most powerful forms of bonding there is. On top of that Sellaro (2014) found that "trustors transferred significantly more money to trustees after engaging in divergent thinking as compared to convergent thinking. This observation provides support for the idea that interpersonal trust is controlled by domain-general (i.e., not socially dedicated) cognitive states" (Sellaro, Hommel, De Kwaadsteniet, Van de Groep & Colzato, 2014, p. 1). This matches with Leckey’s (2011) results, who found that “participation may contribute to improvements within the individual’s immediate social networks” (Leckey, 2011, p. 508).

Engaging in design activities also seems to increase participants’ level of understanding, reflection, and self-regulation (e.g. Koh, Chai, Wong & Hong, 2015; Cast, Hastie, & Rovegno, 2011; Ching & Kafai, 2008; Liljeström, Enkenberg, & Pöllänen, 2013). Enhanced deductive reasoning skills may contribute positively to situations in which multiple aspects are "abstract, apparently incomplete, contradictory or otherwise untenable" (Gustafson, 2015, p. 1). A designerly attitude may thus improve the ability to deal with unfamiliar territory beyond the comfort zones and in situations that are otherwise hard to assess without oversimplifying the issue (Gustafson, 2015), becoming more competent to solve wicked problems. Being more competent in complex situations can potentially lead to transformations of hegemonic structures and ideologies through higher understanding of originally resisted assumptions and values (Brown, 2004).

A review done by Razzouk and Shute (2012) aimed to "examine either the differences between novice and expert designers or characterize expert behaviour in the designing process" (Razzouk & Shute, 2012, p. 344). They found however that "experimental
evidence is lacking in the field of design research” (Razzouk & Shute, 2012, p. 344). For the scope of this research we aim to explore which capabilities are being enhanced when using design-based approaches. Focus is thus not on what people know, or what they can do in a professional or creative setting, but on how it may affect other aspects in life, either directly or indirectly. The question we aim to answer thus becomes: 'How can design-based approaches influence people's capabilities?'

3. Method: Mapping Merits of a Designerly Attitude

The aim of this research was to explore with designers what the merits of a designerly attitude are by identifying which aspects of their lives have been influenced as a result of becoming familiar with design-based approaches. This was achieved through three phases, briefly described in table 1, and in more detail in this chapter.

Table 1  Structure of the research

<table>
<thead>
<tr>
<th>Phase I</th>
<th>Choice of Amartya Sen's Capability Approach as an explorative framework.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase II</td>
<td>Appropriation of the Capability Approach by defining categories for the interview and domains for the panel</td>
</tr>
<tr>
<td>Phase III</td>
<td>Gathering data using two formats:</td>
</tr>
<tr>
<td></td>
<td>A. Writing stories of change on a panel displaying Capability Domains</td>
</tr>
<tr>
<td></td>
<td>B. In-depth interview around Capability Categories</td>
</tr>
</tbody>
</table>

3.1. Phase I. Measuring Development with the Capability Approach

Existing research focused mostly on differences between novice and expert designers or on professional and creative skills and characteristics (e.g. Razzouk & Shute, 2012; Efeoglu et al., 2013; Koh et al., 2015). In this research, we aimed to create a mapping with both novice and expert designers to identify which aspects of their lives had been influenced by design-based approaches. Although various approaches could be used for this exercise, we selected Amartya Sen's Capability Approach (CA) because of its wide spectrum of abilities that people may have reason to value (Mink et al., 2015).

The CA is concerned with how development can enhance what people have reason to value to be and do in life. Sen (1933-present) is an Indian economist and philosopher. He developed the CA in the 1980s as a response to traditional approaches to economic welfare (Sen, 1999). He argues that in developmental work it is not income or commodities that are ultimately important, but what they allow us to do and to be, the kind of lives they enable us to live (Sen, 1999). A similarity can be drawn for educational development, in which the focus should also "not solely [be] on trained potentials (as skills, abilities and aptitudes)" (Mink et al., 2015, p. 1639). Although those may be important for professional careers, what is ultimately much more important is what type of people it helps shape, which choices and freedoms it helps create (Zheng & Walsham, 2008), or in short what central and basic things it helps them to be able to do (Burchardt and Vizard, 2007). Sen focuses on ‘capabilities’: the freedom of action and decision and the actual opportunities that people have as a result of a developmental intervention. In this research, we thus look at what opportunities, or what expanded freedoms people experienced as a result of obtaining experience with design-based approaches.
This philosophical, sociological approach is not well-known in the designer’s world. This is no surprise as it is very difficult to translate this philosophy into working evaluative criteria. A predefined list with key topics to be discussed throughout interviews however can be highly beneficial (Larsen & Flensborg, 2011). The CA is valuable in the sense that it challenges researchers to create a list of relevant human capabilities in collaboration with the envisioned users (Sen, 2003; Nussbaum, 2001). Several scholars have attempted to make the CA operational and created different lists, which allow for evaluation and reconsideration (Nussbaum, 2001; Alkire, 2007). By probing people with questions of many different topics and asking them to reflect upon those topics it can give rich insights in their habits, freedoms and values, as well as underlying reasonings (Mink et al., 2015).

3.2. Phase II. Defining Capability Categories and Domains

A list of relevant capability categories and domains to explore the impact of design-based approaches had not yet been created. In order to create this all lists created by Alkire (2005 & 2007), Anand (2005, 2007 & 2009) and Mink (2015) were combined in one overview. This overview contained both abstract phenomena, such as leisure or freedom and very specific activities, such as having food and work.

The topics mentioned in the lists were categorized by the researchers, who both have an educational and professional background in design. This was continued until one list of 48 capability categories was created (see table below). The defined list of capability categories was categorized in four domains for the panel: Body (physical being), Mind (mental being), Activities (doing) and Social Context (social being).

<table>
<thead>
<tr>
<th>Domain</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Life expectancy</td>
</tr>
<tr>
<td></td>
<td>Health</td>
</tr>
<tr>
<td></td>
<td>Diet</td>
</tr>
<tr>
<td></td>
<td>Ability to visit doctors and hospitals</td>
</tr>
<tr>
<td></td>
<td>House or adequate shelter</td>
</tr>
<tr>
<td></td>
<td>Ability to move home</td>
</tr>
<tr>
<td></td>
<td>Sense of safety while walking around your house</td>
</tr>
<tr>
<td></td>
<td>Protection from violence</td>
</tr>
<tr>
<td></td>
<td>Bodily sovereignty</td>
</tr>
<tr>
<td></td>
<td>Sexual satisfaction</td>
</tr>
<tr>
<td></td>
<td>Choice in matters of reproduction</td>
</tr>
<tr>
<td>Mind</td>
<td>Ability to sleep</td>
</tr>
<tr>
<td></td>
<td>Stress level</td>
</tr>
<tr>
<td></td>
<td>Sense of usefulness</td>
</tr>
<tr>
<td></td>
<td>Sense of fear and anxiety</td>
</tr>
<tr>
<td></td>
<td>Perception of the world</td>
</tr>
<tr>
<td></td>
<td>Imagination</td>
</tr>
<tr>
<td></td>
<td>Ability to think</td>
</tr>
<tr>
<td></td>
<td>Reasoning</td>
</tr>
<tr>
<td></td>
<td>Concept of what is right</td>
</tr>
<tr>
<td></td>
<td>Engagement in critical reflection</td>
</tr>
<tr>
<td></td>
<td>Idea of a good life</td>
</tr>
<tr>
<td></td>
<td>Life planning</td>
</tr>
<tr>
<td>Activities</td>
<td>Freedom of expression</td>
</tr>
<tr>
<td></td>
<td>Participating in political and religious choices</td>
</tr>
<tr>
<td></td>
<td>Seeking work on an equal basis</td>
</tr>
<tr>
<td></td>
<td>Working as a human being</td>
</tr>
<tr>
<td></td>
<td>Doing useful activities</td>
</tr>
<tr>
<td></td>
<td>Moving freely</td>
</tr>
<tr>
<td></td>
<td>Pleasurable experiences</td>
</tr>
<tr>
<td></td>
<td>Avoiding non-beneficial pain</td>
</tr>
<tr>
<td></td>
<td>Laughing</td>
</tr>
<tr>
<td></td>
<td>Playing</td>
</tr>
</tbody>
</table>
Using your skills and talents

Social context
- Acceptance by others
- Lasting friendships
- Self-respect
- Sense of dignity
- Sense of feeling equal
- Sense of being discriminated against
- Meaningful social relations
- Ability to share emotions and feelings

Participating in recreational activities
- Ability to live with concern for and toward others
- Love and care for others
- Ability to imagine another’s situation
- Ability to live with concern for and in relation to animals
- Ability to live with concern for and in relation to the world of nature

3.3. Phase III. Gathering Insights through Three Different Formats

People were asked to report what shifted for them as a result of their experience with design-based approaches, the assumption being that this experience developed a designerly attitude which had influenced other aspects of their life. Two different manifestations were designed in an attempt to map those shifts: (A) an interactive installation and (B) an in-depth interview.

3.3.1. Interactive Installation with Stories of Change

The interactive installation was set up at the Dutch Design Week in Eindhoven October 23rd until October 30th 2016 and free for anybody passing by to write their personal story of change on a small piece of paper and put it on the panel. This panel was aesthetically pleasing to attract people to the stand (see figure 1). The researcher and his colleagues assisted by clarifying the purpose or invite people over to share their story. The installation did not explain the Capability Approach; people were free to share anything they felt was meaningful.

People were guided through the process in several steps. First people were asked to pick a card from the board on the left where cards were pinned down with magnets. They could choose from three options: a red card if they identified as an expert designer, a yellow card if they identified as a novice designer, or a blue card if they identified as a non-designer. The main aim of this question was to attract people’s attention, as it was a fairly easy question to answer, and it would commit them to continue to the next step. How participants identified themselves was left to their own definitions. Participants then wrote their story of their personal transformation as a result of using design-based approaches on their cards. Support was given by indicating they could consider either how they feel about themselves, what they do and how, or how people treat them. After writing the story down, participants attached their story to the board with a magnet in one of the Capability Domains. Body and Mind were clustered in this installation to simplify the task. Initially people were also asked to indicate how much the change had impacted their life, but this was removed after the first day since people expressed difficulty doing so.
Figure 1  Design of the interactive installation. On the left board it reads: ‘Step 1. Pick a card that best describes what type of designer you identify as. Use this card on the other panel to share your (expected) personal transformation as a result of using design-based approaches. I identify mostly as: Expert designer, Novice designer, Non-designer.’ On the middle board it reads: ‘Step 2. Write the story of what has changed (or might change) for you as a result of using design-based approaches on your card. Consider either how you feel about yourself, what you do and how, or how people treat you. Place your story along that line to indicate how much it has changed you: Your body and mind, Your activities, Your social context.’ One the right board it reads: ‘Merits of Design Thinking. Besides a proven and repeatable problem solving protocol design thinking is also said to be successful in developing people. NHL University of Applied Sciences is therefore developing educational models based on design thinking in co-creation with professionals and society.’

The installation was present at the Dutch Design Week for eight consecutive days (see figure 2). 90 response cards were added during this week. 7 cards were removed because they were illegible or not related to the provided question (e.g. ‘I do not understand this question’). Whenever the left board was running out of cards, new ones were added. 42 cards were placed in the domain Body and Mind, 33 in Activities, and only 8 in Social Being.
3.3.2. Interviewing to Identify Changes in Capability Categories

If people expressed an interest in the topic, they were invited to participate in the interview. By talking through a wide variety of topics, answers remained open to many potentially impacted areas of life. All capability categories were discussed to explore where shifts had occurred as a result of using design-based approaches. The interviews were semi-structured to enable a free and open dialogue with the participant (Bowman and Crews, 2009), to allow for providing deeper and richer views into behaviours, reasoning and personal experiences. Cards with visualisations of all capability categories were present at the table to create curiosity and provide a physical overview of the answers. One side of each capability card was in colour, the other in grey (see figure 3).
After participants had agreed with the interview being audio-recorded, a brief introduction was given about the topic and aim. The interview would last for about thirty minutes.
First the interviewer asked about the familiarity with design-based approaches, e.g. years of experience, type of design, intention to use more or less design-based approaches, etc. to get acquainted and awaken the right mindset. Then participants were asked to indicate which capability categories displayed on the table they felt had changed as a result of using design-based approaches. Affected capability categories were left upright showing a coloured depiction of the category, unaffected categories were turned upside down revealing the grey side. Participants were free to think out-loud or to themselves. Afterwards, participants explained their choices as far as they hadn’t done so during. If necessary participants were probed with questions like ‘Which ones were very easy, either definitely affected or definitely not?’, or ‘Which ones were you unsure about?’.

At the end of the interview participants were asked whether they had any questions, comments or suggestions for the researcher, and they were asked if they were interested in being kept up-to-date regarding the research results. A photo was taken of the cards on the table to capture the data.

In total 22 people were interviewed. Initially there were no criteria to participate in the interview, but after interviewing two non-designers, it turned out to be a frustrating exercise for participants to imagine what could have been influenced, or what would be influenced in the future, so experience with design-based approaches became a prerequisite to participate.

![Impression of the in-depth interview](image)

**Figure 4** Impression of the in-depth interview

### 4. Results

#### 4.1. General

Participants for the interviews were selected randomly, resulting in a group of people with a wide spectrum of design experience ranging from just half a year into their design
studies to a lifelong experience in design practice. All results were treated equally to explore immediate impact and long-term changes together. For the data analysis, the interview data were leading, since there participants were asked to reflect on all categories. Panel cards were interpreted and linked to capability categories to see where these stories matched up with the interview results.

The 20 novice and expert designers indicated that an average of 28 out of the 48 proposed capabilities were influenced because of using design-based approaches. Mostly categories from the mind domain were influenced (across the 12 categories an average of 16 participants indicated a change), followed by the activities domain (12 categories were mentioned by an average of 14 participants), the social domain (13 categories were mentioned by an average of 13 participants), and least influence was given to the body domain (11 categories were mentioned by an average of 8 participants). Each domain is discussed in further detail in the following paragraphs.

Figure 5  The relative impact on the capability domains.
4.2. Body

The body domain was considered the least influenced. Around half of the participants indicated these categories weren't something they can influence, but rather something that happens to them, or is dependent on external factors, such as money. A slim majority did indicate an effect on their health (12) as a result of using design-based approaches: some felt it had improved because they now better understood what they were doing which had made them more peaceful, whereas others indicated a negative correlation because they could never let go of their designerly attitude even after working hours. Some participants linked this also to their life expectancy (9). House or adequate shelter (11) and the ability to move home (10) was mostly considered as one and the same thing, which for some had changed because they now felt they could see more possibilities in terms of where or how they could live. Participants indicated that through better being able to listen and express what they wanted they had seen a positive change in their sexual satisfaction (6), protection from violence (6) or bodily sovereignty (5). Diet (4) provided doubt for many participants, but most concluded this was not impacted specifically by design-based approaches. Choice in matters of reproduction (4), sense of safety while walking around your house (2) and ability to visit doctors and hospitals (2) were quickly dismissed by almost all participants, as these were considered aspects that are available for everybody.
4.3. Mind

All participants agreed imagination (20) had increased, also shared by many stories on the panel, rippling into all aspects of life. Through confrontation with a lot of material from many different perspectives, people explained, they were forced to be imaginative, encouraging them to always consider bringing more people in. One person also indicated it had changed from dreaming to a technique one can apply anywhere, whereas other participants saw more possibilities, looked beyond the functionality of products and were now more aware of what could be changed, also affecting their perception of the world (16), idea of a good life (16) and concept of what is right (12). In the discussion, it became clear it is a combination of how you perceive what is around you, with an ability to imagine how things could change. The results suggest also that these designers believe their reasoning (18) and ability to think (17) has changed because of becoming familiar with design-based approaches. Because they felt they were better able to communicate their emotions, ideas and perspectives, they felt their sense of usefulness (16) had also increased. Some believed their increased imagination and reasoning skills also contributed to their engagement in critical reflection (15), since in design exercises they have had to reflect on their own perspectives related to those of others, and by doing so have gotten to know themselves and their assumptions much better. This was shared by several
people who shared stories on the panel, who indicated that they learned to 'design themselves', through which they were able to find themselves and learn to love themselves more, increasing their confidence and resulting in an enhanced trust of their own creativity and ideas. Only some people indicated an effect on sense of fear and anxiety (6) and ability to sleep (7), which they linked to increased stress levels (10). This was explained by a feeling that everything can always be better, that there is always room for yet another iteration, causing some restlessness. In the discussion however they also indicated they were now better able to deal with unfamiliar, stressful situations.

4.4. Activities

![Activities Diagram]

*Figure 8  The activities domain. The radius is relative to the number of participants that indicated an effect on that capability category. The aura around the circle is relative to the amount of mentions of this category on the panel.*
Many categories in the capability domain 'activities' were influenced because of using design-based approaches according to the participants. The most important one was using your skills & talents (18), which was often linked to the category sense of usefulness in the domain 'mind'. Both novice and expert designers indicated that through offered approaches and methods they were better able to communicate their thoughts, which previously were often dismissed as weird or unfeasible, hereby increasing their freedom of expression (17). This was often directly linked to experiencing designing as more pleasurable experiences (16), with more laughing (15). Participants indicated that because design as a field is becoming more popular, their expertise allowed them to work in more places, allowing them to move more freely (16) and feeling they were doing useful activities (13). Playing (14) was considered by some to be an essential part of their design practice, whereas others dismissed it completely. In the discussion, it became clear that those who had seen a change meant solely in their work. Nobody indicated an impact on playing activities outside of their professional life, although some did feel that also participating in recreational activities (13) had received a boost. Some clarified that through their design activities they were more exposed and open to new, or alternative ways of recreation. Half of the participants believed that linking working as a human being (12) or seeking work on an equal basis (11) to familiarity with design-based approaches was nonsense, yet the other half indicated that knowing these approaches justified what they were doing, making them more valuable and respected co-workers. Only a handful felt they could participate in political and religious choices (6) more, mainly because they were already involved with these groups and now felt their ability to contribute was enhanced. Avoiding non-beneficial pain (3) turned out to be difficult to comprehend. Only some indicated that their experience with listening more intently and choosing words more carefully to get an idea across, also aided them in guiding conversations away from potentially aggressive conflicts.
4.5. Social Being

Almost all participants indicated their ability to imagine another's situation (17) was enhanced through using design-based approaches, because when designing, according to the participants, you become more aware of people from different cultures, also those geographically close to you, creating a higher understanding of other people's motivations and perspectives, even without having a common language. It thus opened the eyes of some participants of how things could be different from their initial assumptions. This was usually linked to the ability to share emotions and feelings (15), because as part of designing with others, they have had to exchange emotions and identify core values of people, also improving their ability to live with concern for and toward others (13). The panel stories underscored this finding, as people expressed their empathy increased, and through identifying reasons behind people's decisions in design exercises, got better at identifying what is considered truly important. This was often combined with experiencing more acceptance by others (12). Because of existing trends to make design more sustainable the designers also indicated their ability to live with concern for and in relation...
to the world of nature (15) had been enhanced. Because of expressing emotions and ideas more, many participants felt their sense of dignity (14) and self-respect (14) had improved, supported by many stories on the panels, stating that they feel like important shapers of society, trust their creativity more, and through the increased popularity of design methods are better able to explain and justify their ways of thinking and working, increasing their sense of feeling equal (8). Participants indicated they have learned how to quickly bond with those who think differently, enhancing their capability to form meaningful social relations (13) and lasting friendships (8). This also influenced their ability to feel more love and care for others (10). Sense of being discriminated against (5) was not relevant for most because they had never felt discriminated against, and despite having felt excluded in the past, they indicated labelling the former situation as discrimination would be too extreme. The ability to live with concern for and in relation to animals (2) was mostly unchanged and not clarified.
5. Discussion. Creative Exercises as a Means towards a more Harmonious Society

5.1. Most Enhanced Capabilities

Respondents expressed an enhancement of their ability to think and reason. On top of that it came as no surprise that all interviewees indicated an increase in their 'imagination'. Using skills and talents and the freedom of expression were also enhanced. Additionally, the results suggest that being able to imagine another’s situation is also strongly enhanced through design-based approaches. All these categories were backed by stories shared on the panels. Mentioned often on the panel were also self-respect, sense of dignity and doing useful activities increasing people’s confidence and ability to tackle wicked problems in society. Participants indicated that they often now treat their daily activities as design, and that the combination of these capabilities helps with increasing trust in the future, since it enables them to see how things can be changed for the better, making them readier for change happening around them. Through intense, creative
contact with people who think differently, an interviewee concluded, we can create more harmonious living conditions.

5.2. Design-Based Approaches for Social Inclusion
In this research designers indicated that outside their professional environment their trust in the future has improved because of becoming familiar with design-based approaches. This was attributed to their ability to imagine another's situation and sense of feeling more capable to communicate with people who think differently from themselves. They indicated they were better able to imagine, reason and think to come up with solutions and communicate those to others increasing their freedom of expression. Many respondents also reported an increased level of confidence now that they could show the value of their ideas better. If more people develop this attitude, this may enhance well-being and help community integration, as was also found in Pearce's (2016) study, leading to a more inclusive society where people feel more free to express themselves and are better at understanding differently minded people. The results suggest understanding of other viewpoints, habits, values, or assumptions can be increased through designerly ways of seeing and interpreting the world, also encouraging the inclusion of wider varieties of people.

5.3. Design-Based Education
Integrating design-based approaches into educational models might thus aid students, both designers and non-designers, to better harness tensions arising from different perspectives and explore opportunities for creativity. Ending in something harmonious, the creation of something shared by all parties increases bonding. This can have personal, professional and societal benefits as it stimulates innovation and increases understanding of people different from one another leading to more understanding, and less confusion, fear or anger. To create a better world, it can thus be argued integrating design thinking in educational models can be a meaningful step forward.

6. Conclusion
Through this research, we aimed to answer the question: 'How can design-based approaches influence people's capabilities?' There seems to be a potential good fit between using the capability approach to map the impact of design thinking. This research was based on personal reflection by designers, so more research is necessary to identify how familiarity with design-based approaches affects situations outside the workplace. More non-designers also need to be included in further research to find out what is needed to make these personal transformations happen.

Design-based approaches are not claimed to be the only or best way to improve personal, professional and societal environments, but the results do point towards a correlation between designerly attitudes and an increase in capabilities that could benefit a more inclusive society. The results suggest that people familiar with design-based approaches experience an enhancement of their imagination, reasoning, thinking, using skills and talents, freedom of expression, and ability to imagine another’s situation, as well as an increased trust in the future where many different perspectives are being valued. Based on this research it thus seems integrating design-based approaches into educational
models can contribute to people’s personal development and to a transformation towards a more harmonious society.

References


About the Authors

**Floris van der Marel MSc** is a senior researcher at NHL University of Applied Sciences and Frisian Design Factory. Through creative facilitation he supports the reimagining of personal, professional, educational and societal environments towards a genuinely safe and inclusive society.

**Dr Peter Joore MSc** has since 2008 been lead researcher Open Innovation at NHL University of Applied Sciences. Using the instrument design thinking he wants to enhance collaborations and accelerate innovations, to contribute to a smart, sustainable and inclusive society.