



How to Utilize the HuValue Tool for Daily Life Product Design

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Abstract. To support designers considering human value in their design process, the HuValue tool was developed. This tool is instantiated as a tangible, card-based design toolkit including a value wheel, 45 value words, and 207 picture cards, grounded in a comprehensive value framework. Using this toolkit can enable designers to be aware and sensitive to human values and consider various value aspects of their design challenge through different types of values, even if they personally do not value them. To know whether our tool is useful in a design process, we conducted a quasi-experimental study with 64 first year bachelor students in the context of a project based course of an industrial design program. We supported randomly selected students in 12 group projects with four students each, to use our tool during their whole design process (phases: vision, ideation, conceptualization, realization, and validation). Six project groups received the toolkit, an introduction and also guidance during the semester about how to use it in different design phases (Trained Groups). The remaining six of these 12 project groups received the toolkit and an introduction to its usage (Introduction Groups). Additionally, four project groups without any support for human values were used as benchmark (Control Groups). It was up to the students in all 16 groups if at all, and if so when and how to use our tool. We evaluated all the 16 project groups' final designs whether they used the HuValue tool in their design process, if so, how and in which part they used our tool. This setting gave us the opportunity in gaining insights how to propose relevant usage of our tool. The results showed that nine out of the 16 in total (=56%) and eight out of the 12 tool-based (=67%) project groups reported using our tool during their design process for different purposes. Even one of the control groups got - beyond our control - access to our toolkit and used it. The project groups which used the tool applied it in the following phases: vision, ideation, conceptualization and validation, but not realization.

Keywords: Human values · Design tool · Product design · Value-based design · Quasi-experiment

1 Introduction

Products play a mediating role between human beings and the world to anticipate the future, since they co-shape the existence and experience of us and consequently our

lifestyle [1]. On the other hand, human values guide human actions and behaviours in daily situations and give expression to basic human needs [2]. An extensive literature review showed that despite the significance of human values in everyday life and consequently, in product design, they mostly remain implicit and unarticulated in design projects [3]. Only few design approaches concentrate on human values and aim to address them in their design [4–6]. Nonetheless, there is a very little agreement between them to identify values. In this respect, the lack of an established and accepted fundamental grounding [7] and a comprehensive list of values [8] can be considered as a major unresolved issue. Accordingly, with the intention of supporting designers to embed human values consciously and explicitly in the design process, we developed a comprehensive value framework [9] and provided a tool for overcoming this shortage [10].

To design our HuValue toolkit, we first proposed a comprehensive value framework to raise designers' awareness about human values; and then a card-based design tool, containing a value wheel (Fig. 1), 45 value words and 207 picture cards (Fig. 2). These tangible objects should facilitate using the value framework in a design process. Our value framework was created and developed via research with various theoretical, empirical and design-based approaches to compile, classify and structure the existing value lists, including Rokeach [2], Peterson and Seligman [11], Schwartz [12], and 10 more value lists from the last century [10]. This value framework provides a holistic view of the values of different aspects of human life [13]. In our HuValue toolkit, our value framework is illustrated in a circular form as the value wheel, which is a circle with nine value clusters. Each value cluster is represented by an icon, a label, a mood board, a descriptive sentence, five key values, and some relevant terms. In the wheel, each value cluster can be ranked in their order of importance through a 5-point rating scale: from 'Extremely important' to 'Not important'. Each value is represented by a two-sided card with the value word on the front and its relevant value cluster at the back. All value clusters are developed through an empirical investigation and a cluster analysis [10]. The *Picture cards* (see Fig. 2), as complementary to the value wheel, are examples of representative activities, personas and products/services. Despite the simplicity of their presentation, these cards link the abstract human values to concrete everyday life issues. In fact, the cards are supposed to be applied for expressing human values in practice. The *activity cards* are some examples of concrete valuable behaviours, which can be used to express what does a specific value/group of values mean and how it can appear in real life. The *persona cards* are the examples of iconic people, who can be representative of acting based on a specific value or group of values. The *products/services cards* provide some examples that can be used to express how using a product/service in daily life can straighten or weaken such a value or group of values. The cards are samples of everyday life experiences to clarify how to disclose the underlying values of a daily life situation. Indeed, asking "why is this experience/behaviour important?" is the way to reveal the human value(s) behind daily experiences, and asking "How can this value be actualised?" is the way to express human values within everyday life experiences. Clarifying this relation would be helpful for designers to translate human values into design requirements, which have a guiding role in a design process [14].

Applying our tool during a design process is supposed to be effective for enriching design concepts with human values [15]. Indeed, as evidenced by a quasi-experimental



Fig. 2. Examples of value words and picture cards: (left) two-sided cards (size: 5×7 cm) with a value word on the front and its relevant value cluster at the back; (right) three different types of picture cards (size: 7×10 cm) including activity, persona, and product/service. The first number on the left side of picture cards means 1 = activity, 2 = persona, and 3 = product/service; the second number represents the position inside each group of activity/persona/product (e.g. for sorting cards).

HuValue tool in design projects. This setting can give us the opportunity of learning from students to propose relevant usages for the tool.

2.1 Participants

The study was designed in the context of the first project of undergraduate design students (called “Project-1-Design”), running in the semester from February until June 2017. To achieve the goal of the study, we selected randomly two project themes, ‘Sleep’ and ‘IoT’ (out of 10 themes), with an equal number of project groups to use the tool during their whole design project (2 project themes \times 8 project groups \times 4 students = 64 first-year design students out of ca. 180 students). The participants were divided randomly into three categories (independent variable, IV):

1. *Trained Groups (TG)*: Six project groups received the tool, introduction in the tool’s usage during a special workshop, and also more guidance during the semester about how to use it in different design phases (in group meetings).
2. *Introduction Groups (IG)*: Six project groups received only the tool and introduction to its usage (in the workshop).
3. *Control Groups (CG)*: Four project groups without any support for human values were saved as control groups.

All 180 ‘Project-1-Design’ students were asked to select one out of ten project themes based on their interests. At the end of the semester, every project group delivered a poster and a final report. With a poster presentation they introduce their final design concept; in the final report, they described (a) their design process, (b) their design iterations, (c) their decisions, and (d) relevant arguments to justify their design decisions as occurred during the project.

2.2 Introduction Workshop

We conducted once a specially set-up workshop to introduce our HuValue tool to the selected six TG and six IG project groups. During this workshop, at least three out of four members of each project group were present, and all group members received a complete set of the toolkit. In this workshop, we introduced the HuValue toolkit and its components through a playful group activity. Furthermore, they followed a simple instruction to make their value-board (see Fig. 3 as a fictive example):

- 1- Rank the groups of values in their order of importance to you.
- 2- Find important values (between value words) for you.
- 3- Find important activities (between picture cards) for you.
- 4- Assign your important activities to groups of values.
- 5- Assign your values to your important activities.
- 6- Capture the result in a photo as your value-board.

This procedure can be applied by designers not only to define their personal values but also to discover the common values of the team and also other stakeholders. Via those activities with the toolkit, we guided students to think deeper about values and possible links to their daily life. In addition, they tried to use the tool for defining what is important for them and for understanding what is important for their groupmates. To conclude the activities, by pointing to their values-board as examples, we showed them how this visualisation could help them to reflect on their own value system and highlight their important values, to clarify their vision and goal and also to be sensitive about differences in values with others. Moreover, by mentioning some simple examples, we showed them how they could apply the tool to look at anything from different perspectives and analyse and evaluate them from a value point of view. For instance, in a design project it can be a person as a designer (to define her/his vision) or as a user (to identify her/his needs, wants and ideals), or an existing product or service (to know which value(s) will be supported/conflicted by using the selected product), or a situation and context of use (to clarify the design challenge and to define the design goal), or a design concept or an idea (to evaluate the concept). Finally, we briefly mentioned that the tool could also be used as a source of inspiration for generating ideas and criteria for evaluating them.

2.3 Group Meetings

The six TGs were guided step by step in group meetings to use the tool during their design process. As this study was conducted in the context of a first year bachelor design project in an engineering-focused university, we had to follow the pre-defined structure of the whole course: A design process was considered to have four phases: (1) ideation, (2) conceptualisation, (3) realisation, and (4) evaluation. Additionally, at the start of the semester, students had to formulate their vision and identity, as well as their learning goal in a personal development plan.

The main purpose of our group meetings was to guide and support students to apply the tool in their design process for specifying important human values in their design situation and designing for them. Four group meetings, 30 min per project group, were



Fig. 3. A concrete example of a value-board made by the first author of this paper

arranged over the semester. Since the students were familiar with the tool and possible applications for ideation phase, the first group meeting (Week 4) was allocated for analysing the design situation and context of use from a value point of view, using the Five W's [17]. During this meeting, we explained how they could apply the tool to look at their topic from different perspectives. The second meeting (Week 6) was about defining the design challenge from a value point of view, in which they were encouraged to highlight human values in their design story. The third group meeting (Week 7), which was just before mid-term demonstration day, was appointed for value specification. In that meeting, we asked them to clarify the link between their concept and the intended values from previous meetings. The fourth group meeting (Week 14) was about evaluating concepts from a value point of view.

During the group meetings, we mostly used the HuValue tool to show how the intended goals such as 'analysing design situation and context of use from a value point of view' are practically achievable. For each meeting, we have some relevant examples, which was fixed for all project groups and were not close to any of their project ideas. We used the toolkit to explain these examples, and then asked the students to follow the idea and use it for reflecting on their own projects. We did try to form the questions in their mind, but we did not provide answers for them since they were supposed to find their own ways. In each meeting, depending on the goal of that meeting, we mentioned some

possible ways of using the toolkit, for instance, visualizing “what is important in their design” with making a value-mood-board or a value-storyboard. For this, we suggested making new relevant picture cards of activities, products, and personas to their project or simply use the existing cards of the HuValue tool (see more in Table 1). Meanwhile, we used the toolkit components, including value wheel, value words and picture cards, and post-it notes during the meetings to facilitate the discussion.

According to the plan of ‘Project-1-Design’, after seventeen weeks of ideation, conceptualisation, realisation and validation, students were supposed to present their outcomes to the public and a week after they had to deliver their final reports. In these final reports they described their design process, and how the iterations contributed to their end results. After collecting students’ final reports, we read and analysed their reports to find out whether they applied the tool in their project. If this was the case, we tried to find out in which phase and for what purpose the tool was used. Furthermore, we tried to understand how the tool was utilized. For this purpose, we semi-automatically searched the reports of all TG, IG, and CG groups via search option with the keywords of ‘human values’, ‘value tool’, ‘value workshop’, and also with any of our 45 value items.

3 Results

According to our search results in the final reports of participants, nine out of 16 groups mentioned using human values in their design process: six TGs (=100%), two IGs (=33%), and one CG (=25%); six of them reported to use the HuValue tool in their design process (the tool was mentioned in the text and/or shown in photos) and three of them used the HuValue perspective in their design process (the workshop and/or the workshop leader’s name, as well as “values”, were mentioned in the reports). Seven other groups did not mention human values in their report; five of them used value words unclearly (without identifying those words as values). Two other groups did not mention anything about values at all.

To know how students used human values in their design process, we went to relevant parts in the reports, which mentioned human values, and highlighted their purpose of usage. These usages can be labelled as ‘Defining design goal’, ‘Choosing final idea’, ‘Searching for what is important for the design and make a list of values’, ‘Discovering common value(s) of the group’, ‘Developing the concept to cover the intended values’, ‘Being inspired by value words or related activities/ products/ personas’, ‘Presenting intended values in a mood board’, and ‘Using intended values for user test’. We analysed this information based on the design phases, as such (0) Vision, (1) Ideation, (2) Conceptualization, and (4) Validation. Realisation phase (3) is excluded, since no value use were reported in this phase at all.

3.1 Vision

As a result, ‘Defining design goal’ was the most popular purpose of using human values during their design process. Seven groups reported defining their design goals based on values:

Table 1. Four group meetings were arranged over the semester to support project groups in TG with step by step training how to apply the tool in different parts of their project.

Description
<p>Meeting 1 Goal: Analyse design situation and context of use from value point of view Context: Week 4 - Project-1-Design Content: They received some general information about analysing the design situation with the Five W's questions and specifically, how each question can be answered from a value point of view. So, we asked them to make some examples of common and relevant activities or behaviours of their target group in the situation as keywords, and also some examples of existing products in that context. (Those examples can be picture cards, or simply, photos or even drawings and texts on post-its.) We used the examples to facilitate the discussion and to review how different values and groups of values play a role in their design situation. Tool application: We presented how to use the tool to find relevant values for anything including the keywords and examples.</p>
<p>Meeting 2 Goal: Define the design challenge from a value point of view. Context: Week 6 - Project-1-Design Content: They received some general information about how to use the answers of the Five W's questions to tell a story about their design and how to define their design challenge in a brief question. We stressed on "WHY" question. In addition, we asked them to make a list of important values in their design: - Find important values for: the target group (generally) the target group (specifically in the context of use) the context of use the problem/challenge the solution(s) the design goal - Find relevant examples for those values. - Find relations between those values. Tool application: We used the tool to find relevant values for their answers to the Five W's questions. We showed them how to use the tool for interviewing the user. We used picture cards as examples to show how to find relevant examples of the intended values and how to make this link clear and understandable.</p>
<p>Meeting 3 Goal: Value specification Context: Week 7 - Project-1-Design Content: They received some general advice for presenting their concept and specifically about how and where to show the important values for their design during the mid-term demonstration day. In addition, we checked together what they made based on last discussions and how to improve them. For instance, we suggested making a value-mood-board or a value-story-board for visualizing "what is important in their design". Tool application: We used the tool to make some examples of specifying values in their presentation.</p>
<p>Meeting 4 Goal: Evaluate the concept from a value point of view Context: Week 14- Project-1-Design Content: After reviewing relevant values for their design, they received some guidance about how to use the values for evaluating their concept in validation phase and discussed how to specify abstract values and criteria in more clear and understandable statements. Tool application: We showed them how to use the tool as a questionnaire to review which human values can be supported by their concept. We mentioned that this could be done by themselves or the user.</p>

"Based on a workshop we had on values, we defined the values of TU/e students. We used our own knowledge to do this. We found that the most important values were

creativity, pleasure, self-discipline, intelligence, success, ambition. Apart from these, TU/e students also value freedom, helpful, self-awareness, environment, security, varied life and independent.” (Final report, project group IoT.3, IG)

“From our personal wishes, we focused on what our stakeholders; students in LaPlace find important regarding sociality in the study space. These values, which were checked in evaluation, made us state our final project goal. The important values within our project are personal development and pleasure. We want our users to focus finding seats on their social environment preference and to stimulate playful interaction with the ceiling. Our project goal is to design a study space that communicates with its user to stimulate personal development and pleasure.” (Final report, project group IoT.5, TG)

“[...] the concept is in line with important values, the device will be enjoyable to use, improve the working environment of students, be sustainable and be respectful to all users that interact with it.” (Final report, project group IoT.4, TG)

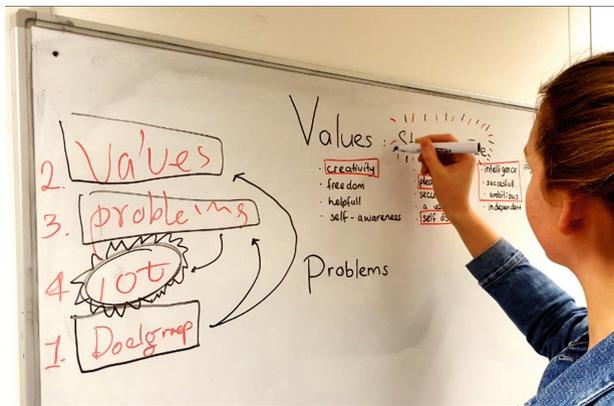


Fig. 4. Defining design goal (Image is adopted from final report, IoT.3, IG)

Regarding this purpose, one project group expressed defining their design goal by focusing on user’s needs and wants and linking them to values (see Fig. 4):

“We did not want to focus on making large changes in people’s lifestyles, because we think that new designs should not interfere with one’s ordinary life too much, and instead improve their lifestyle. Therefore, we focused more on the human values, because those influence the user experience and whether a person would use it. Paying attention to human values would help our product to be more personal and accessible for everybody.” (Final report, project group Sleep.5, TG)

Also, three project groups reported that they discovered common values for the team, however, each in their own way, such as by ranking value words individually and then compared (see Fig. 6):

“To get to know each other better and to get a clear image of our joined vision, we used the value cards we got during the human value workshop. We divided the value cards among our team. By ranking these value cards, we could see what value was especially important for whom. We calculated the points each value got from each team member and made a joint value ranking for the whole team. We found out that personal development was a value we had in common, carefulness was a close second. We discovered that our least important value was meaningfulness. The overall score of all 5 first values did not vary a lot. In conclusion, we have a lot of different values in our team. This is something to keep in mind during our design process.” (Final report, project group Sleep.1, TG)

Or by making a group Value-board (see Fig. 5):

“With the technique that we learned at the workshop we had from [author], we first started thinking about what our vision was for this project and what our values were. By placing pictures and words on a circle we found that pleasure, respect for others and self-development were important to us and therefore we wanted to include that in our design. [...] When doing the human value test [Fig. 5], we found out that we ourselves find self-development and pleasure very important. In addition, we want to stimulate the students in divergent thinking, this is one of the few external ways to influence creativity of humankind 2. In conclusion, we want to inspire them and stimulate their creativity.” (Final report, project group IoT.2, IG)

Or by finding important values and then clustering and ranking them (see Fig. 6):

“To start getting our minds on the same track, we explored values. What do we find important? What do we find interesting? Where do we want to work on? Do we find the same things interesting? Can we convince each other? How can we work together? Then, we clustered all the values that are related to either efficiency, business, user, innovation, design or environment together. For example, “sustainable”, “eco-friendly” and “not harmful for the environment” are all in the group “environment”. Next step was to rank the group to importance with numbers from 1 to 6. With 6 the least important and 1 the most important. These values will be used for the QOC later on. After doing this, we started brainstorming again. With a better understanding of our common values and goals we could now focus on generating ideas. [...] We agreed to overwork our values in another way. We made a collective of all values, piled them up and drew a round target on the table. Important values get placed in the bull’s eye and the importance decreases the further away they are. We realized the importance of this exercise and repeated it when all members of the group were present. It showed the diverse viewpoints of the members and their personal view on where to go with our project. Not that our previous work was less valuable, but it could have been more effective. Of course, new ideas came up during these exercises, which were more of an unstructured collection of thoughts [...] This exercise of ranking values was therefore useful in a way that we now knew what area interested our team the most so we could now focus on that.” (Final report, project group IoT.6, TG)

or target groups that had to do with sleeping and with what you could see on the card. We ended up with 18 ideas for target groups, products and design areas. We invented the idea of brainstorming this way for ourselves. We used the cards we got during the human value workshop from [author].” (Final report, project group Sleep.1, TG)



Fig. 7. Inspiration by value words or related activities/ products/personas (Image is adopted from final report, IoT.2, IG)

One project group of CG, who was supposed to have no access to the tool, received the tool from their friends in TG and used it. Although in an interview they mentioned that they did not have any information about the tool or its function and possible application(s) in design, they used the picture cards as inspiration in the ideation phase:

“We used a couple of different methods for brainstorming: [...] Cards with images [...]. We used this method to look into different users, situations and places. We borrowed these cards from another group at our coach meeting. Each card had a picture printed on it. These pictures could be of anything, they did not have a specific theme. For each card we tried to identify a user-group, for example celebrities, people who suffer depression, taxi drivers and stewardesses. We also tried to identify in what places (for example at work) their sleeping problems might occur and what the problems are. This method helped us a lot with the idea generating, because we had a clearer overview of possible users and problems.” (Final report, project group Sleep.2, CG)

Another project group mentioned they started ideation from values:

“As a designer it is important to focus on the human values of your design. Therefore we, at the end of each cycle, reflected on the design specifically focusing on human values. For this part we received help from [author] who was doing her PhD about this subject.” (Final report, project group IoT.6, TG)

“Implementing values as a way to brainstorm: After deciding the target group and defining IoT we started an individual brainstorm. In this matrix we used what we learned about values during the workshop of [author] to rate the ideas partly on our visions and values. [...] We started the ideation by each brainstorming to acquire at least 25 ideas per person. We categorized these ideas to see in which areas our interest was. We used these categories to selectively broaden our idea field. Since the use of values worked out very good in the pressure-cooker, we used this again to brainstorm, together with the goals we had set for this project. (Final report, project group IoT.3, IG)

3.3 Conceptualization

Four project groups mentioned searching for what is important for their design and making a list of values (see Fig. 9), for instance:

“[...] we did research about the human values of our target group. [...] An overview of our research is in the picture [Fig. 8].” (Final report, project group Sleep.1, TG)



Fig. 9. Making a list of values (Image is adopted from Final report, Sleep.1, TG)

“We found important values for different categories. To start we looked for important values for the target group. This could be divided into two categories itself: generally and via a questionnaire. Also we thought of important values for the context of use. Furthermore we found values for the problem/challenge and what

the most important in the ideation phase. Also the four compartments of BinK instead of the two compartments right now in LaPlace and the fact that BinK eventually will be programmed to be respectful to the users will cover the other values, respectively sustainability and respect.” (Final report, project group IoT.4, TG)



Fig. 11. Developing the concept to cover the intended values (Image is adopted from final report, IoT.6, TG)

“By using pictures and cards we found the human values and designs related to our concept ‘SEE’, and used them to develop the concept.” (Final report, project group IoT.6, TG)

“Now that we have our idea, the Fixcloud, it is time to turn this idea into a concept. This means that we have to elaborate the idea by asking questions like ‘What is the purpose of our design?’ [...] The meetings with [author] helped us answering these questions and made us also look at the human values our design supports. [...] During the meetings with [author] we looked at the human values our design contained. We assigned the values to categories for which certain values are important or applicable. We first looked at the values that are important for our target group. [...] Then we looked what values the context of our design contains (working in the study spaces). [...] At last we looked at the values that are connected with the design goal. [...] The relation between those values is: taking the values respect for others, justice and personal development into account, you create a study environment that is nice to work in. This stimulates the personal development and makes studying in this environment a nice experience which stimulates the value pleasure. This supports our design goal. Ultimately we looked at how these values play role in our design. We want to achieve this by [...]” (Final report, project group IoT.5, TG)

3.4 Validation

One project group used their intended values for evaluation by user testing:

“The statements [of the questionnaire] were based on our design goal and human values. Before validating, we made sure we had the right values for our concept. Values that we find important for our users. We would then test if these values are important for them as well, in the first part of the test. We divided all our discussed values into a target group general value-set which centers the values for the entire target group and then we have a value-set for the target group in context of use. This guided the statements for user evaluation 2. This evaluation exists of three parts. In total we tested 11 students. 0% on the sliders means that the user could not identify his or her-self with that statement, and 100% means that it totally suited the user’s perception. [...]” (Final report, project group IoT.5, TG)

All in all, a general look at the results indicates that using human values was with ten groups most reported in conceptualisation (=83%). Both ideation and defining vision with nine groups stand in second place (=75%), and validation with five groups is third (=42%). None of the groups used value words in the realisation phase.

4 Discussion

As our results show, nine out of 16 project groups reported using the tool during their design for different purposes; all six groups of TG, who were present in the workshop and received guidance for using the tool in the group meetings; two introduction groups (IG), who were present in the workshop but not in the latter group meetings; and one group of CG, who was supposed to do not have access to the toolkit. In fact, although they mostly preferred to follow their own personal and creative way, they still used the toolkit for the same purposes as we discussed during the workshop and group meetings. We proposed using the toolkit to generate valuable and creative ideas, and to analyse and value anything, such as a person, an object, even an activity or a context, from a value point of view.

We emphasise on - before making any decision - defining design challenge clearly with considering human values. For this, the designer is supposed to start from analysis phase to define vision and design goal and to identify the user and the context of use from a value perspective. Our suggestion for facilitating this is a technique of using our toolkit with the value wheel and the cards, which can be applied for different purposes. For instance, for defining the vision, the designer should consider him/herself in the centre of the value wheel and visualize his/her important values, as mentioned in Sect. 2.2 above. Afterwards, the designer is supposed to consider this visualisation as her/his value-board and conclude it with answering “What is important for me?”, “Why I am doing this design?” and “What do I want to achieve?”. Furthermore, s/he can link her/his vision to design goal and ask “What is the goal of design?” and “Why a new design is needed?”. The designer also can use the same technique for identifying the user. For this, s/he is supposed to moderate a meeting with some people from the target group, ask them to make their own value-boards, and discuss “What is important for them in

life?”, “What are their needs, wants and dreams?” and “What are their values and anti-values?” In continue, these general questions can be specified about the context of use from the user view and clarify “How do they see the current situation?”, “What is right and what is wrong there?”, “What is important for them in that context?”, and “What is an ideal situation for them?” In this meeting, the value-wheel is supposed to be a ground for discussing and making relevant examples, and the value words and the picture cards could be helpful for this sake. In addition, we suggested that designer could prepare more relevant cards to their topic and put them between the picture cards. To summarise the collected information, we suggest visualising the results in a mood-board or story-board. Also, the designer is asked to make a list of requirements including important human values as guidance for the design phase and as criteria for the evaluation part. By this, we mean to specify important human value not only for the designer but also for the user and the context of use.

We also suggest some creativity techniques with human values to diverge ideas. “Value-based mind mapping”, “Random value” and “Value-based participatory” are simple techniques to generate ideas around human values. For instance, in “Value-based mind mapping” shared values can be starting points for ideation: we suggest designer starts with marking relevant values for the project’s designer, employer, end user, and other stakeholders in different colours. Then, they were supposed to find shared and different values between those groups. In next step, designer is asked to put their challenge in the middle of the framework and start doing mind-map with human values. For this, they were asked to pick one of the shared values and find an example for that in daily life. S/he is supposed to imagine him/herself as a person who cares a lot about that value, try to link the value to the goal of the project and find a solution. S/he is asked to write or draw their idea on the mind-map as a new branch for that value and try to grow the map like a tree. Designer is supposed to ask him/herself “how to motivate people with this value to use my design?” and/or “How to help people to reach this value as their goal?” In “Random value”, the designer is supposed to pick a value word at random, create associations between the random value and her/his design challenge, and use the associations to find new ideas. The idea in “Value-based participatory” is to co-design with two or more persons from the target group and do ideation together around human values. We also suggest that after generating enough ideas, they can cluster them in terms of values. By this, they can focus more on relevant ideas to their vision and design goal, and develop them with combining ideas even from less important groups. For selecting the final idea, we suggest using “Decision matrix”, in which the list of requirements including important human values considered as criteria. In this phase, the main application of the tool components is inspiring discussions and idea generations.

For evaluating any object such as a design concept or product, the tool can function the same. For instance, the designer can put the final concept or its picture in the centre of the wheel, ask the user(s) to rate the relevance of value groups to the concept, and then open a discussion to understand “What is the main value of this design from user’s view?”, “Which value(s) would become stronger with using this concept?” and “Which value(s) would become weaker?”. This co-evaluation meeting(s) can help the designer to know whether the design covers the requirements and goals, or not. The same approach

can be applied to an existing product in the market to assess and understand the current trends.

Studying the reported usages by students indicated that not only the HuValue tool but also its value point of view can be applied in a design process. This means after knowing the tool and its perspective, designer can apply the view, even without using the toolkit, in different design phases. Widening designers' views in terms of human values and facilitating using this concept in a design process can be helpful for enriching their design concepts with human values. The results of the whole experimental study with design students is published in another article [15]. There we provide empirical evidence that the project groups who were supported with the HuValue toolkit addressed *significantly* stronger human values in their design concepts compared to the control groups.

5 Conclusion

Our HuValue toolkit, consisting of the value wheel and the cards, provides tangible materials to investigate everything from a human value perspective. Due to the flexibility of our components, this function can be fulfilled in many ways and for many purposes. Based on our empirical results, we suggest several possible usages of our tool in a design process as informative examples. These usages are as follows: for defining vision, guiding during ideation, support focus in conceptualisation, and provide criteria in validation. Usage of our tool helps in uncovering the human values of designers behind their needs, goals, motivations and actions in a design process. In this respect, we applied well-known design techniques, and added the important but often neglected *value point of view* to them. In other words, although our comprehensive framework of human values is borrowed from philosophy and social sciences, by revealing the place of our framework in every design discussion, our tool introduces and represents human values as substantiated terms in design, not only as a moral and ethical concern, but also as an essential aspect of design discussions and practice.

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